

THE YORKSHIRE TYPE AMMONITES AND NAUTILOIDS OF YOUNG AND BIRD, PHILLIPS, AND MARTIN SIMPSON

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ABSTRACT. The work of figuring and interpreting the Yorkshire Mesozoic ammonite species of Young and Bird, Phillips, and Martin Simpson started by Buckman in his well-known *Yorkshire Type Ammonites* is completed and critically revised. In addition to the Jurassic ammonites dealt with by Buckman, the nautiloids and Cretaceous ammonites are also figured and interpreted, as well as the remaining Jurassic ammonites. The type specimens of 38 species are figured, many of them for the first time. Of the 225 specific names proposed by the four Yorkshire authors, 188 can now be interpreted from figured type specimens, and out of the 37 remaining, 27 have no type specimens and cannot be interpreted with sufficient accuracy to be of use or to be put in synonymy. It is emphasized that all the specific names are valid according to the Rules of Nomenclature from the date of their original proposal, and the authenticity of their type specimens is established in each case.

INTRODUCTION

'In the early days of Geology four authorities dealt with the Jurassic fossils of Yorkshire: Young & Bird, John Phillips, and Martin Simpson. They named a large number of species, but their task was inadequately performed: Young & Bird described their species very shortly, giving poor figures of a portion only; Phillips issued mere sketches, and gave no descriptions; while Simpson furnished good descriptions, but gave no figures.

'Phillips' types are lost, stolen in London from a coaching inn: perhaps they lie at the bottom of the Thames. However, the majority of the types of Young & Bird, and of Simpson, are contained in Whitby Museum, with which Young, Bird, and Simpson were connected; the specimens are, for the most part, readily identifiable from the Museum registers, as well as from other indications. They form a fine collection: there will be, perhaps, 150 or more species; and in regard to the majority of them, authors, both British and foreign, have failed to interpret the Yorkshire writers correctly, which is not surprising.' (Buckman 1909, p. iii.)

THESE paragraphs stand at the opening of Buckman's *Yorkshire Type Ammonites* (1909-19) and its continuation *Type Ammonites* (1919-30). In this well-known work Buckman figured the primary type specimens of 136 of Young and Bird's, Phillips's, and Simpson's species of Yorkshire Jurassic ammonites, and this is generally considered to be one of his greatest contributions to factual palaeontology. In all, 225 new specific names were created for Yorkshire ammonites and nautiloids in the eight works of Young and Bird (1822; 1828), Phillips (1829; 1835; 1875) and Simpson (1843; 1855; 1884), comprising 201 Jurassic ammonites, 17 Cretaceous ammonites, and 7 Jurassic nautiloids. In this paper an attempt is made to complete the accurate interpretation of these early Yorkshire species by figuring all the remaining type specimens still in existence. In fact, the primary type specimens and neotypes of a further 38 species are figured here; these include some of the Cretaceous ammonites and nautiloids as well, for, although Buckman was concerned only with the Jurassic ammonites, it will enable the holotypes of the type species of two Cretaceous genera to be figured photographically for the first time.

[Palaeontology, Vol. 5, Part 1, 1962, pp. 93-136, pls. 13-19.]

Out of the total of 225 species, 37 now remain uninterpretable from any sort of type specimen, but from their original descriptions 10 of these are specifically determinable or are synonyms of other well-defined species, so that only 27 specific names remain finally unusable. The importance of these early specific names may be judged from the fact that 28 of the 225 species have been made type species of genera, and 20 of these are now considered worthy of generic or subgeneric status, while the remaining 8 are synonyms of other genera.

Although Buckman specifically warned against it in his introduction to *Yorkshire Type Ammonites* (1909, p. iii), Simpson's species are still summarily dismissed or wrongly attributed by some authors. Spath (1925, pp. 112, 140) dismissed three of Simpson's unfigured species with 'These *nomina nuda* ought to be ignored', and again, 'These, however, are *nomina nuda*, and quite unrecognizable from the descriptions'. In the same paper Spath frequently attributed Simpson's species to '(Simpson) S. Buckman sp.'. Arkell (1957, pp. L240, 243, 256, 258, &c.) in a recent work has used the wrong author attribution 'Simpson in Buckman', referring to figures in *Yorkshire Type Ammonites*. Donovan (1958, pp. 47, 48) has attributed some of Simpson's species to 'Buckman, ex. Simpson', and in addition he has cast doubts on the authenticity of some of the types figured by Buckman with the statement 'supposed type figured' when citing the figured holotypes of three well-known Upper Lias species of Young and Bird and Simpson.

It must be emphasized that none of the species of Young and Bird, Phillips, and Simpson are *nomina nuda*, and all of them, originally figured or unfigured, are valid according to the Rules of Nomenclature. There is no reason to single out these Yorkshire species for treatment different to that given to the ammonite species erected by such authors as Bruguière, Lamarck, de Montfort, Reinecke, Schlotheim, and Zieten. The species of the latter authors are universally accepted, but their original descriptions were no better than those of Simpson, and some were much more general and less specific; the figures which illustrate a few of their species are no better than the best of Young and Bird's figures, and those of some well-known species, such as *Amaltheus margaritatus* de Montfort, are much poorer. Even some of the Sowerbys's species are no better described and figured than the best of Young and Bird's and Phillips's species. It cannot be held that the Yorkshire species should lapse through long disuse, for they were well known to later British workers such as Tate and Blake (1876) and Wright (1878-86), even though they were mostly incorrectly interpreted by them according to modern ideas. D'Orbigny, Quenstedt, and Reynès were no more accurate in their interpretations of the species of early continental workers. There is, therefore, no reason to ignore or to change the authorship or priority of any of the Yorkshire species, until it can be shown that no satisfactory type specimen can be obtained. It is unfortunate that very few, if any, of the species of these Yorkshire and continental authors could be satisfactorily understood until their type specimens were figured. Some of the species still remain to be properly interpreted by means of a figured type specimen, and this paper is an attempt to provide interpretations of as many of the Yorkshire species as is now possible.

The question of the authenticity of the type specimens is concerned with those preserved at Whitby Museum. During the time that Simpson was curator of Whitby Museum he prepared a manuscript 'Catalogue of the Contents of the Whitby Museum

(referred to later in this paper as Simpson's Catalogue), in which all the specimens were listed and identified under register numbers. In the descriptions of Simpson's new species a statement of the size of the specimen described (the holotype) is often given, and sometimes there are remarks relating to details of its preservation. In almost every case this holotype can be readily recognized from amongst the specimens identified with that species in Simpson's Catalogue. Where doubts exist, or when the original description is too general, all the specimens which Simpson used to draw up the description are considered syntypes, and appropriate designations are made. In some cases the only specimen remaining is clearly not the holotype, but is a paratype, or even a later topotype, and this is stated in the descriptions below. Young and Bird's descriptions and figures are in general less accurate and detailed, but where precise details do occur the specimen can usually be recognized from the identifications in Simpson's Catalogue. The author is satisfied that where a specimen is claimed to be a primary type in the present paper, its authenticity is beyond reasonable doubt.

Young and Bird's type specimens were all at Whitby Museum, except for a few in the Bean Collection which were transferred to York Museum, where some are still preserved (Melmore 1947, pp. 235-6). The whereabouts of Phillips's figured specimens are listed in his plate explanations (1835, pp. 177-84; 1875, p. 321). Many can still be found at the museums indicated, but those in Phillips's own collection are known to be lost, those in Bean's collection went to York Museum with one exception, and those in the Williamson Collection went to Scarborough Museum, where only a few now remain. Simpson's types were all at Whitby Museum, except when stated otherwise in his descriptions, and most of the types not at Whitby have now been traced.

In the list of the species presented here substitution of the preoccupied names has not been attempted, for this is best left until a revision of the group concerned is undertaken. Specific relationships and synonymies are only given in those cases of which the author has special knowledge, or where the relationships are quite clear.

Dimensions of the type specimens are given as follows: diameter: whorl height, whorl breadth (thickness), width of umbilicus. The whorl height is measured from the umbilical seam or umbilical edge to the mid-ventral line. All the figures are in millimetres, and this notation is not the same as in Buckman's *Type Ammonites*, where the latter three figures are expressed as percentages of the diameter.

The following abbreviations are used:

WM	Whitby Museum.
YM	York Museum.
BM	British Museum (Natural History).
GSM	Geological Survey Museum, London.
SM	Sedgwick Museum, Cambridge.

The discovery of the type specimens figured here has entailed a good deal of searching through collections at various museums, and the author is indebted to the following authorities and curators in charge of collections for freely offering facilities to search collections under their charge, for answering inquiries, and for the loan of type specimens: Dr. J. E. Hemingway; Miss D. M. Walker at Whitby Museum; Mr. G. F. Willmot at York Museum; Mr. R. V. Melville at the Geological Survey; Mr. A. G. Brighton at the Sedgwick Museum; Mr. G. G. Watson at Scarborough Museum; Dr. J. Weir; Mr. R. W. Flett and Dr. G. E. Bowes at the Royal College of Science and Technology, Glasgow; Miss B. Green at Castle Museum, Norwich; Miss S. M. Davis at Saffron Walden Museum.

NAUTILOID SPECIES

Family NAUTILIDAE d'Orbigny 1840

Genus CENOCERAS Hyatt 1883

1. *Cenoceras annulare* (Phillips)

Plate 13, figs. 2a, b

Nautilus annularis Phillips 1829, p. 163, pl. 12, fig. 18; 1835, p. 134, pl. 12, fig. 18; 1875, p. 263, pl. 12, fig. 18.

Holotype. WM 62; Lower Lias, Robin Hood's Bay. Dimensions: 66.5 mm.: 34.8, —, 11.9.

Phillips stated (1829, p. 163) that his type was in Whitby Museum, and the specimen now figured is clearly the original of his drawing. Where the shell is preserved it has ribs on the side of the whorl which are sharp near the umbilical edge, slope strongly backwards on the side of the whorl, and flatten out and fade before reaching the venter. These ribs do not occur on the internal cast. There are also fine reticulate striae on the outside surface of the shell. The suture-lines are almost straight.

2. *Cenoceras heterogeneum* (Simpson)

Plate 13, figs. 1a-c

Nautilus heterogeneus Simpson 1855, p. 33; 1884, p. 60.

Holotype. WM 442, probably from the Lower Lias. The locality is not known. Dimensions: 51.5 mm.: 27.0, 32.2, 11.7.

The holotype is wholly septate and has shell preserved only on a small part at the beginning of the outer whorl. Faint intersecting longitudinal and transverse striae can be seen as described by Simpson, the transverse striae bending away from the aperture in crossing the venter. The tubercles, also described by Simpson, are small projections on the inside surface of the dorsal part of the next outer whorl, and they are not part of the shell of the whorls now preserved. The second 'siphuncle' is at the mid-dorsal margin of the septa and is a small posterior projection in the septal surface; projections of adjacent septa are not connected. This character is known in many other forms and it was made the basis of the genus *Bisiphytes* Montfort 1808, but this genus is now held to be synonymous with *Cenoceras* Hyatt 1883 (see Kummel 1956, pp. 364-6).

3. *Cenoceras undulatum* (Young and Bird, *non* Sowerby)

Nautilus undulatus Young and Bird 1828, p. 272 (*non* J. Sowerby 1813).

Holotype. WM 62, also the holotype of *Cenoceras annulare* (Phillips), described and figured above (see Simpson 1855, pp. 33-34; 1884, pp. 59-60).

4. *Cenoceras astacoides* (Young and Bird)

Plate 13, figs. 3a, b; Plate 14, fig. 1

Nautilus pompilius Young and Bird 1822, p. 254, pl. 13, fig. 2 (*non* Linné).

Nautilus astacoides Young and Bird 1828, p. 270, pl. 13, fig. 2.

EXPLANATION OF PLATE 13

Figs. 1a-c. *Cenoceras heterogeneum* (Simpson). *Holotype*, WM 442. Probably Lower Lias; north Yorkshire coast.

Figs. 2a, b. *Cenoceras annulare* (Phillips). *Holotype*, WM 62. Lower Lias; Robin Hood's Bay.

Figs. 3a, b. *Cenoceras astacoides* (Young and Bird). Paratype (? *holotype*), WM 61. Upper Lias, Alum Shales; foreshore east of Whitby. $\times 0.35$. For apertural view see Plate 14, fig. 1.

All figures natural size, except figs. 3a, b.

Type. The paratype or holotype is WM 61, from the Alum Shale, Bifrons Zone, on the foreshore east of Whitby. Dimensions: 282 mm.: 175, 171, —. This is the 11 inch by 8 inch specimen described by Young and Bird in 1828 (p. 270), but it is not certain that it is the specimen figured in their Plate 13, fig. 2, which has a smooth septal surface at the aperture.

The specimen is wholly septate, a septum occurring just before the aperture, and the suture lines are almost straight. Fragments of shell are preserved in a few places and these show well-developed longitudinal striae.

5. *Nautilus reticularis* Simpson, *non* Deshayes, *non* Hauer

Nautilus reticularis Simpson 1884, p. 59 (*non* Deshayes 1827, *non* Hauer 1846).

The holotype of this Upper Lias ? *Cenoceras* is lost, and the species is not now interpretable.

6. *Nautilus youngi* Simpson

Nautilus astacoides Simpson 1855, p. 33 (*non* Young and Bird 1828).

Nautilus youngi Simpson 1884, p. 59.

The holotype is lost, and the species cannot now be interpreted.

7. *Nautilus maltonensis* Young and Bird

Nautilus maltonensis Young and Bird 1828, p. 271.

The holotype, probably a *Paracenoceras* from the Malton Oolite, is lost, and the species cannot be identified from the description alone.

LIASSIC AMMONITE SPECIES

Family PHYLLOCERATIDAE Zittel 1884

Genus PHYLLOCERAS Suess 1865

8. *Phylloceras easingtonense* (Simpson)

Plate 17, figs. 1, 2

Ammonites easingtonensis Simpson 1855, p. 35; 1884, p. 63.

Types. The large slab described by Simpson, containing about eighty well-preserved *Harpoceras exaratum* (Young and Bird), several *Harpoceras* sp. nov., and the holotype and paratype of the present species is in the collection of the Royal College of Science and Technology, Glasgow. It is from the Jet Rock at Boulby. The holotype is 121 mm. diameter and the paratype 34 mm.

The spiral line on the side of the whorl, described by Simpson, is seen well on both types, and on the paratype there are several other vague spiral lines. The whorl shape and characters of the radial striae are seen very well on the figures (Plate 17, figs. 1, 2). On the paratype about half a whorl before the aperture every seventh stria is slightly raised and enlarged. Amongst a large collection of *Phylloceras heterophyllum* (J. Sowerby) from the Yorkshire Jet Rock Series and Alum Shale Series spiral ridges are irregularly developed at varying positions on the side of the whorl, and even, in a few specimens, at different positions on opposite sides of the same whorl. These are not a specific character, and as the present specimens do not differ otherwise from typical *P. heterophyllum*, *P. easingtonense* is to be considered a synonym of that species.

9. *Phylloceras whitbiense* (Young and Bird)

Nautilus whitbiensis Young and Bird 1822, p. 254, pl. 13, fig. 1; 1828, p. 270, pl. 13, fig. 1.

The holotype figured by Young and Bird was 16 inches diameter, and it was lost when Buckman made inquiries at Whitby Museum in 1922. From the description and figure there can be no doubt that the specimen was a large example of *Phylloceras heterophyllum* (J. Sowerby 1820).

Genus CALLIPHYLLOCERAS Spath 1927

10. *Calliphylloceras fabricatum* (Simpson)

Ammonites fabricatus Simpson 1855, p. 37; 1884, p. 65.

Holotype. WM 469, figured by Buckman (1911, pl. 34).

Family JURAPHYLLITIDAE Arkell 1950

Genus TRAGOPHYLLOCERAS Hyatt 1900

11. *Tragophylloceras ambiguum* (Simpson)

Ammonites ambiguus Simpson 1843, p. 8; 1855, p. 36; 1884, p. 64.

Holotype. WM 89, figured by Buckman (1910, pl. 16); Robin Hood's Bay.

12. *Tragophylloceras huntoni* (Simpson)

Ammonites huntoni Simpson 1843, p. 41; 1855, p. 83; 1884, p. 119.

Type. WM 477 was figured by Buckman (1921, pl. 219) as the holotype, but Simpson said that his specimen was 0.6 inches diameter, whereas WM 477 is 0.4 inches. This species is listed only as No. 477 in Simpson's Catalogue, and therefore the specimen figured is either a paratype, or Simpson's diameter is wrong and it is the holotype.

13. *Tragophylloceras? nanum* (Simpson)

Ammonites nanus Simpson 1855, p. 38; 1884, p. 66.

Holotype. WM 472, figured by Buckman (1926, pl. 679).

14. *Tragophylloceras robinsoni* (Simpson)

Ammonites robinsoni Simpson 1843, p. 42; 1855, p. 83; 1884, p. 120.

Paratype. WM 478, figured by Buckman (1921, pl. 220), from Robin Hood's Bay, is a paratype and probably not the holotype, for it differs in size from Simpson's description. In Simpson's Catalogue WM 236 is also listed as this species, and this specimen, now lost, was probably the holotype.

Family LYTOCERATIDAE Neumayr 1875

Genus LYTOCERAS Suess 1865

15. *Lytoceras cornucopia* (Young and Bird)

Ammonites cornucopia Young and Bird 1822, p. 252, pl. 12, fig. 16; 1828, p. 255, pl. 12, fig. 16

Holotype. WM 82, figured by Buckman (1923, pl. 391A); Upper Lias, Bifrons and Variabilis Zones.

Genus TRACHYLYTOCERAS Buckman 1913

16. *Trachylitoceras balteatum* (Phillips)

Ammonites balteatus Phillips 1829, p. 163, pl. 12, fig. 17; 1835, p. 135, pl. 12, fig. 17; 1875, p. 270, pl. 12, fig. 17.

Holotype. Phillips (1835, p. 183) said that his figured specimen was in Whitby Museum. It is clear that the specimen which Phillips used for his drawing is WM 2547, the primary type of *T. nitidum* (Young and Bird), which was figured by Buckman (1913, pl. 86). The ribs on Phillips's drawing are diagrammatic, but the drawing can only be of a Lytoceratid, and the swollen rounded ribs of the sort figured

do not occur in that family, nor in any other Upper Lias ammonite. The rib spacing and direction and all other features of the drawing agree with WM 2547, so there can be no doubt that the specimen is the holotype.

Objective synonym of *Trachyltoceras nitidum* (Young and Bird).

17. *Trachyltoceras fasciatum* (Simpson, non Quenstedt)

Ammonites fasciatus Simpson 1855, p. 41; 1884, p. 70 (non Quenstedt 1848).

Holotype. WM 91, figured by Buckman (1913, pl. 87); Jet Rock, Hawsker Bottoms. This is probably a synonym of *T. nitidum* (Young and Bird).

18. *Trachyltoceras nitidum* (Young and Bird).

Ammonites nitidus Young and Bird 1828, p. 256.

Type. WM 2547 was figured as holotype by Buckman (1913, pl. 86). In Simpson's Catalogue both WM 93 and 2547 are listed at this species. The former is now lost. Although it cannot be determined whether WM 2547 is the holotype, a paratype, or a syntype, it is the type specimen from which the species must now be identified. See also No. 16 above.

Type species of *Trachyltoceras*.

Genus PACHYLYTOCERAS Buckman 1905

19. *Pachyltoceras gubernator* (Simpson)

Ammonites gubernator Simpson 1843, p. 17; 1855, p. 40; 1884, p. 68.

Holotype. WM 69, figured by Buckman (1913, pl. 70); Peak, Ravenscar.

20. *Pachyltoceras? peregrinum* (Simpson)

Ammonites peregrinus Simpson 1855, p. 36; 1884, p. 64.

Holotype. WM 71, figured by Buckman (1913, pl. 88).

Family PSILOCERATIDAE Hyatt 1867

Genus PSILOCERAS Hyatt 1867

21. *Psiloceras erugatum* (Phillips)

Plate 14, figs. 2a, b

Ammonites erugatus Phillips 1829, p. 163, pl. 13, fig. 13; 1835, p. 135, pl. 13, fig. 13; 1875, p. 270, pl. 13, fig. 13.

Holotype. BM 37982, Bean Collection, is accompanied by the following label in Bean's handwriting: 'Ammonites erugatus Bean—Upper Lias. Marked and figd. by Phillips.' Phillips's specific name was a manuscript name of Bean, and Phillips stated (1835, p. 184) that his figured holotype was in Bean's collection; therefore there can be no doubt that BM 37982 is the holotype. Its locality is not recorded. WM 100, figured as the holotype by Buckman (1921, pl. 223), does not bear a Bean label and is not the holotype. Dimensions of BM 37982: 36 mm.: 11.4, —, 15.3.

The holotype has an oval whorl section with no trace of a keel, and the shell is smooth except for some low irregular ribs on the innermost whorls up to 7 mm. diameter. The striae shown on Phillips's figure cannot be seen on any part of the specimen. It has two-thirds of a whorl of body chamber, but the mouth border is not preserved and it does not show any adult characters.

Genus CALOCERAS Hyatt 1870

22. *Caloceras belcheri* (Simpson)

Ammonites belcheri Simpson 1843, p. 12; 1855, p. 43; 1884, p. 72.

Holotype. WM 101, figured by Buckman (1910, pl. 17); Robin Hood's Bay.

23. *Caloceras convolutum* (Simpson, *non* Schlotheim)

Ammonites convolutus Simpson 1855, p. 43; 1884, p. 73 (*non* Schlotheim 1820).

Holotype. WM 491, figured by Buckman (1910, pl. 18); Robin Hood's Bay.

Family SCHLOTHEIMIIDAE Spath 1923

Genus SAXOCERAS Lange 1924

24. *Saxoceras aequale* (Simpson)

Plate 14, figs. 3a, b

Ammonites aequalis Simpson 1855, p. 49; 1884, p. 80.

Schlotheimia aequalis (Simpson), Spath 1924a, pp. 196–7.

Saxoceras aequale (Simpson), Spath 1925, p. 204, fig. 4.

Holotype. BM 18109, bearing a label in Simpson's writing 'A. aequalis Lias. Yorks. 110'. In Simpson's Catalogue this species is registered under the number 110, and the specimen agrees in all respects with Simpson's description. Dimensions: 42 mm.: 13.4, 11.0, 18.9.

A rough drawing of the holotype was given by Spath (1925, p. 204, fig. 4), and a further figure is now given. The locality may be Redcar, for the Angulata Zone is not exposed above sea-level at Robin Hood's Bay.

Genus SCHLOTHEIMIA Bayle 1878

25. *Schlotheimia redcarensis* (Young and Bird)

Ammonites redcarensis Young and Bird 1822, p. 248, pl. 14, fig. 13; 1828, p. 258, pl. 14, fig. 10.

Type. The holotype is lost. WM 314, from Robin Hood's Bay, figured as 'holotype?' by Buckman (1925, pl. 608), is here designated neotype.

Descriptions and remarks relating to the identification of this species can be found in Young and Bird (1822, pp. 248, 327; 1828, p. 258) and Simpson (1843, p. 55; 1855, pp. 100–1). Young and Bird established that their figured holotype was smaller than, and different from, *Arietites bucklandi* (J. Sowerby), which they also found at the same localities (Robin Hood's Bay and Redcar), and much of their description in 1828 is suggestive of a *Schlotheimia*. Simpson examined Young and Bird's original specimens and pointed out that their figure was 'entirely erroneous', that the species usually has a flat smooth band or sulcus on the venter, and that the feature described by Young and Bird (1828, p. 258) as an 'imperfect keel, where the ribs, which are bent forward, regularly meet in pairs, at a sharp angle, in the form of arrowheads', was present in a few of the specimens. This imperfect keel is mainly a

EXPLANATION OF PLATE 14

Fig. 1. See Plate 13, figs. 3a, b. $\times 0.35$.

Figs. 2a, b. *Psiloceras erugatum* (Phillips). Holotype, BM 37982. Lower Lias; Yorkshire coast.

Figs. 3a, b. *Saxoceras aequale* (Simpson). Holotype, BM 18109. Lower Lias; Yorkshire coast (? Redcar).

Figs. 4a, b, 5a, b. *Coroniceras validanfractum* (Simpson). 4a, b, Holotype, WM 282. 5a, b, Paratype, WM 530. Both from Lower Lias; Robin Hood's Bay.

Figs. 6a, b. *Vermiceras multanfractum* (Simpson). Neotype, WM 281. Lower Lias; Robin Hood's Bay.

Figs. 7a, b. *Gagaticeras gagateum* (Young and Bird). WM 744, Paratype of *Vermiceras multanfractum* (Simpson). Lower Lias; Robin Hood's Bay.

All figures natural size, except fig. 1.

preservational feature, and is associated with slight crushing or distortion. The neotype is not preserved in this way, for it has a normal ventral sulcus, but otherwise it agrees well with Young and Bird's descriptions.

26. *Schlotheimia sulcata* (Simpson, non Lamarck)

Ammonites sulcata Simpson 1843, p. 55; 1855, p. 101; 1884, p. 142 (non Lamarck 1822, &c.).

Holotype. WM 743, figured by Buckman (1911, pl. 38); Robin Hood's Bay.

Genus BOUCAULTICERAS Spath 1924

27. *Boucaulticeras? antiquatum* (Simpson)

Ammonites antiquatus Simpson 1855, p. 36; 1884, p. 64.

Holotype. WM 79 and 80 (fragments of the same specimen), figured by Buckman (1927, pls. 718A, B).

Family ARIETITIDAE Hyatt 1874

Genus ARIETITES Waagen 1869

28. *Arietites radiatus* (Simpson, non Bruguière)

Ammonites radiatus Simpson 1843, p. 47; 1855, p. 88; 1884, p. 126 (non Bruguière 1789).

Holotype. WM 304, figured by Buckman (1911, pl. 35); Robin Hood's Bay.

Genus CORONICERAS Hyatt 1867

29. *Coroniceras validanfractum* (Simpson)

Plate 14, figs. 4a, b, 5a, b

Ammonites validanfractus Simpson 1855, p. 95; 1884, p. 135.

Types. WM 282 is the holotype of the 1855 description, and WM 530 is the paratype which was described as a variety with tubercles at the ventro-lateral edge. In the 1884 description WM 530 was made the normal type. Both are from Robin Hood's Bay. Dimensions: WM 282—maximum diameter 68 mm.; at 55 mm.: 13·8, 13·9, 30·7; WM 530—65·5 mm.: 17·6, 17·5, 35·1.

The holotype and paratype differ slightly on the venter, but the differences are not specific. Both are evolute with quadrate whorl sections and strong, straight ribs. There are twenty-three ribs at 65 mm. diameter in WM 282, and twenty-two at 61 mm. in WM 530. In WM 282, the holotype, the ventro-lateral tubercles are small, and on the venter there are shallow sulci flanking the central keel, then two low outer keels. In WM 530, the paratype, the ventro-lateral tubercles are more prominent, the sulci on the venter are barely developed and there are only mere traces of the two outer keels. The species seems to be transitional to *Megarietites*.

Genus VERMICERAS Hyatt 1889

30. *Vermiceras multanfractum* (Simpson)

Plate 14, figs. 6a, b

Ammonites multanfractus Simpson 1855, p. 95; 1884, p. 134.

Type. The 2¼-inch diameter holotype described by Simpson appears to be lost, but the two paratypes figured here are WM 281 and 744, both from Robin Hood's Bay. WM 281 is here designated neotype; it consists of parts of five whorls with a maximum size of about 40 mm. diameter. The venter has a central keel flanked by very shallow sulci and traces of two outer keels. The ribs are widely spaced

and blunt and the whorls are very evolute. WM 744 is only 15 mm. diameter, and it is the inner whorls of a specimen of *Gagaticeras gagateum* (Young and Bird) (see Plate 14, figs. 7a, b).

Genus AGASSICERAS Hyatt 1875

31. *Agassiceras illatum* (Simpson 1855, non 1843)

Plate 15, figs. 1a, b

Ammonites illatus Simpson 1855, p. 39; 1884, p. 67 (non 1843, p. 10).

Type. WM 84, the specimen figured here, is the holotype of the 1855 description; Robin Hood's Bay. The original of the 1843 description is different and belonged to a different species, but it is now lost and the species cannot be identified from the description alone. Dimensions of WM 84: 42 mm.: 16.6, c. 12.5, 15.8 (the specimen is worn).

The holotype is considerably water worn, especially on the venter. The ribs are strong, straight and without tubercles, and they appear to die out on the venter. This belongs to one of the more evolute species of *Agassiceras*, but it does not show the characteristic flat venter of *Euagassiceras*.

32. *Agassiceras personatum* (Simpson)

Ammonites personatus Simpson 1843, p. 9; 1855, p. 38; 1884, p. 65.

Types. The holotype and paratype are WM 2125 and 67 respectively and were figured by Buckman (1920, pl. 187, figs. 1-4).

Genus EUAGASSICERAS Spath 1924

33. *Euagassiceras resupinatum* (Simpson)

Ammonites resupinatus Simpson 1843, p. 15; 1855, p. 43; 1884, p. 73.

Holotype. WM 96, figured by Buckman (1909, pl. 6); Robin Hood's Bay.

34. *Euagassiceras transformatum* (Simpson)

Ammonites transformatus Simpson 1855, p. 91; 1884, p. 130.

Holotype. WM 279, figured by Buckman (1913, pl. 75).

EXPLANATION OF PLATE 15

- Figs. 1a, b. *Agassiceras illatum* (Simpson). Holotype, WM 84. Lower Lias; Robin Hood's Bay.
 Figs. 2a, b. *Arnioceras vetustum* (Simpson). Holotype, GSM 26404, Clarkson Collection. Lower Lias; Robin Hood's Bay.
 Figs. 3a, b. *Gleviceras lens* (Simpson). Holotype, GSM 26405, Clarkson Collection. Lower Lias; Robin Hood's Bay.
 Figs. 4a, b. *Metoxynoticeras complanatum* (Simpson). Holotype, WM 239. Lower Lias; probably Robin Hood's Bay. Photographs by J. W. Tutchter.
 Figs. 5a, b. *Apoderoceras marshallani* (Simpson). Holotype, WM 468. Lower Lias; Robin Hood's Bay.
 Fig. 6. *Hyperderoceras mamillatum* (Simpson). Neotype, WM 2102. Lower Lias; Robin Hood's Bay.
 Figs. 7a, b, 8a, b. *Polymorphites rutilans* (Simpson). 7a, b, Neotype, WM 95. 8a, b, WM 94. Both from Lower Lias; Robin Hood's Bay.
 Figs. 9a, b. *Eoderoceras diversum* (Simpson). Neotype, SM J34799. Lower Lias; Robin Hood's Bay.

All figures natural size.

Genus DEFOSSICERAS Buckman 1913

35. *Defossiceras defossum* (Simpson)

Ammonites defossus Simpson 1843, p. 15; 1855, p. 48; 1884, p. 78.

Holotype. WM 103, figured by Buckman (1913, pl. 76).

Type species of *Defossiceras*.

Genus ARNIOCERAS Hyatt 1867

36. *Arnioceras acuticarinatum* (Simpson)

Ammonites youngi Simpson 1843, p. 46 (*non* Young and Bird 1828).

Ammonites acuticarinatus Simpson 1855, p. 94; 1884, p. 133.

Holotype. WM 295, figured by Buckman (1911, pl. 40) and by Jaworski (1931, p. 126, pl. 5, figs. 2a, b); Robin Hood's Bay. The 1855 specific name is a direct substitution for the preoccupied 1843 name.

37. *Arnioceras semicostatum* (Young and Bird)

Ammonites semicostatus Young and Bird 1828, p. 257, pl. 12, fig. 10.

Holotype. WM 924, figured by Buckman (1918, pl. 112) and by Jaworski (1931, p. 114, fig. 4, pl. 5, figs. 1a, b).

38. *Arnioceras vetustum* (Simpson)

Plate 15, figs. 2a, b

Ammonites vetustus Simpson 1855, p. 88; 1884, p. 125.

Holotype. GSM 26404, Clarkson Collection; Robin Hood's Bay. Dimensions: maximum diameter 30.2 mm.; at 27.8 mm.: 9.0, c. 7.0, 11.8.

The holotype is an immature specimen with two-thirds of a whorl of body chamber. The whorls are smooth up to 16 mm. diameter and then low ribs are developed on the outer whorl. These end in a very small tubercle at the ventro-lateral edge and continue only as faint striae on the venter. The venter is obtusely angled and there are no sulci at the sides of the slightly differentiated keel.

39. *Arnioceras youngi* (Simpson, *non* Young and Bird)

See *Arnioceras acuticarinatum*, no. 36 above.

Genus EPARIETITES Spath 1924

40. *Eparietites denotatus* (Simpson)

Ammonites denotatus Simpson 1855, p. 76; 1884, p. 111.

Holotype. SM J3273, Leckenby Collection, figured by Wright (1881, pl. 22b, figs. 1-3) and by Buckman (1912, pls. 67A, B); Robin Hood's Bay.

41. *Eparietites impendens* (Young and Bird)

Ammonites impendens Young and Bird 1828, p. 266.

Holotype. WM 292, figured by Buckman (1919, pl. 120).

42. *Eparietites tenellus* (Simpson)

Ammonites tenellus Simpson 1855, p. 97; 1884, p. 137.

Holotype. WM 293, figured by Buckman (1912, pl. 54); Robin Hood's Bay.

Type species of *Eparietites*.

Genus CYMBITES Neumayr 1878

43. *Cymbites? arctus* (Simpson)

Ammonites arctus Simpson 1843, p. 10; 1855, p. 38; 1884, p. 66.

Holotype. WM 471, figured by Buckman (1911, pl. 36) as *Oxynoticeras*; Robin Hood's Bay.

44. *Cymbites? dennyi* (Simpson)

Ammonites dennyi Simpson 1843, p. 9; 1855, p. 38; 1884, p. 66.

Type. WM 470 is the holotype or lectotype, and was figured by Buckman (1909, pl. 7, figs. 1, 1A) as *Oxynoticeras*; Robin Hood's Bay. Two paratypes or syntypes also figured by Buckman (1909, pl. 7, figs. 2, 3) may not belong to this species.

Family OXYNOTICERATIDAE Hyatt 1867

Genus OXYNOTICERAS Hyatt 1867

45. *Oxynoticeras? aliaenum* (Simpson)

Ammonites aliaenus Simpson 1855, p. 85; 1884, p. 122.

The holotype and three paratypes were in the collection of Mr. E. Charlesworth and are now lost. Tate and Blake (1876, p. 311) said the species was an *Arietites*, and Buckman (1915, p. 99) referred it to *Oxynoticeras*, but in the absence of the type specimens it cannot be properly determined.

46. *Oxynoticeras bucki* (Simpson)

Ammonites buckii Simpson 1843, p. 42; 1855, p. 84; 1884, p. 121.

Holotype. WM 479a, figured by Buckman (1920, pl. 165A); Robin Hood's Bay.

47. *Oxynoticeras? dejectum* (Simpson)

Ammonites dejectus Simpson 1855, p. 85; 1884, p. 122.

The holotype was in the collection of Mr. E. Charlesworth and is now lost. Tate and Blake (1876, p. 291) regarded the species as an *Oxynoticeras*, but in the absence of the holotype it cannot now be identified.

48. *Oxynoticeras flavum* (Simpson)

Ammonites flavus Simpson 1843, p. 43; 1855, p. 86; 1884, p. 123.

Holotype. WM 481, figured by Buckman (1912, pl. 55); Robin Hood's Bay.

49. *Oxynoticeras? limatum* (Simpson)

Ammonites limatus Simpson 1843, p. 41; 1855, p. 86; 1884, p. 123.

Holotype. WM 480, figured by Buckman (1912, pl. 56, figs. 1, 1a); Robin Hood's Bay.

50. *Oxynoticeras polyophyllum* (Simpson)*Ammonites polyophyllus* Simpson 1843, p. 39.*Ammonites polyophyllus* Simpson 1855, p. 81; 1884, p. 117.*Holotype*. WM 739, figured by Buckman (1909, pl. 8); Robin Hood's Bay.51. *Oxynoticeras simpsoni* (Simpson)*Ammonites simpsoni* Simpson 1843, p. 37; 1855, p. 79; 1884, p. 115.*Holotype*. WM 813, figured by Buckman (1912, pls. 66A, B) as *Aetomoceras*; Robin Hood's Bay.

Genus GLEVICERAS Buckman 1918

52. *Gleviceras lens* (Simpson)

Plate 15, figs. 3a, b

Ammonites lens Simpson 1855, p. 80; 1884, p. 116.*Holotype*. GSM 26405, Clarkson Collection; Robin Hood's Bay. Dimensions: 27.3 mm.: 12.8, 5.3, 6.6.

The holotype is wholly septate. It has involute compressed whorls and a sharp keel which is crenulated in some places where crossed by the nearly obsolete ribbing. The ribs are well marked up to about 17 mm. diameter, after which they fade to low occasional undulations; they are straight on the side of the whorl and curve forwards on the venter and die out, but they reach the keel to form crenulations in a few places. The suture-lines are characteristic of the family Oxynoticeratidae.

Genus METOXYNOTICERAS Spath 1922

53. *Metoxynoticeras complanosum* (Simpson)

Plate 15, figs. 4a, b

Ammonites complanatus Simpson 1843, p. 38 (*non* Bruguière 1789).*Ammonites complanosus* Simpson 1855, pp. 79, 80 (named on p. 80); 1884, pp. 115–16.

Holotype. WM 239, now lost, and figured here for the first time. In Simpson's Catalogue specimen no. 239 is registered as this species. The photograph now reproduced (Plate 15, figs. 4a, b) is a J. W. Tutchter photograph found in the card index left to the British Museum (Natural History) by Dr. L. F. Spath. It was evidently obtained by Spath from some of Buckman's papers also left at the British Museum. Spath had written 'Type in Whitby Museum no. 239' across part of the photograph, and he could only have obtained this register number from original information with the photograph. Unfortunately the specimen cannot now be found at Whitby or London, and it must be presumed lost. The specimen agrees exactly with Simpson's description, including the size, and it is undoubtedly the holotype. The approximate dimensions taken from the figure are: 91.6 mm.: 55.5, —, c. 2.5.

Genus RETENTICERAS Buckman 1920

54. *Retenticeras retentum* (Simpson)*Ammonites retentus* Simpson 1855, p. 84; 1884, p. 120.*Holotype*. GSM 26401, figured by Buckman (1920, pl. 166): Robin Hood's Bay.Type species of *Retenticeras*.

Family ECHIOCERATIDAE Buckman 1913

Genus GAGATICERAS Buckman 1913

55. *Gagaticeras gagateum* (Young and Bird)

Ammonites gagateus Young and Bird 1828, p. 255, pl. 12, fig. 7.

Holotype. WM 104, figured by Buckman (1913, pl. 78).

Type species of *Gagaticeras*.

56. *Gagaticeras neglectum* (Simpson)

Ammonites neglectus Simpson 1855, p. 45; 1884, p. 76.

Holotype. WM 98, figured by Buckman (1914, pl. 101); Robin Hood's Bay.

Genus ECHIOCERAS Bayle 1878

57. *Echioceras aureolum* (Simpson)

Ammonites aureolus Simpson 1855, p. 94; 1884, p. 134.

Holotype. GSM 26402, figured by Buckman (1914, pl. 96); Robin Hood's Bay. A second specimen (WM 872) figured by Buckman (1911, pl. 28) and said to be the paratype (1914, p. 96*b*) was later referred to the species *E. regustatum* Buckman (1914, p. 96*c*).

58. *Echioceras cereum* (Simpson)

Ammonites cereus Simpson 1855, p. 47; 1884, p. 77.

Holotype. WM 461, figured by Buckman (1912, pl. 49); Robin Hood's Bay.

59. *Echioceras exortum* (Simpson)

Ammonites exortus Simpson 1855, p. 44; 1884, p. 73.

Type. Simpson said that the specimen he described was in Mr. Clarkson's Collection. It is not in the Clarkson Collection at the Geological Survey Museum, and it is therefore lost. Two specimens from Robin Hood's Bay (both WM 645) were figured by Buckman (1910, pl. 19, figs. 1-3) as holotype and paratype, but it is clear that these are not the primary types, and the smaller, better-preserved one (*ibid.*, figs. 2, 3) is here designated neotype.

Family EODEROCERATIDAE Spath 1929

Genus XIPHEROCERAS Buckman 1911

60. *Xipheroceras scoresbyi* (Simpson)

Ammonites scoresbyi Simpson 1843, p. 12; 1855, p. 69; 1884, p. 103.

Holotype. WM 173, figured by Buckman (1911, pls. 39A, B); Robin Hood's Bay.

Genus BIFERICERAS Buckman 1913

61. *Bifericeras integricostatum* (Simpson)

Ammonites integricostatus Simpson 1855, p. 46; 1884, p. 76.

Holotype. WM 92, figured by Buckman (1912, pl. 47) as *Androgynoceras*; Robin Hood's Bay.

62. *Bifericeras vitreum* (Simpson)

Ammonites vitreus Simpson 1855, p. 46; 1884, p. 76.

Holotype. WM 462, figured by Buckman (1924, pl. 529); Robin Hood's Bay.

Genus PROMICROCERAS Spath 1925

63. *Promicroceras aureum* (Young and Bird)

Ammonites aureus Young and Bird 1822, p. 248, pl. 13, fig. 6.

The figured holotype is lost. As was recognized by Young and Bird in 1828 (pp. 259, 359) this species is a synonym of *Promicroceras planicosta* (J. Sowerby, 1814).

64. *Promicroceras? siphunculare* (Simpson)

Ammonites siphuncularis Simpson 1843, p. 46; 1855, p. 88; 1884, p. 126.

Holotype. WM 485, figured by Buckman (1912, pl. 48) as *Androgynoceras*; Robin Hood's Bay.

Genus EODEROCERAS Spath 1925

65. *Eoderoceras anguiforme* (Simpson)

Ammonites anguiformis Simpson 1843, p. 17; 1855, p. 41; 1884, p. 70.

Holotype. WM 86, figured by Buckman (1912, pl. 64).

66. *Eoderoceras? armiger* (Simpson, *non* Sowerby)

Ammonites armiger Simpson 1855, p. 66; 1884, p. 100 (*non* J. de C. Sowerby 1840).

Tate and Blake (1876, p. 277) and Buckman (1915, p. 95) said that the species was probably an *Eoderoceras*, but the holotype is lost and it cannot now be interpreted.

67. *Eoderoceras? diversum* (Simpson)

Plate 15, figs. 9a, b

Ammonites diversus Simpson 1843, p. 13; 1855, p. 45; 1884, p. 75.

Type. The neotype, here designated and figured, is SM J34799, figured previously by Tate and Blake (1876, p. 282, pl. 8, fig. 3); its maximum diameter is 58.5 mm. It is improbable that this specimen is the holotype, for Simpson said that his specimen consisted of 'only a portion of the two outer whorls' and was 2½ inches in diameter. The neotype is 2¼ inches diameter, has the two outer whorls complete, and has very badly preserved inner whorls. In Simpson's Catalogue the type is registered as no. 97 and marked in Simpson's writing 'not to be found'.

The neotype is serpenticonic, with slender whorls and distant ribs. There are eighteen ribs on the outer whorl at 57 mm. diameter, and only 14 on the next inner whorl at 38 mm. Each rib bears a small, sharp umbilical tubercle and a large ventro-lateral spine. The spines are connected across the flat venter by ribs. The specimen has five-sixths of a whorl of body chamber, but it does not appear to be adult.

68. *Eoderoceras miles* (Simpson)

Ammonites miles Simpson 1855, p. 65; 1884, p. 97.

Holotype. WM 162, figured by Buckman (1911, pl. 44); Robin Hood's Bay.

69. *Eoderoceras owenense* (Simpson)

Ammonites owenensis Simpson 1843, p. 25; 1855, p. 64; 1884, p. 96.

Holotype. WM 476, figured by Buckman (1912, pl. 65); Robin Hood's Bay.

Genus HYPERDEROCERAS Spath 1926

70. *Hyperderoceras mamillatum* (Simpson)

Plate 15, fig. 6

Ammonites mamillatus Simpson 1843, p. 28.*Ammonites mammillatus* Simpson 1855, p. 67; 1884, p. 101 (*non* Schlotheim, 1813).

Type. The holotype was WM 183, but it is now lost. The specimen figured here is WM 2102, a second example which was identified with this species by Simpson, and it is now designated neotype.

This is a species of *Hyperderoceras* with distant, large mid-lateral spines on flared ribs. On the neotype there are five such spines on the last whorl at 42 mm. diameter.

71. *Hyperderoceras nativum* (Simpson)*Ammonites nativus* Simpson 1855, p. 68; 1884, p. 101.*Holotype.* WM 931, figured by Buckman (1913, pl. 84); Robin Hood's Bay.

Genus PHRICODOCERAS Hyatt 1900

72. *Phricodoceras cornutum* (Simpson)*Ammonites cornutus* Simpson 1843, p. 31; 1855, p. 71; 1884, p. 105.*Holotype.* WM 185, figured by Buckman (1911, pl. 32); Robin Hood's Bay.73. *Phricodoceras quadricornutum* (Simpson)*Ammonites quadricornutus* Simpson 1855, p. 71; 1884, p. 106.*Holotype.* WM 495, figured by Buckman (1911, pl. 33); Robin Hood's Bay.

Genus COELODEROCERAS Spath 1923

74. *Coeloderoceras retusum* (Simpson)*Ammonites retusus* Simpson 1855, p. 62; 1884, p. 94.*Holotype.* WM 184, figured by Buckman (1913, pl. 82); Robin Hood's Bay.75. *Coeloderoceras? sociale* (Simpson)*Ammonites socialis* Simpson 1855, p. 39; 1884, p. 67.*Holotype.* WM 68, figured by Buckman (1914, pl. 95); Robin Hood's Bay.76. *Coeloderoceras validum* (Simpson)*Ammonites validus* Simpson 1855, p. 62; 1884, p. 95.

Holotype. SM J3275, figured by Tate and Blake (1876, p. 278, pl. 7, fig. 3) and Buckman (1913, pl. 83); Robin Hood's Bay.

Genus APODEROCERAS Buckman 1921

77. *Apoderoceras aculeatum* (Simpson)*Ammonites aculeatus* Simpson 1843, p. 27; 1855, p. 66; 1884, p. 99.

Type. The holotype is lost. The paratype is WM 177 and was figured by Buckman (1913, pls. 72A–C); Robin Hood's Bay.

78. *Apoderoceras decussatum* (Simpson)

Plate 16, figs. 1a, b

Ammonites decussatus Simpson 1843, p. 25; 1855, p. 63; 1884, p. 95.*Aegoceras leckenbyi* Wright 1882, p. 344, pl. 30, figs. 1-7.

Holotype. SM J18225, Leckenby Collection, ex Bean Collection; Robin Hood's Bay. The specimen bears a faded label in Bean's writing 'A. decussatus Bean L. Lias'. Simpson stated that the ammonite he was describing was in Bean's Collection, and this specimen matches his description exactly including the details of preservation and size. Dimensions 84.6 mm.: 29.6, 30.3, 37.0.

The specimen is wholly septate and largely preserved as a pyritic cast with the shell remaining in only a few places. The ribbing is strong with prominent ventro-lateral tubercles up to 35 mm. diameter; at larger sizes the ribs are much reduced, but they remain well marked on the venter, and the tubercles become infrequent and reduced. On the small portions of the shell preserved on the venter of the outer whorl fine longitudinal and radial striae cross the main ribbing giving the shell a 'decussated' appearance.

The present holotype and SM J18224 were made syntypes of *Aegoceras leckenbyi* Wright (1882, p. 344, pl. 30, figs. 1-7), and both were figured by Wright. SM J18224 is now the only remaining syntype of *A. leckenbyi* and it is therefore designated lectotype. Both species, *A. leckenbyi* and *A. decussatum*, are regarded as synonyms of *A. aculeatum* (Simpson) (Donovan 1954, p. 35).

79. *Apoderoceras hamiltoni* (Simpson)*Ammonites hamiltoni* Simpson 1843, p. 27; 1855, p. 67; 1884, p. 100.*Holotype*. WM 165, figured by Buckman (1924, pls. 530A, B); Robin Hood's Bay.80. *Apoderoceras hastatum* (Young and Bird)*Ammonites hastatus* Young and Bird, 1828, pp. 261-2, pl. 14, fig. 3.*Type*. WM 661, figured by Buckman (1914, pls. 102A, B), is probably the holotype; Robin Hood's Bay.81. *Apoderoceras marshallani* (Simpson)

Plate 15, figs. 5a, b

Ammonites marshallani Simpson 1843, p. 24; 1855, p. 62; 1884, p. 94.

Holotype. WM 468, from Robin Hood's Bay, figured here. The paratypes of the 1843 description in the collection of Mr. G. Buck have not been found; the smaller of them formed the basis of the 1855 and 1884 descriptions.

The holotype consists of small evolute inner whorls, 16.6 mm. diameter, bearing ribs with ventro-lateral tubercles. The species is a synonym of *Apoderoceras aculeatum* (Simpson 1843).

82. *Apoderoceras mutatum* (Simpson)*Ammonites mutatus* Simpson 1855, p. 63; 1884, p. 96.*Holotype*. GSM 26406, figured by Buckman (1914, pl. 105).83. *Apoderoceras sinuatum* (Simpson)*Ammonites sinuatus* Simpson 1855, p. 62; 1884, p. 94.*Holotype*. WM 160, figured by Buckman (1914, pl. 94); Robin Hood's Bay.84. *Apoderoceras spicatum* (Simpson)*Ammonites spicatus* Simpson 1843, p. 28; 1855, p. 65; 1884, p. 98.*Holotype*. WM 920, figured by Buckman (1914, pl. 103).

85. *Apoderoceras subtriangulare* (Young and Bird)

Ammonites subtriangularis Young and Bird 1822, p. 250, pl. 12, fig. 4.

Holotype. WM 927, figured by Buckman (1913, pls. 71A, B).

Family POLYMORPHITIDAE Haug 1887

Genus POLYMORPHITES Haug 1887

86. *Polymorphites rutilans* (Simpson)

Plate 15, figs. 7a, b, 8a, b

Ammonites rutilans Simpson 1843, p. 45; 1855, p. 42; 1884, p. 72.

Types. The $\frac{1}{2}$ -inch diameter holotype in the Bean Collection described by Simpson in 1843 is lost. The two specimens now figured, WM 94 and 95, are identified in Simpson's Catalogue with this species and they were the originals of his 1855 description. WM 95 is here designated neotype, and it was probably from this specimen that Simpson (1855, p. 43) obtained his diameter of $1\frac{3}{4}$ inches. Both specimens are from Robin Hood's Bay.

The neotype and WM 94 are pyritic casts and both are somewhat split by decomposition. The neotype has nearly half a whorl of adult body chamber with a maximum diameter of about 46 mm., and WM 94 is wholly septate up to its maximum diameter of 36 mm. The ornament fades on the last part of the body chamber of the neotype and the aperture is probably close to the adult mouth border. The whorl section is elliptical, and the venter evenly rounded. The ribs are feeble and inclined forwards on the side of the whorl, and on the venter they swing further forwards and diminish to striae.

87. *Polymorphites trivialis* (Simpson)

Ammonites trivialis Simpson 1843, p. 10; 1855, p. 44; 1884, p. 73.

Holotype. WM 105, now lost, figured by Buckman (1912, pl. 53, figs. 1, 1a, 1b); Robin Hood's Bay.

Genus PLATYPLEUROCERAS Hyatt 1867

88. *Platypleuroceras aureum* (Simpson, *non* Young and Bird)

Ammonites aureus Simpson 1855, p. 44; 1884, p. 74 (*non* Young and Bird, 1822).

Holotype. WM 107, figured by Buckman (1909, pl. 3); Robin Hood's Bay.

89. *Platypleuroceras ripleyi* (Simpson)

Ammonites ripleyi Simpson 1843, p. 11; 1855, p. 44; 1884, p. 74.

Holotype. WM 106, figured by Buckman (1909, pl. 2); Robin Hood's Bay.

EXPLANATION OF PLATE 16

Figs. 1a, b. *Apoderoceras decussatum* (Simpson). Holotype, SM J18225, Leckenby Collection, ex. Bean Collection. Lower Lias; Robin Hood's Bay.

Figs. 2a, b, 3, 4. *Amauroceras conjunctivum* (Simpson). 2a, b, Lectotype, WM 227. 3, Paratype, WM 223. 4, Paratype, WM 224. All from Middle Lias; Hawsker Bottoms.

Figs. 5a, b. *Androgynoceras arcigerens* (Phillips). Holotype, BM 17139, Ripley Collection. Lower Lias; Robin Hood's Bay.

Figs. 6a, b. *Dactylioceras crassifactum* (Simpson). Paratype, WM 497. Upper Lias; Hawsker Bottoms.

Figs. 7a, b. *Dactylioceras crassibundum* (Simpson). Holotype, GSM 26407, Clarkson Collection. Upper Lias, Whitby.

All figures natural size.

90. *Platypleuroceras tenuispina* (Simpson)

Ammonites tenuispina Simpson 1855, p. 69; 1884, p. 103.

The holotype, originally in the collection of Mr. E. Charlesworth, is lost. There are two specimens (GSM 26490, 91) in the Clarkson Collection at the Geological Survey identified by Clarkson as '*A. tenuispina* Simpson'. Both are 16 mm. diameter, somewhat larger than stated by Simpson, but otherwise they agree closely with his description. They clearly belong to *Platypleuroceras aureum* (Simpson, non Young and Bird), and, although neither can be claimed to be the holotype of *tenuispina*, it is probable that the latter is a synonym of *P. aureum*.

Genus UPTONIA Buckman 1898

91. *Uptonia ignota* (Simpson)

Ammonites ignotus Simpson 1855, p. 61; 1884, p. 94.

Holotype. WM 159, figured by Buckman (1910, pl. 21); Robin Hood's Bay.

92. *Uptonia obsoleta* (Simpson)

Ammonites obsoletus Simpson 1843, p. 23; 1855, p. 59; 1884, p. 91.

Holotype. WM 157, figured by Buckman (1914, pl. 92); Robin Hood's Bay.

Genus GEMMELLAROCERAS Hyatt 1900

93. *Gemmellaroceras? tubellum* (Simpson)

Ammonites tubellus Simpson 1855, p. 42; 1884, p. 71.

Holotype. WM 981, figured by Buckman (1924, pl. 491); Robin Hood's Bay.

This is the type species of the genus *Tubellites* Buckman 1924, which genus is now usually placed in the synonymy of *Gemmellaroceras*. The holotype is, however, only 8 mm. diameter, and it bears much resemblance to the smooth inner whorls of an *Eoderoceras*, such as the specimen figured by Buckman (1924, pl. 64A) as *E. anguiforme* (Simpson). Inclusion of the genus and species in *Eoderoceras* would, therefore, seem at least equally likely.

Family LIPAROCERATIDAE Hyatt 1867

Genus LIPAROCERAS Hyatt 1867

94. *Liparoceras heptangulare* (Young and Bird)

Ammonites heptangularis Young and Bird 1828, p. 263, pl. 14, fig. 1.

Holotype. WM 170, figured by Buckman (1914, pls. 108A-C).

Genus BEANICERAS Buckman 1913

95. *Beaniceras luridum* (Simpson)

Ammonites luridus Simpson 1855, p. 46; 1884, p. 76.

Holotype. SM J3274, figured by Buckman (1913, pl. 73) and by Dean, Donovan, and Howarth (1961, pl. 69, fig. 6).

Type species of *Beaniceras*.

Genus ANDROGYNOCERAS Hyatt 1867

96. *Androgynoceras arcigerens* (Phillips)

Plate 16, figs. 5a, b

Ammonites arcigerens Phillips 1829, p. 163, pl. 13, fig. 9; 1835, p. 135, pl. 13, fig. 9; 1875, p. 270, pl. 13, fig. 9.

Holotype. BM 17139, probably from Robin Hood's Bay. Dimensions: 62 mm.: 17.5, 16.8, 32.2; 20 ribs at 63 mm., 19 at 59 mm., 18 at 56 mm., 18 at 47 mm., 19 at 40 mm., 20 at 31 mm.

Spath (1938, pp. 127-30) used *arcigerens* as a variety of *A. maculatum*, saying that the holotype was lost. However, Phillips stated (1835, p. 184) that his figured specimen was in the Ripley Collection, and in the British Museum (Natural History) there is a specimen, bought from Mr. Ripley before 1850, which agrees so closely with Phillips's figure (1835, pl. 13, fig. 9) that there can be little doubt that it is the holotype. In particular it has the same number of ribs on the last whorl as in Phillips's figure, and the beginning of the last whorl is crushed and cut away on one side just as in the drawing. The specimen corresponds closely to the holotype of *A. maculatum* and it cannot be separated as a variety.

97. *Androgynoceras heterogenes* (Young and Bird)

Ammonites heterogenes Young and Bird 1828, p. 264, pl. 14, fig. 7.

Holotype. WM 195, figured by Buckman (1912, pl. 46).

98. *Androgynoceras maculatum* (Young and Bird)

Ammonites maculatus Young and Bird 1822, p. 248, pl. 14, fig. 12; 1828, p. 259, pl. 14, fig. 9.

Holotype. WM 493, figured by Buckman (1912, pls. 45A, B).

Genus OISTOCERAS Buckman 1911

99. *Oistoceras? anguliferum* (Phillips)

Ammonites anguliferus Phillips 1829, p. 163, pl. 13, fig. 19; 1835, p. 135, pl. 13, fig. 19; 1875, p. 270, pl. 13, fig. 19.

This species is probably an *Oistoceras* (Spath 1938, p. 174), but the holotype, originally in York Museum, is lost.

100. *Oistoceras figulinum* (Simpson)

Ammonites figulinus Simpson 1855, p. 47; 1884, p. 78.

Holotype. WM 115, figured by Buckman (1911, pl. 26A).

Type species of *Oistoceras*.

101. *Oistoceras omissum* (Simpson)

Ammonites omissus Simpson 1855, p. 47; 1884, p. 77.

Holotype. WM 502, now lost, figured by Buckman (1911, pl. 27); Robin Hood's Bay.

Family AMALTHEIDAE Hyatt 1867

Genus AMALTHEUS de Montfort 1808

102. *Amaltheus clevelandicus* (Young and Bird)

Ammonites clevelandicus Young and Bird, 1822, p. 253, pl. 13, fig. 11; 1828, p. 267.

Paratype. WM 252, figured by Buckman (1918, pl. 109); this specimen is probably not the holotype which is lost.

The species is a synonym of *Amaltheus stokesi* (J. Sowerby).

103. *Amaltheus depressus* (Simpson, *non* Bruguière)

Ammonites depressus Simpson 1843, p. 40; 1855, p. 82, 1884, p. 118 (*non* Bruguière 1789).

Holotype. WM 247, figured by Buckman (1911, pl. 25). This species was renamed *Amaltheus striatus* Howarth (1955, p. 161) with the same holotype.

104. *Amaltheus? exasciatus* (Simpson)

Ammonites exasciatus Simpson 1855, p. 90; 1884, p. 129.

The holotype is lost, and although from the description the species is clearly a Middle Lias Amaltheid, in the absence of a type specimen it cannot now be interpreted.

105. *Amaltheus nodulosus* (Young and Bird, *non* Link)

Ammonites nodulosus Young and Bird 1828, pp. 258, 359, 367, pl. 12, fig. 4 (*non* Link 1807).

Young and Bird's figured holotype is lost. The species was put into synonymy with *Amaltheus subnodosus* (Young and Bird) by Howarth (1958, pp. 8, 9).

106. *Amaltheus reticularis* (Simpson)

Ammonites reticularis Simpson 1843, p. 38; 1855, p. 78; 1884, p. 114.

Holotype. WM 217, figured by Buckman (1909, pl. 1); Hawsker Bottoms.

107. *Amaltheus subnodosus* (Young and Bird)

* *Ammonites subnodosus* Young and Bird 1828, p. 258, pl. 13, fig. 3.

Neotype. SM J44248, from Staithes, designated and figured by Howarth (1958, p. 8, pl. 2, fig. 11). There are eight specimens listed as this species in Simpson's Catalogue, but none of them agree with Young and Bird's description and figure, and most belong to *Pleuroceras*.

108. *Amaltheus vittatus* (Young and Bird)

Ammonites vittatus Young and Bird 1828, p. 268, pl. 14, fig. 11.

The figured holotype from Hawsker Bottoms is lost, but from Young and Bird's description it is clear that the specimen was an *Amaltheus subnodosus* (see Howarth 1958, p. 9).

Genus AMAUROCERAS Buckman 1913

109. *Amauroceras conjunctivum* (Simpson)

Plate 16, figs. 2a, b, 3, 4

Ammonites conjunctivus Simpson 1855, p. 78; 1884, p. 114.

Types. In Simpson's Catalogue the five specimens WM 223-7 are listed as this species and all must be considered syntypes. Of these only WM 223, 224, and 227 now remain, and 227 is here selected lectotype; all are from Hawsker Bottoms. Dimensions of lectotype: 21.1 mm.: 9.4, c. 5.5, 5.5.

This species is clearly synonymous with *Amauroceras ferrugineum* (Simpson 1855, p. 79), which has

been fully described by Howarth (1958, pp. 24–26). The types of the present species are from the upper half of the Apyrenum Subzone at Hawsker Bottoms. Both *A. ferrugineum* and *A. conjunctivum* have equal priority, and in order to preserve nomenclatural stability *A. ferrugineum* is here selected as the name for this species, because it is well known and has been widely used, whereas *A. conjunctivus* has never been in common use since its proposal by Simpson.

110. *Amauroceras ferrugineum* (Simpson)

Ammonites ferrugineus Simpson 1855, p. 79; 1884, p. 114.

Types. Simpson's two syntypes are both numbered WM 482. The one figured by Buckman (1919, pl. 142) was designated lectotype by Howarth (1958, p. 24).

Type species of *Amauroceras*.

111. *Amauroceras lenticulare* (Young and Bird)

Ammonites lenticularis Young and Bird 1828, p. 269.

Holotype. WM 218, figured by Buckman (1910, pl. 20).

Genus PLEUROCERAS Hyatt 1867

112. *Pleuroceras birdi* (Simpson)

Ammonites birdi Simpson 1843, p. 49; 1855, p. 92; 1884, p. 131.

Holotype. WM 278, figured by Buckman (1911, pl. 24).

113. *Pleuroceras elaboratum* (Simpson)

Ammonites elaboratus Simpson 1884, p. 128.

Holotype. WM 302, figured by Buckman (1910, pl. 22); Hawsker Bottoms.

The name was used as an early 'subspecies' or 'transient' of *Pleuroceras hawskerense* (Young and Bird) by Howarth (1959, pp. 47–48).

114. *Pleuroceras hawskerense* (Young and Bird)

Ammonites hawskerensis Young and Bird 1828, p. 258, pl. 14, fig. 6.

Type. The paratype is WM 269, figured by Buckman (1923, pl. 408); Hawsker Bottoms.

115. *Pleuroceras regulare* (Simpson, *non* Bruguière)

Ammonites regularis Simpson 1855, p. 89; 1884, p. 127 (*non* Bruguière 1789).

Holotype. GSM 26403, figured by Buckman (1913, pl. 77); Hawsker Bottoms. Put into the synonymy of *P. solare* (Phillips) by Howarth (1959, p. 29).

116. *Pleuroceras solare* (Phillips)

Ammonites solaris Phillips, 1829, p. 135, pl. 4, fig. 29; 1835, p. 107, pl. 4, fig. 29.

Neotype. SM J44277, from Hawsker Bottoms, was designated and figured by Howarth (1959, p. 29, pl. 5, fig. 1). The holotype was in the Williamson Collection which went to Scarborough Museum, but it is now lost.

117. *Pleuroceras solitarium* (Simpson)

Ammonites solitarius Simpson 1855, p. 93; 1884, p. 133.

Holotype. WM 500, figured by Buckman (1912, pl. 52) and by Howarth (1959, p. 31, pl. 5, fig. 10) where it was shown to be a variety of *P. solare* (Phillips); Hawsker Bottoms.

Family DACTYLIOCERATIDAE Hyatt 1867

Genus DACTYLIOCERAS Hyatt 1867

118. *Dactyloceras andersoni* (Simpson)

Ammonites andersoni Simpson 1855, p. 58; 1884, p. 90.

The holotype was in the Andersonian Museum, Glasgow, probably transferred later to the Royal College of Science and Technology, Glasgow, but it is now lost. The species is definitely a *Dactyloceras* but in the absence of a type specimen it cannot be defined.

119. *Dactyloceras annuliferum* (Simpson)

Ammonites annuliferus Simpson 1855, p. 50; 1884, p. 81.

Holotype. WM 492, figured by Buckman (1912, pl. 63); Whitby.

120. *Dactyloceras athleticum* (Simpson)

Ammonites athleticus Simpson 1855, p. 102; 1884, p. 82.

Type. The holotype is WM 123, figured by Buckman (1912, pl. 51A). A much better preserved topotype was also figured by Buckman (1912, pl. 51B). The horizon and locality—Middle Lias, Hawsker Bottoms—added by Simpson in 1884 (p. 82) indicate that the specimens were found loose, having fallen from the cliff, for the species occurs in large numbers in the upper half of the Commune Subzone.

Type species of *Athlodactylites* Buckman 1927, now included in the synonymy of *Dactyloceras*.

121. *Dactyloceras crassibundum* (Simpson)

Plate 16, figs. 7a, b

Ammonites crassibundus Simpson 1855, p. 55; 1884, p. 87.

Holotype. GSM 26407, Clarkson Collection; Whitby. Dimensions: maximum diameter 59 mm.; at 57.8 mm.; 16.3, 16.4, 30.5; 46 primary ribs at 54 mm.

The holotype is wholly septate and is clearly a synonym of *Dactyloceras commune* (J. Sowerby) from the Alum Shales at Whitby. It probably came from the lowest part of the Commune Subzone, where similar specimens are found which are not so finely ribbed up to 25 mm. diameter as the holotype of *D. commune*.

122. *Dactyloceras crassifactum* (Simpson)

Plate 16, figs. 6a, b

Ammonites crassifactus Simpson 1855, p. 56; 1884, p. 87.

Type. The holotype, 2½ inches in diameter and containing mineral oil as described by Simpson, is lost. The paratype, WM 497 from Hawsker Bottoms, listed in Simpson's Catalogue, is now figured. Dimensions: 47.3 mm.: 15.5, —, 21.6; 41 primary ribs.

This is a depressed species of *Dactyloceras* for the whorl breadth slightly exceeds the height. Simpson said that his holotype came from the Jet Rock; the horizon of the paratype might be the same, but it is not recorded and it cannot be deduced from the preservation.

123. *Dactyloceras crassiusculosum* (Simpson)

Ammonites crassiusculosus Simpson 1855, p. 57; 1884, p. 88.

Holotype. WM 137, figured by Buckman (1912, pl. 62).

124. *Dactylioceras crassiusculum* (Simpson)

Ammonites crassiusculus Simpson 1855, p. 56; 1884, p. 88.

Holotype. WM 499, figured by Buckman (1921, pl. 209).

125. *Dactylioceras crassulosum* (Simpson)

Ammonites crassulosus Simpson 1855, p. 55; 1884, p. 88.

Holotype. WM 124, figured by Buckman (1912, pl. 58).

126. *Dactylioceras crassulum* (Simpson)

Ammonites crassulus Simpson 1843, p. 20; 1855, p. 54; 1884, p. 86.

Holotype. WM 489, figured by Buckman (1921, pl. 208).

127. *Dactylioceras delicatum* (Simpson)

Ammonites delicatus Simpson 1855, p. 54, 1884, p. 86.

Types. Buckman (1926, pl. 656) figured a block (WM 139) containing the syntypes and selected one of them to be the lectotype.

128. *Dactylioceras gracile* (Simpson)

Ammonites gracilis Simpson 1843, p. 20; 1855, p. 54; 1884, p. 85.

Holotype. WM 488, figured by Buckman (1914, pl. 107).

129. *Dactylioceras semicelatum* (Simpson)

Ammonites semicelatus Simpson 1843, p. 22; 1855, p. 50; 1884, p. 81.

Holotype. WM 116, figured by Buckman (1911, pl. 31).

Type species of *Kryptodactylites* Buckman, 1926, now included in synonymy with *Dactylioceras*.

130. *Dactylioceras tenuicostatum* (Young and Bird)

Ammonites tenuicostatus Young and Bird 1822, p. 247, pl. 12, fig. 8.

Ammonites annulatus Sowerby, Young and Bird 1828, p. 253, pl. 12, fig. 11.

Type. The holotype was WM 81 which is now lost. Records of this widely quoted species have been based on three well-preserved topotypes figured by Wright (1884, p. 475, pl. 84, figs. 7, 8) and Buckman (1920, pl. 157; 1927, pl. 157A). A suitable neotype should be designated when the group is next revised.

Type species of *Tenuidactylites* Buckman 1926, now included in *Dactylioceras*.

131. *Dactylioceras vermis* (Simpson)

Ammonites vermis Simpson 1855, p. 51; 1884, p. 82.

Holotype. WM 483, figured by Buckman (1913, pl. 68).

Type species of *Vermidactylites* Buckman 1926, now included in *Dactylioceras*.

GENUS PERONOCERAS Hyatt 1867

132. *Peronoceras andraei* (Simpson)

Ammonites andraei Simpson 1843, p. 23; 1855, p. 59; 1884, p. 91.

Holotype. WM 520, figured by Buckman (1912, pl. 57); Whitby.

133. *Peronoceras attenuatum* (Simpson)

Ammonites attenuatus Simpson 1855, p. 54; 1884, p. 85.

Holotype. WM 111, figured by Buckman (1926, pl. 655); Peak, Ravenscar.

Type species of *Microdactylites* Buckman 1926, included here in the synonymy of *Peronoceras*.

134. *Peronoceras perarmatum* (Young and Bird)

Ammonites perarmatus Young and Bird 1822, pp. 249–50, pl. 14, fig. 11 (*non* J. Sowerby, 1822).

Ammonites subarmatus Young and Bird 1828, p. 263, pl. 14, fig. 8.

Holotype. WM 180, figured by Buckman (1912, pl. 50).

135. *Peronoceras semiarmatum* (Simpson)

Plate 17, figs. 6a, b

Ammonites semiarmatus Simpson 1855, p. 60; 1884, p. 92.

Type. WM 155 and 522 are listed as belonging to this species in Simpson's Catalogue. WM 155 is lost, and WM 522 does not agree with Simpson's description, for the outer whorl has normal ribs and tubercles. The holotype appears to have been a worn or abnormal specimen for no known *Peronoceras* becomes smooth even on the adult body chamber. Therefore WM 522 may be designated neotype. It is from the Alum Shales on the foreshore east of Whitby.

The neotype has about two-thirds of a whorl of body chamber, which has single unlooped ribs bifurcating at the ventro-lateral edge, and ventro-lateral tubercles. The inner whorls are coronate, with ribs looped to ventro-lateral spines. It is closely related to, and perhaps conspecific with, *Peronoceras andraei* (Simpson).

136. *Peronoceras subarmatum* (Young and Bird)

Plate 17, figs. 5a, b

Ammonites subarmatus Young and Bird 1822, p. 250, pl. 13, fig. 3 (*non* 1828, p. 263, pl. 14, fig. 8 = *P. perarmatum*).

Type. In Simpson's Catalogue WM 181 and 521 are identified with this species. WM 181 is lost and it may have been Young and Bird's figured holotype. WM 521, figured here, is definitely the specimen described by Simpson (1843, p. 23; 1855, p. 60) under this specific name, and it bears much resemblance to Young and Bird's description and figure. It has a label in Simpson's writing 'A. subarmatus Lias Whitby', and clearly comes from the foreshore outcrop east of Whitby. This specimen is here designated neotype, though the possibility remains that it might be the holotype. Dimensions of WM 521: maximum diameter 60 mm.; at 50 mm.: 16.6, 19.3, 24.3.

The neotype (? holotype) has a deep umbilicus, depressed whorls with a broad arched venter crossed by the secondary ribs, and primary ribs on the side of the whorl mostly looped in pairs to prominent ventro-lateral tubercles. On the inner whorls the tubercles are elongated into short spines. There are thirty-nine primary ribs on the last whorl at 60 mm. diameter.

137. *Peronoceras turriculatum* (Simpson)

Ammonites turriculatus Simpson 1855, p. 59; 1884, p. 91.

Holotype. WM 152, figured by Buckman (1911, pl. 30).

Genus PORPOCERAS Buckman 1911

138. *Porpoceras vortex* (Simpson)

Ammonites vortex Simpson 1855, p. 60; 1884, p. 92.

Holotype. WM 153a, figured by Buckman (1911, pl. 29A).

Type species of *Porpoceras*.

139. *Porpoceras vorticellum* (Simpson)

Ammonites vorticellus Simpson 1855, p. 61; 1884, p. 93.

Holotype. WM 154, figured by Buckman (1913, pl. 90).

Genus NODICOELOCERAS Buckman 1926

140. *Nodicoeloceras crassescens* (Simpson)

Ammonites crassescens Simpson 1855, p. 55; 1884, p. 87.

Holotype. WM 135, figured by Buckman (1927, pl. 719).

141. *Nodicoeloceras crassoides* (Simpson)

Ammonites crassoides Simpson 1855, p. 55; 1884, p. 86.

Holotype. WM 126, figured by Buckman (1913, pl. 89).

Type species of *Nodicoeloceras*.

142. *Nodicoeloceras fonticulus* (Simpson)

Ammonites fonticulus Simpson 1855, p. 57; 1884, p. 89.

Holotype. WM 496, figured by Buckman (1912, pl. 59).

143. *Nodicoeloceras incrassatum* (Simpson)

Ammonites incrassatus Simpson 1855, p. 54; 1884, p. 86.

Holotype. WM 149, figured by Buckman (1921, pl. 210).

Genus CATACOELOCERAS Buckman 1923

144. *Catacoeloceras crassum* (Young and Bird)

Ammonites crassus Young and Bird 1828, p. 253.

Holotype. WM 125, figured by Buckman (1918, pl. 119).

EXPLANATION OF PLATE 17

Figs. 1, 2. *Phylloceras easingtonense* (Simpson). 1, Holotype. 2, Paratype. Both on a large slab in the collection of the Royal College of Science and Technology, Glasgow. Upper Lias, Jet Rock; Boulby.

Figs. 3a, b. *Eleganticerias rugatulum* (Simpson). Holotype, WM 250. Upper Lias, Jet Rock; Yorkshire coast.

Figs. 4a, b. *Harpoceras multifoliatum* (Simpson). Holotype, WM 219. Upper Lias, Jet Rock; Yorkshire coast.

Figs. 5a, b. *Peronoceras subarmatum* (Young and Bird). Neotype (? Holotype), WM 521. Upper Lias; foreshore east of Whitby.

Figs. 6a, b. *Peronoceras semiarmatum* (Simpson). Neotype, WM 522. Upper Lias; foreshore east of Whitby.

All figures natural size.

145. *Catacoeloceras crosbeyi* (Simpson)*Ammonites crosbeyi* Simpson 1843, p. 22; 1855, p. 58; 1884, p. 90.*Holotype*. WM 134, figured by Buckman (1912, pl. 60).146. *Catacoeloceras foveatum* (Simpson)*Ammonites foveatus* Simpson 1855, p. 57; 1884, p. 89.*Holotype*. WM 340, figured by Buckman (1913, pl. 69).147. *Catacoeloceras puteolum* (Simpson)*Ammonites puteolus* Simpson 1855, p. 58; 1884, p. 90.*Holotype*. WM 136, figured by Buckman (1912, pl. 61).

Family HILDOCERATIDAE Hyatt 1867

Genus ARIETICERAS Seguenza 1885

148. *Arietoceras geometricum* (Phillips)

Plate 18, figs. 2a, b

Ammonites geometricus Phillips 1829, p. 164, pl. 14, fig. 9; 1835, p. 135, pl. 14, fig. 9; 1875, p. 268, pl. 14, fig. 9.

Type. Phillips stated (1835, p. 184) that his figured specimen was in Mr. Ripley's Collection. The specimen figured here, BM 14721, was purchased by the British Museum (Natural History) from Mr. Ripley about 1843, and it shows a close resemblance to Phillips's figure. The whorl proportions and ribbing are the same as in the figure, there being thirty-three ribs on the last whorl of the specimen and thirty-four or thirty-five on the figure. This species has often been referred to *Arnioceras* before, but the venter and curiously drawn keel in the figure do not bear this out, for they show much greater resemblance to *Arietoceras*. This also agrees with Phillips's assertion (1875, p. 268) that the species was from the Middle Lias and was close to the Amaltheidae. The specimen BM 14721 cannot be proved to be the holotype and it is therefore here designated neotype. It is from the Margaritatus Zone at either Hawsker Bottoms or Staithes. Dimensions: 78 mm.: 23.0, 14.8, 37.0.

The neotype is slightly distorted, and has nearly half a whorl of body chamber, but it is not adult. The ribs are simple and almost straight throughout, curving forwards on the venter to die out before reaching the keel.

149. *Arietoceras nitescens* (Young and Bird)*Ammonites nitescens* Young and Bird 1828, p. 257.*Holotype*. WM 256, figured by Buckman (1913, pl. 74).

Genus HARPOCERAS Waagen 1869

150. *Harpoceras exaratum* (Young and Bird)*Ammonites exaratus* Young and Bird 1828, p. 266.*Holotype*. WM 202, figured by Buckman (1909, pl. 5).151. *Harpoceras mulgraviium* (Young and Bird)*Ammonites mulgravius* Young and Bird 1822, p. 251, pl. 13, fig. 8; 1828, p. 266, pl. 13, fig. 8.*Holotype*. WM 205, figured by Buckman (1909, pls. 4A, B).

152. *Harpoceras multifoliatum* (Simpson)

Plate 17, figs. 4a, b

Ammonites multifoliatum Simpson, 1855, p. 73, 1884, p. 108.*Holotype*. WM 219, from the Jet Rock. Dimensions: 25.4 mm.: 12.2, —, 5.7.

The holotype consists of wholly septate inner whorls, with mineral oil in some of the air chambers, a preservation typical of the Jet Rock. The specimen shows all the normal characters of *Harpoceras exaratum* (Young and Bird) of which it is a synonym, and it can be matched exactly with many specimens collected from known horizons in the Jet Rock. The fauna to which it belongs will be described in detail elsewhere.

153. *Harpoceras sigmifer* (Phillips)*Ammonites sigmifer* Phillips 1829, p. 164, pl. 13, fig. 4; 1835, p. 136, pl. 13, fig. 4; 1875, p. 331, pl. 13, fig. 4.

The holotype was probably a Falcifer Zone *Harpoceras*, but it is now lost and the species cannot be accurately identified.

Genus ELEGANTICERAS Buckman 1913

154. *Eleganticeras elegantulum* (Young and Bird)*Ammonites elegantulum* Young and Bird 1828, p. 267.*Holotype*. WM 212, figured by Buckman (1914, pl. 93).155. *Eleganticeras ovatum* (Simpson)*Ammonites ovatum* Simpson 1855, p. 76; 1884, p. 112.*Holotype*. WM 235, figured by Buckman (1914, pl. 106).156. *Eleganticeras rugatum* (Simpson)

Plate 17, figs. 3a, b

Ammonites rugatus Simpson 1855, p. 73; 1884, p. 108.*Holotype*. WM 250, from the Jet Rock. Dimensions: 22.4 mm.: 9.3, 5.7, 5.9; 18.5 mm.: 8.2, 4.9, 4.4.

The holotype is a complete adult with a constricted and flared mouth border at 22.5 mm. diameter. Large numbers of this species have been collected from the Jet Rock, and together with the holotype they will be described in detail elsewhere.

157. *Eleganticeras simile* (Simpson)

Plate 18, figs. 1a, b

Ammonites similis Simpson 1843, p. 34; 1855, p. 74; 1884, p. 109.*Holotype*. WM 237, from the Jet Rock, Hawsker Bottoms. Dimensions 33.2 mm.: 17.4, —, 5.5.

The holotype is a small specimen from the lower part of the Jet Rock and it clearly belongs to *E. elegantulum* (Young and Bird). The latter species will be described in detail elsewhere.

Genus HARPOCERATOIDES Buckman 1909

158. *Harpoceratoides alternatus* (Simpson, non Woodward, non d'Orbigny)

Ammonites alternatus Simpson 1843, p. 43; 1855, p. 86; 1884, p. 123 (*non* Woodward, 1833, *non* d'Orbigny, 1842).

Holotype. WM 338, figured by Buckman (1909, pl. 9); Jet Rock, Hawsker Bottoms.
Type species of *Harpoceratoides*.

Genus OVATICERAS Buckman 1918

159. *Ovaticeras ovatum* (Young and Bird)

Ammonites ovatus Young and Bird 1822, p. 251, pl. 13, fig. 4; 1828, p. 265, pl. 13, fig. 4.

Holotype. WM 197, figured by Buckman (1918, pl. 111A), is the original of the 1822 figure and is therefore the holotype. WM 198 (now lost), also figured by Buckman (1918, pls. 111B, C) and made the holotype of his new species, *O. pseudovatum*, is the original of the 1828 figure, and it does not differ specifically from *O. ovatum*.

Type species of *Ovaticeras*.

Genus WHITBYICERAS Buckman 1913

160. *Whitbyiceras pingue* (Simpson, *non* Roemer)

Ammonites pinguis Simpson 1855, p. 100; 1884, p. 141 (*non* Roemer 1836).

Holotype. GSM 26408, figured by Buckman (1913, pl. 80).
Type species of *Whitbyiceras*.

Genus PSEUDOLIOCERAS Buckman 1889

161. *Pseudolioceras boulbiense* (Young and Bird)

Ammonites boulbiense Young and Bird 1822, p. 252; 1828, p. 267.

Holotype. WM 213, figured by Buckman (1910, pl. 11).

162. *Pseudolioceras compactile* (Simpson)

Ammonites compactilis Simpson 1855, p. 75; 1884, p. 110.

Type. GSM 24914 is probably the holotype and was figured by Buckman (1911, pl. 41A). A topotype named by Simpson (WM 298) was also figured by Buckman (1911, pl. 41B).

Type species of *Pseudolioceras*.

163. *Pseudolioceras? lectum* (Simpson)

Ammonites lectus Simpson 1843, p. 34; 1855, p. 75; 1884, p. 110.

Holotype. WM 238, figured by Buckman (1911, pl. 43).

164. *Pseudolioceras leptophyllum* (Simpson)

Plate 18, figs. 5a, b

Ammonites leptophyllus Simpson 1855, p. 80; 1884, p. 116.

Holotype. An unnumbered specimen in Scarborough Museum as stated by Simpson. Dimensions: 82.3 mm.: 43.8, —, 12.0.

The holotype is a wholly septate internal mould, completely covered with matrix on the unfigured side. The whorls are compressed with a vertical umbilical wall. Ribs are present on the ventral half of

the whorl, inclined strongly backwards but fading before reaching the ventral edge. The matrix is a ferruginous sandstone which cannot be matched with any bed in the Whitbian of the Yorkshire coast. The most likely horizon is the Serpula Beds, the upper half of the Grey Beds, at Peak, Ravenscar; probably beds 79–81 of Dean (1954, p. 167) belonging to the Dispansum Subzone. The matrix of other ammonites from this horizon agrees with that of the present holotype.

165. *Pseudolioceras lythense* (Young and Bird)

Ammonites lythensis Young and Bird 1828, p. 267.

Holotype. WM 208, figured by Buckman (1910, pl. 13).

166. *Pseudolioceras simplex* (Simpson)

Plate 18, figs. 4a, b

Ammonites simplex Simpson 1855, p. 84; 1884, p. 120.

Holotype. GSM 23949, Lycett Collection, ex Charlesworth Collection. Dimensions: at 21.2 mm.: 9.9, —, 4.5.

The holotype is a small juvenile specimen with a quarter of a whorl of body chamber. The whorls are compressed and have a slightly differentiated keel. At the beginning of the last whorl there are reduced and striate sigmoidal ribs but these soon fade and the last half whorl is smooth. The suture-line is characterized by a small lobe which divides the first lateral saddle into two halves, and a fairly deep first lateral lobe. Generic placing of this specimen is difficult, but *Pseudolioceras* is favoured rather than *Oxynticeras* because of the suture-line characters. *Pseudolioceras lectum* figured by Buckman (1911, pl. 43) and the specimen figured by Tate and Blake (1876, p. 309, pl. 8, fig. 7—BM C17985), probably belonging to the same species, both have suture-lines with these same features. The locality of the holotype was said to be Robin Hood's Bay, but this could include the Upper Lias at Peak from which it probably came.

167. *Pseudolioceras? subconcavum* (Young and Bird)

Ammonites concavus Young and Bird 1822, p. 251, pl. 13, fig. 5 (*non* J. Sowerby 1815).

Ammonites subconcavus Young and Bird 1828, p. 266, pl. 13, fig. 5.

Holotype. WM 214, figured by Buckman (1910, pl. 10).

Genus *MONESTIERIA* Cossmann, 1922

168. *Monestieria errata* (Simpson)

Ammonites erratus Simpson 1843, p. 8; 1855, p. 37; 1884, p. 65.

Holotype. WM 90, figured by Buckman (1920, pl. 188) as *Pseudolioceras*: ? Hawsker Bottoms.

EXPLANATION OF PLATE 18

Figs. 1a, b. *Eleganticeras simile* (Simpson). Holotype, WM 237. Upper Lias, Jet Rock; Hawsker Bottoms.

Figs. 2a, b. *Arietoceras geometricum* (Phillips). Neotype (? Holotype), BM 14721, Ripley Collection. Middle Lias; Yorkshire coast (Hawsker Bottoms or Staithes).

Figs. 3a, b. *Hoplocrioceras phillipsi* (Phillips). Holotype, YM 424, Bean Collection. Speeton Clay; Speeton.

Figs. 4a, b. *Pseudolioceras simplex* (Simpson). Holotype, GSM 23949, Lycett Collection, ex Charlesworth Collection. Upper Lias; ? Peak, Ravenscar.

Figs. 5a, b. *Pseudolioceras leptophyllum* (Simpson). Holotype, Scarborough Museum. Upper Lias (probably Grey Beds, Peak, Ravenscar).

All figures natural size.

Genus HILDOCERAS Hyatt 1867

169. *Hildoceras hildense* (Young and Bird)

Ammonites hildensis Young and Bird 1822, p. 247, pl. 12, fig. 1; 1828, p. 254, pl. 12, fig. 1.

Type. This species is an objective synonym of *Hildoceras walcoti* (J. Sowerby), and the neotype is a specimen from the Alum Shales of Whitby figured by Buckman (1928, pl. 773). The original specimen figured by Young and Bird (now lost) and the topotype figured by Buckman (1926, pl. 667) are not valid as type specimens. See note on nomenclature below.

Genus HILDAITES Buckman 1921

170. *Hildaites levisoni* (Simpson)

Ammonites levisoni Simpson 1843, p. 54; 1855, p. 99; 1884, p. 140.

Holotype. WM 310, figured by Buckman (1910, pl. 12).

Genus FRECHIELLA Prinz 1904

171. *Frechiella subcarinata* (Young and Bird)

Ammonites subcarinatus Young and Bird 1822, p. 255, pl. 12, fig. 7; 1828, p. 271, pl. 12, fig. 9.

Holotype. WM 63, figured by Buckman (1910, pl. 23).

Type species of Frechiella.

Genus PSEUDOGRAMMOCERAS Buckman 1901

172. *Pseudogrammoceras latescens* (Simpson)

Ammonites latescens Simpson 1843, p. 54; 1855, p. 100; 1884, p. 140.

Holotype. WM 311, figured by Buckman (1913, pl. 79).

Family HAMMATOCERATIDAE Buckman 1887

Genus PHYMATOCERAS Hyatt 1867

173. *Phymatoceras fabale* (Simpson)

Ammonites fabalis Simpson 1855, p. 77; 1884, p. 113.

Holotype. WM 774, figured by Buckman (1921, pl. 244), but the specimen is now lost.

174. *Phymatoceras rude* (Simpson)

Ammonites rudis Simpson 1843, p. 44; 1855, p. 87; 1884, p. 124.

Holotype. WM 251, figured by Buckman (1910, pl. 14).

Genus HAUGIA Buckman 1888

175. *Haugia beani* (Simpson)

Ammonites beani Simpson 1843, p. 36; 1855, p. 77; 1884, p. 113.

Holotype. WM 291, figured by Buckman (1910, pl. 15); Peak, Ravenscar.

176. *Haugia obliquata* (Young and Bird)

Ammonites obliquatus Young and Bird 1828, p. 265.

Type. WM 222, figured by Buckman (1921, pls. 234A, B), is the holotype or the only remaining syntype; in Simpson's Catalogue four specimens are identified as this species.

177. *Haugia phillipsi* (Simpson, *non* Sowerby, *non* Roemer)

Ammonites phillipsi Simpson 1843, p. 36; 1855, p. 78; 1884, p. 113 (*non* J. de C. Sowerby 1831, *non* Roemer 1841).

Holotype. WM 1370, figured by Buckman (1913, pl. 85); Peak, Ravenscar.

Indeterminate Liassic species

178. *Ammonites bispicatus* Simpson 1855, p. 102; 1884, pp. 102, 105.
 179. *Ammonites complanatus* Young and Bird 1828, p. 268 (*non* Bruguière 1789).
 180. *Ammonites involutus* Simpson 1855, p. 39; 1884, p. 67 (*non* Quenstedt 1846).
 181. *Ammonites labratus* Simpson 1855, p. 36; 1884, p. 63.
 182. *Ammonites petricosus* Simpson 1855, p. 68; 1884, p. 102.
 183. *Ammonites volutus* Simpson 1843, p. 43; 1855, p. 86; 1884, p. 123.

The primary type specimens of the preceding six species are all lost, and none of them can be identified, specifically or generally, from the description alone. Nos. 178, 180, and 182 were probably from the Lower Lias, but the age of the others cannot be narrowed down at all.

UPPER JURASSIC AMMONITE SPECIES

Family OPPELIIDAE Bonarelli 1894

Genus TARAMELLICERAS Del Campana 1904

184. *Taramelliceras oculatum* (Phillips)

Ammonites oculatus Phillips 1829, p. 138, pl. 5, fig. 16; 1835, p. 109, pl. 5, fig. 16; 1875, p. 265, pl. 5, fig. 16.

Holotype. YM, Bean Collection, figured by Buckman (1921, pl. 224); Oxford Clay, Scarborough.

Family MACROCEPHALITIDAE Buckman 1922

Genus MACROCEPHALITES Zittel 1884

Subgenus *Kamptokephalites* Buckman 1922185. *Macrocephalites* (*Kamptokephalites*) *terebratus* (Phillips)

Plate 19, figs. 1a, b

Ammonites terebratus Phillips 1829, p. 145; 1835, p. 116; 1875, p. 267.

Type. BM 39566, from the Cornbrash, Scarborough, is here designated neotype. It was figured in front view by Blake (1905, pl. 3, fig. 6). The specimen is from the Bean Collection and bears his label '*Ammonites terebratus*. Cb.' There is the possibility that this is Phillips's holotype, which was simply described as 'similar [to *Am herveyi* Sow.] but more globular species, with a very acute and narrow umbilicus'; but it was not figured, and in the absence of direct evidence it is best to take it as the neotype. Dimensions: 93 mm.: 55, 69, 15.8.

The neotype is a globular, almost spherical specimen, with a very large whorl breadth, a narrow

umbilicus, vertical umbilical walls, and a crescent-shaped whorl section. The ribs bifurcate soon after leaving the umbilical edge and in some places a third secondary rib is intercalated. There is two-thirds of a whorl of body chamber and part of the mouth border is preserved. Blake (1905, p. 44, pl. 3, fig. 6) referred this specimen to *M. macrocephalus* (Schlotheim) but Spath (1928a, p. 172) kept Phillips's species distinct.

Family KOSMOCERATIDAE Haug 1887

Genus KOSMOCERAS Waagen 1869

186. *Kosmoceras gemmatum* (Phillips)

Ammonites gemmatus Phillips 1829, p. 141, pl. 6, fig. 17; 1835, p. 113, pl. 6, fig. 17; 1875, p. 266, pl. 6, fig. 17.

Neotype. SM J4822, designated and figured by Arkell (1939b, p. 189, fig. 4). The holotype is lost.

Subgenus LOBOKOSMOCERAS Buckman 1923

187. *Kosmoceras (Lobokosmoceras) rowlstonense* (Young and Bird)

Ammonites rowlstonensis Young and Bird 1822, p. 253, pl. 13, fig. 10; 1828, p. 269, pl. 13, fig. 10.

Holotype. WM 1512, figured by Buckman (1923, pl. 437); Hackness Rock, Rowlston Scar.

Family CARDIOCERATIDAE Siemiradzki 1891

Genus CHAMOUSSETIA Douvillé 1912

188. *Chamoussetia funifera* (Phillips)

Ammonites funiferus Phillips 1829, p. 142, pl. 6, fig. 23; 1835, p. 113, pl. 6, fig. 23; 1875, p. 266, pl. 6, fig. 23.

The holotype was from the Kelloways Rock of Scarborough but is lost, and the species, although probably a *Chamoussetia*, is not now recognizable.

189. *Chamoussetia lenticularis* (Phillips, *non* Young and Bird)

Ammonites lenticularis Phillips 1829, pp. 131, 142, 164, pl. 6, fig. 25; 1835, p. 135, pl. 6, fig. 25; 1875, p. 266, pl. 6, fig. 25 (*non* Young and Bird 1828).

The holotype is lost. The species is a *Chamoussetia* from the Kelloways Rock, and the name, if revived, must be based on an authentic Yorkshire neotype, and not on the Wiltshire specimen figured by Buckman (1924, pl. 462).

Genus QUENSTEDTOCERAS Hyatt 1877

190. *Quenstedtoceras crenulare* (Phillips)

Ammonites crenularis Phillips 1829, p. 164, pl. 12, fig. 22; 1835, p. 135, pl. 12, fig. 22; 1875, p. 268, pl. 12, fig. 22.

The holotype, originally in York Museum, is now lost, and, although the species is a *Quenstedtoceras* probably of the Lamberti Zone, it cannot be properly interpreted.

191. *Quenstedtoceras flexicostatum* (Phillips)

Ammonites flexicostatus Phillips 1829, p. 142, pl. 6, fig. 20; 1835, p. 113, pl. 6, fig. 20; 1875, p. 266, pl. 6, fig. 20.

The holotype is lost, but the species is a *Quenstedtoceras* of the Hackness Rock, probably conspecific with *Q. lamberti* (J. Sowerby 1819).

Genus GOLIATHICERAS Buckman 1919

192. *Goliathiceras ammonoides* (Young and Bird)

Nautilus ammonoides Young and Bird 1828, p. 271.

Holotype. WM 1276, figured by Buckman (1919, pls. 132A, B), and by Arkell (1942a-3a, pp. 254-6, text-fig. 90).

Subgenus GOLIATHITES Arkell 1943

193. *Goliathiceras (Goliathites) capax* (Young and Bird)

Ammonites capax Young and Bird 1822, p. 253.

Holotype. WM 1275, figured by Buckman (1922, pl. 349) and by Arkell (1943a, pp. 259-61, text-fig. 92); Malton.

Genus CARDIOCERAS Neumayr and Uhlig 1881

194. *Cardioceras chalcedonicum* (Young and Bird)

Nautilus chalcedonicus Young and Bird 1828, pp. 271-2.

Holotype. WM 1280, figured by Buckman (1922, pls. 295B, C). For discussion see Arkell (1941a, p. lxxv; 1948, p. 394).

Type species of *Chalcedoniceras* Buckman 1922, now considered a synonym of *Cardioceras*.

Subgenus SCARBURGICERAS Buckman 1924

195. *Cardioceras (Scarburgiceras) scarburgense* (Young and Bird)

Ammonites scarburgensis Young and Bird 1828, p. 265.

Type. WM 232, from the Oxford Clay at Scarborough, was figured and accepted as the holotype by Buckman (1924, pl. 508) and Arkell (1939b, p. 156, pl. 10, fig. 1). There is no satisfactory evidence that

EXPLANATION OF PLATE 19

Figs. 1a, b. *Macrocephalites (Kamptokephalites) terebratus* (Phillips). Neotype (? Holotype), BM 39566, Bean Collection. Cornbrash; Scarborough.

Figs. 2a, b. *Simbirskites spetonensis* (Young and Bird). Neotype, BM C34951, Lamplugh Collection. Speeton Clay, bed C6; Speeton.

Figs. 3a, b. *Simbirskites venustus* (Phillips). Holotype, YM 419. Speeton Clay; Speeton.

Figs. 4a-d. *Toxoceratoides obliquatus* (Young and Bird). Holotype, YM 423. Speeton Clay; Speeton. 4a, b, $\times 1$. 4c, d, $\times 2$.

Figs. 5a, b. *Distoloceras hystrix* (Phillips). Holotype, YM 413. Speeton Clay; Speeton.

Figs. 6a, b. *Simbirskites concinnus* (Phillips). Neotype, BM C4651, Bean Collection. Speeton Clay, Speeton.

Figs. 7a, b. *Crioceratites beani* (Young and Bird). Holotype, YM 422, Bean Collection. Speeton Clay; Speeton.

Figs. 8a, b. *Aegocrioceras bicarinatum* (Young and Bird). Neotype, BM 89107, Bean Collection. Speeton Clay; Speeton.

All figures natural size, except figs. 4c, d.

this specimen is the one described by Young and Bird; it was not accepted as such by Simpson who listed the specimen as '*Am. volutus. spinatus* z., Hawsker' in his Catalogue, and Young and Bird said that their specimen was found by Mr. Williamson. The Williamson Collection went to Scarborough Museum, but there is now no specimen which could be the original of this species at that Museum and none was listed by Arkell (1945b, p. 345). It is unlikely that WM 232 is the holotype, but in view of the nomenclatural stability required for this, the type species of *Scarburgiceras*, this specimen is now designated neotype.

Subgenus MALTONICERAS Arkell 1941

196. *Cardioceras (Maltoniceras) maltonense* (Young and Bird)

Ammonites maltonensis Young and Bird 1822, p. 252, pl. 12, fig. 10; 1828, p. 268, pl. 12, fig. 13.

Type. The holotype was WM 2472, but it has not been figured since Young and Bird, and it is now lost. Arkell (1941a, pp. 231–3, pl. 51, fig. 1) interpreted the species on what he called a 'provisional neotype', a Wiltshire specimen which he designated and figured. This interpretation was correct, but an authentic Yorkshire specimen should be designated neotype when one is found.

Type species of *Maltoniceras*.

Family PERISPINCTIDAE Steinmann 1890

Genus GROSSOUVRIA Siemiradzki 1898

Subgenus KLEMATOSPINCTES Buckman 1922

197. *Grossouvria (Klematosphinctes) vernoni* (Young and Bird)

Ammonites vernoni Young and Bird 1828, pp. 264–5, pl. 14, fig. 5.

Holotype. YM, but not listed by Melmore (1947, p. 234), so probably now lost; figured by Buckman (1922, pl. 333); Oxford Clay, Scarborough.

Type species of *Klematosphinctes*.

Genus PERISPINCTES Waagen 1869

198. *Perisphinctes instabilis* (Phillips)

Ammonites instabilis Phillips 1829, p. 135; 1835, p. 107; 1875, p. 265.

The holotype is lost, and, although it belonged to *Perisphinctes* s.l., the species cannot be interpreted from the description alone (Arkell, 1938a, p. 74; 1948a, p. 395).

Subgenus ARISPINCTES Buckman 1924

199. *Perisphinctes (Arisphinctes) ingens* (Young and Bird)

Ammonites ingens Young and Bird 1822, p. 247, pl. 12, fig. 2; 1828, p. 254, pl. 12, fig. 2.

Type. The holotype is lost, for the specimen WM 1279 figured by Buckman (1920, pl. 184) and claimed as the holotype, does not agree with Young and Bird's description and figure. BM 82361 has been designated neotype and figured by Arkell (1939a, pp. 119–26, pl. 23, fig. 2).

200. *Perisphinctes (Arisphinctes) maximus* (Young and Bird)

Ammonites maximus Young and Bird 1828, p. 255.

Holotype. WM 1281, figured by Buckman (1924, pl. 512) and by Arkell (1939a, pp. 112–18, text-fig. 34); Middle Calcareous Grit, Pickering.

201. *Perisphinctes (Arisphinctes) pickeringius* (Young and Bird)

Ammonites pickeringius Young and Bird 1822, p. 251, pl. 12, fig. 9; 1828, p. 254, pl. 12, fig. 9.

Holotype. WM 1273, figured by Buckman (1923, pl. 448) and by Arkell (1939a, pp. 134–9, pl. 26, fig. 3); Middle Calcareous Grit, Pickering.

Type species of *Toxosphinctes* Buckman 1923, which is probably a synonym of *Arisphinctes*.

Family ASPIDOCERATIDAE Zittel 1895

Genus PELTOCERAS Waagen 1871

202. *Peltoceras athleta* (Phillips)

Ammonites athleta Phillips 1829, pp. 138, 141, pl. 6, fig. 19; 1835, pp. 110, 113, pl. 6, fig. 19; 1875, p. 266, pl. 6, fig. 19.

Type. The holotype is lost. The neotype is BM 89052, from the Hackness Rock, Scarborough, which was figured by Spath (1931a, p. 561, pl. 106, fig. 3; pl. 107, fig. 5) and designated neotype and refigured by Arkell (1933, p. 610, pl. 37, fig. 7).

Type species of *Peltoceras*.

Genus PELTOCERATOIDES Spath 1924

203. *Peltoceratoides intertextus* (Simpson)

Ammonites intertextus Simpson 1855, p. 50.

Holotype. WM 2415, figured by Buckman (1926, pl. 662).

204. *Peltoceratoides williamsoni* (Phillips)

Ammonites williamsoni Phillips 1829, p. 131, pl. 4, fig. 19; 1835, p. 102, pl. 4, fig. 19; 1875, p. 265, pl. 4, fig. 19.

Holotype. Scarborough Museum, Williamson Collection, figured by Spath (1929b, pp. 293–5, text-fig. 1) and Arkell (1945a, pp. 287–90, pl. 64, fig. 3; pl. 67, fig. 3); Ayton, probably Hambleton Oolite Series.

Genus EUASPIDOCERAS Spath 1931

205. *Euaspidoceras acuticostatum* (Young and Bird)

Ammonites acuticostatus Young and Bird 1822, p. 248.

Holotype. WM 1286, figured by Buckman (1923, pls. 438A, B) and Arkell (1945a, p. 278, text-fig. 95); the locality is probably Malton.

206. *Euaspidoceras silphouense* (Young and Bird)

Ammonites silphouensis Young and Bird 1822, p. 250, pl. 12, fig. 5.

Holotype. WM, unnumbered specimen, figured by Buckman (1823, pl. 364B) and described by Arkell (1945a, p. 287).

Indeterminate Upper Jurassic species

207. *Ammonites bifrons* Phillips 1829, p. 141, pl. 6, fig. 18; 1835, p. 113, pl. 6, fig. 18 (*non* Bruguière 1789).

208. *Ammonites diversus* Phillips 1875, pp. 266, 327, pl. 6, fig. 18 (*non* Simpson 1843).

A. diversus, itself preoccupied, was a substitute name for the preoccupied *A. bifrons*. The holotype, probably from the Hackness Rock, is lost, and the species cannot be interpreted.

CRETACEOUS AMMONITE SPECIES

Family ANCYLOCERATIDAE Meek 1876

Genus AEGOCRIOCERAS Spath 1924

209. *Aegocrioceras bicarinatum* (Young and Bird)

Plate 19, figs. 8a, b

Hamites bicarinatus Young and Bird 1828, p. 278, pl. 15, fig. 10.

Neotype. BM 89107, here designated, from the Speeton Clay at Speeton. This specimen is from Bean's Collection and has a register entry '*Hamites intermedius*', presumably from Bean's label which has since disintegrated. However, the specimen agrees closely with Young and Bird's good description and with what can be seen on their poor figure, and it seems certain that this is the species they described. The holotype was also in Bean's collection and went to York Museum, but it is now lost.

The neotype is an uncoiled, wholly septate fragment consisting of about two-thirds of a whorl with a maximum diameter of 29 mm. The whorl shape is quadrate with rounded sides. There are 25 ribs on the specimen indicating 35–38 per whorl; each is radial, straight, and continuous across the flattened venter, and there is a small tubercle at the ventro-lateral angle. The flat dorsum is crossed only by striae.

According to Spath (1924b, pp. 76–77) species of this form occur at about the middle of the Hauterivian, and his record of '*A. intermedium* (Bean MS., *non* Phillips)' in bed C7 or C lower to middle, may refer to the present neotype.

210. *Aegocrioceras? raricostatum* (Phillips)

Hamites raricostatus Phillips 1829, p. 123, pl. 1, fig. 23; 1835, p. 95, pl. 1, fig. 23; 1875, p. 264, pl. 1, fig. 23.

The holotype, originally in the Williamson Collection at Scarborough Museum, is now lost, and the species cannot be interpreted.

Genus CRIOCERATITES Leveillé 1837

211. *Crioceratites beani* (Young and Bird)

Plate 19, figs. 7a, b

Hamites beani Young and Bird 1828, p. 278, pl. 15, fig. 9.

Hamites beani Young and Bird, Phillips 1829, p. 124, pl. 1, fig. 28; 1835, p. 95, pl. 1, fig. 28; 1875, p. 264, pl. 1, fig. 28.

Paracrioceras statheri Spath 1924b, p. 77.

Holotype. YM tablet 422; Speeton Clay, Speeton. Young and Bird's and Phillips's drawings are taken from the same specimen. A comparison of the drawings shows that this is likely, but in addition it was stated in both works (Young and Bird 1828, p. 278; Phillips 1835, p. 178) that the figured specimen was in Bean's collection, and it is known that all the specimens in that collection figured by Young and Bird and Phillips went to York Museum (Melmore 1946, p. 208). *Paracrioceras statheri* Spath, a new name for *H. beani* Phillips, *non* Young and Bird, is therefore an objective synonym.

The holotype is an uncoiled, wholly septate fragment, with a maximum dimension of 24.5 mm. It consists of about one-third of a whorl, and has eight ribs with tubercles, with two to five fine non-tuberculate ribs between each. The larger ribs have paired ventral, median lateral and umbilical

tubercles, which are all small. The dorsum and venter are smooth and are not crossed by ribs. According to Spath (1924b, p. 77) this species occurs in beds C7 to C1 and in the base of bed B at Speeton, i.e. the Upper Hauterivian, and possibly the top of the Lower Hauterivian.

Genus HOPLOCRIOCERAS Spath 1924

212. *Hoplocrioceras phillipsi* (Phillips)

Plate 18, figs. 3a, b

Hamites phillipsi Phillips 1829, p. 124, pl. 1, fig. 30; 1835, p. 95, pl. 1, fig. 30; 1884, p. 264, pl. 1, fig. 30.

Holotype. YM tablet 424, bearing both Bean's and Phillips's labels and a later one; Speeton Clay, Speeton.

The holotype consists of $1\frac{1}{2}$ coiled whorls and a length of slightly curved uncoiled body chamber. The inner whorls are missing. The maximum diameter of the coiled part is 46 mm. Septation ceases about 5 mm. before the whorls uncoil and the length of the body chamber is 44 mm. The last suture-lines are not clearly approximated and there is no evidence of a modified mouth border, so the specimen is probably immature. Both the coiled whorls and the body chamber have an elliptical cross-section. The ribs are straight and single, with a few intercalated ones which do not reach the umbilical edge. There are no tubercles on any part of the whorls, though on the body chamber the ribs tend to be slightly raised at the umbilical edge. This specimen is the holotype of the type species of *Hoplocrioceras* Spath 1924. According to Spath (1924b, p. 78) forms related to this species occur in beds C1 and B up to the top of the Cement Beds, i.e. Upper Hauterivian and Barremian.

Genus TOXOCERATOIDES Spath 1924

213. *Toxoceratoides obliquatus* (Young and Bird)

Plate 19, figs. 4a-d

Hamites obliquatus Young and Bird 1828, p. 278, pl. 15, fig. 11.

Holotype. YM tablet 423; Speeton Clay, Speeton.

The holotype is a wholly septate, slightly curved fragment 15 mm. long, with a circular cross-section, 3.2 mm. diameter at the smaller end, 5.0 mm. at the larger end. There is a narrow smooth-band on the dorsum; commencing at the side of this are simple ribs, inclined forwards on the side of the shell and passing without a break across the venter. At the ventro-lateral edge small tubercles surmount the ribs; these vary in size and tend to be developed only on alternate ribs. In a few cases two ribs on the side of the whorl unite at a tubercle.

The species belongs to the genus *Toxoceratoides* which has recently been discussed in detail by Casey (1961, pp. 77-82). Spath (1924b, p. 78) recorded it from the upper part of bed B at Speeton, i.e. the Lower Aptian.

Family OLCOSTEPHANIDAE Haug 1910

Genus SIMBIRSKITES Pavlow 1892

214. *Simbirskites concinnus* (Phillips)

Plate 19, figs. 6a, b

Ammonites concinnus Phillips 1829, p. 123, pl. 2, fig. 47; 1835, p. 94, pl. 2, fig. 47; 1875, p. 264, pl. 2, fig. 47.

Olcostephanus (Simbirskites) concinnus (Phillips), Pavlow and Lamplugh 1892, p. 501, pl. 18, fig. 16.

Type. Phillips's figured holotype was in York Museum (Phillips 1835, p. 179; Platnauer 1891, p. 78), but by 1946 it had decomposed (Melmore 1947, p. 235). The neotype, here designated, is BM C4651, from the Speeton Clay at Speeton, figured by Pavlow and Lamplugh (1892, pl. 18, fig. 16) and refigured here. This specimen is from Bean's collection, and has his original label '*Ammonites knaptonensis*'. It does not, however, agree in any way with Young and Bird's (1828, p. 272) description of that species. Dimensions of neotype: maximum diameter 28 mm.; 26.8 mm.: 11.6, 9.9, 8.0; 18 primary ribs and about 46 secondary ribs.

The neotype agrees closely in size, whorl proportions, and style and density of ribbing with Phillips's figure. It is wholly septate, with primary ribs bifurcating or trifurcating at a small tubercle in the middle of the side of the whorl. The secondary ribs are projected slightly forwards on the venter. Pavlow and Lamplugh (1892, p. 502) said that this species is found in bed C6 at Speeton, at about the middle of the Hauterivian.

215. *Simbirskites spetonensis* (Young and Bird)

Plate 19, figs. 2a, b

Ammonites spetonensis [sic] Young and Bird 1828, p. 265, pl. 12, fig. 5.

Neotype. BM C34951, from bed C6, Speeton Clay, Speeton, here designated and figured, and figured previously by Pavlow and Lamplugh (1892, p. 500, pl. 18, fig. 7). Dimensions: maximum diameter 34 mm.; 32.3 mm.: 14.6, 11.2, 8.1. The holotype was in the Bean Collection and went to York Museum, but it is now lost or decomposed.

The neotype is a close match for the specimen described and figured by Young and Bird. It is wholly septate and has fairly compressed whorls which are thickest near the rounded umbilical edge. The primary ribs are sharp and curve gently forwards from the umbilical edge; about a third of the way across the whorl they split into three or four secondaries and at the point of splitting there is a small sharp tubercle. In some places the fourth secondary is intercalated and does not spring directly from the tubercle. The secondaries curve forwards in crossing the evenly rounded venter. There are eighteen primary and sixty-three secondary ribs on the last whorl at 34 mm. diameter. This species differs from *S. concinnus* (Phillips) in being more compressed, rather more involute, and having more and finer secondary ribs. *S. venustus* (Phillips) is a synonym. The species occurs in bed C6, about the middle of the Hauterivian.

216. *Simbirskites venustus* (Phillips)

Plate 19, figs. 3a, b

Ammonites venustus Phillips 1829, p. 123; pl. 2, fig. 48; 1835, p. 94, pl. 2, fig. 48; 1875, p. 264, pl. 2, fig. 48.

Holotype. YM tablet 419, from the Speeton Clay at Speeton. Dimensions: 23.2 mm.: 10.3, 7.8, 5.7.

The holotype is wholly septate and well preserved. At similar sizes it compares very closely with the neotype of *S. spetonensis* (Young and Bird) and Phillips's species is clearly a synonym. On the last whorl at 23 mm. diameter there are twenty-one primary ribs and sixty-two secondary ribs. The transition is seen from rib trifurcation with occasional bifurcation at the beginning of the last whorl, through trifurcation alone for the next half whorl, to trifurcation with an occasional fourth secondary rib intercalated near the aperture on the last whorl. The horizon is the same as that of *S. spetonensis*.

Family BERRIASSELIDAE Spath 1922

Genus DISTOLOCERAS Hyatt 1900

217. *Distoloceras curvinodum* (Phillips)

Ammonites curvinodus Phillips 1829, p. 123, pl. 2, fig. 50; 1835, p. 95, pl. 2, fig. 50; 1875, p. 264, pl. 2, fig. 50.

The holotype is lost, and a satisfactory neotype is not available. The species was probably correctly

interpreted by Neumayr and Uhlig (1881, p. 174, pl. 43, fig. 3; pl. 44, fig. 2; *non* pl. 42, fig. 2) and von Koenen (1902, p. 189, pl. 13, fig. 7).

218. *Distoloceras hystrix* (Phillips)

Plate 19, figs. 5a, b

Ammonites hystrix Phillips 1829, p. 123, pl. 2, fig. 44; 1835, p. 95, pl. 2, fig. 44; 1875, p. 264, pl. 2, fig. 44.

Holotype. YM tablet 413, from the Speeton Clay at Speeton. Dimensions: maximum diameter 68 mm.; at 53 mm.: 20.6, 17.2, 18.5.

The holotype has one-third of a whorl of body chamber, and its last suture-line is at 49 mm. diameter. It does not show any adult characters. At 53 mm. diameter the outer whorl begins to uncoil; at the aperture there is a gap of 2 mm. between the dorsum of the outer whorl and the venter of the preceding whorl, and this gap is crossed by the paired ventral spines of the inside whorl which touch the dorsum of the body chamber. The whorl section is roughly circular. Long umbilical, ventro-lateral, and paired ventral spines are developed on the primary ribs, commencing at 12–15 mm. diameter. The ribs are straight up to the ventro-lateral spines and are projected well forwards on the venter. All the primary ribs bear spines. Commencing at about 35 mm. diameter, much smaller non-tuberculate secondary ribs are intercalated between most primary ribs. There are seventeen primary ribs on the last whorl at 68 mm. diameter. This specimen is the holotype of the type species of *Distoloceras* Hyatt 1900. According to Spath (1924b, pp. 75–76) *D. hystrix* is found in bed D1, and there are several closely related species in D2; both beds are at the base of the Hauterivian.

Family HOLCODISCIDAE Spath 1924

Genus SPITIDISCUS Kilian 1910

219. *Spitidiscus youngi* (Young and Bird)

Ammonites youngi Young and Bird 1828, pp. 256–7, pl. 12, fig. 6.

The holotype from the Speeton Clay is lost, but it was almost certainly a specimen of *S. rotula* (J. de C. Sowerby 1827). The latter name has been widely used since its proposal, and should not be replaced by the ill-defined *S. youngi*.

Family DESHAYESITIDAE Stoyanow 1949

Genus DESHAYESITES Kazansky 1914

220. *Deshayesites fissicostatus* (Phillips)

Ammonites fissicostatus Phillips 1829, p. 123, pl. 2, fig. 49; 1835, p. 95, pl. 2, fig. 49; 1875, p. 264, pl. 2, fig. 49.

The holotype was in the Williamson Collection (Phillips 1835, p. 179), later transferred to Scarborough Museum, but it is now lost. Spath (1924b, p. 78) referred the species to *Deshayesites* and said it came from the upper part of bed B at Speeton.

Indeterminate Cretaceous species

221. *Ammonites knaptonensis* Young and Bird 1828, p. 272.

222. *Ammonites marginatus* Phillips 1829, p. 123, pl. 2, fig. 41; 1835, p. 95, pl. 2, fig. 41; 1875, p. 264, pl. 2, fig. 41.

223. *Ammonites nucleus* Phillips 1829, p. 174, pl. 2, fig. 43; 1835, p. 167, pl. 2, fig. 43; 1875, p. 264, pl. 2, fig. 43.

224. *Ammonites trisulcosus* Phillips 1829, p. 123; 1835, p. 94; 1875, p. 64.

225. *Crioceras williamsoni* Phillips 1875, p. 263.

The holotypes of nos. 221 to 224 were from the Speeton Clay at Speeton, but all are now lost; those of nos. 222 and 223 were originally at York Museum (Melmore 1947, p. 235). *Crioceras williamsoni* was a large Upper Cretaceous species from the Chalk of Danes' Dyke; the holotype was in the Williamson Museum, but it is now lost and the species is not interpretable from the description alone.

NOTE ON NOMENCLATURE

In a few cases Young and Bird stated that the species for which they were proposing a new specific name had been named previously by Sowerby, and it must now be considered whether it can be established under the Rules of Nomenclature that Young and Bird's specific name is in each case an objective synonym of Sowerby's specific name. These cases are covered by Article 72 (d) of the Rules (International Code of zoological nomenclature. *Int. Comm. Zool. Nomen.*, London 1961, p. 75), which reads: 'If an author proposes a new specific name expressly as a replacement for a prior name, but at the same time applies it to particular specimens, the type of the replacement nominal species must be that of the prior nominal species, despite any contrary designation of type-specimen or different taxonomic usage of the replacement name.' In this rule the phrase 'expressly as a replacement for a prior name' means 'definitely stated, not merely implied, to be a replacement for a prior name,' and it is on this point that Young and Bird's species have to be examined. There are five cases and the following are the relevant extracts from Young and Bird's original descriptions.

1. *Phylloceras whitbiense*. 'No. 1, Pl. XIII, which we have named *N. Whitbiensis*, is the most common of our nautilites. . . . The siphuncle runs along the back, in which respect it resembles the ammonite family, and Sowerby has figured it under the name *A. heterophyllus*, Tab. 266.' (1828, pp. 270-1.)
2. *Lytoceras cornucopia*. 'From its great resemblance to a spiral horn, we have named this shell *A. cornucopia*. Sowerby has figured a fragment of it, under the name *A. fimbriatus*, Tab. 164.' (1828, p. 256.)
3. *Schlotheimia redcarensis*. 'The *a. Bucklandi* of Sowerby, Tab. 130, seems to be a cast of this species. We would prefer naming it *a. Redcarensis*.' (1822, p. 248.) 'This appears to be a smaller species than *a. Bucklandi*, which is also found in the lowest shale, both at Redcar and Robin Hood's Bay.' (1822, p. 327, footnote to plate explanation, where the figure is called *Ammonites Redcarensis*.)
4. *Promicroceras aureum*. 'As it is generally found in a pyritous state, shining like gold, we might call it *a. aureum*; but it seems to be the same with *a. planicosta* of Sowerby, Tab. 73.' (1822, p. 248.)
5. *Hildoceras hildense*. 'It is the *a. Walcottii* of Sowerby, Tab. 106. We would rather name it *a. Hildensis*, in honour of our Lady Hilda.' (1822, p. 247.)

In the descriptions of *Ammonites whitbiensis* and *A. cornucopia* the references to the Sowerby species are very similar. In neither case is it definitely stated that the new specific names are substitutes for those of Sowerby, and therefore it cannot be held that Young and Bird's specific names are objective synonyms of Sowerby's names. The phrase 'we would prefer naming it' in the description of *Ammonites redcarensis* is a definite statement that Sowerby's species is being renamed, but in the previous sentence it is stated that the specimen figured by Sowerby only 'seems to be' a cast of this species, and later, in a footnote, the two species are clearly stated to be different. Again, in *Ammonites aureum*, Sowerby's species only 'seems to be' the same, and Young and Bird's specific names cannot, therefore, be considered objective synonyms of Sowerby's

species. In the description of *Ammonites hildensis* the phrase 'we would rather name it' is a definite statement of renaming, and it is not qualified anywhere else in the description. In this case alone objective synonymy must be considered established under the Rules of Nomenclature, and the type specimen of *Ammonites hildensis* Young and Bird is the type specimen of *Hildoceras walcoti* (J. Sowerby 1815, *Min. Conch.*, vol. 2, p. 7, pl. 106). Sowerby figured two syntypes of *H. walcoti*, the upper figure of his plate 106 being a complete Whitby specimen and the lower figure a sectioned specimen from Bath. Both syntypes are lost, but a good Whitby topotype was figured by Buckman (1928, pl. 773), which, though larger, is a close match for Sowerby's figure, and this specimen (GSM 49347) is here designated neotype.

ALPHABETICAL LIST OF SPECIES

- aculeatum*, *Apoderoceras*, 77.
acuticarinatum, *Arnioceras*, 36.
acuticostatum, *Euaspidoceras*, 205.
aequale, *Saxoceras*, 24.
aliaenum, ? *Oxynoticeras*, 45.
alternatus, *Harpoceratoides*, 158.
ambiguum, *Tragophylloceras*, 11.
ammonoides, *Goliathiceras*, 192.
andersoni, *Dactylioceras*, 118.
andraei, *Peronoceras*, 132.
anguiforme, *Eoderoceras*, 65.
anguliferum, ? *Oistoceras*, 99.
annulare, *Cenoceras*, 1.
annuliferum, *Dactylioceras*, 119.
antiqum, ? *Boucalticeras*, 27.
arcigerens, *Androgynoceras*, 96.
arctus, ? *Cymbites*, 43.
armiger, ? *Eoderoceras*, 66.
astacoides, *Cenoceras*, 4.
athleta, *Peltoceras*, 202.
athleticum, *Dactylioceras*, 120.
attenuatum, *Peronoceras*, 133.
aureolum, *Echioceras*, 57.
aureum Simpson, *Platypleuroceras*, 88.
aureum Young and Bird, *Promicroceras*, 63.
balteatum, *Trachylitoceras*, 16.
beani, *Crioceratites*, 211.
beani, *Haugia*, 175.
belcheri, *Caloceras*, 22.
bicarinatum, *Aegocrioceras*, 209.
bifrons, *Ammonites*, 207.
birdi, *Pleuroceras*, 112.
bispicatum, *Ammonites*, 178.
boulbiense, *Pseudolioceras*, 161.
bucki, *Oxynoticeras*, 46.
capax, *Goliathiceras*, 193.
cereum, *Echioceras*, 58.
chalconicum, *Cardioceras*, 194.
clevelandicus, *Amaltheus*, 102.
compactile, *Pseudolioceras*, 162.
complanatus, *Ammonites*, 179.
complanosum, *Metoxynoticeras*, 53.
concinus, *Simbirskites*, 214.
conjunctivum, *Amauroceras*, 109.
convolutum, *Caloceras*, 23.
cornucopia, *Lytoceras*, 15.
cornutum, *Phricodoceras*, 72.
crassescens, *Nodicoeloceras*, 140.
crassibundum, *Dactylioceras*, 121.
crassifactum, *Dactylioceras*, 122.
crassiusculosum, *Dactylioceras*, 123.
crassiusculum, *Dactylioceras*, 124.
crassoides, *Nodicoeloceras*, 141.
crassulosum, *Dactylioceras*, 125.
crassulum, *Dactylioceras*, 126.
crassum, *Catacoeloceras*, 144.
crenulare, *Quenstedtoceras*, 189.
croseyi, *Catacoeloceras*, 145.
curvinodum, *Distoloceras*, 217.
decussatum, *Apoderoceras*, 78.
defossum, *Defossiceras*, 35.
dejectum, ? *Oxynoticeras*, 47.
delicatum, *Dactylioceras*, 127.
dennyi, ? *Cymbites*, 44.
denotatus, *Eparietites*, 40.
depressus, *Amaltheus*, 103.
diversus Phillips, *Ammonites*, 208.
diversum Simpson, *Eoderoceras*, 67.
easingtonense, *Phylloceras*, 8.
elaboratum, *Pleuroceras*, 113.
elegantulum, *Eleganticeras*, 154.
errata, *Monestieria*, 168.
erugatum, *Psiloceras*, 21.
exaratum, *Harpoceratites*, 150.
exasciatus, ? *Amaltheus*, 104.
exortum, *Echioceras*, 59.
fabale, *Phymatoceras*, 173.
fabricatum, *Calliphylloceras*, 10.
fasciatum, *Trachylitoceras*, 17.
ferrugineum, *Amauroceras*, 110.
figulinum, *Oistoceras*, 100.
fissicostatus, *Deshayesites*, 220.
flavum, *Oxynoticeras*, 48.
flexicostatum, *Quenstedtoceras*, 191.
fonticulus, *Nodicoeloceras*, 142.
foveatum, *Catacoeloceras*, 146.
funifera, *Chamoussetia*, 188.
gagateum, *Gagaticeras*, 55.
gemmatum, *Kosmoceras*, 186.
geometricum, *Arietoceras*, 148.
gracile, *Dactylioceras*, 128.
gubernator, *Pachylitoceras*, 19.
hamiltoni, *Apoderoceras*, 79.
hastatum, *Apoderoceras*, 80.
hawskerense, *Pleuroceras*, 114.
heptangulare, *Liparoceras*, 94.
heterogenes, *Androgynoceras*, 97.
heterogeneum, *Cenoceras*, 2.
hildense, *Hildoceras*, 169.
huntoni, *Tragophylloceras*, 12.
hystrix, *Distoloceras*, 218.
ignota, *Uptonia*, 91.
illatum, *Agassiceras*, 31.
impedens, *Eparietites*, 41.
incrassatum, *Nodicoeloceras*, 143.
ingens, *Perisphinctes*, 199.
instabilis, *Perisphinctes*, 198.
integricostatum, *Bifericeras*, 61.
intertextus, *Peltoceratoides*, 203.
involutus, *Ammonites*, 180.
knaptonensis, *Ammonites*, 221.
labratus, *Ammonites*, 181.
lataescens, *Pseudogrammoceras*, 172.

- lectum*, ? *Pseudolioceras*, 163.
lens, *Gleviceras*, 52.
lenticulare Young and Bird, *Amauroceras*, 111.
lenticularis, Phillips, *Chamoussettia*, 189.
leptophyllum, *Pseudolioceras*, 164.
leptoni, *Hildaites*, 170.
limatum, ? *Oxynoticeras*, 49.
luridum, *Beaniceras*, 95.
lythense, *Pseudolioceras*, 165.
maculatum, *Androgynoceras*, 98.
maltonense, *Cardioceras*, 196.
maltonensis, *Nautilus*, 7.
mamillatum, *Hyperderoceras*, 70.
marginatus, *Ammonites*, 222.
marshallani, *Apoderoceras*, 81.
maximus, *Perisphinctes*, 200.
miles, *Eoderoceras*, 68.
mulgravium, *Harpoceras*, 151.
multanfractum, *Vermiceras*, 30.
multifoliatum, *Harpoceras*, 152.
mutatum, *Apoderoceras*, 82.
nanum, ? *Tragophylloceras*, 13.
navium, *Hyperderoceras*, 71.
neglectum, *Gagaticeras*, 56.
nitescens, *Arietoceras*, 149.
nitidum, *Trachylitoceras*, 18.
nodulosus, *Amaltheus*, 105.
nucleus, *Ammonites*, 223.
obliquata, *Haugia*, 176.
obliquatus, *Toxoceratoides*, 213.
obsoleta, *Uptonia*, 92.
oculatum, *Taramelliceras*, 184.
omissum, *Oistoceras*, 101.
ovatum, *Eleganticeras*, 155.
ovatum, *Ovaticeras*, 159.
owenense, *Eoderoceras*, 69.
perarmatum, *Peronoceras*, 134.
peregrinum, ? *Pachylitoceras*, 20.
personatum, *Agassiceras*, 32.
petricosus, *Ammonites*, 182.
phillipsi, *Haugia*, 177.
phillipsi, *Hoplocrioceras*, 212.
pickeringius, *Perisphinctes*, 201.
pingue, *Whitbyceras*, 160.
polyophyllum, *Oxynoticeras*, 50.
puteolum, *Catacoeloceras*, 147.
quadricornutum, *Phricodoceras*, 73.
radiatus, *Arietites*, 28.
raricostatum, ? *Aegocrioceras*, 210.
redcarensis, *Schlotheimia*, 25.
regulare, *Pleuroceras*, 115.
resupinatum, *Euagassiceras*, 33.
retentum, *Retenticeras*, 54.
reticularis, *Amaltheus*, 106.
reticularis, *Nautilus*, 5.
retusum, *Coeloderoceras*, 74.
ripleyi, *Platypleuroceras*, 89.
robinsoni, *Tragophylloceras*, 14.
rowlstonense, *Kosmoceras*, 187.
rude, *Phymatoceras*, 174.
rugatum, *Eleganticeras*, 156.
rutilans, *Polymorphites*, 86.
scarburgense, *Cardioceras*, 195.
scoresbyi, *Xiphoceras*, 60.
semiararmatum, *Peronoceras*, 135.
semicelatum, *Dactylioceras*, 129.
semicostatum, *Arnioceras*, 37.
sigmifer, *Harpoceras*, 153.
silphouense, *Euaspidoceras*, 206.
simile, *Eleganticeras*, 157.
simplex, *Pseudolioceras*, 166.
simpsoni, *Oxynoticeras*, 51.
sinuatum, *Apoderoceras*, 83.
siphunculare, ? *Promicroceras*, 64.
sociale, ? *Coeloderoceras*, 75.
solare, *Pleuroceras*, 116.
solitarium, *Pleuroceras*, 117.
spetonensis, *Simbirskites*, 215.
spicatum, *Apoderoceras*, 84.
subarmatum, *Peronoceras*, 136.
subcarinata, *Frechiella*, 171.
subconcauum, ? *Pseudolioceras*, 167.
subnodosus, *Amaltheus*, 107.
subtriangulare, *Apoderoceras*, 85.
sulcata, *Schlotheimia*, 26.
tenellus, *Eparietites*, 42.
tenuicostatum, *Dactylioceras*, 130.
tenuispina, *Platypleuroceras*, 90.
terebratus, *Macrocephalites*, 185.
transformatum, *Euagassiceras*.
trisolcosus, *Ammonites*, 224.
trivialis, *Polymorphites*, 87.
tubellum, ? *Gemmellaroceras*, 93.
turriculatum, *Peronoceras*, 137.
undulatum, *Cenoceras*, 3.
validanfractum, *Coroniceras*, 29.
validum, *Coeloderoceras*, 76.
venustus, *Simbirskites*, 216.
vermis, *Dactylioceras*, 131.
vernoni, *Grossouvrria*, 197.
vetustum, *Arnioceras*, 38.
vitreum, *Bifericeras*, 62.
vittatus, *Amaltheus*, 108.
volutus, *Ammonites*, 183.
vortex, *Porpoceras*, 138.
vorticellum, *Porpoceras*, 139.
whitbiense, *Phylloceras*, 9.
williamsoni, *Crioceras*, 225.
williamsoni, *Peltoceratoides*, 204.
youngi, *Nautilus*, 6.
youngi Simpson, *Arnioceras*, 39.
youngi Young and Bird, *Spiritidiscus*, 219.

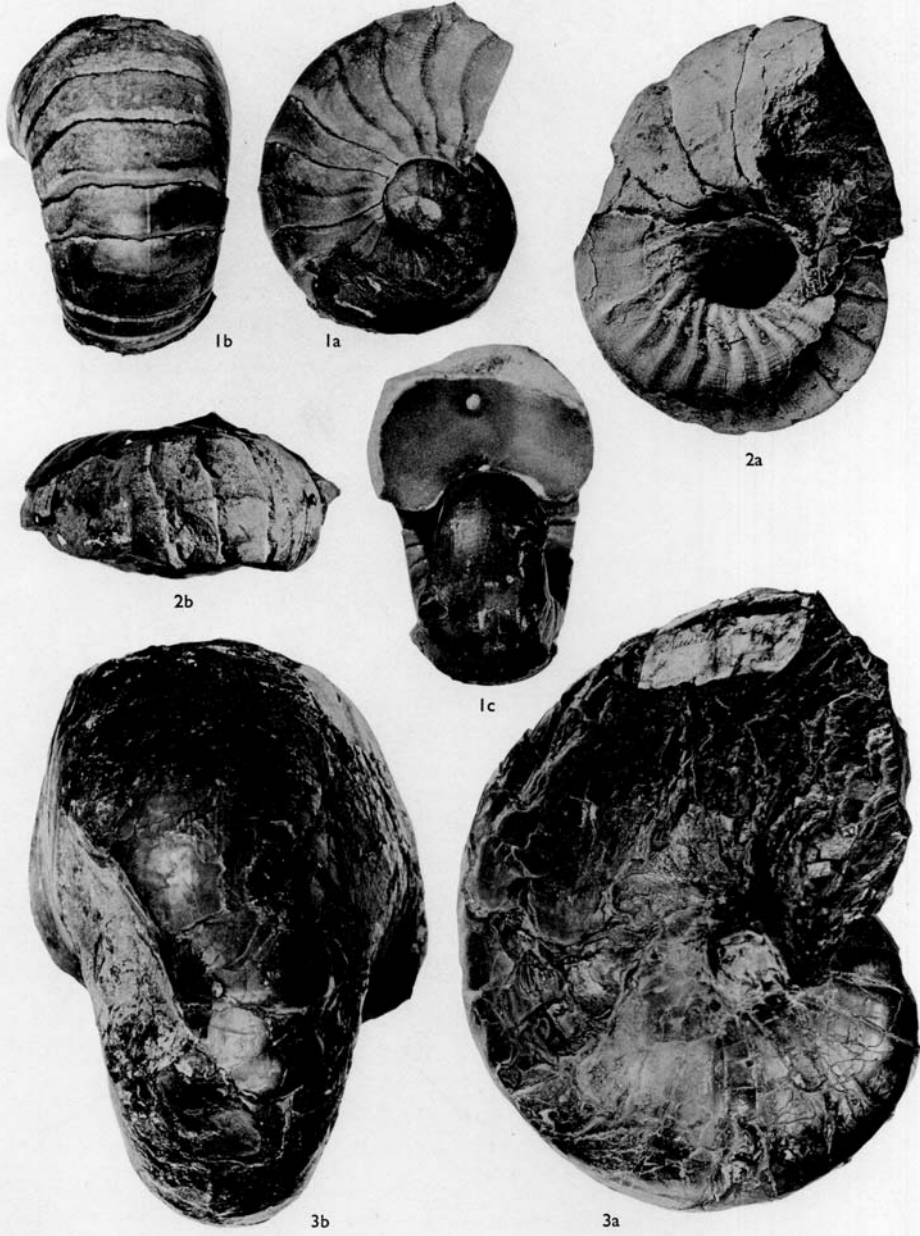
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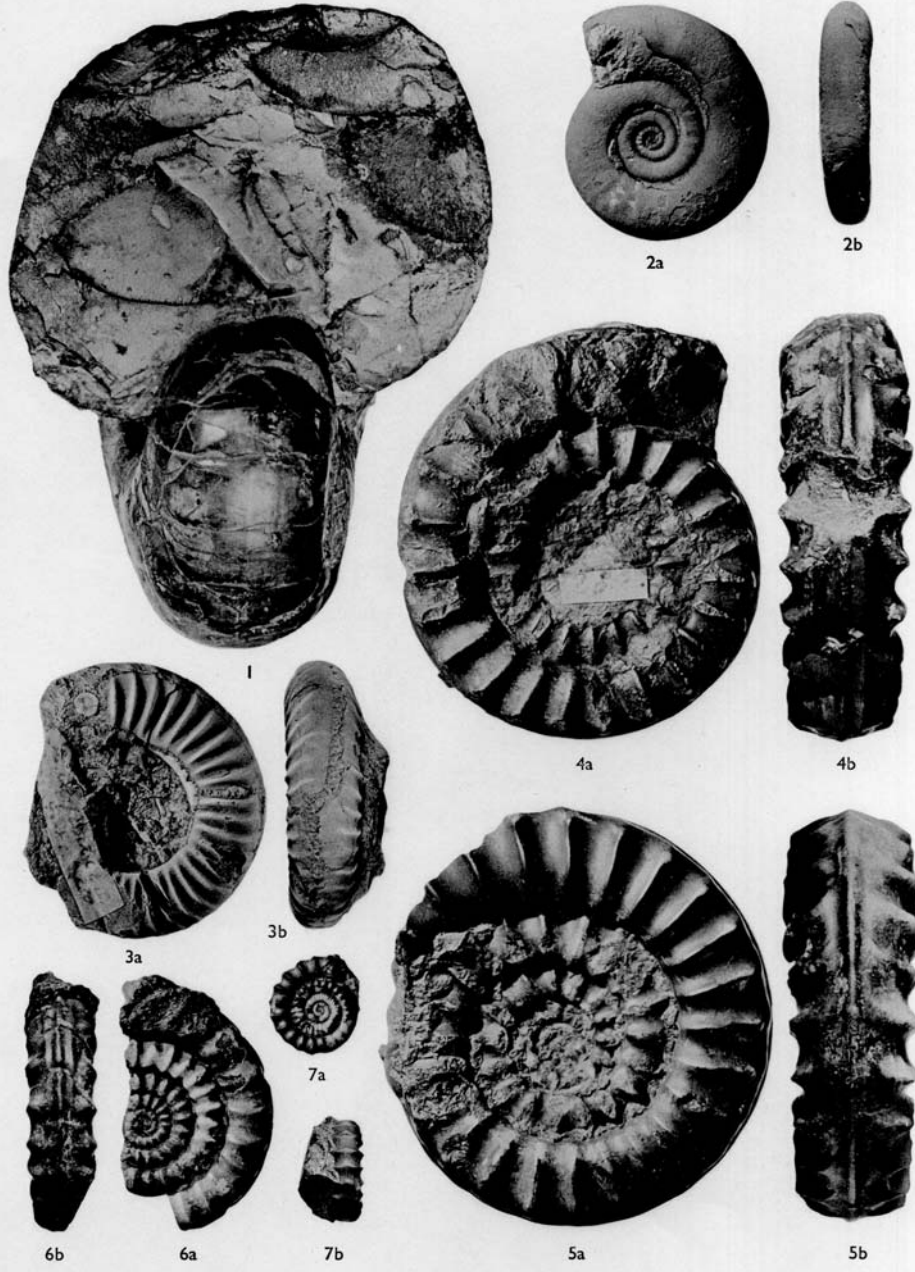
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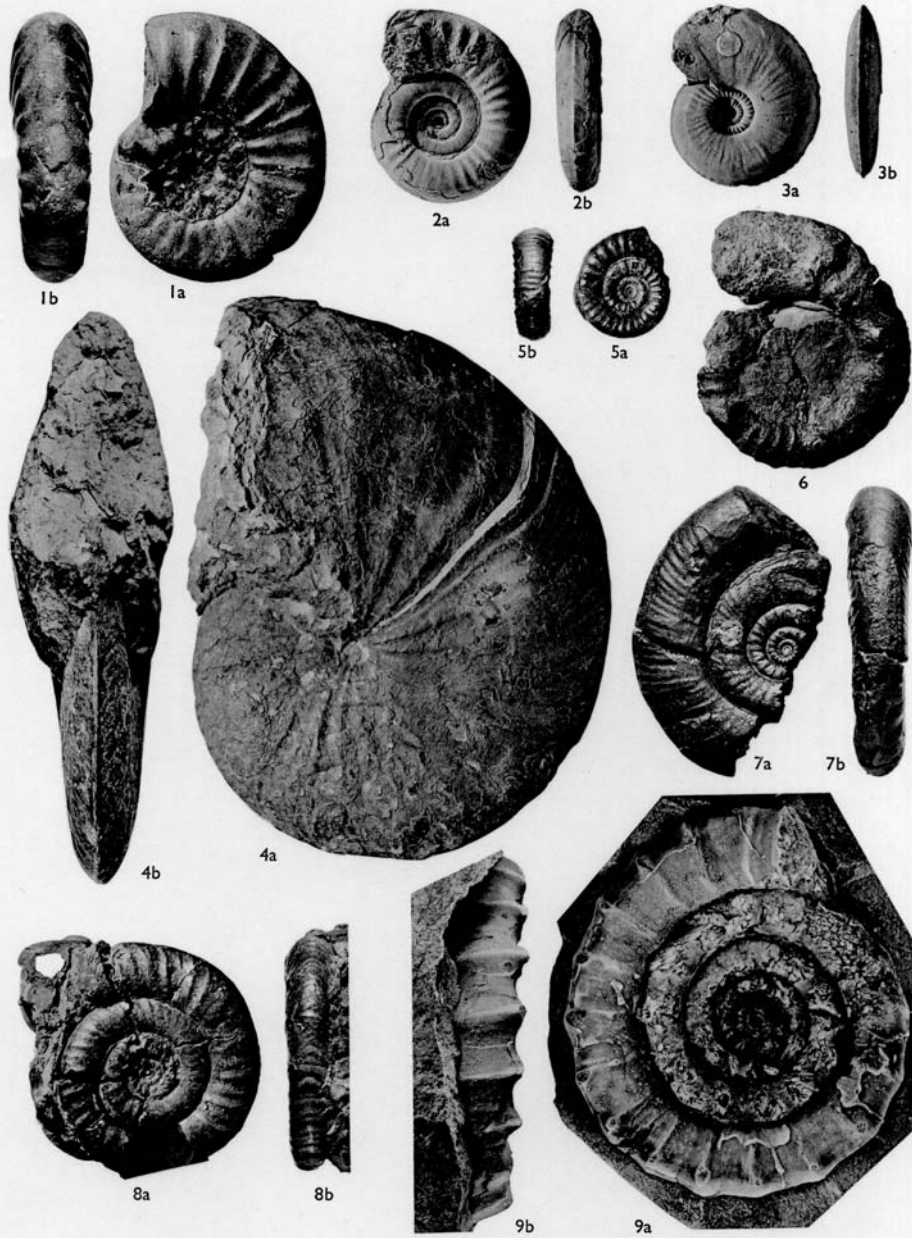
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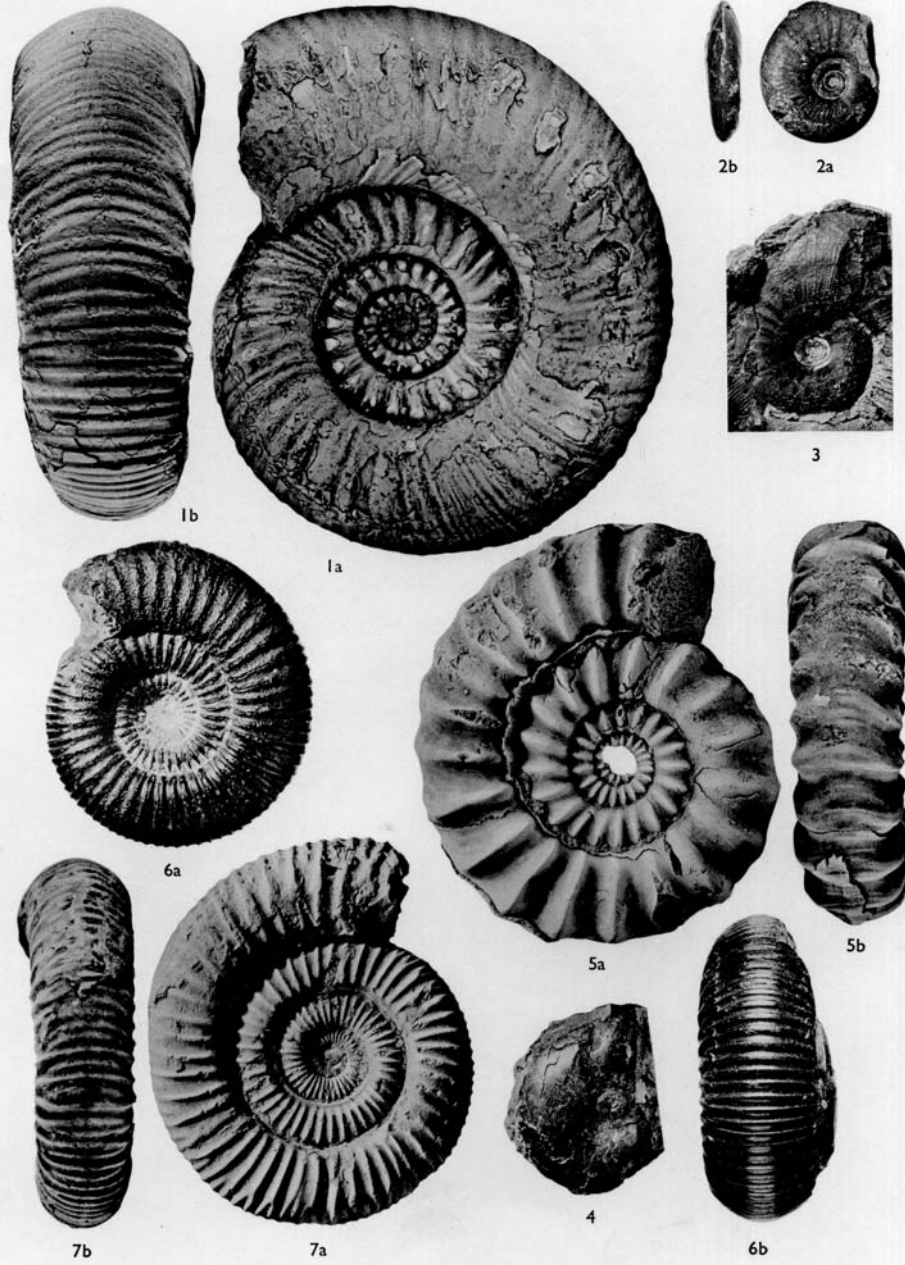
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HOWARTH, Yorkshire ammonites



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2



3a



3b



4a



4b



5b



5a

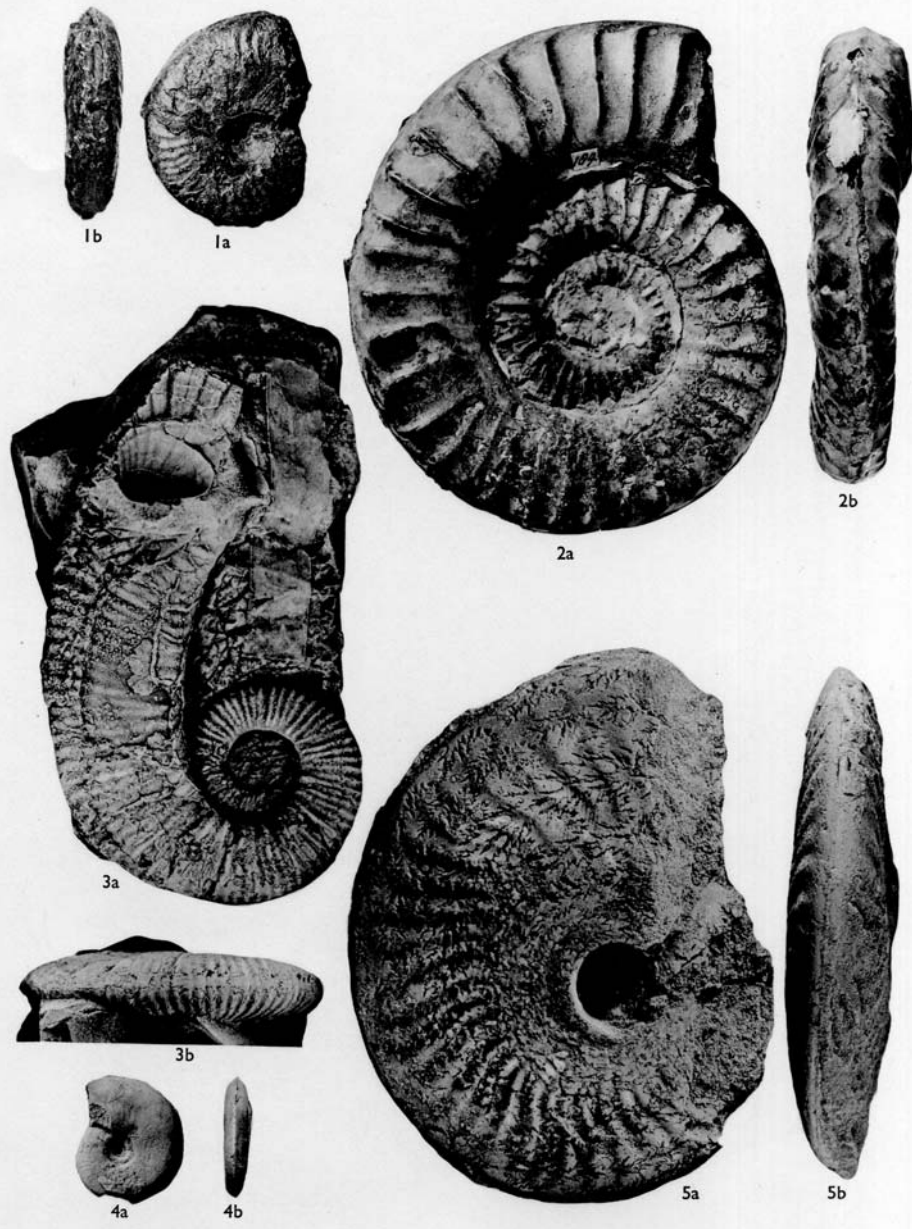


6a

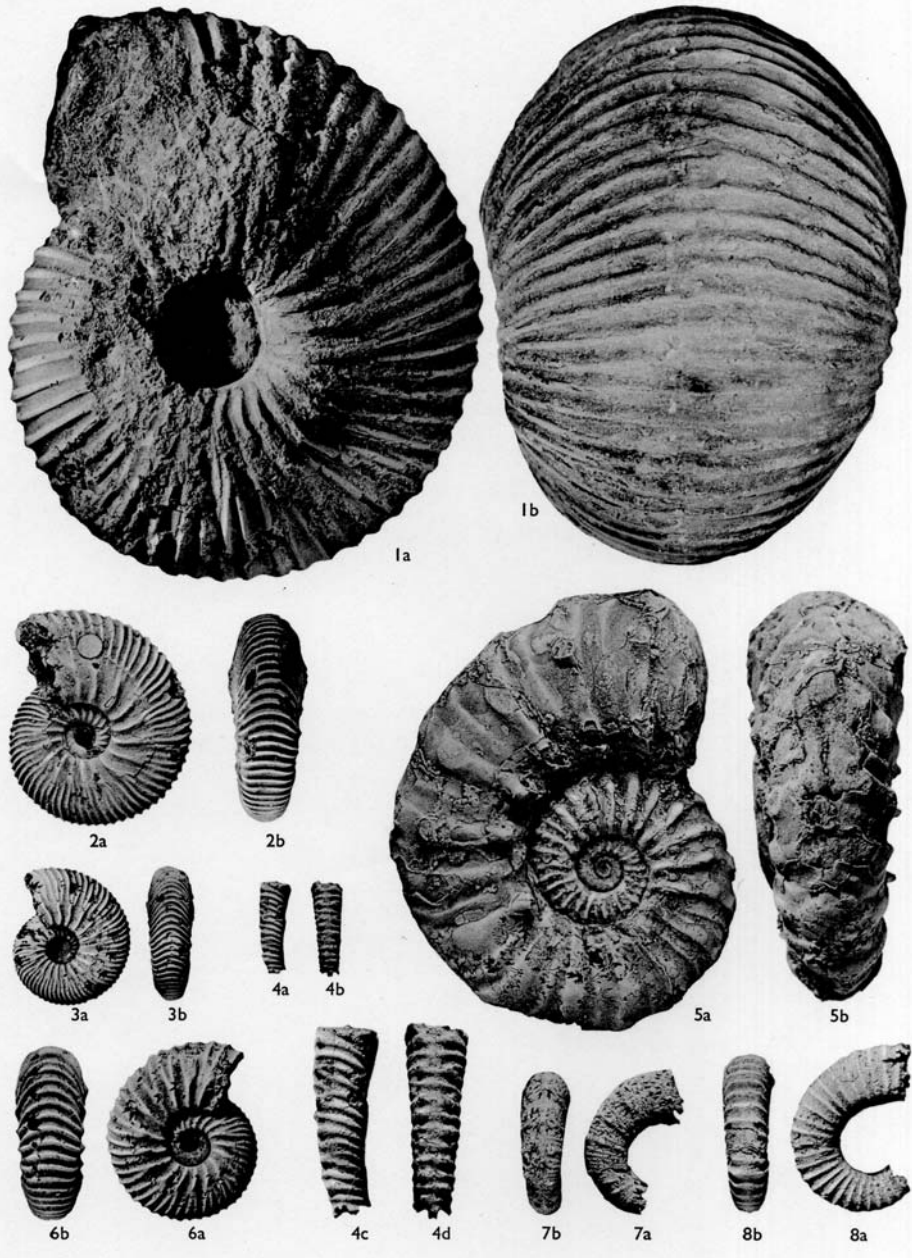


6b

HOWARTH, Yorkshire ammonites



HOWARTH, Yorkshire ammonites



HOWARTH, Yorkshire ammonites