

No. 5. — *The Fossil Cephalopods of the Museum of Comparative Zoölogy.* By ALPHEUS HYATT.

This number of the Bulletin begins a series of notices upon the Cephalopoda, which besides fulfilling the common object of similar numbers already published, has some peculiar features of its own requiring a few explanatory remarks.

The Ammonoids, including all the Cephalopods with serrated or foliated septa, the Clymeniæ, Goniatites, Ceratites, and Ammonites proper, are separated by Professor L. Agassiz from the Nautiloids and Dibranchiæ Cephalopods as a distinct order.

The typical group of this order is the so-called genus Ammonites.

De Montfort and De Haan both recognized a few new genera within the limits of this incongruous genus before Von Buch described the natural groups which continue to bear his names. Von Buch called these groups "families," but classified them under the "generic" name of Ammonites; thus plainly, although indirectly, announcing his opinion of their sub-generic value.

Professor L. Agassiz, for many years past, considered some of these groups as natural families, and deemed them capable of division into subordinate groups of generic importance.

He imparted this fundamental idea to me at the beginning of my studies upon these interesting fossils, and selected the five genera which are referred to his authority as examples of the manner in which I should treat this subject, at the time he recommended the investigation to me. Further than this, the work is my own.

I have pursued no special method in the classification; but have directed my whole attention to the verification of the groups defined by Von Buch and others, and the subsequent testing of the limits of the included genera by a careful comparison of all the minor divisions in each natural group.

The shells or mineral casts of every group have been first arranged in series of species, and the limits of these series determined the genera. The generic characteristics were selected from those peculiar to all the species of each series which were not common to the family or any more comprehensive division.

The materials in the possession of the Museum afford ample means for the successful completion of such a plan, which, more than any other, demands large numbers of specimens. They consist of collections purchased from Professors Bronn and L. de Koninck, MM. Boucault and Duval, Dr. A. Krantz, and others, besides those obtained by exchange, among which is a valuable collection, numbering many species, from the Museum of Stuttgart.

I am indebted to Professor L. Agassiz for the free use of all the specimens in these collections, and desire to express here my acknowledgment of the facilities for study given me both by himself and the Institution.

The position of the female *Argonauta* in its shelly case, and of the *Nautilus* in its shell, show conclusively that the periphery of the whorls of an *Ammonite* is the abdominal side, as stated by Richard Owen and Pictet. This view, therefore, has been adopted, and the outer side of the whorl is called "the abdominal," and the inner "the dorsal side," in accordance with their opinion.

No further changes have been made in the nomenclature generally employed, with the exception of the use of the words "pilæ" for ribs, and "geniculæ" for the knees of the ribs, these being found somewhat more convenient in the description of the species than the ordinary terms.

Lower Lias.

PSILO CERATIDÆ.

Shell smooth. Umbilicus open, exposing the sides of the whorls; sides depressed.

Psiloceras HYATT.

Abdomen smooth; shell often folded; sides depressed; septa foliated. Whorls enveloped to the line of the superior lateral lobes.

Psiloceras psilonotum HYATT.

Ammonites psilonotus Quens'dt, Die Ceph., p. 73, pl. 3, fig. 18.

Loc. Nellingen, Balingen, Rudern, and Semur; Coll. L. de Koninck, Prof. Fraas, Mus. of Stuttgart, L. Agassiz, and Boucault.

It is quite probable that *Amm. erugatus* Bean (Phil. Geol. York, p. 168, pl. 13, figs. 1-3) is identical with this species, and if so, it will become necessary to change the name to *Psil. erugatus*, and consider *Psil. psilonotus* as a synonyme.

Psiloceras planorbis HYATT.

Amm. planorbis Sow., Min. Conch., v. 5, p. 69, pl. 448.

Loc. Semur; Coll. Boucault.

Psiloceras planilaterale HYATT.

Loc. Semur; Coll. Boucault.

Sides flattened, but more convex than other species, and marked with transverse striæ; occasionally plicated at intervals, resembling in this respect plicated variety of *P. psilonotus*. Abdomen depressed, convex, smooth; the siphon merely indicated by a raised line in the adult. Umbilicus shallow, showing great breadth in the young.

Psiloceras acutidorsale HYATT.

Loc. Semur; Coll. Boucault.

Closely allied to *P. psilonotus*, but with smaller whorls and a more acute abdomen. It is, also, not so gibbous, and has a greater number of whorls than either *P. planilateralis* or *P. planorbis*. The shell may be marked with very numerous plications, or smooth on the sides. Abdomen prominent, acute. Umbilicus shallow.

NOTE. It is probable that *Amm. latesulcatus* Hauer, Ueber d. Ceph. aus d. Lias d. Nordöstlichen Alpen, p. 44, pl. 9, figs. 1-3, is the type of another genus of this family, having a keeled and sulcated abdomen.

DISCOCERATIDÆ.***Arnioceras†** AGASSIZ.

Abdomen keeled and channelled, but both parts are variable, being sharply defined in some species and very shallow in others. Abdominal lobe shallow and broad; not so deep as the superior lateral lobe; deeper than the inferior lateral; both divided equally. Superior lateral cell equally divided. Inferior lateral cell unequally divided. The young retain the smooth character for some time during their growth, thus giving to the umbilicus a decidedly embryonic aspect. Envelopment extends laterally to the geniculæ.

Arnioceras cuneiforme HYATT.

Loc. Semur; Coll. Boucault.

Sides regularly convex. Pilæ depressed, most prominent in the centre, and sloping gradually to either side; striæ of growth very fine and sharply bent. Abdomen obtusely angular; keel indicated by a ridge; channels obsolete or only indicated by shallow depressions. The auxiliary lobes near the umbilicus are hardly more than mere serrations.

* Equals Arietes.

† 'Αρνειός, a ram.

Arnioceras incipiens HYATT.

Loc. Semur; Coll. Boucault.

Sides convex. Pilæ with prominent geniculæ. Abdomen obtusely angular; keel prominent, narrow; channels either absent or well defined by shallow, narrow depressions. Young, smooth as in *Arnioceras cuneiformis*, but the pilæ begin with a line of abdominal tubercles, which quickly spread into true pilæ.

Arnioceras semicostatum HYATT.

Loc. Semur; Coll. Boucault.

Sides convex. Pilæ have square prominent geniculæ. Abdomen flattened. Keel may be a depressed ridge without channels, prominent without channels, or prominent with well-defined narrow channels; in the first variety the young retain the smooth character until a later period than in the second and third.

Arnioceras kridiforme HYATT.

Amm. kridion D'Orb., Terr. Jurass., I, p. 205, pl. 51.

Loc. Whitby, Adnet, Semur; Coll. Prof. Bronn, Dr. Krantz, and M. Boucault.

This species differs from *A. semicostatus* in the larger number and narrowness of the whorls, and the prevalence of the deeply channelled variety. The ribs of the young are not as smooth as in *Arn. semicostatus*, and they are developed at an earlier period.

It differs also from *Amm. kridion* Ziet., in the absence of tubercles, and its contracted abdomen.

Arnioceras tardecrescens HYATT.

Amm. tardecrescens Hauer, Die Ceph. d. Lias d. Nordöstlichen Alpen, p. 20, pl. 3.

Loc. Durrenberg, Ravensberg, Hildesheim, Thionville, and Whitby, Coll. Dr. Krantz, L. de Koninck, and Damon.

Arnioceras ceratitoides L. AGASSIZ.

Amm. ceratitoides Quens'dt, Die Ceph., p. 239, pl. 19, fig. 3.

Amm. ceras Giebel, Fauna der Vorwelt, Ceph., p. 757.

Amm. ceras Hauer, Die Ceph. d. Lias d. Nordöstlichen Alpen.

Loc. Whitby and Adnet; Coll. Prof. Bronn and Dr. Krantz.

Arnioceras falcaries HYATT.

Amm. falcaries Quens'dt, Der Jura, p. 70, pl. 7, figs. 6, 7.

Loc. Bonnert, Semur, Raidwangen, and Basel; Coll. L. de Koninck, Boucault, Mus. of Stuttgart, and Prof. Bronn.

Ophioceras* Hyatt.

Keel constant, sometimes obscure. The shell has a greater number of whorls than in the preceding genus, because the young increase more slowly in size. Pila straight, depressed; appear at an early stage in the young, and are well defined upon the second whorl. Umbilicus open; sides exposed. Abdominal lobe deeper and narrower than the lateral lobes. Superior lateral lobes broad, shallow, and but very little longer than the inferior lateral. The auxiliary lateral lobes are cuneiform, and incline toward the umbilicus.

Ophioceras torus Hyatt.

Amm. torus D'Orb., Terr. Jurassique, I., p. 212, pl. 53.

Loc. Semur, Quedlinburg, Rinteln, and Schaumburg; Coll. Boucault, Dr. Krantz, and De Koninck.

Ophioceras raricostatum Hyatt.

Amm. raricostatus Ziet., Verst. Würt., p. 18, pl. 13, fig. 4.

Amm. raricostatus Quens'dt, Der Jura, p. 105, pl. 13, figs. 16-18.

Loc. Semur, Boll, and Balingen, Württemberg; Coll. Boucault, Dr. Krantz, Mus. of Stuttgart, and De Koninck.

Ophioceras Johnstoni Hyatt.

Amm. Johnstoni Sow., Min. Conch., v. 5, p. 70, pl. 449.

Amm. arietis Ziet., Verst. Würt., p. 3, pl. 2, fig. 4, but not figs. 2 and 3.†

Amm. raricostatus D'Orb., Terr. Jurassique, I., p. 212, pl. 54.

Loc. Lyme Regis, Semur, and Balingen; Coll. Wright, Damon, Boucault, and De Koninck.

Ophioceras kridioides Hyatt.

Loc. Basle; Coll. Prof. Bronn.

Abdomen like that of *O. Johnstoni*, but rounder than in *O. raricostatus*, and the young increase more rapidly than in either of these species. The pila are most prominent near the abdomen, and in the young they are more numerous than in the adult, numbering about twenty-four on the third whorl, and about twenty on the fifth whorl.

Abdominal and superior lateral lobes broad and shallow, the latter equally divided. There are two pointed auxiliary lobes on each side, and the superior lateral cells are equally divided.

Ophioceras commiscens Hyatt.

Loc. Lyme Regis; Coll. B. M. Wright.

* Ὀφίς, a serpent.

† Figs. 2 and 3 are identical with *Discoceras spiratissimus Hyatt* (*Amm. spiratissimus Quens'dt*).

Sides convex; pilæ depressed. The pilæ and the form of the whorl in the young, greatly resemble those of adult *raricostatus*, but in the adult they closely resemble those of the adult shell of *O. Johnstoni*.

Septa unknown.

Ophioceras tortile HYATT.

Amm. tortilis D'Orb., Terr. Jurassique, I., p. 201, pl. 49.

Loc. Semur; Coll. Boucault.

Ophioceras deciduum HYATT.

Amm. Nodotianus Hauer, Ceph. d. Lias d. Nordöstlichen Alpen, p. 24, pl. 6, figs. 1-3.

Loc. Whitby; Coll. Dr. Krantz.

Amm. Nodotianus D'Orb. is probably generically different, since it has a more acute abdomen.

Discoceras* AGASSIZ.

Abdomen keeled and channelled. Both characters are constant, although the channels are sometimes nearly obsolete. Pilæ smooth. Geniculæ curved forwards. Umbilicus open. Sides flattened, exposed. Abdomen depressed. Abdominal lobe deep and narrow. Superior lateral, and inferior lateral, narrow and irregularly pointed with minor lobes.

Superior lateral cell equally divided. Inferior lateral, unequally divided. First auxiliary cell well developed, and nearly as long as the inferior lateral.

Discoceras? *laqueus* HYATT.

Amm. laqueus Quens'dt, Der Jura, p. 43, pl. 3, fig. 5.

Loc. Nellingen, Würtemberg; Coll. Mus. of Stuttgart.

The abdomen of the specimen examined is so obscured by its matrix of limestone, that the reference of the species to this genus must be considered doubtful.

Discoceras ophioides HYATT.

Ammonites ophioides D'Orb., Terr. Jurassique, p. 241, pl. 64.

Loc. Semur; Coll. Boucault.

Discoceras carusense HYATT.

Amm. carusensis D'Orb., Terr. Jurassique, I., p. 284, pl. 8, figs. 3-6.

Amm. spiratissimus Hauer, Ceph. d. Lias d. Nordöstlichen Alpen, p. 18, pl. 3, figs. 1-3.

Loc. Semur, Balingen; Coll. Boucault, L. de Koninck, and Prof. Bronn.

* Δίσκος, a quoit.

Discoceras spiratissimum HYATT.

Amm. arietis Ziet., Verst. Würt., p. 3, pl. 2, fig. 3, not figs. 2 and 4.*

Amm. spiratissimus Quens'dt, Hand. Pet., p. 355, pl. 27, fig. 9.

Loc. Filder, Vaihingen, Metzingen, Hohenheim, and Stuttgart; Coll. De Koninck, Dr. Krantz, Mus. of Stuttgart, and Boucault.

Discoceras Conybeari L. AGASSIZ.

Amm. Conybeari Sow., Min. Conch., v. 1, p. 70, pl. 131.

Amm. obliquecostatus Ziet., Verst. Würt., p. 20, pl. 15, fig. 1.

Amm. Conybeari Ziet., Verst. Würt., p. 35, pl. 26, fig. 2.

Amm. Conybeari D'Orb., Terr. Jurass., I, p. 202, pl. 50.

Amm. Conybeari Hauer, Ceph. d. Lias d. Nordöstlichen Alpen, p. 16, pl. 2, figs. 1 - 6.

Loc. Semur, Waltzing, and Balingen; Coll. Boucault and L. de Koninck.

Coroniceras † HYATT.

Keels prominent, constant; channels well-defined. Pilæ tuberculated and bent. Umbilicus open. Sides of the whorls exposed.

Pilæ preceded by a line of tubercles in the young, which gradually elongate to form the tuberculated pilæ of the adult. Ventral lobe deep and narrow. Lateral lobes unequally divided. Superior lateral cell irregularly divided; abrupt on the siphonal side; sloping rapidly on the opposite side. Inferior lateral cell exceedingly variable in form, but unequally divided.

Coroniceras latum HYATT.

Loc. Semur and Tübingen; Coll. Boucault and Dr. Krantz.

Abdomen very broad, overhanging. Tubercles prominent. Keel varies from thick to attenuated; and channels, from well-defined to almost obsolete. Septal lobes broad and shallow, irregularly divided. Superior lateral cell upon the abdomen. Inferior lateral cell broad and short.

Coroniceras kridion HYATT.

Amm. kridion Hehl. Ziet., Verst. Würt., p. 4, pl. 3, fig. 2.

Amm. kridion Quens'dt, Der Jura, p. 70, pl. 7, fig. 8.

Loc. Semur and Stuttgart; Coll. Boucault and Mus. of Stuttgart.

Coroniceras bisulcatum HYATT.

Amm. bisulcatus Brug., Ency. Meth., v. 1, p. 39, pl. 13.

Amm. bisulcatus D'Orb., Terr. Jurass., p. 187, pl. 43.

Loc. Semur and Balingen; Coll. Boucault and De Koninck.

* Figs. 2 and 4 have already been referred to *Ophioceras Johnstoni*.

† *Kopævis*, a crown.

Coroniceras multicosatum HYATT.

Amm. multicosatus Sow., Min. Conch., v. 5, p. 76, pl. 454.

Amm. multicosatus Ziet., Verst. Würt., p. 35, pl. 26, fig. 3.

Amm. multicosatus Quens'dt, Der Jura, p. 67, pl. 7, fig. 2.

Loc. Leicestershire and Semur; Coll. Sir C. Lyell and M. Boucault.

Coroniceras coronaries HYATT.

Amm. coronaries Quens'dt, Der Jura, p. 68, pl. 7, fig. 5.

Loc. Semur, Boll, Balingen, and Stuttgart; Coll. Boucault, Dr. Krantz, L. de Koninck, and Mus. of Stuttgart.

Coroniceras lyra HYATT.

Loc. Balingen, Aalen, and Tübingen; Coll. L. de Koninck and Dr. Krantz.

Abdomen prominent, rounded. Keel and channels well defined. Tubercles well defined. Pilæ depressed laterally near the tubercles and swelling out below. Radial diameter of the whorl increases faster in proportion to the transverse than in *C. coronaries*. Superior lateral lobe unequally divided by deep, narrow minor lobes into three branches. Superior lateral cell on the abdomen. Inferior lateral cell long and deeply indented by minor lobes.

Coroniceras rotiforme HYATT.

Amm. rotiformis Sow., Min. Conch., v. 5, p. 76, pl. 453.

Amm. rotiformis Ziet., Verst. Würt., p. 35, pl. 26, fig. 1.

Amm. rotiformis D'Orb., Terr. Jurass., 1, p. 293, pl. 89, figs. 1-3.

Amm. caprotinus D'Orb., Terr. Jurass., 1, p. 240, pl. 64, figs. 1, 2.

Loc. Semur, Vaihingen, and Stuttgart; Coll. Boucault, Mus. of Stuttgart, and L. de Koninck.

Coroniceras sinemuriense HYATT.

Amm. sinemuriensis D'Orb., Terr. Jurass., p. 303, pl. 95, fig. 1.

Loc. Semur and Schaichof; Coll. Boucault and Mus. of Stuttgart.

The old of this species is frequently described as *Amm. Bucklandi*.

Coroniceras orbiculatum HYATT.

Amm. Bucklandi Ziet., Verst. Würt., p. 35, pl. 27, fig. 1.

Amm. Bucklandi Quens'dt, Der Jura, p. 67, pl. 7, fig. 3.

Loc. Basel, Schippenstadt, and Balingen; Coll. Prof. Bronn, Dr. Krantz, and L. de Koninck.

Coroniceras Bucklandi HYATT.

Amm. Bucklandi Sow., Min. Conch., v. 2, p. 69, pl. 130.

Amm. Bucklandi Phil. Geol. York., p. 1, pl. 14, fig. 13.

Loc. Lyme Regis and Semur; Coll. B. M. Wright and M. Boucault

Coroniceras Brookei HYATT.

Amm. Brookei Sow., Min. Conch., v. 2, p. 203, pl. 190.

Loc. Lyme Regis; Coll. B. M. Wright.

Asteroceras* HYATT.

Keel well defined, but varies from prominent and narrow to depressed and broad. Channels obscure to deep and well defined. Pilæ smooth, depressed; often bent on the sides, and appear in the young as lateral folds or large tubercles. Sides in some species not enveloped; in others, covered to fully one half of their breadth. Ventral lobes very deep. Lateral lobes very shallow. Superior and first auxiliary cells short and broad. Inferior lateral cell very prominent.

Asteroceras tenue HYATT.

Loc. Semur, Aargau, Aalen, and Göppingen; Coll. Prof. Bronn and Dr. Krantz.

Abdomen narrow. Dorsal region broad, angular at its junction with the sides. Keel narrow and prominent; channels large. Superior lateral cell almost obsolete. Inferior lateral unequally divided.

Asteroceras trigonatum HYATT.

Amm. Brookei Ziet., Verst. Würt., p. 36, pl. 27, fig. 2.

Loc. Aalen; Coll. Dr. Krantz.

Transverse section of the whorl obtusely triangular. Pilæ prominent internally, decreasing gradually externally. Tubercles are not constantly found in the adult as in *Amm. Brookei*, and it differs, also, from the latter in the narrowness of the abdomen, the greater proportional breadth of the dorsal region, and the decided inclination of the sides of the adult whorls.

Asteroceras obtusum HYATT.

Amm. obtusus Sow., Min. Conch., v. 2, p. 151, pl. 167.

Amm. redcarensis Young and Bird, Geol. York., pl. 14, fig. 15.

Amm. obtusus D'Orb., Terr. Jurass., p. 191, pl. 44.

Amm. stellaris D'Orb., Terr. Jurass., p. 191, pl. 45.

Amm. Turneri Ziet., Verst. Würt., p. 15, pl. 11, fig. 5.

Loc. Lyme Regis, Whitby, Robin Hood's Bay, Semur, Boll, Balingen, Bempflingen, Stuttgart, and Adnet; Coll. L. Agassiz, Robert Damon, Marder, B. M. Wright, L. de Koninck, Dr. Krantz, M. Boucault, and Mus. of Stuttgart.

The identification of Zieten's *Turneri* with *Amm. obtusus* Sow., was made with authentic specimens from Zieten's former collection sent to this Museum by the Museum of Stuttgart, and although the characteristics are

* ἄστρον, a star.

widely divergent, the series between the two forms showed them to be one species with only local differences.

Asteroceras stellare HYATT.

Amm. stellaris Sow., Min. Conch., v. 1, p. 211, pl. 93.

Amm. Turneri Sow., Min. Conch., v. 5, p. 75, pl. 452.

Amm. stellaris Hauer, Ceph. d. Lias d. Nordöstlichen Alpen, p. 22, pl. 5, figs. 1, 2.

Loc. Lyme Regis, Gloucester, and Semur; Coll. B. M. Wright, Marder, Dr. Krantz, and M. Boucault.

Asteroceras Collenotii HYATT.

Amm. Collenotii D'Orb., Terr. Jurass., 1, p. 305, pl. 95.

Loc. England and Semur; Coll. Marder and M. Boucault.

LIPAROCERATIDÆ HYATT.

Microceras* HYATT.

Abdomen flattened; sides rounded or flattened. The pilæ in the adult are undivided upon the abdomen, and are continuous with the large, single lateral pilæ, which last may be ornamented with either one or two rows of small tubercles, or be bare.

The envelopment only covers the abdomen of each internal whorl, reaching no farther than the first row of tubercles, umbilicus is consequently exposed in all the species. The increase of the radii is slow, the species have a greater number of whorls than in succeeding genera, and are also of smaller size. The septa are remarkable for their unequally divided lobes and cells, the large size of the abdominal lobe, the insignificant size of the two lateral lobes, especially the inf. lateral, and the great breadth of the cells.

Microceras biferum HYATT.

Amm. bifer bispinosus Quens'dt, Der Jura, p. 104, pl. 13, figs. 10, 11, and 13.

Amm. bifer nudicosta Quens'dt, Der Jura, p. 104, pl. 13, fig. 14.

Loc. Gloucester, Pleinsbach, Balingen, Boll; Coll. L. de Koninck, Dr. Krantz, Mus. of Stuttgart.

Microceras confusum HYATT.

Amm. confusus Quens'dt, Der Jura, p. 127, pl. 75, figs. 8, 9.

Loc. Lansdown Station, near Cheltenham, and Gloucester; Coll. L. de Koninck.

* Μικρός, small.

Microceras mixtum HYATT.

Amm. polymorphus mixtus Quens'dt, Der Jura, p. 128, pl. 15, fig. 12.

Loc. Gloucester; Coll. L. de Koninck.

Is not the same as *polymorphus mixtus* Quens'dt, Die Ceph., p. 87, pl. 4, fig. 10. This has a keel and must be of a different genus from the specimens here described, which appear to be identical with the figure in "Der Jura," as quoted above.

D E R O C E R A T I D Æ .***Deroceras**† HYATT.

Whorl circular; pilæ depressed; linear between and bifurcated on the tubercles. Tubercles large, prominent, pointed, and in a single row. Septal lobes with numerous pointed, deeply cut, irregularly shaped minor lobes. Abdominal lobe very deep, and level with superior lateral lobe. Siphonal cell long and narrow.

Deroceras ziphius HYATT.

Amm. ziphius Ziet., Verst. Würt., p. 6, pl. 5, fig. 2.

Amm. arnatus sparsinodus Quens'dt, Die Ceph., p. 82, pl. 4, fig. 5.

Amm. ziphius Quens'dt, Der Jura, p. 97, pl. 12, fig. 2.

Loc. Löppingen; Coll. Mus. of Stuttgart.

NOTE. The foregoing descriptions of the Discoceratidæ, Liparoceratidæ, and Deroceratidæ comprehend all the species in the Museum collections from the Lower Lias, except *Amm. Birchü* Sow., which I was unable to assign to its proper place.

*Middle Lias.***LIPAROCERATIDÆ.**

There is throughout the three genera of this family a positive agreement in the septa and the mode of development.

The young of *Liparoceras indecisus* resemble the adult of *Androgynoceras*, and the young of *Androgynoceras* in turn closely resemble the adults of *Microceras*.

Abdominal lobe is large and not generally so deep, but of less width than the superior lateral. Inferior lateral lobe very narrow, and of insignificant size; one auxiliary lobe is usually visible on the side. The minor lobes are particularly sharp or pointed; penetrate deeply into the cells. Both cells and lobes unequally divided by three minor lobes.

Microceras.**Microceras planicosta** HYATT.

Amm. planicosta Sow., Min. Conch., v. 1, p. 167, pl. 73.

* Includes the Dorsati.

† Δέρας, skin.

Amm. planicosta D'Orb., Terr. Jurass., Ceph., p. 242, pl. 65.

Loc. Whitby, Yeovil, Semur, Besançon, Gundershofen; Coll. Sir C. Lyell, L. de Koninck, Prof. Bronn, and M. Boucault.

Microceras crescens HYATT.

Loc. Whitby and Rautenberg bei Schöppenstadt; Coll. L. de Koninck, Dr. Krantz, and Prof. Bronn.

This species is closely allied to *Microceras arcigerens*; it differs, however, in being more robust, the young are larger, the radii of the spiral increase faster, and the septa differ in having a very deep ventral, and very shallow, superior lateral and inferior lateral lobes. The minor lateral lobes are also of the simplest kind, the superior and inferior lateral cells being but slightly indented by them.

Microceras arcigerens HYATT.

Amm. arcigerens Phil. Geol. York, p. 163, pl. 13, fig. 9.

Loc. Whitby, Semur, St. Cyr bei Lyon and Aargau; Coll. L. de Koninck, Prof. Bronn, and M. Boucault.

Microceras maculatum HYATT.

Amm. capricornus nudus Schlot. Petrefactenkunde.

Amm. maculatus Young and Bird, Geol. York, pl. 14, fig. 12.

Amm. maculatus Phil. Geol. York, p. 135, pl. 13, fig. 11.

Amm. capricornus nudus Ziet., Verst. Würt., p. 6, pl. 4, fig. 8.

Amm. capricornus nudus Bronn, Leth, Geog., Sh. 4, p. 340, pl. 22, fig. 1.

Amm. capricornus nudus Quens'dt, Der Jura, p. 96, pl. 12, fig. 3.

Loc. Lyme Regis, Whitby, Semur, Pouilly, Besançon, Milhau Dep. L'Aveyron, Gundershofen, Rautenberg bei Schöppenstadt, and Gegenberg; Coll. Sir C. Lyell, Damon, L. Agassiz, Dr. Krantz, and M. Boucault.

Microceras sinuosum HYATT.

Loc. Pouilly en Auxois, Venarey près Semur, Gundershofen, Reutlingen, and Brunswick; Coll. M. Boucault, Dr. Krantz, and L. de Koninck.

This species differs from *Planicosta* in its development, acquiring the pilæ at an earlier age of growth, and from *M. arcigerens* and *M. maculatus* in the forward bend of the abdominal pilæ, the double row of tubercles ornamenting the lateral pilæ of the adult, and the more complicated character of the septa.

Abdominal lobe with abrupt sides. Minor lobes long and narrow. Superior lateral lobe broad and shallow; inferior lateral, proportionately very narrow. Superior lateral cell very broad; inferior lateral, much longer and narrower, and very irregularly and deeply cut by minor lobes, resembling in this respect the upper portion of the superior lateral cell.

Androgynoceras* HYATT.

The sides of the adult whorl slope outward and are ornamented with pilæ, usually single and set with two rows of tubercles. Abdomen narrow. The large pilæ of the young are split into smaller pilæ on the abdomen of the adult, but usually retain the characteristics of *Microceras* until a late period of growth. The septa are more complicated than in *Microceras*, and the increase by growth in the radii of the spiral is much greater, the species consequently have fewer whorls and are of larger size. The envelopment may cover up only the abdomen of each internal whorl, or extend over the whole side to the internal line of tubercles.

Androgynoceras hybridum HYATT.

Amm. androgynoceras D'Orb., Terr. Jurass., Ceph., p. 285, pl. 85.

Loc. Semur; Coll. M. Boucault.

Androgynoceras appressum HYATT.

Loc. Rautenberg; Coll. Dr. Krantz.

This species is very much flatter than *Liparoceras Bechei*, and differs also in the development of the shell. The pilæ for a long time resemble those of *Microceras*, the peculiar pilæ of this genus are not brought out distinctly until the fifth whorl is attained.

Envelopment extends laterally to the internal line of tubercles. The external tubercles are larger and more prominent than the internal row. Abdominal lobe is deeper than the superior lateral, which last is deeper but hardly broader than the inferior lateral. Lateral lobes and lateral cells unequally divided.

Liparoceras† HYATT.

This genus differs from both of those previously described in the greater breadth of the abdomen, the greater increase of the radii of the spiral, the consequently smaller number of whorls, and the larger size of the species.

The envelopment may cover only the abdomen of each internal whorl, or extend to the inner row of tubercles.

The pilæ of the adult are split into numerous smaller pilæ, and are ornamented on the sides with two rows of tubercles. The young are smooth on the first two or three whorls, the pilæ never appear to assume, except to a very slight degree, the characteristics of *Microceras*, but at once take on the less prominent and diffuse character of *L. Bechei*.

The septa also at an early period are more complicated than those of the adult *Microceras*. The superior lateral cell is narrower proportionately to the inferior lateral, than in the preceding genera.

* 'Ανδρόγυνος, hermaphrodite.

† Λιπαρός, shining.

Liparoceras indecisum HYATT.

Loc. Lyme Regis, Balingen, and Rautenberg bei Schöppenstadt; Coll. B. M. Wright, L. de Koninck, and Dr. Krantz.

This species is closely allied to *Liparoceras Henleyi*, but differs in the form of the whorls which are much flatter on the sides, do not spread laterally so rapidly, and are more numerous.

The tubercles and lateral pilæ are hardly so prominent, but more numerous than in *Henleyi*. The specimen from Rautenberg, which apparently belongs to this species, has the tubercles and displays the characteristics of *Microceras* in the abdominal pilæ on the fourth whorl. The envelopment barely covers the external line of tubercles, which are larger and more prominent than the internal line of tubercles. Septa were not observed.

Liparoceras Henleyi HYATT.

Amm. Henleyi Sow., Min. Conch., v. 2, p. 161, pl. 172.

Naut. striatus Rein, Naut. et Argo, p. 85, pl. 8, figs. 65, 66.

Amm. striatus Ziet., Verst. Würt., pl. 5, fig. 6.

Amm. Henleyi Bronn, Leth. Geog., p. 449, pl. 23, fig. 7.

Loc. Hewlitt's Hill, Stonehouse, Lyme Regis, Bourgogne, Milhaud, St. Thibault, Venarey, Evrecy in Normandy, and Reschnau in Lippe; Coll. L. de Koninck, B. M. Wright, M. Boucault, Dr. Krantz, and Prof. Bronn.

Liparoceras Bechei HYATT.

Amm. Bechei Sow., Min. Conch., v. 3, p. 143, pl. 280.

Amm. Bechei Ziet., Verst. Würt., p. 37, pl. 28, fig. 4.

Loc. Lyme Regis, Semur, Milhaud, St. Amand, Balingen, and Rautenberg; Coll. B. M. Wright, M. Boucault, L. de Koninck, and Dr. Krantz.

D E R O C E R A T I D Æ.**Deroceras** HYATT.**Deroceras Davōei** HYATT.

Amm. Davōei Sow., Min. Conch., v. 4, p. 71, pl. 350.

Amm. Davōei Ziet., Verst. Würt., p. 19, pl. 14, fig. 2.

Amm. Davōei D'Orb., Terr. Jurass., 1, p. 276, pl. 81.

Amm. Davōei Quens'dt, Die Ceph., p. 91, pl. 5, fig. 6.

Loc. Semur, Ardèche, Vassy, Gmund, Elsass, and Durrenberg; Coll. M. Boucault, Dr. Krantz, Prof. Bronn, and Mus. of Stuttgart.

Deroceras densinodum HYATT.

Amm. armatus densinodus Quens'dt, Der Jura, p. 105, pl. 13, figs. 9, 10.

Loc. Zurmiethen bei Holtzmünden; Coll. Mus. of Stuttgart.

Deroceras armatum HYATT.

Amm. armatus Sow., Min. Conch., v. 1, p. 215, pl. 95.

Loc. Lyme Regis, Dorsetshire; Coll. Damon.

Peronoceras * HYATT.

Abdomen depressed; pilæ depressed; linear between the tubercles; usually, but not invariably, bifurcated by the tubercles on the sides, though invariably bifurcated on the abdomen. Tubercles depressed, often obtuse upon the casts, but pointed and prominent upon the shell. Septa not closely crowded as in *Deroceras*, or so profusely branching.

Peronoceras fibulatum HYATT.

Amm. fibulatus Sow., Min. Conch., v. 4, p. 147, pl. 407, figs. 3, 4.

Loc. Whitby, Boll, Plateau de Larzac, Robin Hood's Bay, St. Quentin près de la Verpillier; Coll. Dr. Krantz, L. Agassiz, Prof. Bronn, and L. de Koninck.

Peronoceras subarmatum HYATT.

Amm. subarmatus Sow., Min. Conch., v. 4, p. 146, pl. 407.

Amm. subarmatus Young and Bird, Geol. York., p. 250, pl. 13, fig. 3.

Loc. Whitby; Coll. Dr. Krantz.

Peronoceras muticum HYATT.

Amm. muticus D'Orb., Terr. Jurass., 1, p. 274, pl. 80.

Loc. Semur and St. Amand; Coll. Boucault and L. de Koninck.

Peronoceras nodogigas HYATT.

Amm. nodogigas Quens'dt, Der Jura, p. 125, pl. 15, fig. 8.

Loc. Göppingen; Coll. Mus. of Stuttgart.

Peronoceras fraudulentum HYATT.

Loc. Lyme Regis; Coll. Damon.

Abdomen rounded, and much broader than the back; tubercles prominent, salient; pilæ single, thick, depressed. Young resemble *Planicosta*, having the flattened abdomen and pilæ of the latter until a late period. Abdominal lobe narrow and deep. Superior lateral cell narrow and deeply cut by pointed minor lobes. Siphonal cell long, narrow, serrated.

Peronoceras alternum HYATT.

Loc. Milhau, Dép. de l'Aveyron; Coll. L. de Koninck.

Whorls much flattened; sides gibbous; tubercles depressed, widely separated by numerous intervening smooth pilæ. Tuberculated pilæ, large

* Περώνη, a clasp.

and most prominent, divided on the abdomen. The young are smooth for the first two or three whorls; tubercles occupy the whole next whorl, extending gradually into tuberculated pilæ between which the smooth pilæ finally appear. Abdominal lobe larger and deeper than superior lateral lobe. Inferior lateral lobe small, shallow; both unequally divided. Superior lateral cell entirely on the abdomen. Inferior lateral cell on the side.

THYSANOIDÆ.

This family includes the Fimbriati, Ligati, and Heterophylli, which agree in the foliaceous character of the septa.

Thysanoceras.*

Abdomen rounded; whorls exposed; the envelopment does not extend laterally over more than one third of each interior whorl.

Abdominal lobe about the same depth, but narrower than the superior lateral lobe; the latter is equally divided by a peculiar minor cell of a lobi-form aspect. The siphonal cell is cuneiform, and the superior and inferior lateral cells equally divided.

Thysanoceras fimbriatum HYATT.

Amm. fimbriatus Sow., Min. Conch., v. 1, p. 145, pl. 164.

Amm. fimbriatus D'Orb., Terr. Jurass., Ceph., p. 313, pl. 98.

Amm. fimbriatus Bronn, Leth. Geog., p. 441, pl. 23, fig. 2.

Loc. Lyme Regis, Semur, Plateau de Larzac, Milhau, Dép. de l'Aveyron, Balingen, Gundershofen, Schomberg, Falkenhagen, Lippe, and Sondelfingen; Coll. Mus. of Stuttgart, B. M. Wright, M. Boucault, Dr. Krantz, L. de Koninck, and Prof. Bronn.

Rhacoceras† AGASSIZ.

Abdomen rounded; sides of the whorls flattened; envelopment extends about two thirds over each of the interior whorls, or entirely encloses them, covering up the umbilicus.

The lobes and cells gradually decrease in size inwardly, and are remarkable for the profusion and peculiar foliaceous aspect of the minor cells.

Rhacoceras Loscombi HYATT.

Amm. Loscombi Sow., Min. Conch., v. 1, p. 183, pl. 183.

Amm. heterophyllus numismalis Quens'dt, Die Ceph., p. 100, pl. 6, fig. 5.

Amm. Loscombi D'Orb., Terr. Jurass., Ceph., p. 262, pl. 75.

Loc. Lyme Regis and Semur; Coll. Damon, Wright, Boucault, and L. de Koninck.

* Θύσανος, fringe.

† Ράκος, ragged.

In some individuals the abdomen is crenulated, resembling in this respect *R. Boblayei*.

Rhacoceras Boblayei HYATT.

Amm. Boblayei D'Orb., Terr. Jurass., Ceph., p. 25, pl. 69.

Loc. St. Thibault près de Semur; Coll. Boucault.

The character of the septa allies this species closely with *Loscombi*, and the abdominal crenulations are of the same character as those of some individuals in that species.

DACTYLOIDÆ.

This family includes the Planulati and part of the Macrocephali.

Cœloceras * HYATT.

Pilæ on the abdomen bifurcated; lateral pilæ single or bifurcated with one external row of tubercles, occurring regularly on each pilæ, or at intervals on widely separated pilæ. The young are very much flatter than the adult, and the sides consequently very narrow. They are smooth for the first one or two whorls, subsequently becoming tuberculated.

The tubercles almost immediately spread, forming the pilæ; they may enlarge and remain distinct, or become absorbed and disappear upon alternate pilæ. The abdomen remains perfectly smooth for some time after the lateral pilæ are developed, not acquiring the abdominal pilæ until the third whorl is reached. Septa close together and very intricate in the adult. Abdominal lobe broader and deeper than the superior lateral. The inferior lateral is nearly the same in size, and both are unequally divided into three shallow, minor lobes. Superior lateral cell lobiform and together with the inferior lateral, unequally divided by two minor lobes.

Cœloceras centaurus HYATT.

Amm. centaurus D'Orb., Terr. Jurass., Ceph., p. 266, pl. 76, fig. 3 - 6.

Loc. St. Amand, Semur, and Balingen; Coll. L. de Koninck and M. Boucault.

Cœloceras pettos HYATT.

Amm. pettos Quens'dt, Flotzge., p. 178.

Amm. pettos Quens'dt, Der Jura, p. 135, pl. 16, fig. 14.

Amm. crenatus Ziet., Verst. Würt., pl. 1, fig. 4.

Loc. Venarey, Milhaud, Balingen, Metzigen, Hinterweiler; Coll. Boucault, L. de Koninck, Prof. Bronn, and Dr. Krantz.

* Κοῖλος, hollow.

PHYMATOIDÆ.***Phymatoceras** HYATT.†

Abdomen may be flattened or rounded, but never acute; has no channels in the adult. Envelopment covers the abdomen of each internal whorl. Radii of the spiral increase more slowly than in the succeeding genera. The young are smooth on the first or second whorl, the tubercles begin either on the second or third whorl, and, gradually dividing, spread themselves out upon the abdomen as bifurcated pilæ, which disappear on the borders of the channels. The keel makes its appearance at an early stage, probably on the second whorl, but the channels are not visible until a much later period, and disappear in the adult.

Abdominal lobe broad and deep. Superior lateral broader, but of about the same depth; inferior lateral, very shallow. Superior and inferior lateral cells equally divided; both are short, broad, and but slightly indented by the minor lobes.

Phymatoceras robustum HYATT.

Loc. Plateau de Larzac; Coll. Dr. Krantz.

The abdomen of this species is flattened, the sides of the whorls gibbous and narrow, and the keel very prominent. The channels in the young are shallow, and the whorls unusually broad. Superior lateral cell is deeper than the inferior lateral, and the latter is straight; the auxiliary cell is divided by one small auxiliary lobe.

Hammatoceras ‡ HYATT.

Abdomen may be either rounded or acute, always keeled, but never sulcated. Pilæ are prominent and straight. Envelopment may extend over one half the sides, or only cover the abdomen of each internal whorl. The young develop as in *Phymatoceras*, but are generally much broader; the pilæ, also, do not become prominent so soon. Nor do they invariably begin by the development of tubercles on the sides, but may make their appearance as fine, raised lines, and afterwards become tuberculated.

During the earlier stage of growth the different species have a very close resemblance to the adult *Macrocephali*. The lobes are more complicated than in *Phymatoceras*. Abdominal lobe broad and deep, and continued into two long, narrow, minor lobes. Superior lateral narrower than the abdominal. Inferior lateral hardly wider than the minor lobes of the superior lateral, and of about the same depth. Abdominal cell blunt. Superior lateral and inferior lateral very narrow and deeply indented by the minor lobes.

* Includes part of the Falciferi. † Φῦμα, a swelling. ‡ ἄμμα, a knot.

Hammatoceras insigne HYATT.

Amm. insignis Schlo., Ziet., Verst. Würt., p. 20, pl. 15, fig. 2.

Amm. insignis D'Orb., Terr. Jurass., Ceph., p. 347, pl. 112.

Amm. insignis Quens'dt, Die Ceph., p. 280, pl. 40, figs. 4, 5.

Loc. Uhrweiler and Gundershofen; Coll. Dr. Krantz and L. de Koninck.

Hammatoceras variabile HYATT.

Amm. variabilis D'Orb., Terr. Jurass., Ceph., p. 350, pl. 113.

Loc. Bantz; Coll. Dr. Krantz.

A M A L T H E O I D Æ .**Pleuroceras** * HYATT.

Abdomen flat, with keel and channels well defined; keel crenulated; channels vary from obsolete to deep and well defined. Pilæ swelling below, tuberculated; genicular bend prominent. Tubercles lateral, arranged along the line of envelopment. Umbilicus open.

Ventral lobe narrow and but slightly deeper than lateral lobes; the latter unequally divided. Inferior lateral lobe small, shallow, equally divided. Superior lateral cell only partly exposed on the side, and together with the inferior lateral unequally divided.†

SUB-GENUS No. 1.

Sides of whorls exposed.

Pleuroceras hawskerense HYATT.

Amm. hawskerensis Y. and B., Phil. Geol. York., p. 164, pl. 13, fig. 8.

Loc. Yeovil; Coll. H. W. Marder.

Pleuroceras spinatum HYATT.

Amm. spinatus Brug., Ency. Meth., t. 1, p. 40, pl. 14.

Amm. spinatus D'Orb., Terr. Jurass., I., p. 209, pl. 52.

Loc. Whitby, Yeovil, Avallon, Quedlinburg, Coburg, Franconia, Bantz, Gundershofen, and Canal du Danube; Coll. Mus. of Stuttgart, Dr. Krantz, L. de Koninck, Bronn, Marder, and Boucault.

Pleuroceras costatum HYATT.

Amm. costatus Schlot., Pet., p. 66, pl. 12.

Naut. costatus Rein., Naut. et Argo., p. 87, figs. 68, 69.

Amm. costatus Ziet., Verst. Würt., p. 5, pl. 4, fig. 7.

Amm. costatus Bronn, Leth. Geog., pl. 22, fig. 12.

* Πλευρόν, a rib.

† Septa are described from one species only, — *Pleuroceras spinatum*.

Loc. England, Tours, Weimar, Bantz, Uhrweiler, and Bas-Rhin; Coll. Sir C. Lyell, M. Boucault, Bronn, Dr. Krantz, and L. Agassiz.

SUB-GENUS NO. 2.

Sides of whorls partially covered and flatter, especially in the young.

Pleuroceras pseudo-costatum HYATT.

Amm. costatus nudus Quens'dt, Die Ceph., p. 95.

Amm. costatus nudus Quens'dt, Der Jura, p. 171, pl. 21, fig. 3.

Loc. Yeovil, Dumbleton near Cheltenham, Rogueport, Canal du Danube, Plateau de Larzac, Goslar, Gundershofen, Baiern; Coll. Bronn, L. de Koninck, and Dr. Krantz.

Pleuroceras pseudo-spinatum HYATT.

Amm. costatus spinatus Quens'dt, Der Jura, p. 171, pl. 21, fig. 1-3.

Amm. costatus spinatus Quens'dt, Die Ceph., p. 95, pl. 5, fig. 10.

Loc. Vassy (Dép. Yonne), Milhaud (Dép. de l'Aveyron), and Courcy; Coll. Boucault and L. de Koninck.

Pleuroceras vittatum HYATT.

Amm. vittatus Phil. Geol. York., p. 164, pl. 13, fig. 1.

Loc. Whitby; Coll. Dr. Krantz.

Amaltheus DE MONTFORT.

Abdomen acute, keeled, and channelled; whorls compressed laterally. Keel crenulated, well defined. Tubercles, when present, are in a single row along the line of envelopment. Umbilicus open, with the sides of the whorls exposed or only partially covered.

Amaltheus gloriosus HYATT.

Amm. amaltheus coronatus Quens'dt, Der Jura, p. 169, pl. 20, figs. 9-12.

Loc. Milhaud, Balingen, Pliensbach, Boll, and Ofterdingen; Coll. L. de Koninck, Bronn, and Dr. Krantz.

Amaltheus salebrosus HYATT.

Amm. amaltheus spinosus Quens'dt, Die Ceph., p. 95, pl. 5, fig. 4.

Amm. amaltheus spinosus Quens'dt, Der Jura, p. 168, pl. 20, fig. 8.

Loc. Whitby, Semur, Strasburg, Mühlhausen (Bas-Rhin), Pliensbach, Boll, Geyslingen, Balingen, and Gundershofen; Coll. Dr. Krantz, Boucault, Bronn, L. Agassiz, and L. de Koninck.

Amaltheus turgidus HYATT.

Amm. Amaltheus gibbosus Schlot., Pet. p. 10.

Amm. Amaltheus gibbosus Ziet., Verst. Würt., p. 4, pl. 4, fig. 2.

Amm. paradoxus Stahl, Ziet., Verst. Würt., p. 15, pl. 11, fig. 6.

Loc. Plateau de Larzac, Heiningen, Boll, Lutzude bei Hanover, Semur, Göppingen, Ofterfeld bei Goslar, and Pliensbach; Coll. Mus. of Stuttgart, Dr. Krantz, L. de Koninck, Prof. Bronn, L. Agassiz, and Boucault.

Amaltheus margaritatus DE MONT.

Amaltheus margaritatus De Montfort, Conch. Sys., p. 91.

Amm. acutus Sow., Min. Conch., v. 1, p. 51, pl. 17, fig. 1.

Naut. rotula Rein., Naut. et Argo., p. 59, pl. 1, fig. 5.

Amm. Stokesi Sow., Min. Conch., v. 2, p. 205, pl. 191, figs. 9, 10.

Amm. clevelandicus Phil. Geol. York., pl. 14, fig. 6.

Amm. amaltheus Ziet., Verst. Würt., p. 4, pl. 4, fig. 1.

Amm. margaritatus D'Orb., Terr. Jurass., I., p. 246, pl. 67.

Loc. Whitby, Avallon, Semur, Milhaud (Dép. de l'Aveyron), Bas-Rhin, Lutzude bei Hanover, Eisingen, Rezingen, Wasseralfingen, Gundershofen, Mühlhausen, Boll, Ubstadt bei Bruchsal, Falkenhagen in Lippe, Balingen, and Göppingen; Coll. Mus. of Stuttgart, L. de Koninck, Prof. Bronn, L. Agassiz, and Boucault.

Amaltheus præstabilis HYATT.

Amm. amaltheus nudus Quens'dt, Der Jura, p. 167, pl. 20, fig. 4.

Amm. amaltheus nudus Quens'dt, Die Ceph., p. 94.

Loc. Robin Hood's Bay, Scarborough, Whitby, Mende in Lozère, Venarey près Semur, Milhaud, St. Cyr près de Lyon, Metzingen, Lutzude bei Hanover, Balingen, Geislingen, and Göppingen; Coll. Mus. of Stuttgart, Dr. Krantz, L. de Koninck, M. Boucault, Prof. Bronn, and L. Agassiz.

CYCLOCERATIDÆ.

This family is remarkable for containing species which on the one side ally it with the *Liparoceratidæ*, and on the other with the higher *Hildoceratidæ*. There is, however, a general agreement in the development and in the septal characteristics, which unite them in one family. The form is much more compressed laterally than in the *Liparoceratidæ* and the tuberculations of the pilæ separate them from the *Hildoceratidæ*. The young of *Tropidoceras Actæon* resemble the adults of *Cycloceras Valdani*, and the young of the last in their turn are like the adults of *Platypleuroceras latecosta*; thus all three genera are closely connected by development. The abdominal lobe is of about the same depth as the superior lateral; the latter is unequally divided into three minor lobes of variable length, and there is only one auxiliary lobe exposed to view on the side. Superior lateral cell is generally equally divided, and of great breadth. Inferior lateral, narrower and more prominent.

Platypleuroceras* Hyatt.

Abdomen nearly as broad, or broader, than the dorsal side of the whorl. Pilæ single, tuberculated, and extending across the rounded abdomen, as in *Planiceras*. The septa are minutely divided by minor lobes, very closely set. The abdominal lobe is deep; sides abrupt. Superior lateral very narrow, deeper than the abdominal, and profusely branching. Inferior lateral not as deep as superior lateral, and of about the same breadth and general aspect. Abdominal cell large and serrated. Superior lateral very broad, about the same height as the inferior lateral.

Platypleuroceras lataecosta Hyatt.

Amm. lataecosta Sow., Min. Conch., v. 6, p. 106, pl. 556.

Amm. lataecosta Ziet., Verst. Würt., p. 36, pl. 27, fig. 3.

Amm. natrix-rotundus Quens'dt, Die Ceph., p. 85, pl. 4, fig. 17.

Loc. Gegenberg, Hinterweiler, Welfingen, Rentlingen, and Balingen; Coll. Mus. of Stuttgart, L. Agassiz, Dr. Krantz, and L. de Koninck.

Cycloceras† Hyatt.

Abdomen rounded or keeled, not so broad as the dorsal side of the whorl. Pilæ single, tuberculated, and not extending across the abdomen in the keeled species. Young smooth for the first two or three whorls, then become ribbed. Keel appears at an earlier stage of growth than the pilæ. Septa not so minutely divided by minor lobes, and the large lobes less dendritic than in *Platypleuroceras*. The abdominal lobe of medium depth, and quite broad. Superior lateral of medium breadth and considerable depth. Inferior lateral about two thirds as broad and deep as superior lateral. One small auxiliary lobe exposed laterally. Superior lateral cell broad and depressed. Inferior lateral more prominent and narrower; small auxiliary cell exposed on the side.

Cycloceras molare Hyatt.

Amm. natrix oblongus Quens'dt, Die Ceph., p. 85, pl. 4, fig. 16.

Loc. Balingen; Coll. L. de Koninck.

Cycloceras natrix Hyatt.

Amm. natrix Schlot., Petrefaktenkunde.

Amm. natrix Ziet., Verst. Würt., p. 5, pl. 4, fig. 5.

Loc. Balingen and Rentlingen; Coll. L. de Koninck and Dr. Krantz.

Cycloceras Valdani Hyatt.

Amm. Valdani D'Orb., Terr. Jurass., Ceph., p. 255, pl. 71.

Amm. compressus Quens'dt, Die Ceph., p. 90, pl. 5, fig. 3.

* Πλατύς, flat, and Πλευρόν, rib.

† Κύκλος, circle.

Amm. Valdani Quens'dt, Der Jura, p. 131, pl. 16, fig. 2-3.

Loc. St. Amand, Semur, Balingen, Rentlingen, and Gagenberg; Coll. Mus. of Stuttgart, L. de Koninck, M. Boucault, and L. Agassiz.

Tropidoceras * HYATT.

Abdomen invariably keeled, much narrower than the dorsal side of the whorl. Pilæ single, smooth or tuberculated in the same species, do not extend across the abdomen in any species.

Young are smooth for one or two whorls. Keel and pilæ appear simultaneously. Septa have a more complicated aspect than in the preceding genus, the minor lobes being deeper and more numerous. The abdominal very broad at the bottom, narrower above. Superior lateral lobe narrow, and about the same depth as the abdominal. Inferior nearly the same, but less branching than the superior lateral. One auxiliary lobe exposed on the side. Abdominal cell very broad. Superior lateral and inferior lateral cells very irregularly divided by minor lobes. One small auxiliary lobe exposed on the side.

Tropidoceras Actæon HYATT.

Amm. Actæon D'Orb., Terr. Jurass., Ceph., p. 232, pl. 61, fig. 1-3.

Loc. Semur and Schöppstadt; Coll. Dr. Krantz and L. de Koninck.

Tropidoceras Ægæon HYATT.

Amm. Ægæon D'Orb., Terr. Jurass., Ceph., p. 234, pl. 61, fig. 4-6.

Loc. Près de Semur; Coll. M. Boucault.

Tropidoceras Masseanum HYATT.

Amm. Masseanus D'Orb., Terr. Jurass., Ceph., p. 225, pl. 58.

Amm. Masseanus Quens'dt, Die Ceph., p. 90, pl. 5, fig. 2.

Loc. Scarborough in Yorkshire, Près de Semur, and Balingen; Coll. Dr. Krantz, L. de Koninck, and M. Boucault.

Upper Lias.

DISCOCERATIDÆ.

Ophioceras.

Ophioceras Levesquei HYATT.

Amm. Levesquei D'Orb., Terr. Jurass., Ceph., I., p. 230, pl. 60.

Amm. solaris Ziet., Verst. Würt., p. 19, pl. 14, fig. 7.

Amm. radians quadratus Quens'dt, Die Ceph., p. 113.

Loc. Niort, Salins, Heiningen, and Metzingen; Coll. Mus. of Stuttgart, Dr. Krantz, and L. de Koninck.

* *Τροπίς*, a keel.

DEROCERATIDÆ.**Deroceras.****Deroceras minatum** HYATT.

Loc. Plateau de Larzac ; Coll. Dr. Krantz.

Abdomen depressed. Sides flattened or inclining toward umbilicus. Septal lobes and cells very simple, with but few minor lobes. Abdominal lobe broad and shallow. Superior lateral the same, and of nearly the same size. Inferior lateral pointed and very small. Superior lateral and inferior lateral cells equally divided by minor lobes. Young are smooth for the first two or three whorls. Tubercles usually make their appearance on the third whorl and on the fourth ; these spread out into pilæ, and other untuberculated pilæ arise between them. The pilæ are often slightly depressed or concave along the siphonal line.

Deroceras subarmatum HYATT.

Amm. subarmatus Sow., Min. Conch., v. 4, p. 146, pl. 407.

Amm. subarmatus Young and Bird, Geol. York., p. 250, pl. 13, fig. 3.

Loc. Milhaud (Dép. de l'Aveyron) ; Coll. M. Boucault.

Deroceras acanthopsis HYATT.

Amm. acanthopsis D'Orb., Prod. Pal. Stratigraph., p. 247.

Loc. Villebois (Dép. Ain) ; Coll. Prof. Bronn.

DACTYLOIDÆ.**Cœloceras.****Cœloceras Grenouillouxii** HYATT.

Amm. Grenouillouxii D'Orb., Terr. Jurass., Ceph., pl. 96.

Loc. Fontaine Étoupe and Fours in Calvados, Plateau de Larzac, Cheville in Sarthe, and Semur ; Coll. Dr. Krantz, L. de Koninck, and M. Boucault.

Cœloceras Desplacei HYATT.

Amm. Desplacei D'Orb., Terr. Jurass., Ceph., p. 334, pl. 107.

Loc. Avallon (Dép. Yonne) ; Coll. M. Boucault.

Cœloceras crassum HYATT.

Amm. crassus Phil., Geol. York., p. 12, fig. 15.

Amm. crassus Quens'dt, Der Jura, p. 251, pl. 36, fig. 1.

Amm. raquinianus D'Orb., Terr. Jurass., p. 332, pl. 106.

Loc. Whitby, Milhaud, Laumière, Cheville in Sarthe, St. Cyr bei Lyon Plateau de Larzac, Villebois (Dép. de l'Ain), Salins (Dép. Jura), Semur Montpellier, St. Quentin, and Près de Verpillier ; Coll. L. de Koninck, Dr Krantz, L. Agassiz, Prof. Bronn, and M. Boucault.

Cœloceras mucronatum HYATT.

Amm. mucronatus D'Orb., Terr. Jurass., Ceph., p. 328, pl. 104, fig. 4-8.

Loc. Whitby, Milhau, Laumière, Mende in Lozère, Donau-Main Canal, Salins in Jura, Près d'Avallon, Montpellier; Coll. Dr. Krantz, L. de Koninck, Prof. Bronn, and M. Boucault.

Dactylioceras * HYATT.

The abdomen is either equal in breadth, or less than the back, instead of being broader than, or equal in breadth to, the back, as in the preceding genera. The lateral pilæ in the adult are smooth and invariably single; the abdominal pilæ may be either bifurcated or single. The young have the same development as the young of *Cœloceras crassum*, but the tubercles are dispensed with before the adult state is attained. (The tubercles are hardly distinguishable in the young of some species, such as *Holandrei* and *Braunianum*, especially on the fossil casts, but are, nevertheless, present in all the shells.) Septa do not differ materially from those of the preceding genus, except perhaps in the greater simplicity of the lobes and cells, which are hardly so close together or so complicated.

Dactylioceras commune HYATT.

Amm. communis Sow., Min. Conch., v. 2, p. 9, pl. 107, fig. 23.

Naut. annularis Rein., Naut. et Arg., p. 79, pl. 6, figs. 56, 57.

Amm. annularis Ziet., Verst. Würt., p. 14, pl. 10, fig. 10.

Loc. Whitby, Boll, Amberg, and Langenbrücken; Coll. Dr. Krantz, L. de Koninck, and Prof. Bronn.

Dactylioceras Holandrei HYATT.

Amm. Holandrei D'Orb., Terr. Jurass., Ceph., p. 330, pl. 105.

Loc. Whitby, Cheville in Sarthe, Fontaine Étoupe Fours in Calvados; Coll. L. de Koninck and M. Boucault.

Dactylioceras annulatum HYATT.

Amm. annulatus Sow., Min. Conch., v. 3, p. 41, pl. 222.

Amm. annulatus D'Orb., Terr. Jurass., Ceph., p. 265, pl. 76, figs. 1, 2.

Argo. anguinus Rein., Naut. et Arg., p. 89, No. 1, pl. 12, fig. 73.

Amm. æquistriatus Ziet., Verst. Würt., pl. 12, fig. 5.

Loc. Whitby, Illminster, St. Amand, Fontaine Étoupe Fours; Coll. L. de Koninck and Dr. Krantz.

Dactylioceras Braunianum HYATT.

Amm. Braunianus D'Orb., Terr. Jurass., Ceph., p. 327, pl. 104.

Loc. Milhau and Plateau de Larzac; Coll. L. de Koninck and Dr. Krantz.

* Δακτυλίος, a ring.

THYSANOIDÆ.

Thysanoceras HYATT.

Thysanoceras fimbriatum HYATT.

Amm. fimbriatus Sow., Min. Conch., v. 2, p. 145, pl. 164.

Loc. Pouilly in Côte d'Or and Plateau de Larzac; Coll. L. de Koninck and Dr. Krantz.

Thysanoceras Germainii HYATT.

Amm. Germainii D'Orb., Terr. Jurass., Ceph., p. 320, pl. 101.

Amm. interruptus Ziet., Verst. Würt., pl. 15, fig. 3.

Amm. oblique-costatus Ziet., Verst. Würt., pl. 15, fig. 4.

Loc. Milhaud (Dép. de l'Aveyron), Semur, Pouilly in Côte d'Or, and Gundershofen; Coll. Dr. Krantz, M. Boucault, and L. de Koninck.

Thysanoceras articulatum HYATT.

Amm. articulatus Sow., De la Bèche, Geol. Manual, p. 276, fig. 63.

Loc. Spezzia; Coll. Prof. Bronn.

Thysanoceras Phillipsii HYATT.

Amm. Phillipsii Sow., De la Bèche, Geol. Manual, p. 275, fig. 57.

Loc. Spezzia; Coll. Prof. Bronn.

Thysanoceras cornucopia HYATT.

Amm. cornucopia Young and Bird, Geol. York., pl. 12, fig. 6.

Amm. cornucopia D'Orb., Terr. Jurass., Ceph., p. 316, pl. 99.

Loc. Semur, St. Quentin, près de Verpillier, Plateau de Larzac, and Milhaud (Dép. de l'Aveyron); Coll. L. Agassiz, M. Boucault, Dr. Krantz, and L. de Koninck.

Thysanoceras torulosum HYATT.

Amm. torulosus Schub. Ziet., Verst. Würt., p. 19, pl. 14, fig. 1.

Amm. scutatus Von Buch, Pet. remarq., pl. 8, fig. 1.

Amm. torulosus D'Orb., Terr. Jurass., Ceph., p. 322, pl. 102.

Loc. Plateau de Larzac, Zillhausen, Metzingen, Schomberg, and Durwangen; Coll. Mus. of Stuttgart, Dr. Krantz, and L. de Koninck.

Thysanoceras jurense HYATT.

Amm. jurenensis Ziet., Verst. Würt., pl. 68, fig. 1.

Amm. jurenensis D'Orb., Terr. Jurass., Ceph., p. 218, pl. 100.

Amm. phyllocinctus Quens'dt, Der Jura.

Loc. Semur, Plateau de Larzac, Milhaud (Dép. de l'Aveyron), Hechingen in Württemberg, Uhrweiler in Elsass, Adnet bei Salzburg, Sondelfingen, Balingen, Reutlingen, Metzingen, and Gundershofen; Coll. Mus. of Stuttgart, M. Boucault, Dr. Krantz, Prof. Bronn, and L. de Koninck.

Thysanoceras hircinum HYATT.

Amm. hircinus Schlot., Pet., p. 72.

Amm. hircinus Quens'dt, Der Jura, p. 280, pl. 40.

Loc. Semur, Donau-Main Canal, and Mistlegau bei Bayreuth; Coll. M. Boucault and Prof. Bronn.

Rhacoceras L. AGASSIZ.**Rhacoceras calypso** HYATT.

Amm. calypso D'Orb., Terr. Jurass., I., p. 167, pl. 52, figs. 7-9.

Loc. Plateau de Larzac, Monte de Aquasparta bei Cesi in Umbria, Milhaud, Laumière, Digue in Basses Alpes, and Erba bei Como; Coll. Dr. Krantz, L. de Koninck, and Prof. Bronn.

The abdomen is broader than in *R. heterophyllum*, and the septa different, but, nevertheless, the varieties of this species which are devoid of the annular depressions caused by the permanent mouths, are frequently identified with that species.

Rhacoceras heterophyllum L. AGASSIZ.

Amm. heterophyllum Sow., Min. Conch., v. 3, p. 119, pl. 266.

Amm. heterophyllum D'Orb., Terr. Jurass., I., p. 339, pl. 109.

Loc. Whitby, Boll, Vassy près d'Avallon, Erzingen (Dép. du Doubs), Balingen and Bruchsal; Coll. Dr. Krantz, M. Boucault, and Prof. Bronn.

Rhacoceras cylindricum HYATT.

Amm. cylindricus De la Bèche, Man. Geol., p. 275, fig. 55.

Loc. Schöppenstadt; Coll. Dr. Krantz.

Rhacoceras mimatense HYATT.

Amm. mimatensis D'Orb., Terr. Jurass., p. 344, pl. 110, figs. 4-6.

Loc. Plateau de Larzac (Dép. de l'Aveyron) and Boll; Coll. L. de Koninck and Dr. Krantz.

PHYMATOIDÆ.**Phymatoceras** HYATT.**Phymatoceras enervatum** HYATT.

Loc. Plateau de Larzac and Villenotte près de Semur; Coll. Dr. Krantz and M. Boucault.

The abdomen is much flatter in this species than in the succeeding *P. robustum*, and in the young the channels are deeper and more distinct. The increase of the radii of the spiral is also less, and there are therefore a

greater number of whorls in specimens of the same size. The sides of the whorls are also less gibbous than in *P. robustum*, and auxiliary cells differently formed, being comparatively but slightly indented by the minor lobes, and the inferior lateral cell inclined toward the umbilicus, instead of being straight.

Phymatoceras robustum HYATT.

Loc. Plateau de Larzac, Milhaud, and Semur; Coll. Dr. Krantz, L. de Koninck, and M. Boucault.

Ammatoceras.

Ammatoceras insigne HYATT.

Amm. insignis Schub., Ziet., Verst. Würt., p. 20, pl. 15, fig. 2.

Amm. insignis D'Orb., Terr. Jurass., Ceph., p. 347, pl. 112.

Amm. insignis Quens'dt, Die Ceph., p. 280, pl. 40, figs. 4, 5.

Loc. Gundershofen (Bas-Rhin); Coll. M. Boucault.

Ammatoceras variable HYATT.

Amm. variabilis D'Orb., Terr. Jurass., Ceph., p. 350, pl. 113.

Loc. Laumière, Salins, Plateau de Larzac, St. Julien de Croix in Saone et Loire, Besançon, Evrecy bei Caen, Boll, and Balingen; Coll. Mus. of Stuttgart, L. de Koninck, Dr. Krantz, and M. Boucault.

Pelecoceras * HYATT.

Having but one species of this genus, it would be exceedingly hazardous to give the generic characters. They will, however, probably be found to be distinguished by the peculiarly pointed aspect, shallowness and breadth of the lobes and cells; the limits of the envelopment, which last is greater than in other genera of this family; the acute form of the back, and the breadth of the whorls.

Pelecoceras attenuatum HYATT.

Loc. Plateau de Larzac, Milhaud, and Besançon; Coll. Dr. Krantz and L. de Koninck.

Abdomen acute. Sides very broad and flat. Envelopment covers over one half the side of each internal whorl. Pilæ are curved forward on the abdomen. The young have no channels, and the development does not differ from *Amm. variabilis* or *Amm. insignis*, except in the size of the young, the whorls of these not being proportionately so large or broad. All the lobes and cells are broad and shallow, especially the pointed abdominal and the serrated auxiliary cells.

* Πέλεκυς, an axe.

HILDOCERATIDÆ.***Hildoceras†** HYATT.

Abdomen keeled and channelled. Ribs large and broad. The young continue smooth throughout first whorl. Ribs, keel, and channels appear on the second whorl. The ribs are not preceded by a line of tubercles, but begin as folds, bent much in the same way as in the adult, but with the abdominal bend inclined more toward the apex. The abdominal lobe is shallow and broad. Superior lateral much deeper than either the abdominal or inferior lateral lobes, the last named very narrow and shallow, minor lobes small and pointed.

Hildoceras bifrons HYATT.

Amm. bifrons Brug., Ency. Meth., *Amm.* No. 15.

Amm. bifrons D'Orb., Terr. Jurass., Ceph., p. 219, pl. 56.

Loc. Whitby, Dumbleton, Dorsetshire, Fontaine Étoupe Fours, Poillé in Sarthe, Laumière, Mende in Lozère, Verpillier, Milhaud, Plateau de Larzac, Cesi in Umbria, Mussy près de Semur, Chary près de Privas, Amayer sur Orne, Boll, and Metzigen; Coll. L. de Koninck, Dr. Krantz, M. Boucault, and Prof. Bronn.

Hildoceras Walcotii HYATT.

Amm. Walcotii Sow., Min. Conch., v. 2, p. 7, pl. 106.

Amm. Hildensis Young and Bird, Geol. York., pl. 12, fig. 1.

Loc. Illminster, Niort, Fontaine Étoupe Fours, Plateau de Larzac, Cesi in Umbria, Milhaud, Vieux Ponts, and Guadalaviar in Aragon; Coll. B. M. Wright, Dr. Krantz, and L. de Koninck.

Grammoceras‡ HYATT.

Abdomen keeled, but not channelled. Whorls flattened, laterally giving a discoidal aspect to the shells. Ribs finer and less prominent than those of *Hildoceras*. The young also continue smooth much longer, and channels never appear; they take, however, the same rounded form of the whorl. Septa differ but slightly from *Hildoceras* in the higher species, such as *Grammoceras serpentinum*; and not all generically in the lower, such as *Grammoceras striatulum*.

Grammoceras striatulum HYATT.

Amm. striatulus Sow., Min. Conch., v. 5, p. 23, pl. 421, fig. 1.

Amm. Thouarsensis D'Orb., Terr. Jurass., Ceph., p. 222, pl. 57.

Amm. radians depressus Quens'dt, Der Jura, p. 281, pl. 40.

* Includes all the Falciferi proper with smooth pilæ.

† After St. Hilda.

‡ Γραμμή, a line.

Loc. Whitby, Robin Hood's Bay, Milhaud, St. Julien du Cray in Saone et Loire, Niort, Plateau de Larzac, Près de Lyon, Boll, Keulwagen, Redangen, Heiningen, Aalen, Falkenhagen in Lippe, Metzgingen, and Uhrweiler; Coll. Mus. of Stuttgart, L. de Koninck, Dr. Krantz, Prof. Bronn, and M. Boucault.

Grammoceras radians HYATT.

Amm. radians Schlot., Pet. p. 78, No. 34.

Naut. radians Rein., Naut. et Arg., p. 71, No. 17, figs. 39, 40.

Amm. radians Ziet., Verst. Würt., p. 5, pl. 4, fig. 3.

Amm. lineatus Ziet., Verst. Würt., p. 12, pl. 9, fig. 7.

Amm. radians compressus Quens'dt, Die Ceph., p. 112, pl. 7, fig. 9.

Loc. Niort, Plateau de Larzac and Carnus in Cevenen, St. Cyr bei Lyon, Villebois in Ain, Salins in Jura, Milhaud, Mende, Besançon, Vaches Noires in Calvados, Uhrweiler, Falkenhagen, Boll; Coll. Dr. Krantz, Prof. Bronn, L. de Koninck, and M. Boucault.

Grammoceras aalense HYATT.

Amm. aalensis Ziet., Verst. Würt., p. 37, pl. 28, fig. 3.

Amm. aalensis Quens'dt, Die Ceph., p. 114, pl. 7, fig. 7.

Amm. aalensis D'Orb, Terr. Jurass., Ceph., p. 238, pl. 63.

Loc. Trocester Hill, Milhaud, St. Vigor, St. Julien du Cray, La Verpillière in Ain, St. Quentin, Aalen, Heiningen, Neumarkt, Balingen, Mistle-gau, Amberg, Wiesenthal, and Gundershofen; Coll. Mus. of Stuttgart, L. de Koninck, Sir C. Lyell, L. Agassiz, Prof. Bronn, M. Boucault, and Dr. Krantz.

Grammoceras costulatum HYATT.

Amm. costulatus Schlot., Pet., p. 78, No. 33.

Amm. costula Krüg., Uhrwelt. Naturgesch., p. 27.

Naut. costula Rein., Naut. et Argo, p. 68, pl. 3, fig. 33.

Amm. radians costula Quens'dt, Die Ceph., p. 113, pl. 7, fig. 11.

Loc. Aalen, Amberg, and Metzgingen; Coll. Mus. of Stuttgart, L. de Koninck and Prof. Bronn.

Grammoceras serpentinum HYATT.

Amm. serpentinus Schlot., Pet., p. 64, No. 6.

Argo serpentinus Rein., Naut. et Argo, p. 89, pl. 13, fig. 74.

Amm. serpentinus Ziet., Verst. Würt., p. 16, pl. 12, fig. 4.

Amm. serpentinus D'Orb, Terr. Jurass., p. 215, pl. 55.

Amm. Strangewaysii Sow., Min. Conch., v. 3, p. 99, pl. 25, fig. 1-3.

Loc. Whitby, Somerset, Dorsetshire, Bannington, Milhaud, Fontaine

Étoupe Fours, Thouars, Près de Semur, Vassy in Yonne, Amayer sur Orne, Boll, and Metzingen; Coll. L. de Koninck, Dr. Krantz, M. Boucault, Prof. Bronn, Duval, and Damon.

Leioceras* HYATT.

Abdomen keeled, acute. Sides of the whorls flattened. Envelopment uniformly greater than in *Grammoceras*. The young differ, however, in being much flatter at the corresponding periods of growth. The lobes and cells, also, are less obtuse, shallower, and much more numerous.

Leioceras lythense HYATT.

Amm. lythensis Young and Bird, Phil. Geol. York., p. 164, pl. 13, fig. 6.
Loc. Whitby; Coll. Prof. Bronn.

Leioceras opalinum HYATT.

Naut. opalinus Rein., Naut. et Argo., p. 55, pl. 1, fig. 1.
Naut. comptus Rein., Naut. et Argo., p. 57, pl. 1, figs. 5, 6.
Amm. primordialis Schlot., Pet., No. 7, p. 67.
Amm. erratus Young and Bird, Phil. Geol. York., pl. 13, fig. 7.
Amm. primordialis Ziet., Verst. Würt., p. 5, pl. 4, fig. 4.
Amm. primordialis D'Orb., Terr. Jurass., Ceph., p. 235, pl. 62.
Amm. opalinus Quens'dt, Die Ceph., p. 115, pl. 7, fig. 10.
Loc. Robin Hood's Bay, Whitby, Trocester Hill, La Verpillière in Ain, St. Quentin près Verpillier, Szaflary, Amberg près de Goslar, Neuffen, Quedlinburg, Teufelsloch, Gundershofen, and Metzingen; Coll. Mus. of Stuttgart, Dr. Krantz, Prof. Bronn, L. Agassiz, and M. Boucault.

Leioceras elegans HYATT.

Amm. elegans Sow., Min. Conch., v. 1, p. 213, pl. 94, fig. 1.
Loc. Whitby; Coll. Dr. Krantz.

Leioceras complanatum HYATT.

Amm. complanatus Brug., Encycl., p. 38, No. 11.
Amm. mulgravius Young and Bird, Phil. Geol. York., p. 251, pl. 13, fig. 8.
Amm. elegans Phil. Geol. York., pl. 13, fig. 2.
Amm. elegans Ziet., Verst. Würt., p. 22, pl. 16, fig. 5.
Amm. complanatus D'Orb., Terr. Jurass., p. 353, pl. 114.
Loc. Whitby, Lyme Regis, Villebois in Ain, Mussy près de Semur, Avalon, Privas, Boll, and Ubstadt bei Bruchsal; Coll. Prof. Bronn, Dr. Krantz, M. Boucault, and Damon.

* Λείος, smooth.

Leioceras discoides HYATT.

Amm. depressus Schlot., Pet., p. 80, No. 80.

Amm. discoides Ziet., Verst. Würt., p. 21, pl. 16, fig. 6.

Amm. depressus Ziet., Verst. Würt., p. 7, pl. 5, fig. 15.

Loc. Milhaud, Mende, Plateau de Larzac, and Balingen; Coll. L. de Koninck and Dr. Krantz.

Bruguière (Encyclop., 1789), having described a different species by the name "depressus," Zieten's name "discoides" is necessarily the correct name of this species.

Leioceras cumulatum HYATT.

Amm. bicarinatus Ziet., Verst. Würt., p. 21, pl. 15, fig. 9.

Loc. Milhaud, Laumière, Mende, Plateau de Larzac (Dép. de l'Aveyron), Montpellier, and Zillhausen; Coll. L. Agassiz, L. de Koninck, Dr. Krantz, and M. Boucault.

Zieten's "bicarinatus" differs specifically from Münster's figure, *Beit. zur Pet.*, v. 4, p. 138, pl. 15, fig. 30, and therefore it becomes necessary to adopt a new name for this species.

Leioceras concavum HYATT.

Amm. concavus Sow., *Min. Conch.*, v. 1, p. 215, pl. 94, fig. 2.

Loc. Semur, Salins, and Heiningen; Coll. Dr. Krantz and M. Boucault.

Leioceras capellinum HYATT.

Amm. capellinus Schlot., Pet., p. 65.

Amm. capellinus Quens'dt, *Die Ceph.*, p. 206, pl. 7, fig. 2.

Amm. lythensis lineatus Quens'dt, *Die Ceph.*, p. 107, pl. 7, fig. 1.

Loc. Metzingen and Holzmünden; Coll. Dr. Krantz.