

Ammonites prosperianus D'ORBIGNY 1841 (Cretaceous
Ammonoidea) is a chimaera

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With 3 figures in the text

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Abstract: Re-examination of the remaining syntypes of *Ammonites prosperianus* D'ORBIGNY 1841 show that at least five species are represented in the type series, which are illustrated photographically for the first time. D'ORBIGNY's protograph is a composite drawing based upon the coiling and whorl section of juvenile pachydiscids belonging to the genus *Lewesiceras* SPATH 1939, whilst the ornament is based upon that of the heteromorph *Hyphantoceras reussianum* D'ORBIGNY). The nomenclatorial implications of these conclusions are reviewed; the species cannot be regarded as the rootstock of the Turonian-Coniacian radiation of the genus *Menabonites* HOUŠA 1967, whilst in the interests of nomenclatorial stability the name should be suppressed.

Key words: Nomenclature, Ammonitida (*Ammonites prosperianus*), Turonian, Coniacian; Saone-Rhone Basin (Vaucluse).

Zusammenfassung: Die Nachuntersuchung des verfügbaren Originalmaterials ergab, daß die Syntypen mindestens fünf verschiedene Arten repräsentieren. D'ORBIGNY's Abbildung kombiniert die Aufrollung und den Windungsquerschnitt eines jugendlichen Pachydisciden (*Lewesiceras* SPATH 1939) mit der Skulptur eines Heteromorphen (*Hyphantoceras reussianum* D'ORBIGNY)). Abgesehen von den nomenklatorischen Konsequenzen kann die Art nicht als Wurzel der Radiation von *Menabonites* HOUŠA 1967 im Turon und Coniac angesehen werden. Im Interesse der nomenklatorischen Stabilität wird vorgeschlagen, den Namen aufzugeben.

Introduction

Ammonites prosperianus D'ORBIGNY (1841 p. 335, pl. 100, figs. 3—4 (reproduced here as Fig. 2, e—f)) is one of a number of classic ammonite species described by D'ORBIGNY, the type material of which has never been satisfactorily figured or redescribed. D'ORBIGNY's protographs are well-known for the artistic licence involved in their construction, and this has resulted in much confusion over the identity and affinities of many widely cited species. Contemporaries of D'ORBIGNY such as DANIEL SHARPE (1857 p. 64) criticised "... what is called restoring the entire form of the shell from a fragment instead of representing what is actually seen", and the re-illustration of D'ORBIGNY's material in Paleontologia

Universalis and, latterly, by CASEY in his Monograph of the Ammonoidea of the Lower Greensand (1960 onwards), especially in discussion of *Chelonicerias meyendorffi* (D'ORBIGNY) (CASEY 1962, p. 225) and *Otoboplites guersanti* (D'ORBIGNY) CASEY 1965, p. 507), amply illustrate this point. Judging by the remaining type material of *Ammonites prosperianus*, the published figures of this too are not only reconstructions, but reconstructions based upon members of two different orders of ammonites, an unfortunate conclusion in view of the important role in pachydiscid phylogeny attributed to this species by HOUŠA (1967).

The type specimens

In his original description (1841 p. 335—336), D'ORBIGNY mentions material from Mondragon and Uchaux, two localities north of Orange (Vaucluse) in southern France, long famous for their beautiful silicified Turonian faunas (e. g. ROMAN & MAZERAN 1913). The material mentioned was from the collections of PROSPER RENAUX (for whom the species was named) and D'ORBIGNY himself, although D'ORBIGNY stated very clearly (1841 p. 336) that his figures (pl. 100, figs. 3—4) were composite, "dessine sur des échantillons de la collection de M. RENAUX et de la mienne". The relevant volume of *Paléontologie Française* was published between 1840 and 1842, whilst D'ORBIGNY died in 1857. However, Dr. JACQUES SORNAY of the Muséum d'Histoire Naturelle informs us that his collection was not catalogued until the period 1858—1860. The catalogue is still in existence. The material was originally mounted on boards or stands (Fig. 2d). In many instances, species which D'ORBIGNY described as being based on unique specimens are now represented in his collection by several individuals, whilst in other cases, the cataloguer has committed errors as with the syntypes of *Ammonites largilliertianus* D'ORBIGNY, an oxycone *Forbesiceras*, where one of the mounted specimens is a fragment of the heteromorph *Scaphites*. There are also manuscript species included in the catalogue and collection (e. g. *Ammonites combesi*, subsequently described by SORNAY 1951 p. 627). The collection includes much material additional to that utilised and mentioned by D'ORBIGNY during preparation of *Paléontologie Française* and indeed the *Prodrome de Paléontologie Universelle* (1850). A further complication is that some of D'ORBIGNY's protographs are based upon, or reconstructed with the aid of, material in the collections of other workers (notably DE VIBRAYE, GESLIN, DE BEAUMONT and RENAUX), whilst finally, some specimens have simply disappeared. Even when D'ORBIGNY gives dimensions of specimens, these may not agree with those of the remaining individual, as in the case of the 'type' of *Coilopoceras requienianum* (D'ORBIGNY) for which he gives an adult diameter of 196 mm, although the figured specimen

from REQUIEN's Collection, housed at Avignon, is some 10% smaller (ROMAN & MAZERAN 1913, fig. 5).

In the case of *Ammonites prosperianus*, the catalogue of the D'ORBIGNY Collection lists nine specimens under the catalogue number 6786, giving the locality as Uchaux, Vaucluse. We have recovered all nine of these specimens which, from the above discussion, are, in part or whole, syntypes of the species. Moreover, Dr. J. P. LEFRANC has located specimens in the RENAUX Collection at Montpellier which are also presumed to be syntypes of the species.

Description of the material

The syntypes are all preserved with silicified shells or as silicified internal moulds showing traces of sutures. Preservation is poor, with coarse, partial silicification and much corrosion, whilst the ornament of some specimens is obscured by the presence of traces of the dorsal (internal) septa of the succeeding whorl.

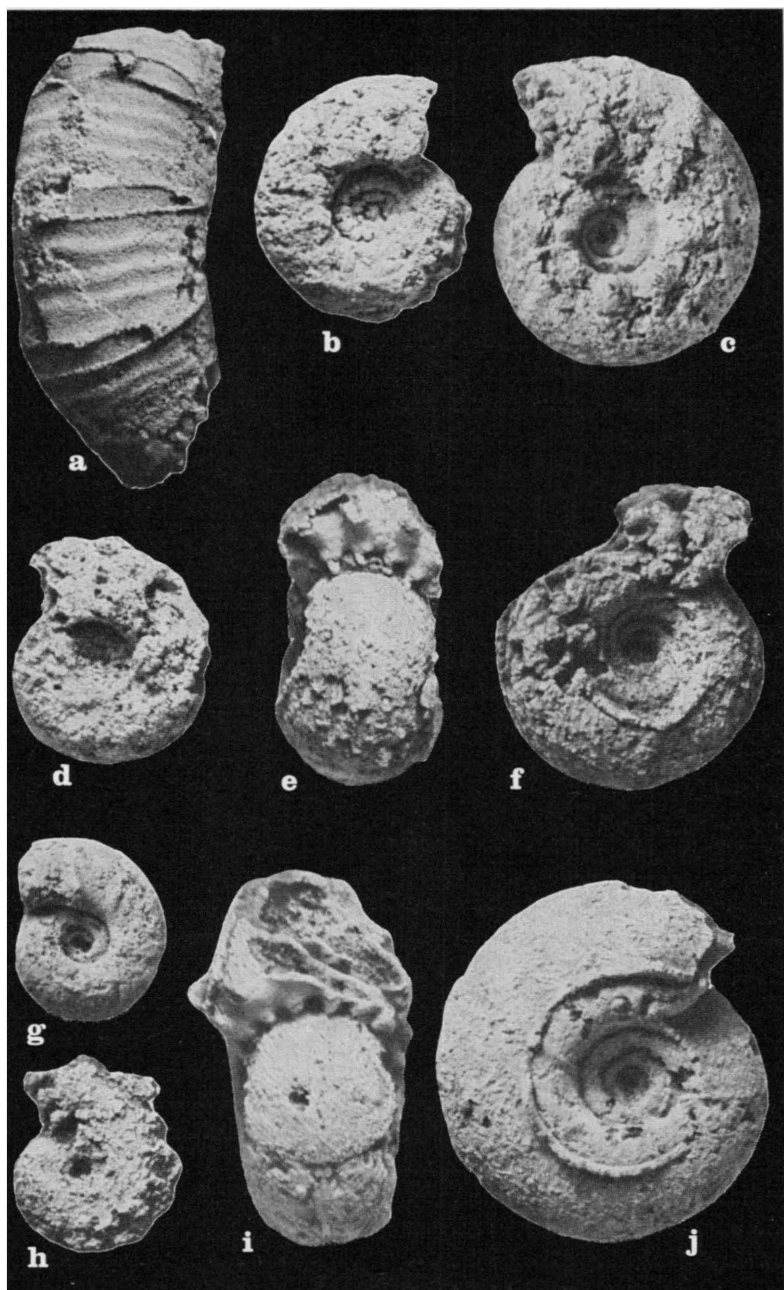
Dimensions (in millimetres):

No.	D	Wb	Wh	Wb/Wh	U
MNHP 6786 a	13	± 6.5 (50)	5 (38)	1.30	3.5 (27)
MNHP 6786 b	13	6 (46)	± 4.5 (35)	1.30	± 3 (23)
MNHP 6786 c	16	± 10 (62)	5.5 (34)	1.81	—
MNHP 6786 d	17	± 10 (59)	6.5 (38)	1.53	5 (30)
MNHP 6786 e	± 22	± 13 (60)	—	—	± 6 (27)
MNHP 6786 f	22	± 12 (54)	9 (40)	1.30	6.5 (29)
MNHP 6786 g	± 25	12 (48)	10.5 (42)	1.14	7 (28)
MNHP 6786 h	± 35		± 17 (48)	1.00	10 (28)

The Paris material

The four smallest specimens (MNHP 6786a—d; Fig. 1b, d, g, h) are too small and poorly preserved for specific identification. They are all, however, juvenile pachydiscids probably assignable to either *Lewesiceras* or *Tongoboryceras*.

Fig. 1, a-j. Eight of the surviving syntypes of *Ammonites prosperianus* D'ORBIGNY in the collections of the Muséum d'Histoire Naturelle, Paris. Suggested identifications of these specimens are as follows: a — MNHP C 6786 h, a fragment of *Hyphantoceras reussianum* (D'ORBIGNY); b — MNHP 6786 d; d — MNHP 6786 c; g — MNHP 6786'a; h — MNHP 6786 b; all juvenile pachydiscids, either *Lewesiceras* or *Tongoboryceras*; c — MNHP 6786 f, *Lewesiceras* cf. *mantelli* WRIGHT & WRIGHT; e-f — MNHP 6786 e; i-j — MNHP 6786 g, both *Tongoboryceras* cf. *rhodanicum* (ROMAN & MAZERAN). All Figures $\times 2$.



MNHP 6786f (Fig. 1c) is moderately well preserved and shows 7—8 swollen umbilical bullae giving rise to quite strong primary ribs, with traces of intercalated ribs. This specimen appears to represent a juvenile *Lewesiceras* comparable to *L. mantelli* WRIGHT & WRIGHT (Fig. 3a—c).

MNHP 6786e (Fig. 1e, f) and 6786g (Fig. 1i—j) lack umbilical tubercles, although MNHP 6786g bears prominent, distant, prorsirade constrictions, and match the specimens figured by ROMAN & MAZERAN (1913 p. 22, pl. 1, fig. 12) as *Puzosia* sp. These specimens may represent early growth stages of *Tongoboryceras rhodanicum* (ROMAN & MAZERAN 1913 p. 18, pl. 1, fig. 10, Pl. 2, figs. 2a—b).

The largest complete syntype is MNHP 6786h (Fig. 3d—e), a weathered internal mould, with a somewhat more compressed whorl section than the other specimens discussed. This specimen lacks any sign of umbilical tuberculation, whilst showing weak constrictions. It is a puzosiid, possibly a juvenile of *Puzosia* (*Mesopuzosia*) *curvatisulcatum* (CHATWIN & WITHERS 1909 p. 66, pl. 2).

The last of D'ORBIGNY's syntypes, MNHP 6786i (Fig. 1a, 2d), is an uncoiled fragment of a heteromorph. The shell is ornamented by periodic flared ribs (which are internally septate), separated by three finer, less pronounced, secondary ribs. Since the outer shell surface of the flared ribs is not preserved, it is uncertain whether or not they were tuberculate. However, comparison with fragments of *Hyphantoceras reussianum* (D'ORBIGNY) from the English Chalk Rock, here illustrated as Fig. 2a—b, c, g—h, m, suggests that D'ORBIGNY's specimen also belongs to this species (see also TRÖGER, 1968).

The Montpellier material

Dr. J. P. LEFRANCE has kindly forwarded casts of four specimens labelled '*Ammonites prosperianus* D'ORBIGNY' from the RENAUX Collection housed in the Faculté des Sciences, Montpellier, FSM1—4 (Fig. 2, i—l).

The largest of these, FSM1, is wholly septate, and shows a well-preserved septal face. The ornament consists of six strong, conical umbilical bullae, which give rise to strong, prorsiradiate ribs, either singly or in pairs, with 3—4 weaker intercalatories between main ribs. This specimen is very clearly a juvenile *Lewesiceras mantelli* WRIGHT & WRIGHT (compare Fig. 3a—c).

FSM2 and FSM3 are much more compressed and flat-sided, while the whorls show a relatively high expansion rate. The larger of these two specimens shows faint transverse ribbing across the outer flanks and venter, and compares well with the Uchaux specimens figured by ROMAN & MAZERAN (1913 pl. 4, figs. 15—17) as *Scaphites planus*. The fourth specimen is too small and ill-preserved for precise determination; its overall proportions suggest that it too is a scaphitid.

The collections of the Muséum d'Histoire Naturelle in Paris include an unregistered cast of *Tongoboryceras rhodanicum* (ROMAN & MAZERAN) (Fig. 3f—g) which is said to be from the RENAUX Collection at Montpellier. In general proportions it closely resembles D'ORBIGNY's protograph and may have been used in the reconstruction. However, it differs from D'ORBIGNY's figure both in ornament and in possessing a septate terminal face. We have been unable to locate the original of this specimen, and are unable to say whether or not it too formed part of the syntype series.

Discussion

The thirteen presumed syntypes of *Ammonites prosperianus* we have located can be grouped as follows:

1. MNHP 6786a—d are indeterminate juvenile pachydiscids; they can presumably be referred to either *Lewesiceras* or *Tongoboryceras*, both of which occur in the associated fauna (see below).
2. MNHP 6786f and FSM1 are juvenile *Lewesiceras mantelli* WRIGHT & WRIGHT. This species occurs at Uchaux as large individuals which have been named *Lewesiceras romani* SORNAY (1964 p. 183, figs. 1—4) (see Fig. 3h—i), a junior subjective synonym of *mantelli* (C. W. WRIGHT, in litt.) (compare Fig. 3a—c with Fig. 3h—i).
3. MNHP 6786g is a juvenile *Tongoboryceras rhodanicum*.
4. MNHP 6786 is probably a juvenile *Puzosia* (*Mesopuzosia*) *curvatisulcatum* (CHATWIN & WITHERS). This species has long been known from the Uchaux fauna under the name of *Puzosia gaudemarisi* ROMAN & MAZERAN (C. W. WRIGHT, in litt.).
5. FSM2—3, and perhaps also FSM4, are the coiled portions of a scaphitid heteromorph, probably *S. planus* ROMAN & MAZERAN.
6. MNHP 6786i is a fragment of the nostoceratid heteromorph *Hyphanto-ceras reussianum* (D'ORBIGNY).
7. The specimen whose dimensions are quoted in D'ORBIGNY's original description may be the example of *Tongoboryceras rhodanicum* (ROMAN & MAZERAN), supposedly in the Renaux Collection, a cast of which is housed in the Muséum d'Histoire Naturelle, Paris (Fig. 3f, g).

What then did D'ORBIGNY's artist base his reconstruction of *Ammonites prosperianus* upon? In his description of the species, D'ORBIGNY (1841 p. 335) speaks of "de huit a dix côtes simples, peu larges, obtuses, ondulées, commençant par un tubercle, puis s'élargissant pour passer sur le dos; entre chacune de ces côtes on en remarque trois autres bien plus petites, à pointe saillantes et légèrement ondulées". This description fits the two juveniles definitely referred to *Lewesiceras mantelli* (MNHP 6786f, FSM1)

but none of the others. The figure, on the other hand, shows an ammonite with the approximate relative proportions of these two specimens, but with quite distinctive ornament of long ribs separated by three shorter intercalated ribs — as in *Lewesiceras* — but with rather weak umbilical tubercles and a curious flexure of the ribs, if not a faint, distinctive upper lateral tubercle (Fig. 2e, f). This very distinctive ornament cannot be matched with any of the normally-coiled syntypes. Instead, it is identical with that of MNHP 6786i, which we have identified as a *Hyphantoceras*. Thus, whilst D'ORBIGNY's general description is compatible with the typical *Lewesiceras* amongst the syntypes, the figures suggest a combination of the whorl form and relative proportions of either *Lewesiceras* or *Tongoboryceras* with the ornament of the *Hyphantoceras* fragment.

Nomenclatorial consequences

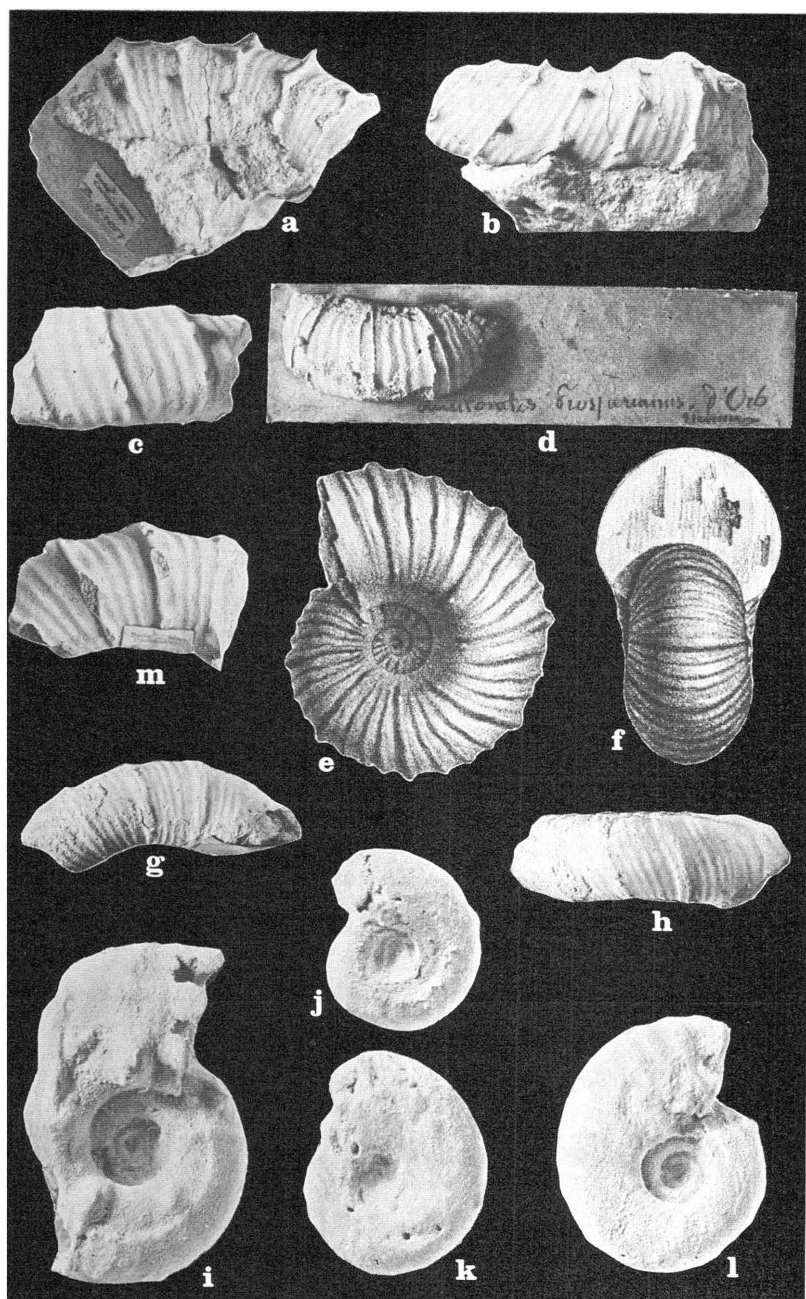
The trivial name *prosperianus* has priority over all the names applied to those species which we have been able to recognise amongst the extant syntypes, including the species upon which we believe the figures and description to be based. These include *Lewesiceras mantelli* WRIGHT & WRIGHT (= *L. romani* SORNAY), *Tongoboryceras rhodanicum* (ROMAN & MAZERAN). *Scaphites planus* ROMAN & MAZERAN, *P. (Mesopuzosia) curvatisulcatum* (CHATWIN & WITHERS) (= *Puzosia gaudemaris* ROMAN & MAZERAN) and *Hyphantoceras reussianum* (D'ORBIGNY). Selection of a lectotype from this material would thus result in a well-established name, based on adequately defined type material, disappearing from the literature, and we would propose instead, therefore, to approach the International Commission on Zoological Nomenclature with the proposal to suppress the name *prosperianus*.

Fig. 2.

Fig. 2i—l. Casts of the Montpellier syntypes of *Ammonites prosperianus*, in the MNHP 6786h, figured $\times 1$ on its original board to show the typical conservation of material in D'ORBIGNY's collection. (a—b) are of B 4107 and (c, m) B 4111 (Sedgwick Museum, Cambridge) from the Upper Turonian Chalk Rock of Cuckhamsley (Berkshire); (g—h) are K692 (University Museum, Oxford) from the same horizon at Wantage (Berkshire).

Fig. 2e—f are copies of D'ORBIGNY's original photograph of *Ammonites prosperianus* (1841 pl. 100, figs. 3—4). Note how the general proportions of the syntetograph are like those of juvenile pachydiscids shown in Fig. 1, c, e—f, i—j, and the ornament like that of the *Hyphantoceras* shown in this figure.

Fig. 2i—l. Casts of the Montpellier syntypes of *Ammonites prosperianus*, in the RENAUX Collection. (i) is a juvenile *Lewesiceras* cf. *mantelli*; (j) probably a juvenile scaphitid, (k) and (l) are juvenile *Scaphites* cf. *planus* ROMAN & MAZERAN. (a—h) $\times 1$, (i—l) $\times 2$.



Phylogenetic consequences

HOUSÁ (1967 p. 39 et seq., fig. 7) referred D'ORBIGNY's *Ammonites prosperianus* to the genus *Menabonites* (type species *Pachydiscus anapaden-sis* KOSSMAT 1898), regarding it as a Mid-Turonian species, and thus the oldest, ancestral representative of what is a predominantly Coniacian genus. Our conclusions that *prosperianus* is a chimaera thus also necessitates a revision of HOUSÁ's reconstruction of the phylogeny of the Turonian pachydiscids.

The age of the syntype series

Ammonites are now rather scarce at Uchaux in our experience, but earlier collections gathered a rather distinctive fauna which included the following: *Lewesiceras mantelli*, *Tongoboryceras rhodanicum*, *Puzosia* (*Mesopuzosia*) *curvatisulcatum*, *Romaniceras deverianum* (D'ORBIGNY), *R. uchauxense* COLLIGNON (possible a synonym of *R. deverianum*), *Coilopo-ceras requienianum* (D'ORBIGNY), *Subprionocyclus bravaisianus* (D'ORBIGNY), *Scalarites gracilis* (D'ORBIGNY), *Baculites undulatus* D'ORBIGNY, *Hyphantoceras reussianum* (D'ORBIGNY) and *Worthoceras rochatianum* (D'ORBIGNY).

This is an Upper Turonian association, and has many elements in common with the well-known faunas of the English Chalk Rock. We would infer that this is the age of the syntype series of *Ammonites prosperianus*.

Acknowledgements

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Mr. C. W. WRIGHT kindly gave us access to his unpublished revision of the fauna of the English Chalk Rock, and was the source of many useful discussions. We are grateful to DR. J. SORNAY (Paris), Mr. D. PHILLIPS and DR. M. K. HOWARTH

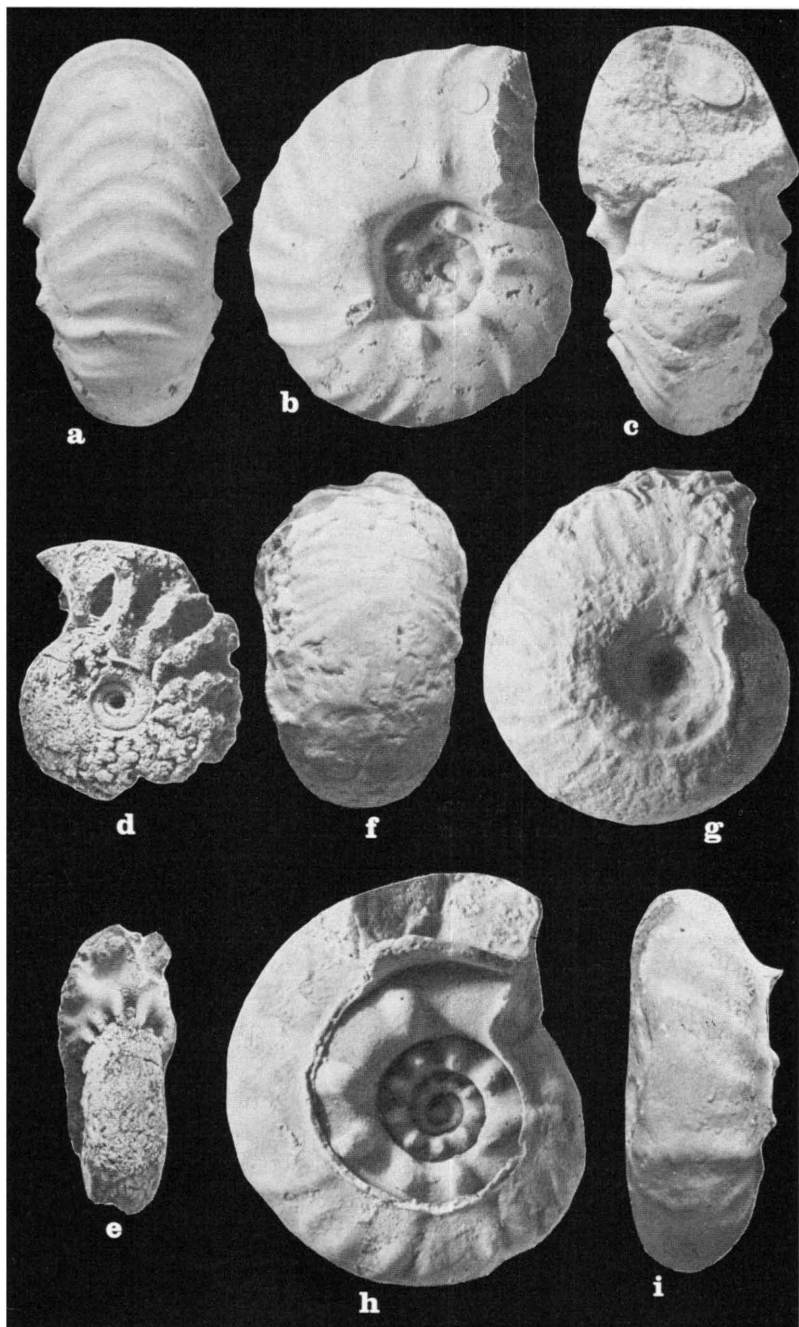
Fig. 3 a—c. The holotype of *Lewesiceras mantelli* WRIGHT & WRIGHT, from the Upper Chalk (presumably *planus* Zone) of Oldbury Hill, Wiltshire.

Fig. 3 d—e. One of the Paris syntypes of *Ammonites prosperianus*, MNHP 6786 h, a juvenile *Puzosia* (*Mesopuzosia*) cf. *curvatisulcatum* (CHATWIN & WITHERS).

Fig. 3 f—g. *Tongoboryceras rhodanicum* (ROMAN & MAZERAN), mould in the Muséum d'Histoire Naturelle, Paris, said to be of a specimen in the RENAUX Collection at Montpellier, and a further possible syntype of *Ammonites prosperianus*.

Fig. 3 h—i. *Lewesiceras mantelli* WRIGHT & WRIGHT. A Uchaux specimen in the DUMORTIER Collection (Muséum Lyon) referred by SORNAY to *L. romani* SORNAY, figured for comparison with the type of *L. mantelli*, of which it is a synonym.

All figures $\times 1$.



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