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SINEMURIAN AMMONITES FROM THE PRAŞCA HILL (THE RARĂU SYNCLINE, EASTERN CARPATHIANS)

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Abstract. Although it had been discovered by Uhlig since 1900, the Sinemurian olistolith of the Praşca Hill (Rarău Mountains) has not yet been researched in detail. The paper presents only the rich ammonite fauna formed of over 150 exemplaries belonging to 41 taxa. The majority of these is figured for the first time from this fossiliferous point.
On account of the identified taxa, there were argued the *Oxynoticeras oxynotum and Echioceras raricostatum* Taxon-range Zones and the possibility of Hettangian and Pliensbachian presence.

Keywords: Ammonites, Sinemurian, Praşca Hill, Rarău Syncline, Eastern Carpathians.

There is an assertion which says that the abundance does not always represent a condition for the stimulation of the interest.

Such a situation is also noticed in the study of the Liassic mollusk fauna, especially the ammonites from the Praşca Hill, Rarău Mountains.

The Sinemurian fossiliferous point representing an olistolith formed of red nodular limestones and relative soft, limonitic marls has been known since the beginning of the XXth century.

Uhlig (1900) published a paper in Praga about the Early Liassic from this point of view signaling the great richness in ammonites. The author identified no less than 20 taxa of cephalopods. Several years later, during a trip in this area accompaning his master Uhlig, Trauth (1906) gathered from the same place other ammonites.

The research around this fossiliferous point went into a dark shadow cone after this substantial début. The Romanian geologists who studied the area (Kräutner, 1929; Ilie, 1957; Mutihac, 1968) only remembered its presence often locating it wrongly. The first who indicated the right position were Popescu and Patrulius (1964).

One of the authors of this paper (I. T.) identified the olistolith since 1963 during his field research in Mount Rarău. In many papers (Turculeț - 1965, 1968, 1970a, 1970b, 1971, 1984) analysed the fossil faunas from many points of view, but whithout having the cephalopods as subject. The only authors who brought new interpretations about the quoted ammonites were Patrulius *et al.* (1966, 1969) as well as Popa & Patrulius (1996).

In the paper published in 1996, Popa & Patrulius sinthetically mentioned the following taxa resulted from the revision of the ammonite faunas prior signaled or the ones they had discovered: *Partschiceras partschi* (Stur), *Geyeroceras persanense* (Herb.), *Paradasyceras planispira* (Reyn), *Harpophylloceras (Bucoviniceras) bucovinicus* (Uhlig), *Meneghiniceras nardii* (Menegh.), *Lytoceras* aff. *secernendum* (Di Stef.), *Microderoceras keindli* (Emmr.), *Gleviceras* sp., *Arnioceras* n. sp. ex. gr. *A. semicostatum*, *Paltechioceras romanicus* (Uhlig), *P. waehneri* (Uhlig), *P. herbichi* (Uhlig), *P. boesei* (Uhlig), *P. charpentieri* (Schaf.), *P.* n. sp., *"Arietites"* cf. *resurgens* Dum., *"A."* cf. *pluricostata* (Mngh.), *Echioceras raricostatum* (Ziet.), *"Phylloceras"* cf. *lunense* Men., *"P."* cf. *leptophyllum* Han., *Zetoceras zetes* (Orb.), *Oxynoticeras* cf. *oxynotum* (Qu.), *Microderoceras* aff. *nothum* Men., *Tmaegophioceras laevis* (Gey.), *Adnethiceras* sp. aff. *A. adnethicum* (Hauer), *Tragolytoceras* sp., *Pseudasteroceras* sp. etc.

What is interesting about the ammonite fauna formed of the tens of the quoted taxa is that only few were figurated in a single plate, respectively the one accompaning Uhlig's paper. Popa & Patrulius (1996) add only one generic taxa (*Paltechioceras* sp.). Which were the reasons? Probably the ones connected to the assertions at the beginning of this introduction.

Taking into account of these things and also the abundance of the ammonite fauna which we have gathered during the years, we considered our duty to capitalise it as it should be. The fauna analysed in this paper includes the last decades of field researches by the first author (I. T.) and in the last years by the second (P. Ţ.); we must mention that 5 exemplaries were provided by Prof. Dragomir Paulencu from Câmpulung Moldovenesc and 2 by the geologist engineer Daniel Palade. We also thank them on this ocasion.

Our fauna includes over 150 exemplaries of ammonites. The taxa identified are the

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following: *Zetoceras zetes* (Orb.), *Z.* sp. ex. gr. *Z. bonarellii* (Bettoni), *Geyeroceras cylindricum cylindricum* (Sow.), *G. cylindricum compressum* (Fucini), *G.* sp. ex. gr. *G. oenotrium complanatus* (Vad.), *G. cylindricum bielzi* (Herbich), *Calliphylloceras bicicolae* (Men.) n. ssp.?, *Juraphyllites gigas* (Fucini), *J. transylvanicus* (Hauer) *J.* cf. *nardii* (Men.), *Paradasyceras* aff. *planispira* (Reynès), *Meneghiniceras* sp. 1 and sp. 2, *Harpophylloceras* sp. ex. gr. *H. eximium* (Hauer), *Lytoceras tuba* (De Stefani), *Aegolytoceras* sp. ex. gr. *A. rugatum* (Stur), *Megarietites* sp., *Epammonites latisulcatus* (Qu.), *Epammonites* sp., *Vermiceras spiratissimus simplex* (Vadasz), ? *Pompeckjoceras* sp., *Euasteroceras* sp., *Palaeoechioceras* cf. *spirale* (Tr.&Will.), *Palaeoechioceras* sp., *Echioceras raricostatum* (Ziet.), *E.* aff. *regulare* (Tr.&Will.), *Paltechioceras romanicus* (Uhl.), *P. waehneri* (Uhlig), *P. boesei* (Uhlig), *P.* sp. ex. gr. *P. rothpletzi* (Böse), *P.* sp. ex. gr. *P. romanicus* (Uhl.), *P.* sp., *Catriceras* aff. *catriense* Venturi, *Catriceras* sp., *Adnethiceras haueri* Wiedmann, *Adnethiceras herbichi* (Bonarelli), *Adnethiceras* sp., ?*Schistophylloceras* sp.

Based on the content of this list we can assert that we are in the Late Sinemurian, respectively the *Oxynoticeras oxynotum* and *Echioceras raricostatum* Taxon-range Zones. There are some species which have been also mentioned in the Early Pliensbachian (the *Uptonia jamesoni* Taxon-range Zone). This fact suposes two interpretations: either the earlier appereance of these species or the presence in the deposits of the Praşca Hill of stratigraphical levels after Sinemurian. There are also species which would indicate older levels such as the *Asteroceras obtusum* Taxon-range Zone and even the *Arnioceras semicostatum* Taxon-range Zone from the Early Sinemurian, *Schistopylloceras* again even the Hettangian. The unchallenged presence of these stratigraphical levels remains a subject which needs hard proofs in future.

We will now present sistematically the taxa we identified.

Suborder *PHYLLOCERATINA*
Arkell, 1950
Superfamily *Phylloceratacea*e Zittel, 1884
Family *Phylloceratidae* Zittel, 1884
Subfamily *Phylloceratinae* Zittel, 1884
Genus *Zetoceras* Kovacs, 1939

Species type: ***Amonites zetes*** d'Orbigny, 1850

***Zetoceras zetes* (d'Orbigny, 1850)**
Plate I, Figures 1-4

1994. *Zetoceras zetes* (d'Orb.). Dommergues et all., pg. 19, Plate I, Figure 3 (*cum syn.*).

Material: 4 exemplaries (LR-89, 90, 91, 92).
Size (mm): D – diameter of the shell; U-umbilicus; H – height of the last worl; W – width of the last worl.

Inv. nr.	D	U	H	W
LR-89	52,4	7,2	27,8	11,4
LR-91	42	8,5	19	-
LR-92	? 34,6	-	-	-
Inv. nr.	U/D	H/D	W/D	W/H
LR-89	0,13	0,53	0,21	0,40
LR-91	0,20	0,46	-	-
LR-92	-	-	-	-

Description: Involute shells with the inner whorls strongly compressed; umbilicus very reduced open (near occluded); flat flanks and narrow venter; whithout sculptural ornamentation. The suture line is very fine cut up, the saddles ussualy having tetraphillic endings.

Occurrence: Italy, France, Germany.
Age: Sinemurian.

***Zetoceras* sp. ex. gr. *Z. bonarellii* (Bettoni, 1900)**
Plate I, Figure 5

1974. *Phylloceras (Zetoceras) bonarellii* Bettoni. Fantini Sestini, p. 226-227 (*cum syn.*).
1996. *Zetoceras bonarellii* (Bettoni), Popa & Patrulius, pg. 55, Plate XX, Figure 3.

Material: 1 exemplary (LR-35)
Size (mm):

Inv. nr.	D	U	H	W
LR-35	25,8	3	15	? 12
Inv. nr.	U/D	H/D	W/D	W/H
LR-35	0,11	0,58	? 0,46	? 0,80

Description: Small, involute shell with flat-convex flanks and convex venter; the umbilicus is reduced; no sculptural ornamentation. The intricate suture line sustains the affiliation to the mentioned genus. The limitations that we manifest about the specific determination consist of the fewer lanceolate aspects of the whorls section, especially the higher value of the L/D report compared to the one given to this species by other authors.

Occurrence: Italy, Switzerland, France, Hungary, Romania (Perşani M., Rarău M.).
Age: Late Sinemurian - Pliensbachian.

Genus *Geyeroceras* Hyatt, 1900

Species type: ***Ammonites cylindricus*** J. C. Sowerby, 1831.

Geyeroceras cylindricum cylindricum (Sowerby, 1831) Plate I, Figures 6-13

1969. *Geyeroceras cylindricum* (Sow.) Fantini Sestini, p. 99, Plate I, Figure 1, 4; Figure text - 2 (*cum syn.*).
1994. *Phylloceras cylindricum* (Sow.) Dommergues *et al.*, pg.19, Plate I, Figure 1-2 (*cum syn.*).
1996. *Geyeroceras cylindricum* (Sow.) Popa & Patrulius, p. 54, XVI, Figure 3.; Plate XVII, Figure 4.
2000. *Geyeroceras cylindricum* Sow., (sic !), Kment, p. 194, Plate II, Figure 1.

Material: 9 exemplaries (LR: 1-5; 99, 100, 102, 103).
Size (mm):

Inv. nr.	D	U	H	W
LR-1	32	2,8	17	? 13
LR-2	27	3	15	10,5
LR-3	27	? 2,7	15	10
LR-4	26	2,5	15	10
LR-5	33,5	? 3	? 18	? 12,5
LR-99	22,4	? 2,9	11,4	9,2
LR-100	30	3,9	16,1	11
LR-102	34,5	? 4,1	19,2	13,3
LR-103	44,1	8,1	29,5	18,6
Inv. nr.	U/D	H/D	W/D	W/H
LR-1	0,08	0,53	? 0,40	? 0,76
LR-2	0,11	0,55	0,38	0,70
LR-3	? 0,10	0,55	0,37	0,66
LR-4	0,09	0,57	0,38	0,66
LR-5	? 0,08	? 0,53	? 0,38	? 0,69
LR-99	? 0,13	0,51	0,41	0,80
LR-100	0,13	0,54	0,36	0,68
LR-102	? 0,11	0,55	0,39	0,69
LR-103	0,18	0,67	0,42	0,63

Description: Middle, involute shells; the whorls have a fast growth and a subquadrate section. The flanks are flat, angular articulated with the subtabular venter. The small umbilicus is limited by high and vertical slopes; smooth external surface. The suture line presents the first lateral saddle diphillic up to tetraphillic, followed by the lateral lobe equal in depth. The other saddles may have less folioles.

Occurrence: Italy, Austria, Hungary, Romania (Perşani M., Rarău M.).

Stratigraphical distribution: It was mentioned by the Late Hettangian up to Pliensbachian.

Geyeroceras cylindricum compressum (Fucini, 1901) Plate I, Figures 14-19

1908. *Phylloceras cylindricum* Sow. sp. var. *compressa* Fucini. Vadasz, p. 339, Figure text 8 (*cum syn.*).
non 1908. *Phylloceras cylindricum* Sow var. *compressa* Fuc. Rosemberg, p. 220, Plate XI, Figure 5 a-c (? = *Geyeroceras cylindricum cylindricum* (Sow.).
1996. *Geyeroceras cylindricum compressum* (Fucini) Popa & Patrulius, Plate XVI, Figure 7.

Material: 6 exemplaries (LR: 9, 34, 80, 97, 98, 104).
Size (mm):

Inv. nr.	D	U	H	W
LR – 9	32	4,5	16	12
LR –34	30	? 6	14,5	12
LR –97	29,4			
LR –98	24,3	5,1	7,7	5
LR-104	42,2	13,6	19,3	11,5
Inv. nr.	U/D	H/D	W/D	W/H
LR – 9	0,14	0,50	0,37	0,75
LR –34	0,20	0,48	0,40	0,82
LR –97				
LR –98	0,20	0,32	0,20	0,65
LR-104	0,32	0,46	0,27	0,59

Description: It differs from the subspecies type through the morphology of the whorl section: the lateral flanks are subparallel and the convex-high venter is articulating with these through a large, normal, unangular convexity.

Occurrence: Italy, Austria, Romania (Perşani M., Rarău M.).

Age: Sinemurian.

Geyeroceras cylindricum bielzi (Herbich., 1878) Plate I, Figure 21

1878. *Phylloceras Bielzi* n. sp. Herbich, p. 113, Plate XX F, Figure 2a-b
1908. *Phylloceras cylindricum* Sow. var, *Bielzii* Herb. Vadasz, p. 340, text Figure 9 (*cum syn.*).
1953. *Phylloceras cylindricum* Sow. var *bielzii* Herb. Preda şi Răileanu, p. 342, Plate II, Figure 2a-c.
1996. *Geyeroceras cylindricum bielzii* Herbich. Popa & Patrulius, p. 56, Plate XVII, Figure 1.

Material: 3 exemplaries (LR-10, 11, 101).
Size (mm):

Inv. nr.	D	U	H	W
LR –10	26	? 5	? 15	13
LR –11	56,5	10	27	23,5
LR–01	50,4	9,6	25,2	? 19,4

Inv. nr.	U/D	H/D	W/D	W/H
LR –10	0,19	0,57	0,50	0,86
LR –11	0,17	0,47	0,41	0,87
LR–01	0,19	0,50	0,38	0,76

Description: It differs from the other described subspecies by the values of the relative size (especially L/H report) and by the clearly different whorl section; this one broadens in the lateral-external zone where it has maximum width; the venter surface has a semicircular tract.

Occurrence: Italy, Romania (Perşani M., Hăghimaş M., Rarău M.).

Age: Sinemurian.

Geyeroceras sp. ex. gr. _G. oenotrium complanatus_ (Vadasz, 1908)
Plate I, Figure 20

1908. *Phylloceras oenotrium* Fuc. var *complanata* n. var. Vadasz., p. 352-353, Plate VIII, Figure 6

Material: 1 fragment (LR-78).

The fragment reminds us of Vadasz's subspecies by the subtriangular outline of the whorl section and by the sutural line aspect.

Age: Late Sinemurian.

Genus _Calliphylloceras_ Spath, 1927

Species type: ***Calliphylloceras disputabile*** **(Zittel, 1869)**

Calliphylloceras bicicolae **(Meneghini, 1875) ssp. n. ?**
Plate II, Figures 1, 2

1974. *Calliphylloceras bicicolae* (Men.) Fantini Sestini, p. 233-236, Plate 19, Figure 4; Plate 20, Figure 1, 2 a, 2b, (cum syn.).
1996. *Calliphylloceras bicicolae* (Men.) Popa & Patrulius, p. 55, Plate 20, Figure 4.

Material: 3 exemplaries (LR-129, 130, 131).
Size (mm):

Inv. Nr.	D	U	H	W
LR–129	22,9	4,8	12,7	7,4
LR– 130	19,7	3,8	10,5	6,1
LR– 131	17,6	3,9	8,3	4,8
Inv. Nr.	U/D	H/D	W/D	W/H
LR– 129	0,21	0,55	0,32	0,58
LR– 130	0,19	0,53	0,31	0,58
LR– 131	0,22	0,47	0,27	0,58

Description: Shell with a disk-like form, involute coiled; narrow and less deep umbilicus; subparallel flanks and convex venter. It is characterised by the presence of maximum 6 constrictions clearly present on the flanks as well as on the venter. These constrictions go from the umbilicus edge with an obvious prorsiradiate aspect, but in the middle of the flanks they bend easily rursiradiate, crossing this way the venter.

The suture line has a short external lobe, a triphyllic shape for the first lateral saddle and a lateral large triphillic lobe.

Discutions: Fantini Sestini (1974) made an ample commentary about the characteristics of the *C. bicicolae,* passing in its synonymy some other species. Our exemplaries have some differences given by the morphological and morphometrical elements. These are: reduced size, more compressed whorls and a distinguished change of the constrictions tract, respectively the condition slightly rursiradiate of the ventral half of this. Because of this we suspect a possible new subspecies in our material.

Occurrence: Italy, Switzerland, Austria, Germany, Hungary, Romania (Perşani M., Rarău M.).

Age: Late Sinemurian - Early Pliensbachian.

Family _Juraphyllitidae_ Arkell, 1950
Genus _Juraphyllites_ Müller, 1939

Species type: ***Phylloceras diopsis*** Gemmellaro, 1884

Juraphyllites gigas **(Fucini, 1901)**
Plate II, Figure 3

1901. *Rhacophyllites gigas* n. sp. Fucini, p. 205, Plate IX.
1908. *Rhacophyllites gigas* Fuc. Vadasz, p. 325-327, Plate VI, Figure 1 (cum syn.).
1953. *Rhacophyllites gigas* Fuc. Preda şi Răileanu, p. 338, Plate III, Figure 2.
1994. *Juraphyllites nardii* (Menegh.) Dommergues *et al.*, p. 20, Plate I, Figure 5-6.

Material: 1 exemplary (LR - 17).
Size (mm):

Inv. nr.	D	U	H	W
LR –17	? 74	21	? 30	? 20
Inv. nr.	U/D	H/D	W/D	W/H
LR –17	0,28	0,40	0,27	0,66

Description: Big shell, convolute coiled, with a large and deep umbilicus; oval whorls section, large-convex flanks and normal-convex venter. The sculpture is formed of radial ridges, well developed only on the living chamber. The ridges are obvious on the lateral-ventral edges, proverse on the venter and they lose themselves towards umbilicus.

The suture line is typical by juraphyllic, the first lateral saddle having a diphyllic outline.

Occurrence: Italy, Austria, Romania (Perşani M., Rarău M.).

Age: Early Liassic.

Juraphyllites transylvanicus (Hauer, 1856) Plate II, Figure 4

1878. *Phylloceras transylvanicum* Hauer. Herbich, p. 114, Plate XX J, Figure 1a-b.

1908. *Rhacophyllites transilvanicus* Hau. Vadasz, p. 323-324, (*cum syn.*).

1993. *Juraphyllites* ex gr. *J. libertus* (Gemmelloro) Meister & Böhm, p. 174, Plate II, Figure 5, 9.

Material: 1 exemplary (LR - 18).

Size (mm):

Inv. nr.	D	U	H	W
LR – 18	78	? 21	34	? 20
Inv. nr.	U/D	H/D	W/D	W/H
LR –18	0,26	0,43	0,25	0,58

Description: Big shell, convolute coiled, with an umbilicus temperate in size and depth; whorls section is prolonged-subquadrate having flat flanks, easily divergent towards the external part; convex venter. The sculptural ornamentation appears only on the living chamber; it consists of radial ribs, strongly developed on the lateral-ventral edges and on the venter; they cross the equally developed external edge where they are of maximum thickness and of prorsiradiate arching. Towards umbilicus the ridges became thin, almost invisible. The suture line is well represented, the first saddle being diphyllic.

Occurrence: Italy, Austria, Romania (Perşani M., Rarău M.).

Age: Early Liasic.

Juraphyllites cf. *nardii* (Meneghini, 1853) Plate II, Figures 5-9

1978. *Juraphyllites* gr. *nardii* (Meneg.) Venturi, p. 101, Plate I, Figure 5.

1993. *Juraphyllites nardii* (Meneghini), Meister & Böhm, p. 174, Plate II, Figure 8 (*cum syn.*).

non 1994. *Juraphyllites nardii* (Men.) Dommergues *et al.*, pg. 20, Plate I, Figure 5 (= *Juraphyllites gigas* (Fucini).

1996. *Meneghiniceras nardii* (Men.) Popa & Patrulius, p. 56.

Material: 4 exemplaries (LR - 38, 39, 81, 109).

Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR – 39	50	20	? 18	15	
LR – 38	? 52	? 20	? 20	15	
LR – 81	42,6	14	20,8	13	fragm.

Inv. nr.	U/D	H/D	W/D	W/H	
LR – 39	0,40	? 0,36	0,30	? 0,83	
LR – 38	? 0,40	? 0,40	? 0,29	? 0,81	
LR – 81	0,30	0,45	0,28	0,63	

Description: Convolute coiled shell, whorls easily compressed, temperate umbilicus in size and depth; the sculpture consists of unequal ribs only on the living chamber; they cross the venter being easily prorsiradiate. The sigmoidal constrictions which interrupt the normal tracts of the ribs on the last half-whorl are typical of this taxa. The absense of the intermittent venter keel on the living chamber does not permit the affiliation to the *Meneghiniceras* genus.

Occurrence: Italy, Austria, Romania (Rarău M.).

Age: Sinemurian.

Juraphyllites sp. Plate II, Figures 10-11; Plate III, Figures 1-6

Material: 9 exemplaries (LR - 19, 82, 83, 87, 88, 134, 141, 142, 147).

Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR - 19	? 79	? 24	37	20	fragm.
LR - 82	60,7	15,2	27,6	15,5	
LR - 83	53,7	14,2	25,1	14,7	
LR - 87	39,7	9,7	20,9	13,9	
LR - 88	59,8	7,7	27,5	14,6	
Inv.nr.	U/D	H/D	W/D	W/H	
LR - 19	? 0,30	0,46	0,25	0,54	
LR - 82	0,25	0,45	0,25	0,56	
LR - 83	0,26	0,46	0,27	0,58	
LR – 87	0,24	0,52	0,35	0,66	
LR – 88	0,12	0,45	0,24	0,53	

Description: Middle shell, convolute coiled, large-convex flanks, temperate umbilicus limited by vertical slopes; typical suture line; the preserved conditions do not permit to observe the sculpture; this is the reason why we do not make a resolute diagnosis.

Age: Sinemurian-Pliensbachian.

Genus *Schistophylloceras* Hyatt, 1900

Species type: ***Phylloceras aulonotum*** Herbich, 1878.

? *Schistophylloceras sp.* Plate III, Figure 7

Material: 1 exemplary (LR - 148).

A fragmental exemplary, convolute coiled, compressed whorls, large-convex flanks, narrow venter. On the venter tract there is an

obvious sulcus limited by narrow keels; juraphyllic suture line.

Age: This genus was described only from Hettangian. Its presence in the Sinemurian from the Praşca Hill seems unquestionable. This is the reason why we do not make a resolute diagnosis.

Genus *Paradasyceras* Spath, 1923

Species type: ***Phylloceras ürmösense*** Herbich, 1878

Paradasyceras aff. *planispira* (Reynès, 1868)
Plate III, Figures 8-17

1900. *Phylloceras planispira* Reynès, Uhlig, p. 17, Plate I, Figure 3.
1964. *Juraphyllites planispira* (Reynès). Rakus, p. 105-106, Plate XVI, Figure 3 (*cum syn.*).
? 1994 *Juraphyllites planispiroides* n. sp. Rakus, p. 301-302, Plate I, Figure 3-6.
1996. *Paradasyceras planispira* (Reynès). Popa & Patrulius, p. 56, Plate XXI, Figure 4

Material: 16 exemplaries (LR - 14, 15 16, 19, 20, 28, 29, 85, 94, ?105, 132, 138, 139, 143 a, 150, 151).

Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR – 14	13,7	? 3	8	4	fragm.
LR – 15	15	? 5	? 5	2,7	fragm.
LR – 16	11,8	2,6	5,8	4,3	
LR – 20	? 37	9	? 18	? 7	
LR – 28	23	? 7	11	? 7	
LR – 29	22,7	-	? 13	? 4	
LR – 85	33,3	9,9	15,7	9,8	
LR – 94	35,5	12,8	15,9	-	
LR- 105	35,7	10,4	14,6	9,7	fragm.
LR- 132	47,5	13,4	19,5	10,1	
LR-143 a	17,6	5,4	8,5	4,4	
LR- 150	27,4	5,1	14,5	7,4	
Inv. nr.	U/D	H/D	W/D	W/H	
LR – 14	? 0,21	0,58	0,29	0,50	
LR – 15	? 0,33	? 0,33	0,18	? 0,54	
LR – 16	0,22	0,49	0,36	0,74	
LR – 20	? 0,24	? 0,48	? 0,18	? 0,38	
LR – 28	0,30	0,47	0,30	0,63	
LR – 29	-	0,57	-	-	
LR – 85	0,29	0,47	0,29	0,62	
LR – 94	0,36	0,45	-	-	
LR- 105	0,29	0,41	0,27	0,66	
LR- 132	0,28	0,41	0,21	0,52	
LR-143 a	0,31	0,48	0,25	0,52	
LR- 150	0,19	0,53	0,27	0,51	

Description: Middle-small shell, convolute coiled, little deep umbilicus; compressed whorls with a lanceolate section, whithout sculpture; narrow-convex venter. The suture line distinguishes by the first saddle with the triphyllic ending.

Occurrence: France, Italy, Austria, Slovakia, Romania (Perşani M., Rarău M.).

Age: Sinemurian- Early Pliensbachian.

Genus *Meneghiniceras* Hyatt, 1900

Species type: ***Phylloceras lariense*** Meneghini, 1867

Meneghiniceras sp. 1
Plate III, Figures 18-19; Plate IV, Figure 1

Material: 3 exemplaries (LR - 6, 7, 8).

Size (mm):

Inv. nr.	D	U	H	W
LR – 6	? 45	? 25	? 14	? 10
LR – 7	37	? 6	? 20	9
LR – 8	52	17	22	? 11
Inv. nr.	U/D	H/D	W/D	W/H
LR – 6	? 0,55	? 0,31	? 0,22	? 0,71
LR – 7	? 0,16	? 0,54	0,24	? 0,45
LR – 8	0,32	0,42	? 0,21	? 0,50

Description: Convolute shell, lateral-flattened whorls, temperate and little deep umbilicus; almost flat flanks, narrow-convex venter. On the well preserved parts we can observe feeble falcifer constrictions, relatively numerous. Because of the precarious preservation, the sculpture is absent and so it does not permit taxonomical explanations.

Age: Sinemurian.

Meneghiniceras sp. 2
Plate IV, Figures 2-4

Material: 3 exemplaries (LR - 84, 93, 96)

Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR - 84	69,3				
LR - 93	80,5				
LR - 96	70,2	10,7	38,4	24,7	
Inv. nr.	U/D	H/D	W/D	W/H	
LR - 84					
LR - 93					
LR - 96	0,15	0,54	0,66	0,64	

Description: Strong shell, convolute narrow-coiled, temperate and deep umbilicus; the well developed last whorl presents large-convex flanks and sharpened-convex venter, especially on the end of the living chamber. The precarious preserved degree does not permit sure observations about the presence and the nature of the ventral keel even the general aspect suposes this element. The suture line guides us to the same genus. The general

morphology would have some affinities with *Meneghiniceras lariense* (Meneg.).

Age: Sinemurian-Pliensbachian.

Genus *Harpophylloceras* Spath, 1927

Species type: ***Ammonites eximius*** Hauer, 1854

***Harpophylloceras* sp. ex. gr. *H. eximium* (Hauer)**
Plate IV, Figure 5

1964. *Harpophylloceras eximium* (Hauer) Rakus, p. 110-11, Plate XVII, Figure 6 (*cum syn.*).
1966. *Juraphyllites eximius* Hauer. Nutzubidze, pg. 53-54, Plate IX, Figure 2 (*cum syn.*).
1974. *Harpophylloceras eximium* (Hauer). Fantini Sestini, p. 219-221 (*cum syn.*).

Material: 1 fragment (LR - 12).
Size (mm):

Inv. nr.	D	U	H	W
LR –12	-	? 15	37	? 16
Inv. nr.	U/D	H/D	W/D	W/H
LR –12	-	-	-	? 0,43

Description: A whorl fragment which generally has the characteristics of the reference species (oval outline of the whorl section, sharpened ribs only on the lateral-ventral termination edge, well-developed keel on the venter axle). We cannot give explanations about the suture line and about the general morphology.

Occurrence: Italy, Germany, Hungary, Georgia Republic, Slovakia, Romania (Perşani M.).

Age: Late Sinemurian – Early Pliensbachian.

Suborder *LYTOCERATINA*
Hyatt, 1889
Superfamily *Lytocerataceae* **Neumayr, 1875**
Family *Lytoceratidae*
Neumayr, 1875
Genus *Lytoceras* Suess, 1865

Species type: ***Ammonites fimbriatus*** Sowerby, 1817

***Lytoceras tuba* De Stefani, 1886**
Plate V, Figure I-one side; Plate VI, Figure 1, the other side

1909. *Lytoceras tuba* De Stefani. Rosemberg, p. 240-241, Plate XIII, Figure 1 (*cum syn.*).

Material: 1 exemplary (LR - 40).
Size (mm):

Inv. nr.	D	U	H	W
LR –40	? 145	? 62	? 54	? 32
Inv. nr.	U/D	H/D	W/D	W/H
LR –40	? 0,42	?0,37	? 0,22	? 0,59

Description: Big shell, evolute coiled, large and relatively deep umbilicus; whorls section is large oval-subcircular. The sculpture is formed by relatively fine ribs, more numerous on the intern whorls; they are unequally developed and they cross the venter. The lytoceratitic sutures are clear.

Occurrence: Austria, Italy, Romania (Rarău M.).

Age: Late Sinemurian – Early Pliensbachian.

***Lytoceras* sp. ex. gr. *L. fimbriatum* (Sow.)**
Plate IV, Figures 7-8

1964. *Lytoceras fimbriatum* (Sow.) Rakus, p. 112-113, Plate 18, Figure 2 (cum syn.).
1993. *Lytoceras* gr. *fimbriatum* (Sow.) Meister & Böhm, p. 175, Plate IV, Figure 1-2.

Material: 3 fragmental whorls, advolute coiled with sub circular section; lytoceratitic suture lines; the sculpture does not preserve.

Age:Early-Middle Liassic.

***Lytoceras* sp.**
Plate IV, Figure 6

The exemplary (LR-122) was assigned to this genus only by the suture lines.

Age: Sinemurian.

Genus *Aegolytoceras* Spath, 1924

Species type: ***Lytoceras serorugatum*** Geyer, 1886

***Aegolytoceras* sp. ex. gr. *A. rugatum* (Stur)**
Plate V, Figure 2

1968. *Aegolytoceras rugatum* (Stur) Arkell, 1968, pg. L. 194, Figure 224/1
1996. *Aegolytoceras* sp. Popa & Patrulius, p. 54, Plate XV, Figure 4

Material: 1 exemplary (LR - 30).
Size (mm):

Inv. nr.	D	U	H	W
LR –30	? 45	? 12	? 18	? 12
Inv. nr.	U/D	H/D	W/D	W/H
LR –30	? 0,26	? 0,40	? 0,26	? 0,66

Description: Shell with evolute-convolute coiled, large umbilicus, subcircular whorls section; the sculpture reduced to few feeble constrictions and anastomosed ribs on the venter ending. We cannot explain other characteristics because of the badly preserved material.

Occurrence: Italy, Romania (Perşani M., Rarău M.).

Age: Late Sinemurian – Early Pliensbachian.

Family *Derolytoceratidae*
Spath, 1927
Genus *Adnethiceras*
Wiedmann, 1970

Species type: ***Ammonites adnethicus*** Hauer, 1854

***Adnethiceras haueri* Wiedmann, 1970**
Plate V, Figures 3-4

1970. *Adnethiceras haueri* n. sp. Wiedmann, pg. 1000-1001, Plate VIII, Figure2; text Figure10 b, 26, 27a, 30N, 30 O.

Material: 2 exemplaries (LR-106, 126).
7*Size* (mm):

Inv. nr.	D	U	H	W
LR-106	53,3	20,3	19,7	16,7
LR-126	72,8	30,2	19,7	17
Inv. nr.	U/D	H/D	W/D	W/H
LR-106	0,31	0,37	0,31	0,85
LR-126	0,41	0,27	0,23	0,86

Description: Shell with advolute coiled; the internal whorls have a subcircular section while the external became more lateral-compressed; the sculpture of the last whorls is formed by 35-36 well-developed ribs which cross the venter; they have feeble tubercles in the lateral-ventral zones and one row again in the middle of the flanks. Lytoceratitic sutures, with incised the external and lateral saddles and the large, three-sides lobe.

Occurrence: Austria, Romania (Rarău M.).
Age: Late Sinemurian.

***Adnethiceras herbichi* (Bonarelli, 1900)**
Plate V, Figures 5-6

1970. *Adnethiceras herbichi* (Bonarelli) Wiedmann, p. 1000, Plate IX, Figure 1, Figure text 30 P (*cum syn.*).

Material: 3 exemplaries (LR - 31, 32, 107).
Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR- 31	-	-	12	12	fragm.
LR-107	41,2	1,5,3	15,1	11,2	
Inv. nr.	U/D	H/D	W/D	W/H	
LR- 31	-	-	-	1	
LR-107	0,37	0,37	0,27	0,74	

Description: Shell with advolute coiled, large and deep umbilicus; subcircular whorls section; The sculpture is formed by simple, well developed ribs being on the lateral-ventral edges one feeble tubercle. There are 40 ribs which cross the venter of the last whorl.

Occurrence: Austria, Italy, Germany, Romania (Perşani M., Rarău M.).
Age: Sinemurian.

***Adnethiceras* sp.**
Plate V, Figures 7-8

Two shell fragments (LR - 108, 123) which the characteristics of this genus (morphology, sculpture and suture lines).

Suborder *AMMONITINA* Hyatt, 1889
Superfamily *Psiloceratacеae*
Hyatt, 1867
Family *Arietitidae* Hyatt, 1874
Subfamily *Arietitinae* Hyatt, 1874
Genus *Megarietites* Spath, 1922

Species type: ***Ammonites meridianalis*** Reynés, 1879

Megarietites *sp.*
Plate VIII, Figures 1-3

Material: 5 exemplaries (LR - 71, 74, 69, 120, 131)

Shell fragments with massive whorls which show impressive size (possible diameters of a few tens centimeters); the sculpture consists of strong ribs, with tubercles on the external edge; the ribs are separated by deep valleys; the venter is typically tricarinate-bisulcate, giving the whorls section a quadrate-trapezoidal outline.

Occurrence: Europe, North America.
Age: Sinemurian.

Genus *Epammonites* Spath, 1922

Species type: ***Ammonites latisulcatus*** Quenstedt, 1883

***Epammonites latisulcatus* (Quenstedt, 1883)**
Plate VI, Figure 4

1883. *Ammonites latisulcatus* n. sp. Quenstadt, p. 88, Plate 12, Figure 1-4.
1968. *Epammonites latisulcatus* (Quenst.) Arkell, p. L 238, fg. 234/4.

Material: 1 exemplary (LR - 33).
Size (mm):

Inv. nr.	D	U	H	W
LR - 33	53	34	10	? 10
Inv. nr.	U/D	H/D	W/D	W/H
LR - 33	0,64	0,18	? 0,18	1

Description: Shell with evolute-advolute coiled, many whorls, large umbilicus, flat flanks; the sculpture consists of right ribs; they

terminate on the sulcus edges which are flat and broad; the venter has a keel beetwen the sulcus. On the last whorl there can be about 40 relative short ribs, which remember those of the *Arnioceras* genus. The whorls section is quadrate (L/H = 1). The suture line distinguishes by the very deep external lobe, narrow and short lateral lobe (a half of the external one), the large, subquadrate lateral saddle.

Occurrence: Germany, Austria, Romania (Perşani M., Rarău M.).

Age: Sinemurian.

Epammonites sp.
Plate VI, Figures 2-3

Material: 3 exemplaries (LR - 59, 61, 119).

Subadvolute shells, quadrate whorls section, right and sharpened ribs, relatively rare; the venter has a keel limited by two flat sulcus.

Age: Sinemurian.

Genus _Vermiceras_ Hyatt, 1889

Species type: ***Ammonites spiratissimus*** Quenstedt, 1852

***Vermiceras spiratissimus simplex* (Vadasz, 1908)**
Plate VII, Figure 1

1908. *Arietites spiratissimus* Quenstedt var. *simplex* n. var. Vadasz, p. 386, Plate 11, Figure 1, 1 a.

Material: 2 exemplaries (LR – 86, 152).

Size (mm):

Inv. nr.	D	U	H	W
LR –86	105,5	? 62	? 26	23,1
LR-152	95,3	53,8	22,8	18,6
Inv. nr.	U/D	H/D	W/D	W/H
LR –86	? 0,58	0,24	0,21	0,88
LR-152	0,56	0,24	0,20	0,81

Description: Shell with subadvolute coiled, oval-circular whorl section, convex flanks, very large umbilicus; The sculpture is formed by numerous ribs (25 on a half of whorl), which are sharpened, obviously rursiradiate. Along the venter axle a keel limited by feeble sulcus develops.

Occurrence: Romania (Perşani M., Rarău M.).

Age: Sinemurian.

Subfamily *Arniocerarinae*
Spath, 1924
Genus _Pompeckjoceras_
Spath, 1925

Species type: ***Arietites oncocephalus*** Pompeckj, 1897

***Pompeckjoceras* sp.**
Plate VII, Figure 2

Material: 1 exemplary (LR - 73).

Size (mm):

Inv. nr.	D	U	H	W
LR - 73	67	32	? 23	? 21
Inv. nr.	U/D	H/D	W/D	W/H
LR - 73	0,47	? 0,34	? 0,31	? 0,91

Description: Temperate-big shell, evolute coiled, subquadrate whorls section, feeble convergent flanks; The sculpture is formed by few gross ribs, observed on the living chamber ending and more developed on the umbilical edge. Along the venter axle a large, relatively clear keel develops.

Occurrence: Germany, Romania (Rarău M.).

Age: Sinemurian.

Genus _Euasteroceras_
Donovan, 1953

Species type: ***Ammonites turneri*** Sowerby, 1824

***Euasteroceras* sp.**
Plate VII, Figure 3

Material: 2 exemplaries (LR – 121, 142).

Size (mm):

Inv. nr.	D	U	H	W
LR-121	-	-	39	? 27
Inv. nr.	U/D	H/D	W/D	W/H
LR-121	-	-	-	0,69

Description: Whorl fragments from the big shell; oval whorls section; The characteritics sculpture consists of dense, strong ridges, which are radial on the flanks and the latero-ventral terminations prorsiradiate. Along the venter axle, a keel with bisulcate aspect limited by smooth areas develops.

Occurrence: England, France, Italy, Romania (Rarău M.).

Age: Sinemurian.

Family _Echioceratidae_
Buckman, 1913
Genus _Palaeoechioceras_
Spath, 1929

Species type: ***Protechioceras spirale*** Trueman & Williams, 1927

***Palaeoechioceras* cf. *spirale* (Trueman & Williams, 1927)**
Plate VII, Figure 4

1927. *Protechioceras spirale* n. sp. Trueman & Williams, p. 715, Plate III, Figure 4.

1968. *Palaeoechioceras spirale* (Trueman & Williams) Arkell, p. L 243, Figure 270/2

Material: 2 exemplaries (LR - 26, 27)
Size (mm):

Inv. nr.	D	U	H	W
LR – 26	18	12	4	4,8
LR - 27	-	-	6	6,5
Inv. nr.	U/D	H/D	W/D	W/H
LR - 26	0,66	0,22	0,26	1,2
LR - 27	-	-	-	1,1

Description: Small shell, advolute coiled, very large umbilicus, circular whorls section; the sculpture consists of numerous ribs which are prorsiradiate in the latero-ventral zones; they do not cross the venter. The limitations that we manifest about the specific determination consist in the presence of the secundary ribs on the latero-ventral zones and in two prorsiradiate pseudoconstrictions which sketch on the last whorl.

Occurrence: England, Romania (Rarău M.).
Age: Late Sinemurian.

Palaeoechioceras sp.
Plate VII, Figures 5-9

Material: 6 exemplaries (LR - 13, 21, 22, 23, 24, 25).
Size (mm):

Inv. nr.	D	U	H	L
LR - 13	21	-	? 10	? 7
LR - 21	24,5	? 9	10	? 7
LR - 22	20	6	6	5,8
LR - 23	21	8,5	7	? 5
LR - 24	14,8	4	6,4	5
Inv. nr.	U/D	H/D	L/D	L/H
LR - 13	-	-	-	0,47
LR - 21	0,36	0,40	0,28	0,70
LR - 22	0,30	0,30	0,29	0,96
LR - 23	0,40	0,33	0,23	0,71
LR - 24	0,27	0,43	0,33	0,78

Description: Numerous whole or fragmental shells, generally with small size, evolute coiled, large umbilicus and oval-subcircular whorls section; the sculpture is formed of numerous ribs, sometimes feebly distinguishable.

Occurrence: Europe, Romania (Rarău M.).
Age: Sinemurian.

Genus _Echioceras_ Bayle, 1878

Species type: ***Ammonites raricostatus*** Zieten, 1831

***Echioceras raricostatum* (Zieten, 1831)**
Plate VII, Figures 11-13

1964. *Echioceras raricostatum* (Ziet.) Rakus, p. 123-125, Plate XIX, Figure 3, 4, 6 (*cum syn.*).

1966. *Echioceras raricostatus* Ziet. Nutzubidze, p. 72-73, Plate XV, Figure 7-8 (*cum syn*).

1991. *Echioceras* gr. *raricostatum* (Ziet.) Meister, p. 231, Plate I, Figure 3, 4, 6, 7 (*cum syn.*).

Material: 3 exemplaries (LR-116, 117, 118).
Size (mm):

Inv. nr.	D	U	H	W
LR –116	58,4	29,8	18,6	19,2
LR –118	43,6	25,2	? 11,5	? 9,2
Inv. nr.	U/D	H/D	W/D	W/H
LR –116	0,51	0,32	0,33	1,03
LR –118	0,58	? 0,26	? 0,21	? 0,80

Description: Shell with subadvolute coiled, many whorls with subcircular-oval section. The sculpture consists of sharpened ribs more developed on the flanks, especially on the half middle-umbilical part and relatively wiped on the lateral-ventral edge. The venter is marked by a feeble keel, limited by smooth spaces.

Occurrence: Germany, France, England, Austria, Italy, Slovenia, Romania (Perşani M., Rarău M.).

Age: Late Sinemurian (*Echioceras raricostatum* Taxon-range Zone).

Echioceras* aff. *regulare
(Trueman & Williams, 1925)
Plate VII, Figure 10

1925. *Echioceras regulare* Trueman & Williams, p. 721, Plate IV, Figure 2

Material: 1 exemplary (LR - 64).

Description: Small shell, oval wholres section, large-convex flanks. The sculpture is formed of sharpened ribs separated by large spaces; towards the lateral-ventral part the ribs are blured. Along the venter axle a narrow and sharpened keel develops; it is limited by smooth spaces. The size and the precarious conservation hinder us to decide on firm taxonomical diagnosis.

Occurrence: England, Austria, Romania (Rarău M.).

Age: Late Sinemurian.

***Echioceras* sp.**

Material: 2 exemplaries (LR-60, 68)

Description: Fragmental shells with the sculpture characteristic of this genus.

Genus _Paltechioceras_
Buckman, 1924

Species type: ***Paltechioceras elicitum*** Buckman, 1924

Paltechioceras romanicus (Uhlig, 1900)
Plate VIII, Figures 4-7; Plate IX, Figures 1-2

1900. *Arietites romanicus* n. sp. Uhlig, p. 25-27, Plate I, Figure 5 a-d.
? 1994. *Paltechioceras* aff. *romanicum* (Uhlig) Dommergues et. al., p. 31, Plate III, Figure 17
1996. *Paltechioceras romanicus* (Uhlig). Popa & Patrulius, p. 56.

Material: 7 exemplaries (LR - 41, 47, 58, 58 P, 112, 113, 114).
Size (mm):

Inv. nr.	D	U	H	W	Obs.
LR-41	? 50	? 25	? 20	? 15	fragm.
LR-47	? 50	? 30	? 12	? 11	fragm.
LR-58	-	-	16	14	fragm.
LR-8P	86,5	? 48	? 21	19	
LR112	64,4	39,3	14,7	? 15	
LR113	34,5	15,3	11,3	? 10	
LR114	45,2	25,3	11,7	10,9	
Inv. nr.	U/D	H/D	W/D	W/H	
LR-41	? 0,50	? 0,40	? 0,30	? 0,75	
LR-47	? 0,60	? 0,24	? 0,22	? 0,91	
LR-58	-	-	-	0,87	
LR58P	? 0,56	? 0,23	0,22	? 0,90	
LR112	0,61	? 0,23	? 0,24	? 1	
LR113	0,44	0,33	0,28	? 0,86	
LR114	0,56	0,26	0,24	0,93	

Description: Shell with large-evolute coiled, very large and relatively deep umbilicus, subquadrate whorls section, large-convex flanks clearly separated by the tricarinate-bisulcate venter. The sculpture is formed by ribs, feeble rursiradiate, relatively strong; the ribs have on the lateral-ventral ending one prorsiradiate arched tubercle. There are 35-36 ribs on the last whorl. The suture line is simple with a large and deep lateral lobe and narrow, feebly toothed.

Occurrence: Italy, Romania (Rarău M.).

Age: Late Sinemurian (*Echioceras raricostatum* Taxon-range Zone).

Paltechioceras waehneri (Uhlig, 1900)
Plate IX, Figures 3-6

1900. *Arietites wähneri* Uhlig, p. 27, Plate I, Figure 4
1996. *Paltechioceras waehneri* (Uhlig) Popa & Patrulius, p. 56

Material: 3 exemplaries (LR-45, 46, 115).
Size (mm):

Inv. nr.	D	U	H	W
LR-45	47	26	13	? 12
LR-46	51	25	14	? 12
LR-115	? 28	13	? 8	7,7
Inv. nr.	U/D	H/D	W/D	W/H
LR-45	0,55	0,27	0,25	? 0,92
LR-46	0,49	0,27	0,23	? 0,85
LR-115	? 0,46	? 0,39	? 0,27	? 0,90

Description: Shell with evolute coiled, quadrate whorls section, flat flanks; The sculpture consists of numerous right ribs (30-32 on the last whorl, separated by large and flat spaces; they finish on the lateral-ventral edge by well developed tubercles. Along the venter develops a relatively sharpened keel limited by two large and less deep sulcus. The suture lines more simple than the one from *P. romanicus*, but it has deeper saddles and lobs.

Occurrence: Romania (Rarău M.).

Age: Late Sinemurian.

Paltechioceras boesei (Uhlig, 1900)
Plate IX, Figures 7-9

1900. *Arietites bösei* n. sp. Uhlig, p. 29, Plate I, Figure 6
? 1996. *Paltechioceras* sp. Popa & Patrulius, p. 56, Plate XIX, Figure 2

Material: 4 exemplaries (LR-42, 70, 110, 111)
Size (mm):

Inv. nr.	D	U	H	W
LR-42	-	-	20	18
LR-70	-	-	23	19
LR-110	-	-	11	9
LR-111	55	? 21	? 13	? 11
Inv. nr.	U/D	H/D	W/D	W/H
LR-42	-	-	-	0,90
LR-70	-	-	-	0,82
LR-110	-	-	-	0,81
LR-111	? 0,38	? 0,23	? 0,20	? 0,85

Description: Shell with evolute coiled, large and less deep umbilicus; lateral compressed whorls given an oval aspect in section. The sculpture is formed by prorsiradiate ribs, separated by large and flat spaces; the ribs are feebly broadened towards the venter. The venter is tricarinate-bisulcate, the middle keel being sharpened and relatively high.

Occurrence: Romania (Rarău M.).

Age: Late Sinemurian.

Paltechioceras sp. ex. gr. *P. rothpletzi* (Böse, 1894)
Plate IX, Figures 10-13; Plate X, Figures 1-2

1994. *Paltechioceras* aff. *rothpletzi* (Böse), Dommergues *et al.*, p. 31, Plate III, Figure 12-16.

Material: 6 fragments (LR - 43, 48, 52, 53, 55, 66).

Size (mm):

Inv. nr.	D	U	H	W
LR-48	-	-	12	9,5
LR-52	-	-	11	8
LR-53	-	-	8,5	6,5
LR-55	-	-	13	10
LR-66	-	-	13	? 9
Inv. nr.	U/D	H/D	W/D	W/H
LR-48	-	-	-	0,79
LR-52	-	-	-	0,72
LR-53	-	-	-	0,76
LR-55	-	-	-	0,76
LR-66	-	-	-	0,70

Description: Whorls fragments which have characteristics of the mentioned species: lateral-compressed whorls, sculpture with prorsiradiate ribs, bisulcate venter, the sulcus being very feeble. The absence of one whole shell and of the suture line limits our diagnosis.

Occurrence: Italy, France, Romania (Rarău M.).

Age: Sinemurian.

Paltechioceras sp. ex. gr. *P. romanicus* (Uhlig, 1900)

Material: fragments (LR-56, 57)

Whorls fragments which indicate the group of the mentioned species by sculpture and whorls section.

Age: Late Sinemurian.

Paltechioceras sp.
Plate X, Figures 3-12

Material: fragments (LR-44, 49, 51, 57, 59, 72, 125, 127, 128, 130)

Shell fragments which have the characteristic morphology and sculpture of this genus.

Age: Sinemurian.

Family *Polymorphitidae* Haug, 1887

Subfamily *Acanthopleuroceratinae* Arkell, 1950

Genus *Catriceras* Venturi, 1978

Species type: ***Catriceras catriense*** Venturi, 1978

Catriceras aff. *catriense* Venturi, 1978
Plate X, Figures 13-15

1978. *Catriceras catriense* n. sp. Venturi, p. 112-114, Plate I, 3, Figure 10; text fig 6, 8, 9, 12c, 12d.

Material: 2 exemplaries (LR-63, 65).

Size (mm):

Inv. nr.	D	U	H	W
LR-63	25	13	? 9	? 7
LR-65	28	13	8	6
Inv. nr.	U/D	H/D	W/D	W/H
LR-63	? 0,52	? 0,36	? 0,28	? 0,77
LR-65	0,46	0,28	0,21	0,75

Description: Middle shells, evolute-convolute coiled, lateral compressed whorls with the maximum breadth in the lateral-ventral part; the sculpture is formed by simple ribs; they are thinner towards umbilicus and they become fatter towards the venter edge; on the lateral-ventral half the ribs arch being feebly rursiradiate, then they suddenly orientate on the previous part, becoming refined and vanishing with the terminations along the flat venter areas; the venter has one keel. The impossibility of suture line preparation and the slightly different morphometry limits our taxonomical diagnosis.

Occurrence: Italy, Romania (Rarău M.).

Age: Late Sinemurian – Early Pliensbachian (*E. raricostatum* and *U. jamesoni* Taxone-range Zones).

Catriceras sp.
Plate X, Figures 16-17

Material: 2exemplaries (LR-50, 62).

Shell fragments which have the morphology and sculpture of the mentioned genus.

Age: Sinemurian.

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PLATES

Plate I

Figures 1-4 *Zetoceras zetes* (d'Orbigny), Sinemurian, LR-90 (x 1,1); LR-92, 91 (x 1); LR-89 (x 0,8).
Figure 5 *Zetoceras* sp. ex. gr. *Z. bonarellii* (Bettoni), Late Sinemurian – Pliensbachian, LR-35 (x 1).
Figures 6-13 *Geyeroceras cylindricum cylindricum* (Sow.), Late Hettangian - Pliensbachian, LR-1, 2 (x 1,2; LR-8, 9, 102 (x 0,8); LR-100, 99 (x 1); LR-103 (x 0,7).
Figures 14-19 *Geyeroceras cylindricum compressum* (Fucini), Sinemurian, LR-9, 10, 34, 97, 98, 104 (x1).
Figure 20 *Geyeroceras* sp. ex. gr. *G. oenotrium complanatum* (Vadasz), Late Sinemurian, LR-78 (x 1).
Figure 21 *Geyeroceras cylindricum bielzi* (Herbich), Sinemurian, LR-11 (x 1).

Plate II

Figures 1-2 *Calliphylloceras bicicolae* (Meneghini) ?ssp. n., Late Sinemurian- Early Pliensbachian (LR-129) (Figure1-x 2; Figure 2-x 1).
Figure 3 *Juraphyllites gigas* (Fucini) , Early Liasic, (LR-17) (x 0,9).
Figure 4 *Juraphyllites transylvanicus* (Hauer), Early Liasic, (LR-18) (0,9).
Figures 5-8 *Juraphyllites* cf. *nardii* (Meneghini), Sinemurian, LR-38 (x1); LR-109 (x 0,7);); LR-39 (a x 1,1; b x 1,37); LR-81 (x 0,8).
Figures 9-10 *Juraphyllites* sp., Sinemurian-Pliensbachian (LR-134, 142) (x 1).

Plate III

Figures 1- 6 *Juraphyllites* sp., Sinemurian-Pliensbachian (LR- 147) (x 1); (LR-19)(x 0,9); (LR-82, 83, 87) (x 1,1); (LR-88) (x 0,8).
Figure 7 ? *Schistophylloceras* sp., ? Hettangian – Early Sinemurian, (LR-144) (x 2).
Figures 8-17 *Paradasyceras* aff. *planispira* (Reyn.), Sinemurian- Early Pliensbachian (LR-94 (x 1,4); LR-85 (x 1); LR-105 (x 0,8); LR 16, 19, 14 (x1); LR-20 (x 1,2); (LR-139 (x 1); LR-138 (x 1,75); (LR- 150) (x 1,5).
Figures 18-19 *Meneghiniceras* sp. 1, Sinemurian-Pliensbachian, (LR-6, 7) (x 1,1).

Plate IV

Figure 1 *Meneghiniceras* sp. 1, Sinemurian-Pliensbachian, (LR-8) (x 1,1).
Figures 2-4 *Meneghiniceras* sp. 2, Sinemurian-Pliensbachian, (LR-84, 96, 93) (x 1).
Figure 5 *Harpophylloceras* sp. ex. gr. *H. eximium* (Hauer), Late Sinemurian – Early Pliensbachian (LR-12) (x 1,1; ventral – (x 1,3).
Figure 6 *Lytoceras* sp., Liassic-Cretaceous, (LR-122) (x 1,1).
Figures 7-8 *Lytoceras* sp. ex. gr. *L. fimbriatum* (Sowerby), Early-Middle Liassic, (LR-155) (x 1,7); (LR- 154) (x 2).

Plate V

Figure 1 *Lytoceras tuba* De Stefani, Late Sinemurian – Early Pliensbachian, (LR-40) (x 1)- one side.
Figure 2 *Aegolytoceras* sp., Early-Middle Liassic, (LR-30) (x 1,1).
Figures 3-4 *Adnethiceras haueri* Wiedmann, Late Sinemurian – Early Pliensbachian, (LR-106 (x 0,7);LR-126 (x 0,9).
Figures 5-6 *Adnethiceras herbichi* (Bonarelli), Sinemurian, (LR-107, 31) (x 0,9).
Figures 7-8 *Adnethiceras* sp., Sinemurian, (LR-123, 108) (x 1,1).

Plate VI

Figure 1 *Lytoceras tuba* De Stefani, Late Sinemurian – Early Pliensbachian, (LR-40) (x 1), the other side.
Figures 2, 3 *Epammonites* sp. Sinemurian, (LR-61, 119) (x 1).
Figure 4 *Epammonites latisulcatus* (Quenst.), Sinemurian, (LR-33) (x 1,2).

Plate VII

Figure 1 *Vermiceras spiratissimus simplex* (Vadasz), Sinemurian, (LR-86) (x 1).
Figure 2 *Pompeckjoceras* sp. (LR-73), Sinemurian (x 1,4).
Figure 3 *Euasteroceras* sp., Sinemurian, (LR-121) (x 1).
Figure 4 *Palaeoechioceras* cf. *spirale* (Tr. & Will.), Late Sinemurian, (LR-26) (x 1).
Figures 5-9 *Palaeoechioceras* sp., Late Sinemurian, (LR-21, 22, 23, 24, 25) (x 1).
Figure 10 *Echioceras* aff. *regulare* (Tr. & Will.), Late Sinemurian, (LR-64) (x 1).
Figures 11-13 *Echioceras raricostatum* (Zieten), Late Sinemurian, (LR- 116, 117, 118) (x 1).

Plate VIII

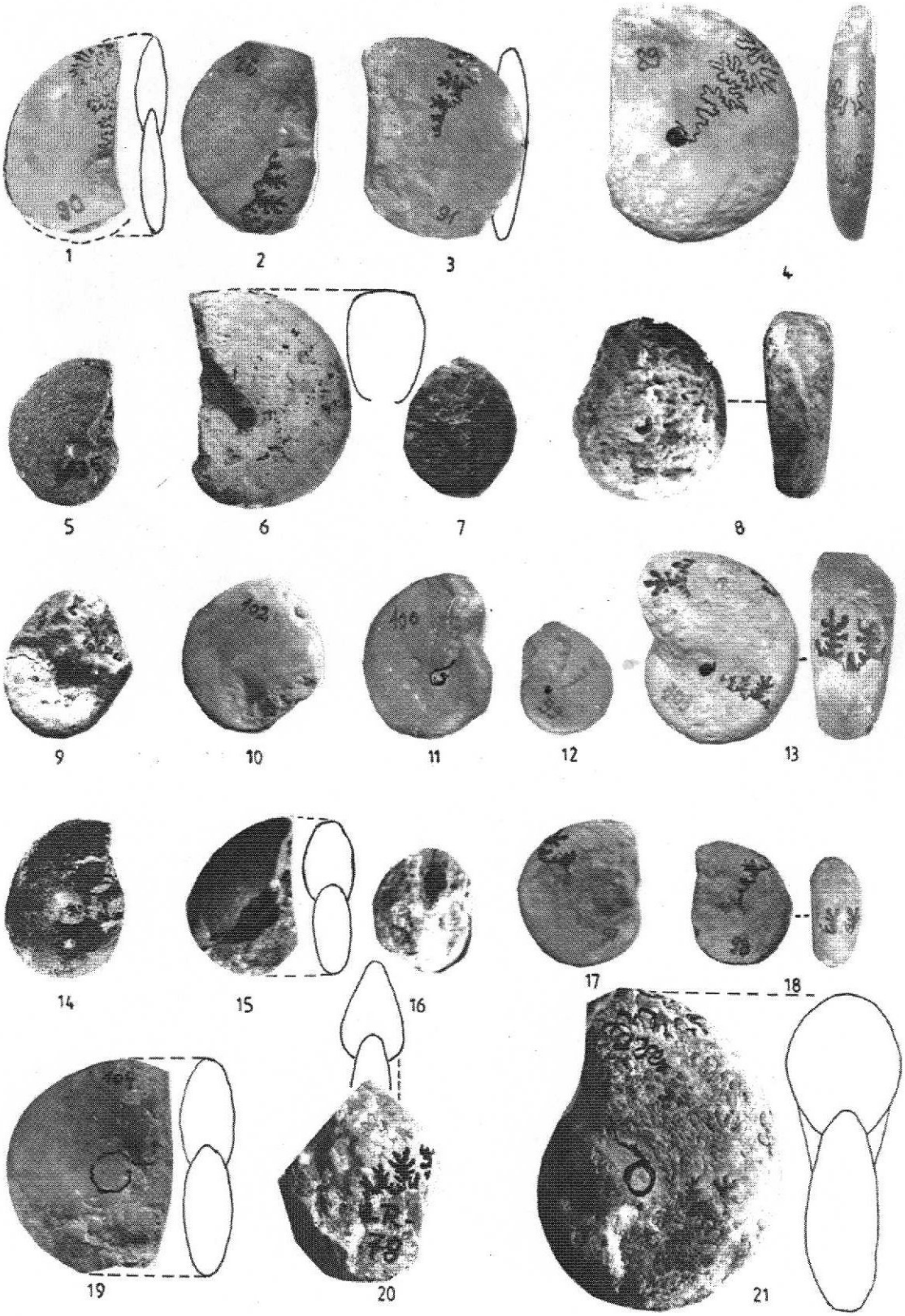
Figures 1-3. *Megarietites* sp., Sinemurian, (LR- 131, 120) (x 1), (LR-74) (x 0,9).
Figures 4-7 *Paltechioceras romanicus* (Uhlig), Late Sinemurian, (LR-113, LR-112) (x 1,2); (LR-58 P) (x 1); (LR-47) (x 1,1).

Plate IX

Figures 1-2 *Paltechioceras romanicus* (Uhlig), Late Sinemurian, (LR-41) (x 1,2); (LR-114 (x 0,8).
Figures 3-6 *Paltechioceras waehneri* (Uhlig), Late Sinemurian, (LR-46, 115 (x 1,2); (LR-45 (x 1,1); (LR-46 (x 1).
Figures 7-9 *Paltechioceras boesei* (Uhlig), Late Sinemurian,(LR-110 (x 1); LR-111(x 0,8); LR-70 (x 1,1).
Figures 10-13. *Paltechioceras* sp. ex. gr. *P. rothpletzi* (Böse), Sinemurian, (LR-43, 48, 52, 55) (x 1).

Plate X

Figures 1-2 *Paltechioceras* sp. ex. gr. *P. rothpletzi* (Böse), Sinemurian, (LR- 66, 53) (x 1)
Figures 3-12 *Paltechioceras* sp., Late Sinemurian, (LR-40, 44, 51, 72, 59, 57, 125, 127, 130) (x 1) (LR -69) (x 1,1).
Figures 13-14 *Catriceras* aff. *catriense* Venturi, Late Sinemurian – Early Pliensbachian, (LR-63, 65) (x 1).
Figures 15-16. *Catriceras* sp., Sinemurian-Pliensbachian, (LR- 62, 50) (x 1).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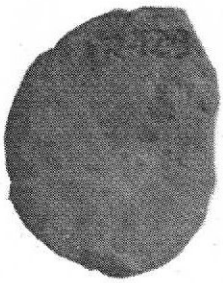

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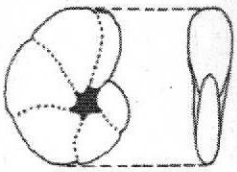

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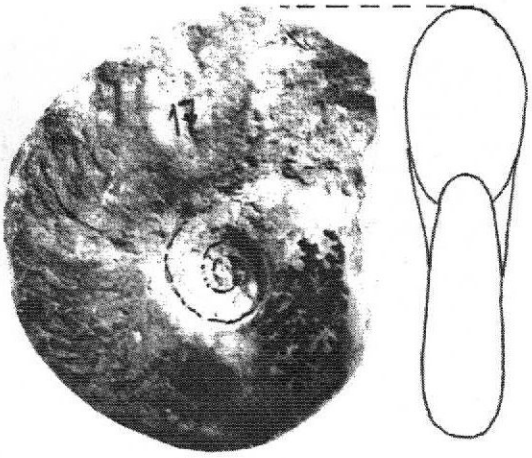

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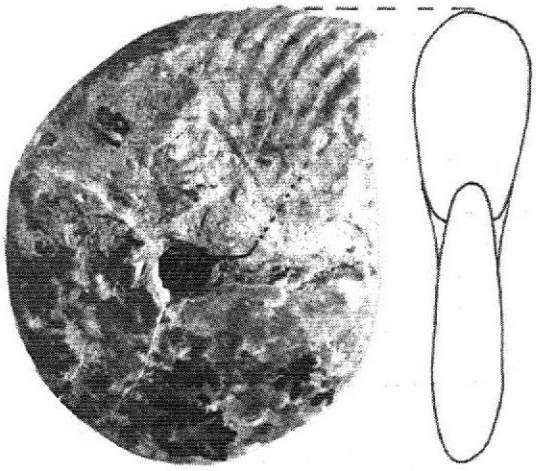

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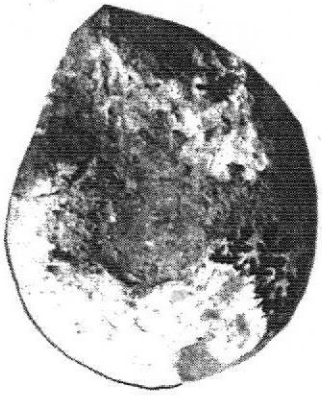

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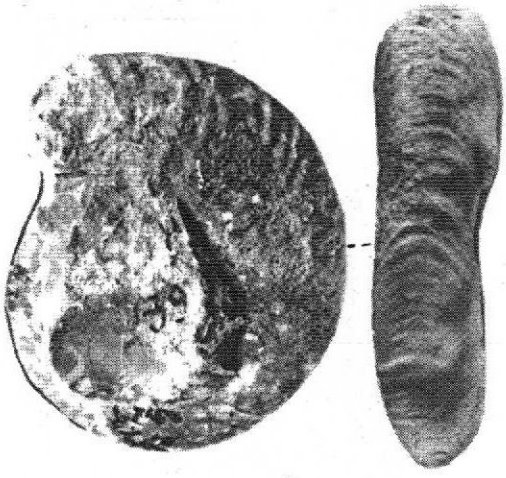

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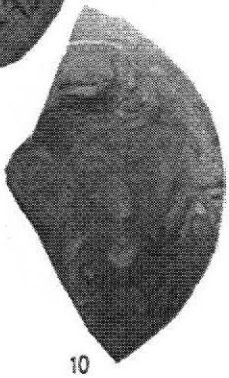

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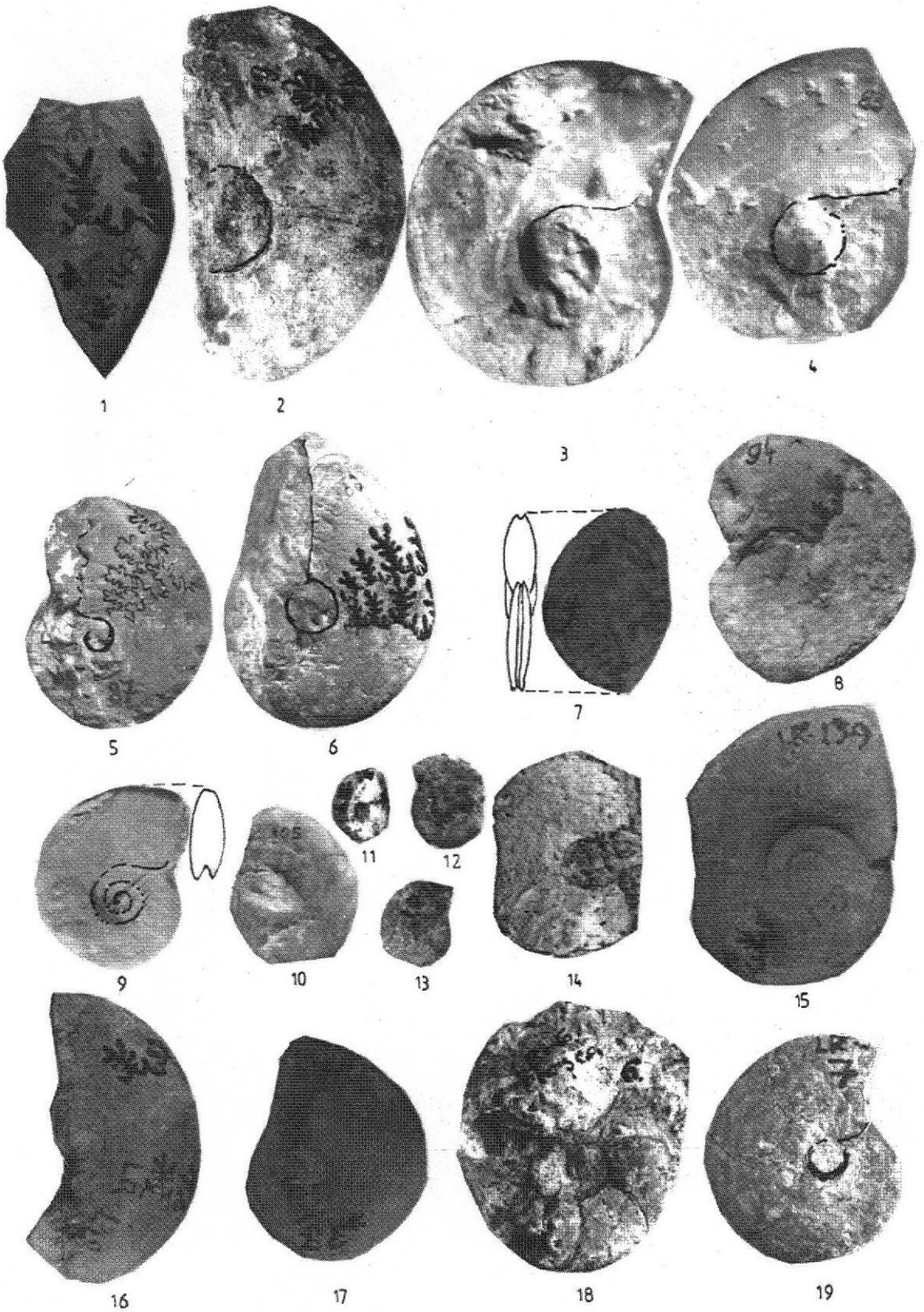
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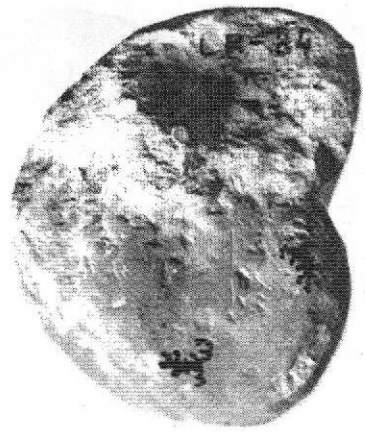

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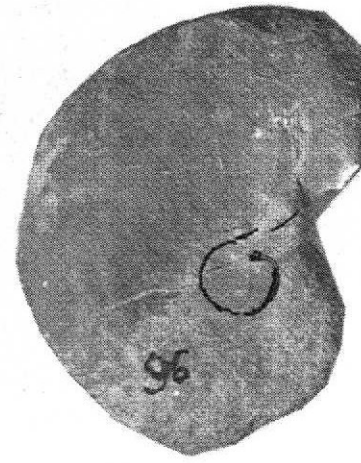

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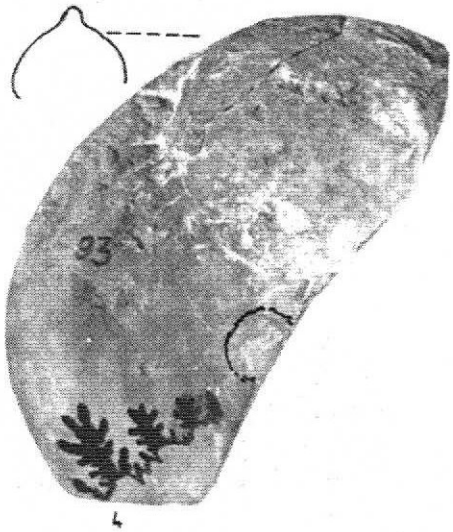

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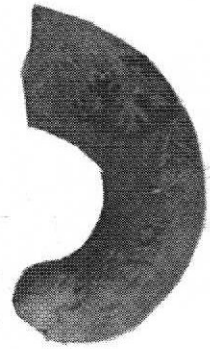

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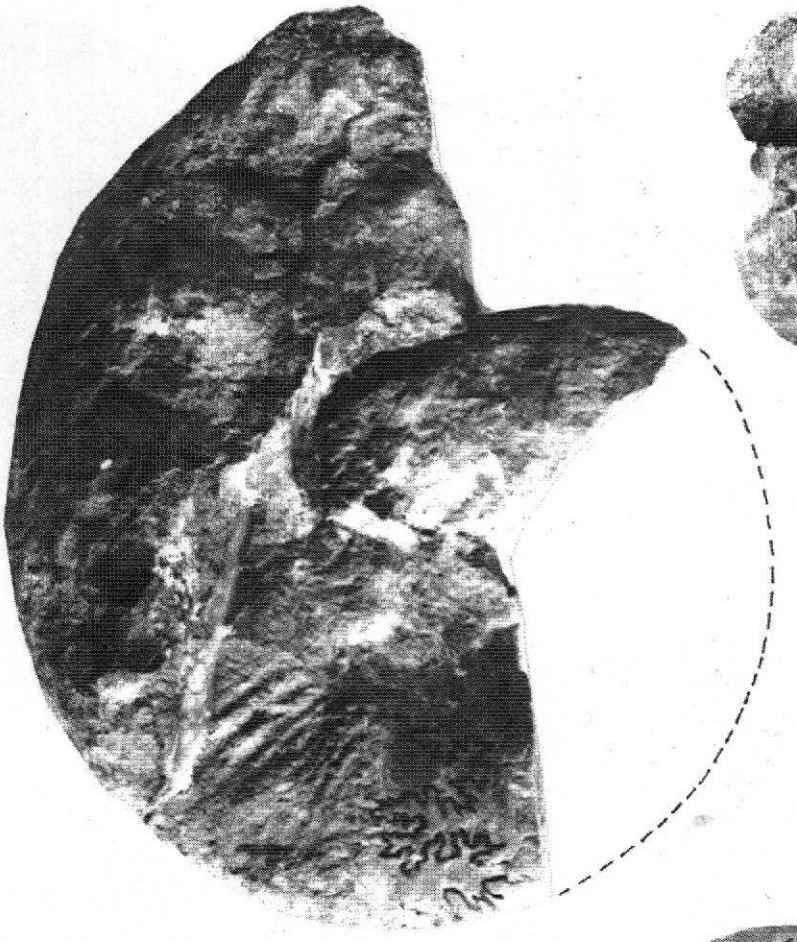

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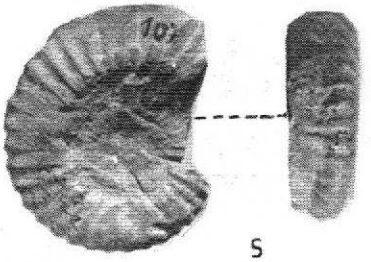

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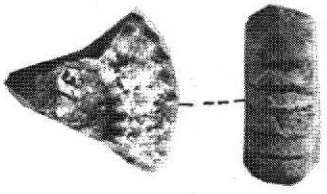

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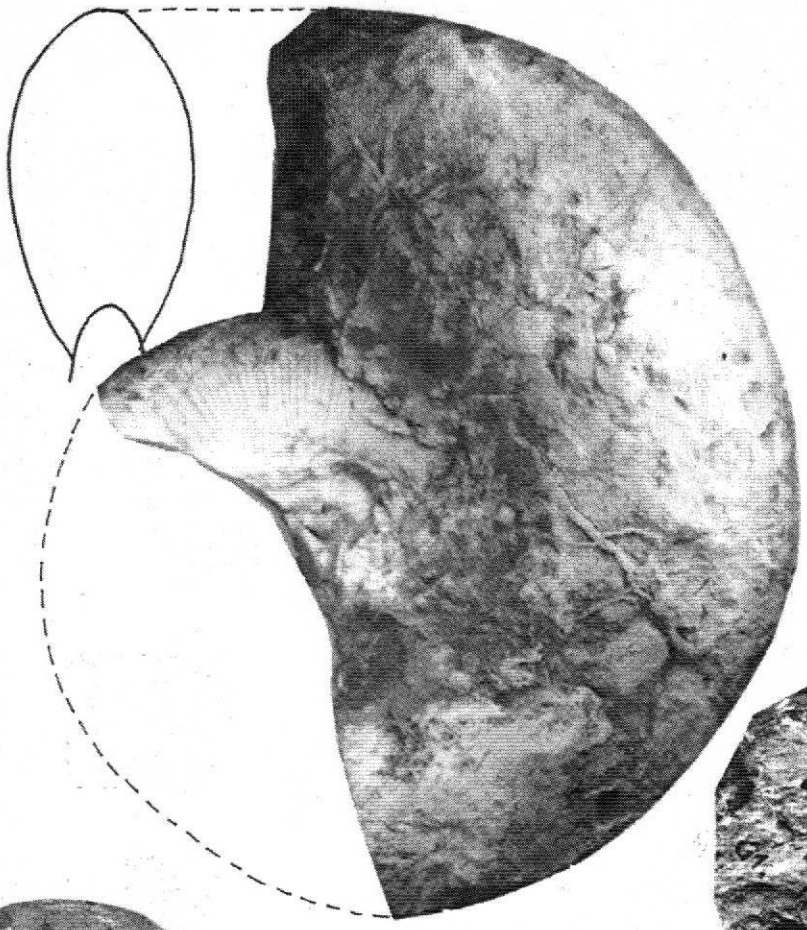

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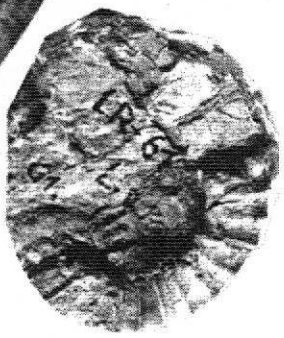

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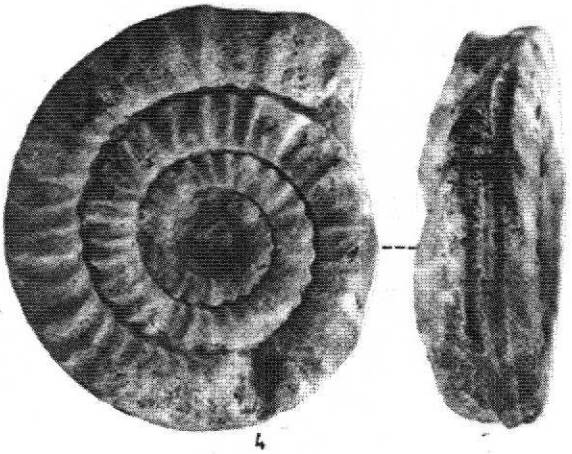

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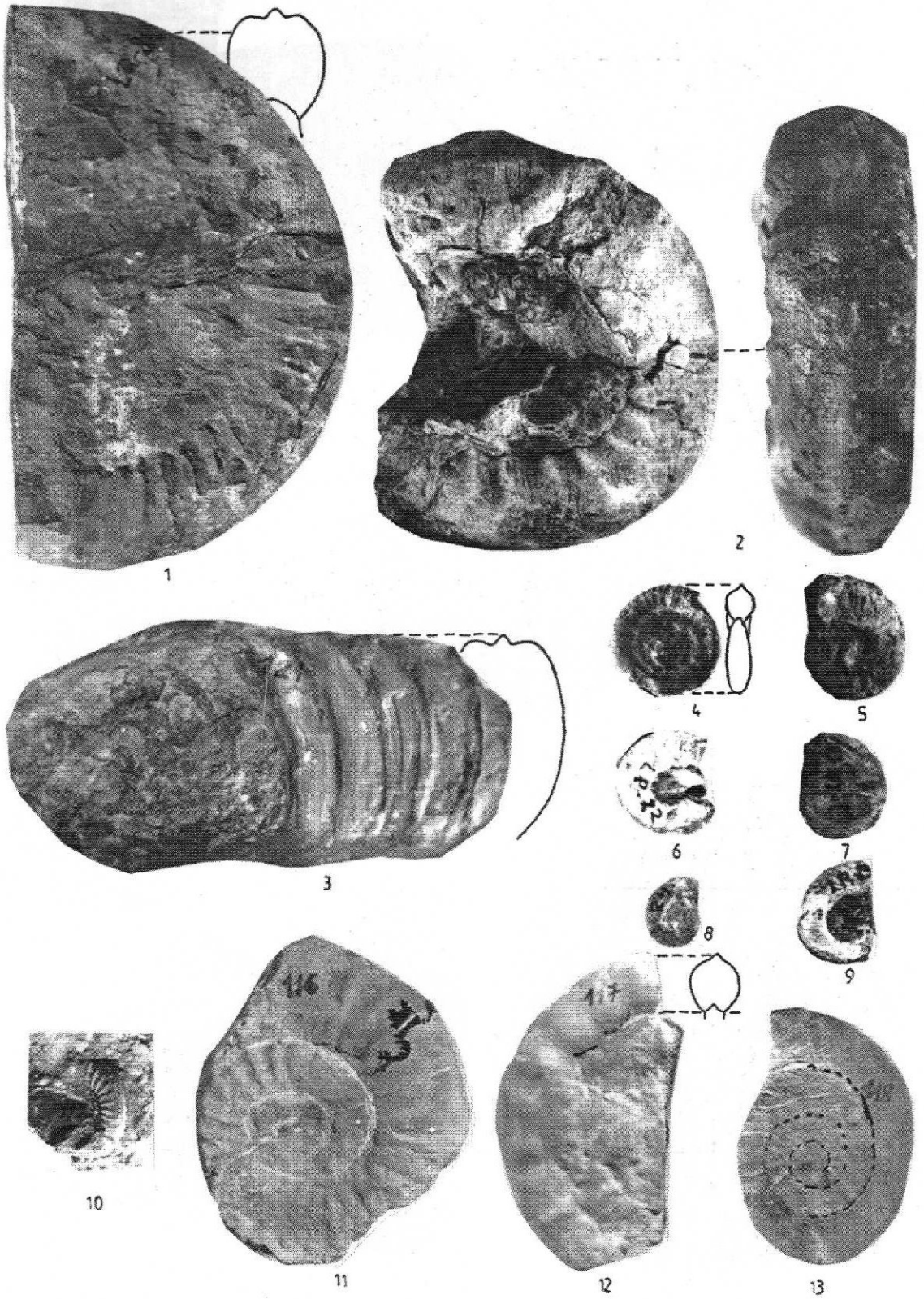
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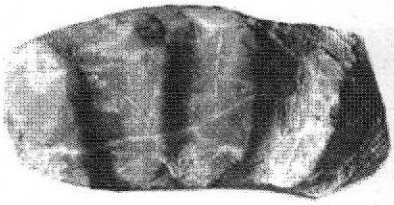

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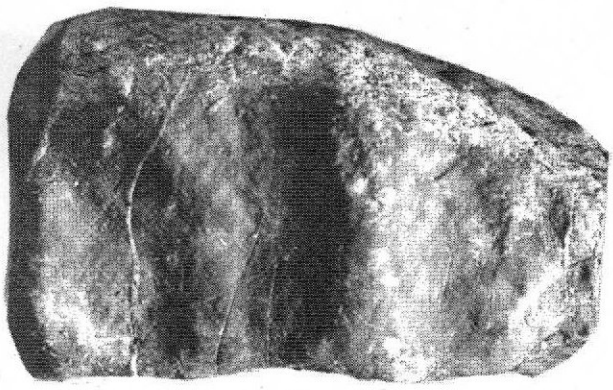

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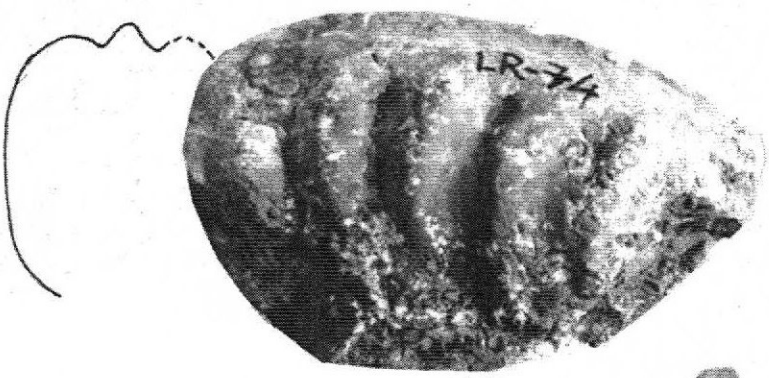

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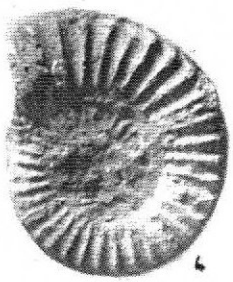

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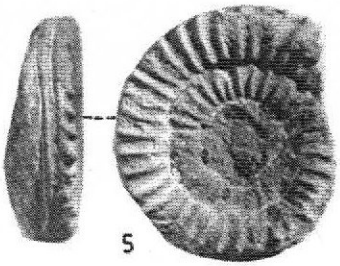

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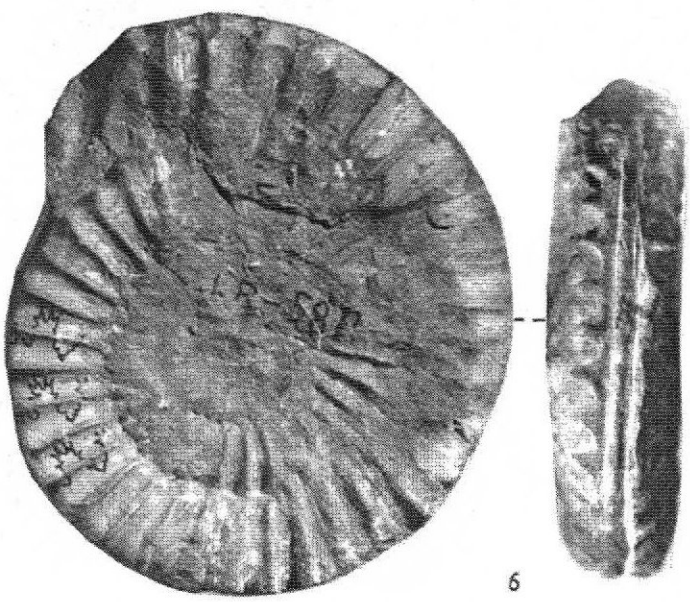

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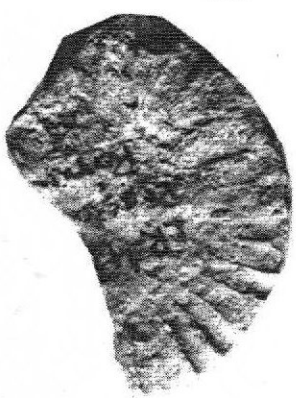

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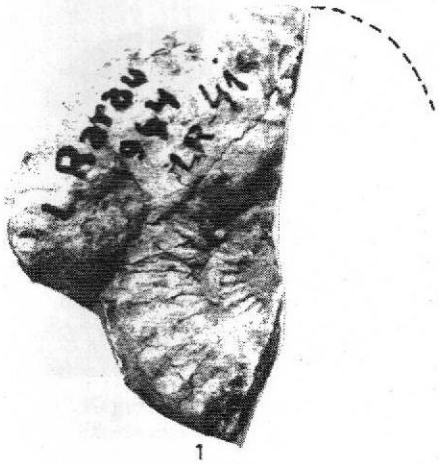

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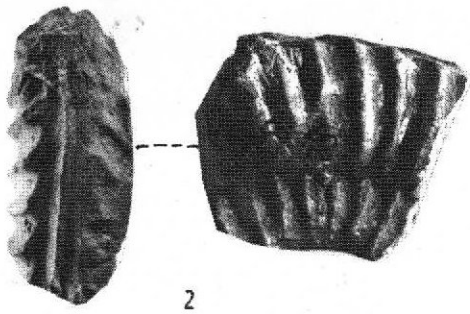

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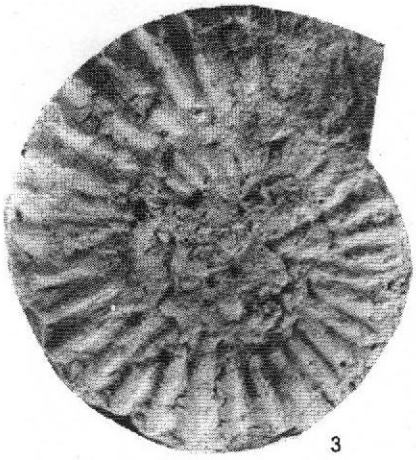

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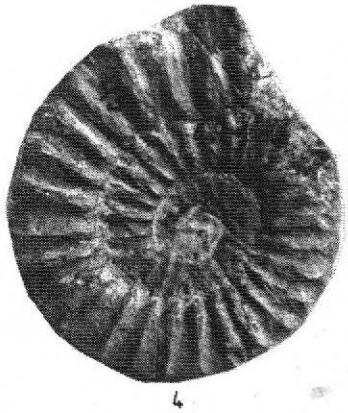

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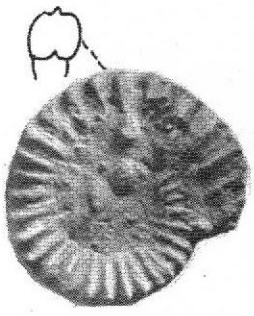

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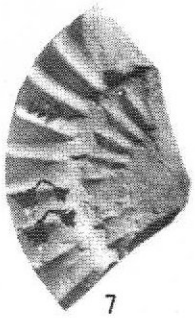

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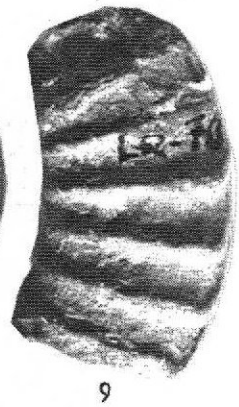

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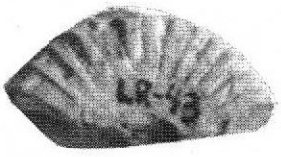

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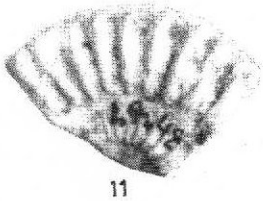

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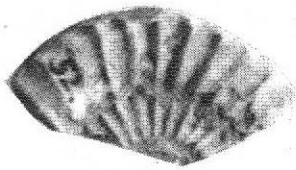

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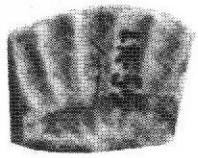

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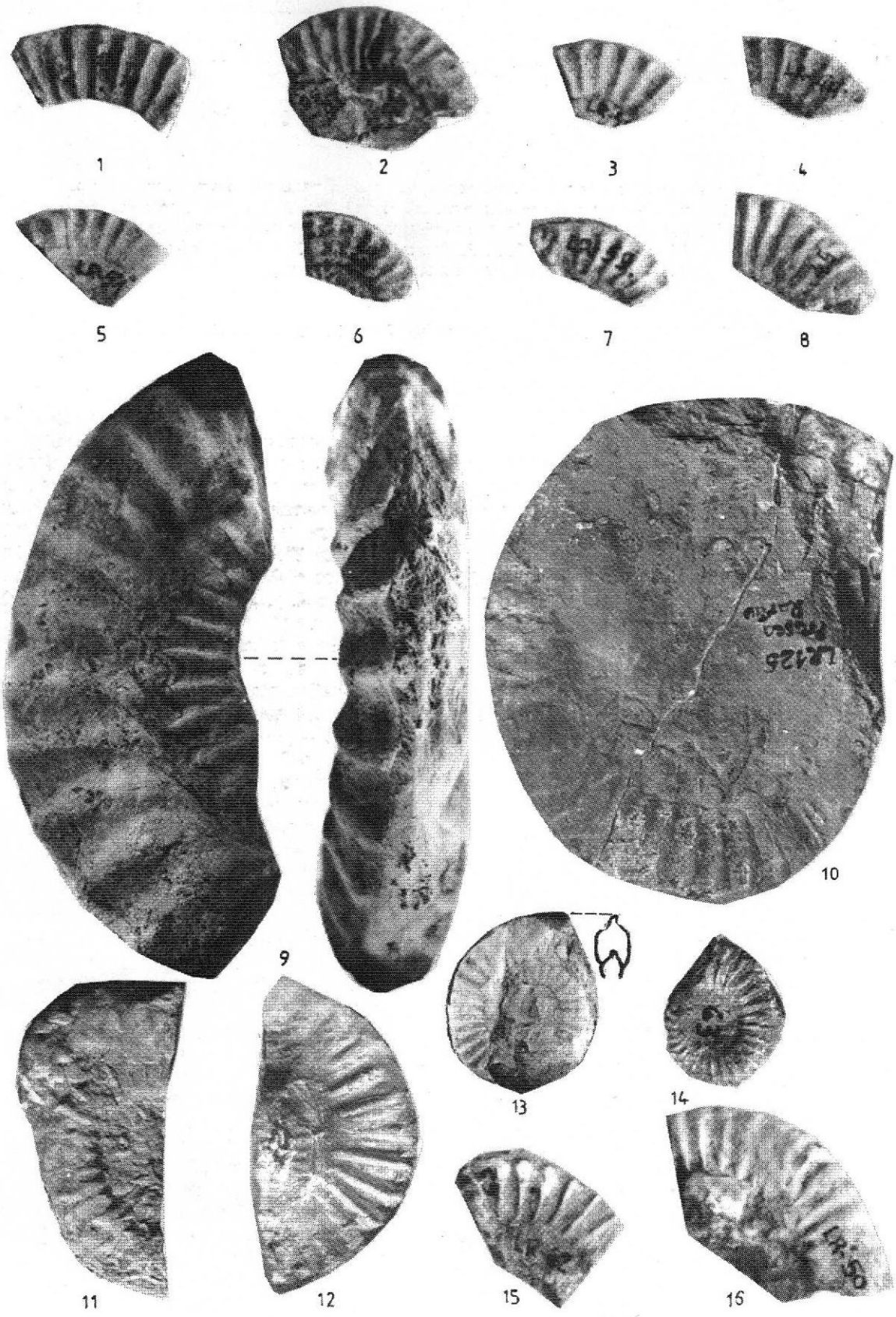
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