

A Catalogue of the Type Specimens of Late Cretaceous Cephalopods housed in the Collections of the Geological Survey of Austria in Vienna

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17 Plates

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Cephalopoda
 Late Cretaceous
 Type specimens
 Paleontological collection

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Cephalopoden-Typen der Ober-Kreide in der Sammlung der Geologischen Bundesanstalt in Wien

Zusammenfassung

Ein übersichtlicher Katalog der an der Geologischen Bundesanstalt aufbewahrten Typusexemplare oberkretazischer Cephalopoden soll der Standeskontrolle und der leichteren Auffindbarkeit der Stücke dienen. Dabei zeigt sich, dass verloren geglaubte Stücke gefunden werden konnten. Als bedauerlicher Abgang, vermutlich während des 2. Weltkrieges, ist der Verlust des Lectotypus von *Belemnitella hoeferi* (SCHLOENBACH, 1867) und des Holotypus von *Muniericeras gosauicum* (HAUER, 1858) zu vermelden.

Abstract

The present catalogue lists and figures the type material of Upper Cretaceous cephalopods housed in the collections of the Geological Survey of Austria in Vienna. Specimens previously believed to be lost have been relocated, but others (the lectotype of *Belemnitella hoeferi* (SCHLOENBACH, 1867) and the holotype of *Muniericeras gosauicum* (HAUER, 1858) have not been traced, and may have been lost in World War II.

Introduction

In the half century following the pioneering work of REYMENT (1958), a series of publications have dealt with the Late Cretaceous cephalopods housed in the collections of the Geological Survey of Austria in Vienna, including the type specimens of HAUER (1847, 1858, 1866), FAVRE (1869), REDTENBACHER (1873), COLLIGNON (1955) and PLÖCHINGER (1955). It is therefore timely to provide a detailed illustrated catalogue that records the current state

of the type material in the collections. The material described here survived the bombing of World War II, and were reorganized in the 1940ies by Josef Langer and others in the Rasumofsky Palace, where the Geological Survey of Austria was based until 2004. Rudolf Sieber, followed by Franz Stojaspal, made outstanding contributions that ensured the conservation and careful documentation of the collections, and led to the publication of a series of catalogues of type specimens. Stojaspal's second catalogue (1976) dealt with Cretaceous inverte-

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brates, including the cephalopods discussed here. Since his publication, a number of types have been rediscovered, including the holotypes of *Hamites hampeanus* HAUER, 1847, and *Nautilus resupinatus* REDTENBACHER, 1873, and the paralectotype of *Ammonites lagarus* REDTENBACHER, 1873. With the relocation of the Geological Survey of Austria to new premises in 2005, improved storage collections

allowed a renewed search for key specimens. ZORN has been employed by the Survey for 15 years and took over the competence for the collections in 2003, whilst SUMMESBERGER has researched the Upper Cretaceous ammonites from Austria that form the basis of this report for more than 25 years, with the generous support and full access to the collections throughout.

List of Type Specimens

The present catalogue is arranged by year of publication, and species are described alphabetically according to original name for each publication. The figures in the plates follow the same scheme, but accompanied with the current name. An alphabetical list of species is also provided.

Abbreviations:

GBA = Geologische Bundesanstalt, Wien

HNS = Haus der Natur, Salzburg

LL = Oberösterreichisches Landesmuseum, Linz

NHMW = Naturhistorisches Museum Wien

HAUER, F. v. (1847): *Hamites hampeanus*. – Ber. Mitth. Freunde Naturwiss. Wien, 2, 75–77, Wien.

Hamites hampeanus HAUER, 1847

(Pl. 1, Figs. 1 a–c)

Coll. no.: GBA 1858/001/0001/03.

Type: Holotype by monotypy.

Type level: Early Maastrichtian, Gosau Group, not differentiated.

Type locality: Krampen, Neuberg, Styria.

Type reference: HAUER, 1847: p. 75.

Revised and figured by: HAUER (1858: p. 8, Pl. 1, Fig. 3 only) under *Hamites cylindraceus* DEFRANCE, 1816.

Remarks: KENNEDY & SUMMESBERGER (1986: p. 195) reported the specimen being lost. KLINGER & KENNEDY (2003a, b) included the species in their works on Diplomoceratidae.

Current name: *Diplomoceras cylindraceum* (DEFRANCE, 1816).

HAUER, F. v. (1858): Über die Cephalopoden der Gosauschichten. – Beitr. Palaeontographie Österr., 1, 7–14, Wien.

Ammonites Gosauicus HAUER, 1858

(Pl. 2, Fig. 1)

Type: Holotype by monotypy, apparently lost.

Type level: Santonian, Gosau Group, Grabenbach Formation.

Type locality: Gosau, Upper Austria.

Type reference and figure: HAUER, 1858: p. 13, Pl. 2, Figs. 7–9.

Remarks: REDTENBACHER (1873: p. 124) and BRINKMANN (1935: p. 4 under *Muniericeras gosauicum*) mentioned the specimen. In the catalogue of STOJASPAL (1976) it is missing. Obviously it got lost between 1935 and 1976, probably during World War II. In SUMMESBERGER & KENNEDY (in prep.) the species is discussed.

Current name: *Muniericeras gosauicum* (HAUER, 1858).

Ammonites Neubergicus HAUER, 1858

(Pl. 2, Figs. 2 a–d)

Coll. no.: GBA 1858/001/0006/01 (former coll. no. 3415).

Type: Lectotype, designated by GROSSOUVRE (1894: p. 209 under *Pachydiscus neubergicus* HAUER, 1858).

Type level: Early Maastrichtian, Gosau Group, not differentiated.

Type locality: Krampen, Neuberg, Styria.

Type reference and figure: HAUER, 1858: p. 12, Pl. 2, Figs. 1–3.

Revised and refigured by: KENNEDY & SUMMESBERGER (1986: p. 189, Pl. 3, Figs. 1–3) under *Pachydiscus (Pachydiscus) neubergicus* (HAUER, 1858).

Refigured by: HANCOCK (2000: p. 417, Pl. 1, Figs. a–e).

Remarks: Genolectotype of the genus *Pachydiscus* ZITTEL, 1884. Apart from the subsequent one two more specimens, originally syntypes, now are paralectotypes.

Current name: *Pachydiscus (Pachydiscus) neubergicus* (HAUER, 1858).

Ammonites Neubergicus HAUER, 1858

(Pl. 3, Figs. 1 a–d)

Coll. no.: GBA 1858/001/0006/02 (former coll. no. 3463).

History of revision and type status:

Syntype of *Ammonites Neubergicus* HAUER, 1858: p. 12, Pl. 3, Figs. 1–2.

Refigured by: REDTENBACHER (1873: p. 120, Pl. 27, Figs. 5 a–b).

Holotype of *Pachydiscus haueri* COLLIGNON, 1955: p. 75, 81.

Revised by: KENNEDY & SUMMESBERGER (1986: p. 189, 192) under *Pachydiscus epiplectus* (REDTENBACHER, 1873).

Type level: Early Maastrichtian, Gosau Group, not differentiated.

Type locality: Krampen, Neuberg, Styria.

Type reference and figure: HAUER, 1858: p. 12, Pl. 3, Figs. 1–2 (only).

Remarks: See also under *Pachydiscus haueri* COLLIGNON, 1955.

Current name: *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873).

***Scaphites multinodosus* HAUER, 1858**

(Pl. 4, Figs. 1 a–c)

Coll. no.: GBA 1858/001/0002a (former coll. no. 3459).
Type: Lectotype (with counterpart), designated by KENNEDY & SUMMESBERGER (1986: p. 198, Pl. 16, Figs. 3–5, Text-Fig. 7) under synonymy of *Hoploscaphites constrictus* (J. SOWERBY, 1817).

Type level: Early Maastrichtian, Gosau Group, not differentiated.

Type locality: Krampen, Neuberg, Styria.

Type reference and figure: HAUER, 1858: p. 9, Pl. 1, Figs. 7–8.

Paralectotypes: GBA 1858/001/0002b, c, d (designated by: KENNEDY & SUMMESBERGER (1986: p. 198, Pl. 16, Figs. 1–2, 8–9, 13; 2b = Pl. 16, Figs. 1–2; 2c = Pl. 16, Figs. 8–9; 2d = Pl. 16, Fig. 13). MACHALSKI et al. (2007: p. 174–176) provisionally referred paralectotypes GBA 1858/001/0002c, d under *Hoploscaphites* sp. 3.

Current name: *Hoploscaphites constrictus* (J. SOWERBY, 1817).

HAUER, F. v. (1866): Neue Cephalopoden aus den Gosaugebilden der Alpen. – Sitz.-Ber. k. Akad. Wiss., math.-naturwiss. Cl., 53, 1–9, Wien.

***Ammonites Haberfellneri* HAUER, 1866**

(Pl. 4, Figs. 2 a–b)

Coll. no.: GBA 1866/001/0001 (former coll. no. 3464).

Type: Lectotype, designated by REYMENT (1958: p. 46, Pl. 12, Figs. 2 a–b, Text-Fig. 6/2).

Type level: Late Turonian, Gosau Group, Grabenbach Formation.

Type locality: Radstatt, Gams, Styria.

Type reference and figure: HAUER, 1866: p. 301, Pl. 1, Figs. 1–2.

Refigured by: REDTENBACHER (1873: p. 101, Pl. 23, Figs. 2 c–d). WRIGHT et al. (1996: p. 187, 190, Fig. 144/a, b) reprinted REDTENBACHER's illustration.

Revised and refigured by: REYMENT (1958: p. 46, Pl. 12, Figs. 2 a–b, Text-Fig. 6/2) under *Barroisiceras (Barroisiceras) haberfellneri haberfellneri* (HAUER, 1866) and by SUMMESBERGER & KENNEDY (1996: p. 121, Pl. 5, Figs. 1–2) under *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

Remarks: Genolectotype of the genus *Barroisiceras* GROSSOUVRE, 1894.

Current name: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

***Ammonites Milleri* HAUER, 1866**

(Pl. 4, Fig. 3)

Coll. no.: GBA 1866/001/0002/01.

Type: Syntype.

Type level: Early Campanian, Gosau Group, not differentiated.

Type locality: Kainach, Styria.

Type reference and figure: HAUER, 1866: p. 304, Pl. 2, Figs. 1–2.

Remarks: Vide SUMMESBERGER et al. (1996: p. 6) for notes on further occurrences of this species. Besides, there are six unfigured syntypes at hand.

Current name: *Placenticeras milleri* (HAUER, 1866).

***Ammonites mitis* HAUER, 1866**

(Pl. 4, Figs. 4 a–b, Pl. 5, Figs. 1 a–b)

Coll. no.: GBA 1866/001/0003 (former coll. no. 3433).

Type: Holotype by monotypy.

Type level: Late Turonian, Gosau Group, not differentiated.

Type locality: Ofenwand near Strobl/Weißenbach, Salzburg.

Type reference and figure: HAUER, 1866: p. 305, Pl. 2, Figs. 3–4.

Suture line figured by: REDTENBACHER (1873: Pl. 27, Fig. 4).

Revised and refigured by: KENNEDY & SUMMESBERGER (1979: p. 74, Pl. 1, Figs. 1 A–D; Text-Fig. 1) and SUMMESBERGER & KENNEDY (1996: p. 112, Pl. 1, Fig. 1) under *Gaudryceras mite* (HAUER, 1866).

Remarks: Genoholotype of the genus *Gaudryceras* GROSSOUVRE, 1894.

Current name: *Gaudryceras mite* (HAUER, 1866).

***Scaphites multinodosus* HAUER, 1866**

(Pl. 5, Figs. 2 a–d)

Coll. no.: GBA 1866/001/0004 (former coll. no. 3480).

Type: Holotype by monotypy.

Type level: Late Campanian, Helvetic Zone, Buntmergel Group.

Type locality: Gschlifgraben, Gmunden, Upper Austria.

Type reference and figure: HAUER, 1866: p. 306, Pl. 1, Figs. 7–8.

Revised and refigured by: KENNEDY & SUMMESBERGER (1984: p. 171, Pl. 12, Figs. 1–3) under *Trachyscaphites pulcherrimus* (ROEMER, 1841).

Remarks: See also REDTENBACHER (1873: p. 129).

Current name: *Trachyscaphites pulcherrimus* (ROEMER, 1841).

***Turrilites binodosus* HAUER, 1866**

(Pl. 5, Figs. 3 a–b)

Coll. no.: GBA 1866/001/0005 (former coll. no. 3469).

Type: Holotype by monotypy.

Type level: Late Turonian, Gosau Group, Grabenbach Formation.

Type locality: Radstatt, Gams, Styria.

Type reference and figure: HAUER, 1866: p. 307, Pl. 1, Fig. 6.

Revised and refigured by: SUMMESBERGER & KENNEDY (1996: p. 131, Pl. 15, Figs. 1–3) under *Tridenticeras binodosum* (HAUER, 1866).

Remarks: See also REDTENBACHER (1873: p. 131).

Current name: *Tridenticeras binodosum* (HAUER, 1866).

SCHLOENBACH, U. (1867): Über einen Belemniten aus der alpinen Kreide von Grünbach bei Wr. Neustadt. – Jb. Geol. R.-A., 17, 589–593, Wien.

***Belemnites hoeferi* SCHLOENBACH, 1867**

(Pl. 5, Fig. 4)

Type: Lectotype, designated and revised by CHRISTENSEN (1997: p. 15) under *Belemnitella hoeferi* (SCHLOENBACH, 1867), is the original of the figured syntype of SCHLOENBACH (1867: Pl. 16, Fig. 1), which is apparently lost.

Type level: Maastrichtian.

Type locality: Grünbach, Lower Austria.
Type reference: SCHLOENBACH, 1867: p. 590, Pl. 16, Fig. 1.
Current name: *Belemnitella hoeferi* (SCHLOENBACH, 1867).

FAVRE, E. (1869): Description des mollusques fossiles de la craie des environs de Lemberg en Galicie. – 187 pp., Geneva – Basel.

***Ammonites galicianus* FAVRE, 1869**
(Pl. 6, Figs. 1 a–d)

Coll. no.: GBA 1869/006/0010/01 (former coll. no. 1869/006/0010a).
Type: Lectotype, designated by THIEDIG & WIEDMANN (1976: p. 17) under *Pseudokossmaticeras galicianum* (FAVRE, 1869).
Type level: Early Maastrichtian.
Type locality: Nagoryany, Ukraine.
Type reference and figure: FAVRE, 1869: p. 16, Pl. 3, Fig. 5.
Refigured by: NOWAK (1913: Pl. 41, Fig. 17) under *Kossmaticeras galicianum* (FAVRE, 1869).
Revised and refigured by: KENNEDY & SUMMESBERGER (1991: p. 93, Pl. 1, Figs. 3–6) under *Pseudokossmaticeras galicianum* (FAVRE, 1869).
Current name: *Pseudokossmaticeras galicianum* (FAVRE, 1869).

***Ammonites galicianus* FAVRE, 1869**
(Pl. 6, Figs. 2 a–c)

Coll. no.: GBA 1869/006/0010/02 (former coll. no. 1869/006/0010b).
Type: Paralectotype, designated by KENNEDY & SUMMESBERGER (1987: p. 29) under *Pseudokossmaticeras galicianum* (FAVRE, 1869).
Type level: Early Maastrichtian.
Type locality: Nagoryany, Ukraine.
Type reference and figure: FAVRE, 1869: p. 16, Pl. 3, Fig. 6.
Refigured by: KENNEDY & SUMMESBERGER (1987: p. 28, Pl. 3, Figs. 7–9).
Revised and refigured again by: KENNEDY & SUMMESBERGER (1991: p. 93, Pl. 1, Figs. 1–2) under *Pseudokossmaticeras galicianum* (FAVRE, 1869).
Current name: *Pseudokossmaticeras galicianum* (FAVRE, 1869).

REDTENBACHER, A. (1873): Die Cephalopodenfauna der Gosauschichten in den nordöstlichen Alpen. – Abh. Geol. R.-A., 5, 91–140, Wien.

***Nautilus gosavicus* REDTENBACHER, 1873**
(Pl. 6, Figs. 3 a–d)

Coll. no.: GBA 1873/001/0003 (former coll. no. 3526).
Type: Holotype by monotypy.
Type level: Middle to Late Santonian, Gosau Group, Grabenbach Formation.
Type locality: Nefgraben, Russbach, Salzburg.
Type reference and figure: REDTENBACHER, 1873: p. 96, Pl. 22, Figs. 2 a–b.
Revised and refigured by: SUMMESBERGER et al. (in prep.) under *Cimomia gosavica* (REDTENBACHER, 1873).
Current name: *Cimomia gosavica* (REDTENBACHER, 1873).

***Nautilus Neubergicus* REDTENBACHER, 1873**
(Pl. 7, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0005/01 (former coll. no. 3462).
Type: Syntype.
Type level: Maastrichtian, Gosau Group.
Type locality: Krampen, Neuberg, Styria.
Type reference and figure: REDTENBACHER, 1873: p. 97, Pl. 22, Fig. 4.
Revision: SUMMESBERGER et al. (in prep.).
Remarks: Published by HAUER (1858: p. 14, Pl. 1, Figs. 1–2) under *Nautilus Sowerbianus* HAUER, 1858 (non D'ORBIGNY, 1840).
Current name: *Angulithes (Angulithes) neubergicus* (REDTENBACHER, 1873).

***Nautilus Neubergicus* REDTENBACHER, 1873**
(Pl. 8, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0005/02 (former coll. no. 3461).
Type: Syntype.
Type level: Maastrichtian, Gosau Group.
Type locality: Krampen, Neuberg, Styria.
Type reference: REDTENBACHER, 1873: p. 97.
Revision: SUMMESBERGER et al. (in prep.).
Remarks: Reference material in HAUER (1858: p. 14) under *Nautilus Sowerbianus* HAUER, 1858 (non D'ORBIGNY, 1840).
Current name: *Angulithes (Angulithes) neubergicus* (REDTENBACHER, 1873).

***Nautilus resupinatus* REDTENBACHER, 1873**
(Pl. 9, Figs. 1 a–c)

Coll. no.: GBA 1873/001/0004 (former coll. no. 3421).
Type: Holotype by monotypy.
Type level: Maastrichtian, Gosau Group, Piesting Formation.
Type locality: Grünbach, Lower Austria.
Type reference and figure: REDTENBACHER, 1873: p. 97, Pl. 22, Figs. 3 a–b.
Remarks: After WIEDMANN (1960: p. 165) conspecific with *Eutrephoceras sublaevigatum* (D'ORBIGNY, 1840), which is questionable in our point of view. The specimen was not mentioned in the catalogue by STOJASPAL (1976).
Current name: *Eutrephoceras sublaevigatum* (D'ORBIGNY, 1840).

***Ammonites anaspastus* REDTENBACHER, 1873**
(Pl. 9, Figs. 2 a–d)

Coll. no.: GBA 1873/001/0016 (former coll. no. 3458).
Type: Holotype by monotypy.
Type level: Early Maastrichtian, Gosau Group, undifferentiated (Piesting Formation?).
Type locality: Neuberg, Styria.
Type reference and figure: REDTENBACHER, 1873: p. 113, Pl. 26, Figs. 1 a–c.
Revised and refigured by: REYMENT (1958: p. 32, Pl. 9, Figs. 1 a–b) under *Mesogaudryceras anaspastum* (REDTENBACHER, 1873).
Revised and refigured by: KENNEDY & SUMMESBERGER (1986: Pl. 1, Figs. 1, 8; Pl. 3, Fig. 5, Text-Fig. 4) under *Pseudophyllites cf. indra* (FORBES, 1846).
Current name: *Pseudophyllites cf. indra* (FORBES, 1846).

***Ammonites Bajuvaricus* REDTENBACHER, 1873**

(Pl. 9, Figs. 3 a–d)

Coll. no.: GBA 1873/001/0012 (former coll. no. 3432).

Type: Lectotype, designated by REYMENT (1958: p. 43) under *Gauthiericeras bajuvaricum* (REDTENBACHER, 1873).

Type level: Middle Coniacian, Gosau Group, undifferentiated.

Type locality: Leiner Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 107, Pl. 24, Figs. 2 a–c.

Revised and refigured by: REYMENT (1958: p. 43, Pl. 11, Figs. 1 a–c, Text-Figs. 6/3 a–b) under *Gauthiericeras bajuvaricum* (REDTENBACHER, 1873).

Revised again by: KLINGER & KENNEDY (1984: p. 235, Figs. 92 B–C, 93) under *Peroniceras (Zuluiceras) bajuvaricum* (REDTENBACHER, 1873).

Current name: *Peroniceras (Zuluiceras) bajuvaricum* (REDTENBACHER, 1873).

***Ammonites Brandti* REDTENBACHER, 1873**

(Pl. 10, Figs. 1 a–c)

Coll. no.: GBA 1873/001/0011 (former coll. no. 3417).

Type: Holotype by monotypy.

Type level: Late Campanian, Gosau Group, Piesting Formation.

Type locality: Grünbach, Lower Austria.

Type reference and figure: REDTENBACHER, 1873: p. 106, Pl. 24, Figs. 1 a–c.

Revised and refigured by: REYMENT (1958: p. 34, Pl. 10, Figs. 1 a–c) under *Pseudokossmaticeras brandti* (REDTENBACHER, 1873).

Revised again by: HANCOCK & KENNEDY (1993: p. 155, Pl. 2, Figs. 4–6; Pl. 4, Figs. 1–5; Pl. 5, Figs. 1–8; Pl. 6, Figs. 1–9; Pl. 7, Figs. 5–11).

Current name: *Pseudokossmaticeras brandti* (REDTENBACHER, 1873).

***Ammonites Czörnigi* REDTENBACHER, 1873**

(Pl. 11, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0010/01 (former coll. no. 3436).

Type: Lectotype, designated by REYMENT (1958: p. 39) under *Peroniceras czoernigi* (REDTENBACHER, 1873).

Type level: Middle Coniacian, Gosau Group undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 105, Pl. 23, Figs. 4 a–c.

Revised by: REYMENT (1958: p. 38, Pl. 4, Figs. 1 a–b, Text-Fig. 5/1) under *Peroniceras czoernigi* (REDTENBACHER, 1873).

Current name: *Peroniceras (Peroniceras) czoernigi* (REDTENBACHER, 1873).

***Ammonites Czörnigi* REDTENBACHER, 1873**

(Pl. 11, Figs. 2 a–c)

Coll. no.: GBA 1873/001/0010/02 (former coll. no. 3440).

Type: Paralectotype.

Type level: Middle Coniacian, Gosau Group undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 105, Pl. 23, Figs. 4 d–e.

Revised by: REYMENT (1958: p. 38, Pl. 5, Fig. 2) under *Peroniceras czoernigi* (REDTENBACHER, 1873).

Current name: *Peroniceras (Peroniceras) czoernigi* (REDTENBACHER, 1873).

***Ammonites Düreri* REDTENBACHER, 1873**

(Pl. 12, Figs. 1 a–c)

Coll. no.: GBA 1873/001/0022 (former coll. no. 3527).

Type: Holotype by monotypy.

Type level: probably Maastrichtian, on the basis of the nannoflora in the matrix of the specimen (pers. comm. WAGREICH, 1993), ? Piesting Formation.

Type locality: probably Grünbach – Neue Welt basin (not from the Gosau area, as the label suggests).

Type reference and figure: REDTENBACHER, 1873: p. 118, Pl. 27, Figs. 2 a–b.

Revised and refigured by: REYMENT (1958: p. 33, Pl. 7, Figs. 1 a–b) under *Pseudokossmaticeras dureri* (REDTENBACHER, 1873).

Refigured by: HANCOCK & KENNEDY (1993: p. 157, Pl. 2, Figs. 7–9) and by WARD & KENNEDY (1993: p. 30, Figs. 16.2, 16.3, 25.6).

Current name: *Pseudokossmaticeras dureri* (REDTENBACHER, 1873).

***Ammonites epiplectus* REDTENBACHER, 1873**

(Pl. 12, Figs. 2 a–c)

Coll. no.: GBA 1873/001/0024 (former coll. no. 3416).

Type: Paralectotype, designated by KENNEDY & SUMMESBERGER (1986: p. 192).

Type level: Early Maastrichtian, Gosau Group, Piesting Formation.

Type locality: Grünbach, “Neue Welt”, Lower Austria.

Type reference and figure: REDTENBACHER, 1873: p. 121, Pl. 28, Figs. 1 a–c.

Revised and refigured by: KENNEDY & SUMMESBERGER (1986: p. 192, Pl. 6, Fig. 3; Pl. 11, Figs. 1–3, Text-Figs. 5 C–D) under *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873).

Current name: *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873).

***Ammonites eugnamtus* REDTENBACHER, 1873**

(Pl. 12, Figs. 3 a–b)

Coll. no.: GBA 1873/001/0021 (former coll. no. 3438).

Type: Holotype by monotypy.

Type level: Middle Coniacian, Gosau Group, undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 117, Pl. 27, Figs. 1 a–c.

Revised and refigured by: REYMENT (1958: p. 45, Pl. 2, Fig. 2; Text-Fig. 5/3) under *Protexanites (Protexanites) eugnamtus* (REDTENBACHER, 1873).

Current name: *Protexanites (Protexanites) eugnamtus* (REDTENBACHER, 1873).

***Ammonites haplophyllus* REDTENBACHER, 1873**

(Pl. 13, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0007 (former coll. no. 3442).

Type: Holotype by monotypy.

Type level: Middle Coniacian, Gosau Group, undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 100, Pl. 23, Figs. 1 a–c.

Revised and refigured by: REYMENT (1958: p. 48, Text-Fig. 2, Pl. 3, Figs. 1 a–b) under *Tissotiooides haplophyllus* (REDTENBACHER, 1873) and by: KENNEDY (1984: p. 123, Pl. 28, Figs. 2–3; Pl. 29, Figs. 3–4; Text-Figs. 38 A–C) under *Tissotiooides (Tissotiooides) haplophyllus* (REDTENBACHER, 1873).

Remarks: Genoholotype of the genus *Tissotiooides* (REYMENT, 1958).

Current name: *Tissotiooides (Tissotiooides) haplophyllus* (REDTENBACHER, 1873).

***Ammonites lagarus* REDTENBACHER, 1873**

(Pl. 13, Fig. 2)

Coll. no.: GBA 1873/001/0015.

Type: Syntype.

Type level: Middle Coniacian, Gosau Group, undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 112, Pl. 25, Figs. 3 a–b.

Revised by: KENNEDY in: KENNEDY et al. (1995: p. 397) under *Hauericeras lagarum* (REDTENBACHER, 1873).

Remarks: One of two syntypes, not mentioned in the catalogue of STOJASPAL (1976). The other one (HNS 6391) from Glanegg is designated lectotype by SUMMESBERGER et al. (in prep.).

Current name: *Hauericeras lagarum* (REDTENBACHER, 1873).

***Ammonites Päon* REDTENBACHER, 1873**

(Pl. 13, Figs. 3 a–c)

Coll. no.: GBA 1873/001/0009/01 (former coll. no. 3481).

Type: Lectotype, designated by REYMENT (1958: p. 47).

Type level: Late Turonian, Gosau Group, undifferentiated.

Type locality: “Ofenwand”, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 103, Pl. 23, Figs. 3 c–e.

Refigured by: REYMENT (1958, Pl. 12, Figs. 1 a–b, Text-Fig. 6/1) under *Barroisiceras haberfellneri paeon* (REDTENBACHER, 1873).

Revised by: SUMMESBERGER & KENNEDY (1996: p. 121, Pl. 5, Figs. 4–5) under *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

Current name: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

***Ammonites Päon* REDTENBACHER, 1873**

(Pl. 13, Figs. 4 a–b)

Coll. no.: GBA 1873/001/0009/02 (former coll. no. 3467).

Type: Paralectotype, designated by SUMMESBERGER & KENNEDY (1996: p. 122).

Type level: Late Turonian, Gosau Group, ? Grabenbach Formation.

Type locality: Gams, Styria.

Type reference and figure: REDTENBACHER, 1873: p. 103, Pl. 23, Figs. 3 a–b.

Revised by: SUMMESBERGER & KENNEDY (1996: p. 121, Pl. 5, Figs. 6–7) under *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

Remarks: Contradicting REYMENT’s comment (1958: p. 47) the specimen is preserved in the GBA collection as already stated by STOJASPAL (1976: A 217).

Current name: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

***Ammonites postremus* REDTENBACHER, 1873**

(Pl. 14, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0018 (former coll. no. 3468).

Type: Lectotype, designated by SUMMESBERGER & KENNEDY (1996, p. 114, Pl. 2, Figs. 3, 5–6, 8, Text-Fig. 11) under *Pseudophyllites postremus* (REDTENBACHER, 1873), the surviving one of two syntypes.

Type level: Late Turonian, Gosau Group, Grabenbach Formation.

Type locality: Gams, Styria.

Type reference and figure: REDTENBACHER, 1873: p. 115, Pl. 26, Figs. 3 c–d.

Current name: *Pseudophyllites postremus* (REDTENBACHER, 1873).

***Ammonites propoetidum* REDTENBACHER, 1873**

(Pl. 14, Figs. 2 a–d)

Coll. no.: GBA 1873/001/0020 (former coll. no. 3435).

Type: Holotype by monotypy.

Type level: Middle Coniacian, Gosau Group.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 116, Pl. 26, Figs. 6 a–c.

Revised and refigured by: REYMENT (1958: p. 41, Pl. 5, Figs. 1 a–b, Text-Figs. 2/3–4, 4/1–2) under *Gauthiericeras propoetidum* (REDTENBACHER, 1873).

Remarks: Species mentioned as *Peroniceras (Zuluiceras) propoetidum* (REDTENBACHER, 1873) by SUMMESBERGER (1985: p. 151).

Current name: *Peroniceras (Zuluiceras) propoetidum* (REDTENBACHER, 1873).

***Ammonites quinquenodosus* REDTENBACHER, 1873**

(Pl. 15, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0013/01 (former coll. no. 2106).

Type: Lectotype, designated by KENNEDY et al. (1981: p. 126, Fig. 8).

Type level: Early Santonian, Gosau Group, Grabenbach Formation.

Type locality: Bad Ischl (possibly Schneiderwirtsbrücke (road bridge) over the Nussenseebach), Upper Austria.

Type reference and figure: REDTENBACHER, 1873: p. 108, Pl. 24, Figs. 3 a–b.

Revised and refigured by: KENNEDY et al. (1981: p. 126, Fig. 8) under *Texanites quinquenodosus* (REDTENBACHER, 1873).

Current name: *Texanites quinquenodosus* (REDTENBACHER, 1873).

***Ammonites quinquenodosus* REDTENBACHER, 1873**

(Pl. 16, Figs. 1 a–d)

Coll. no.: GBA 1873/001/0013/02.

Type: Paralectotype, designated by KENNEDY et al. (1981: p. 127, Figs. 9 a–b, d). Fig. 9 c is NHMW 1864.I.730.

Type level: Early Santonian, Gosau Group, Grabenbach Formation.

Type locality: Bad Ischl (possibly Schneiderwirtsbrücke (road bridge) over the Nussenseebach), Upper Austria.

Type reference and figure: REDTENBACHER, 1873: p. 108.

Revised and refigured by: KENNEDY et al. (1981: p. 126, Figs. 9 A–D) under *Texanites quinquenodosus* (REDTENBACHER, 1873).

Remarks: The old number S.V. 2569, which was glued on the specimen is not an official inventory number of the collections of the “k. k. Geologische Reichsanstalt”. A third paralectotype (LL 41/1938), designated by KENNEDY et al. (1981: p. 127) is labelled Schneiderwirtsbrücke and makes it highly likely that this is the type locality of the species.

Current name: *Texanites quinquenodosus* (REDTENBACHER, 1873).

***Ammonites Schlüteri* REDTENBACHER, 1873**

(Pl. 16, Figs. 2 a–c)

Coll. no.: GBA 1873/001/0017 (former coll. no. 3441).

Type: Holotype by monotypy.

Type level: Middle Coniacian, Gosau Group, undifferentiated.

Type locality: Schmalnauer (= Schmolnauer) Alpe, Strobl/Weißenbach, Salzburg.

Type reference and figure: REDTENBACHER, 1873: p. 114, Pl. 26, Figs. 2 a–c.

Revised by: KENNEDY in: SUMMESBERGER & KENNEDY (in prep.).

Current name: *Hauericeras schlueteri* (REDTENBACHER, 1873).

? *Scaphites Sturi* REDTENBACHER, 1873

(Pl. 16, Figs. 3 a–c)

Coll. no.: GBA 1873/001/0033 (former coll. no. 3418).

Type: Holotype by monotypy.

Type level: Campanian/Maastrichtian, Gosau Group, Piesiting Formation.

Type locality: Muthmannsdorf, Lower Austria.

Type reference and figure: REDTENBACHER, 1873: p. 129, Pl. 30, Fig. 10.

Remarks: SPATH (1922: p. 123) also mentioned the specimen under *Menuites sturi* (REDTENBACHER, 1873).

Current name: *Menuites sturi* (REDTENBACHER, 1873).

COLLIGNON, M. (1955): *Ammonites néocrétacées du Menabe (Madagascar). II. Les Pachydiscidae.* – Ann. Géol. Serv. Mines, 21, 98 pp., Paris.

***Pachydiscus haueri* COLLIGNON, 1955**

(Pl. 3, Figs. 1 a–d)

Coll. no.: GBA 1858/001/0006/02 (former coll. no. 3463).

Type: Holotype by monotypy is the specimen figured by HAUER (1858, p. 12, Pl. 3, Figs. 1–2.), syntype of *Ammonites Nebergicus* HAUER, 1858.

Type level: Early Maastrichtian.

Type locality: Krampen, Neuberg, Styria.

Type reference: COLLIGNON, 1955: p. 75, 81.

Revised by: KENNEDY & SUMMESBERGER (1986: p. 192) under *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873).

Remarks: See also *Pachydiscus (P.) nebergicus* (HAUER, 1858).

Current name: *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873).

PLÖCHINGER, B. (1955): Eine neue Subspecies des *Barroisiceras haberfellneri* v. Hauer aus dem Oberconiac der Gosau Salzburgs. – Sitz. ber. Österr. Akad. Wiss., math.-natw. Kl., Abt. I, 164/4–5, 203–206, Wien.

***Barroisiceras haberfellneri hemitissotiformis* PLÖCHINGER, 1955**

(Pl. 17, Figs. 1 a–d)

Coll. no.: GBA 1955/004/0001.

Type: Holotype by monotypy.

Type level: Late Turonian, Gosau Group, Grabenbach Formation.

Type locality: Strobl/Weißenbach, Salzburg; “Ofenwand” of early authors.

Type reference and figure: PLÖCHINGER, 1955: p. 203–206, Pl. 1, Figs. 1–2.

Revised and refigured by: SUMMESBERGER & KENNEDY (1996: p. 122, Pl. 6, Figs. 3–5) under *Barroisiceras haberfellneri* (HAUER, 1866).

Current name: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866).

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Generic names according to author who introduced the species name.

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Plate 1

Figs. 1 a–c: *Diplomoceras cylindraceum* (DEFRANCE, 1816), holotype of *Hamites hampeanus* HAUER, 1847,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1858/001/0001/03, x 0.5.

Scale bar = 1 cm.

1a



1b



1c



Plate 2

Fig. 1: *Munierceras gosauicum* (HAUER, 1858), holotype, original figure of HAUER (1858: Pl. 2, Figs. 7–9).

Figs. 2 a–d: *Pachydiscus (Pachydiscus) neubergicus* (HAUER, 1858), lectotype,
a), d) lateral views,
b) ventral view,
c) frontal view,
coll. no. GBA 1858/001/0006/01, natural size.

Scale bar = 1 cm.

1



8.



2a



2b



2c



2d



Plate 3

Figs. 1 a–d: *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873), holotype of *Pachydiscus haueri* COLLIGNON, 1955, and syntype of *Ammonites neubergicus* HAUER, 1866,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1858/001/0006/02, x 0.45.

Scale bar = 1 cm.



Plate 4

Figs. 1 a–c: *Hoploscaphites constrictus* (J. SOWERBY, 1817), lectotype of *Scaphites multinodosus* HAUER, 1858,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1858/001/0002a, x 1,5.

Figs. 2 a–b: *Barroisiceras* (*Barroisiceras*) *haberfellneri* (HAUER, 1866), lectotype,
a) lateral view,
b) frontal view,
coll. no. GBA 1866/001/0001, natural size.

Fig. 3: *Placenticerus milleri* (HAUER, 1866), syntype,
lateral view,
coll. no. GBA 1866/001/0002/01, natural size.

Figs. 4 a–b: *Gaudryceras mite* (HAUER, 1866), holotype,
a) lateral view,
b) frontal view,
coll. no. GBA 1866/001/0003, natural size.

Scale bar = 1 cm.

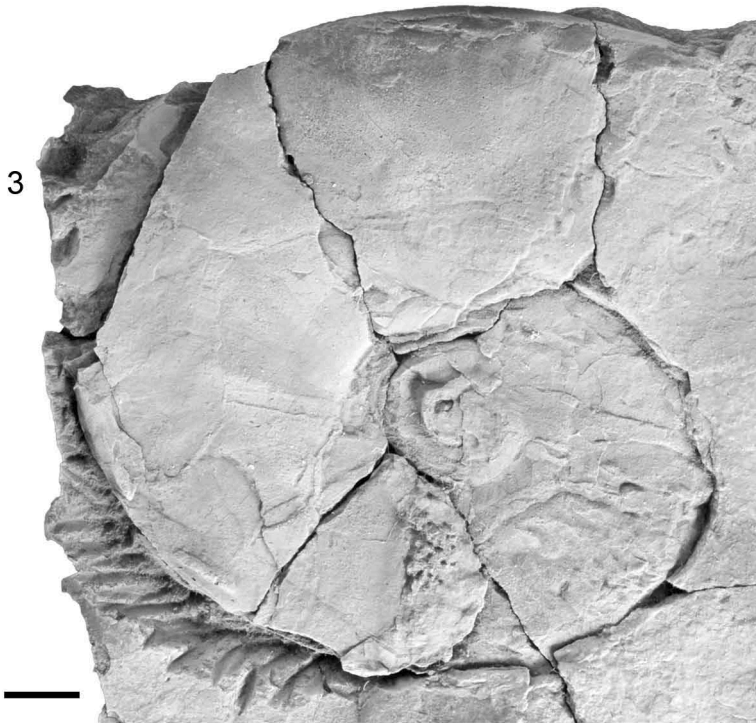
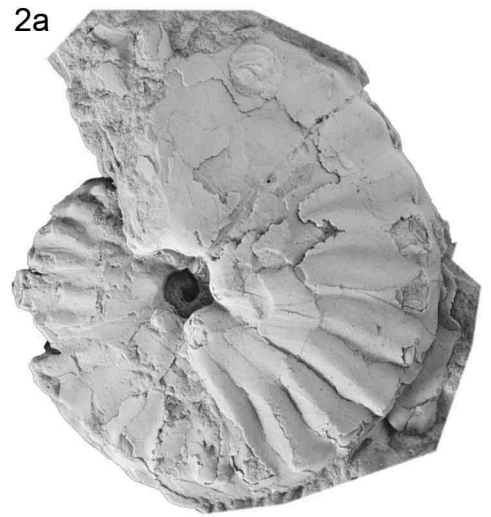
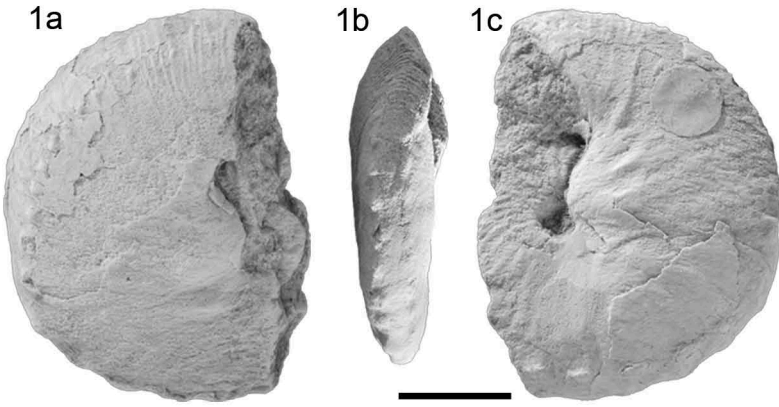


Plate 5

Figs. 1 a–b: *Gaudryceras mite* (HAUER, 1866), holotype,
a) lateral view,
b) ventral view,
coll. no. GBA 1866/001/0003, natural size.

Figs. 2 a–d: *Trachyscaphites pulcherrimus* (ROEMER, 1841), holotype of *Scaphites multinodosus* HAUER, 1866,
a), b) lateral views,
c) frontal view,
d) ventral view,
coll. no. GBA 1866/001/0004, x 1,5.

Figs. 3 a–b: *Tridenticeras binodosum* (HAUER, 1866), holotype,
a) apical view,
b) lateral view,
coll. no. GBA 1866/001/0005, natural size.

Fig. 4: *Belemnitella hoeferi* (SCHLOENBACH, 1867), lectotype, original figure of SCHLOENBACH (1867: Pl. 16, Fig. 1).

Scale bar = 1 cm.

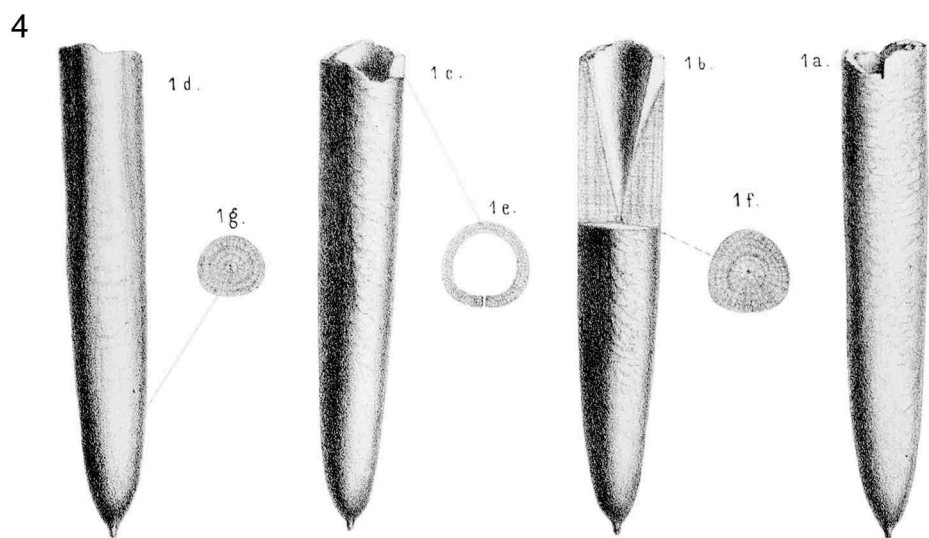
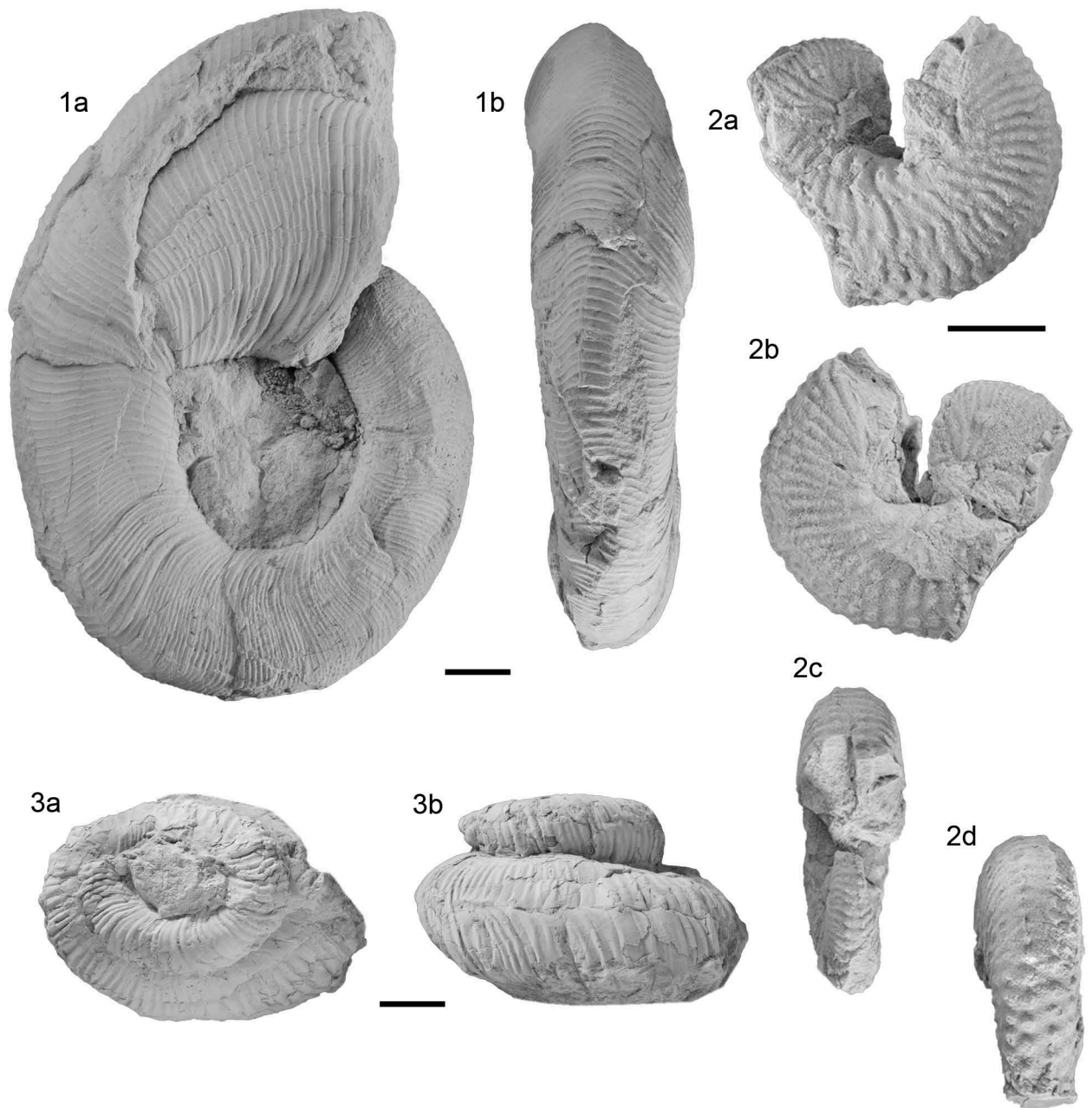


Plate 6

Figs. 1 a–d: *Pseudokosmaticeras galicianum* FAVRE, 1869, lectotype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1869/006/0010/01, natural size.

Figs. 2 a–c: *Pseudokosmaticeras galicianum* FAVRE, 1869, paralectotype,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1869/006/0010/02, natural size.

Figs. 3 a–d: *Cimomia gosavica* (REDTENBACHER, 1873), holotype,
a) frontal view,
b, c) lateral views,
d) ventral view,
coll. no. GBA 1873/001/0003, natural size.

Scale bar = 1 cm.

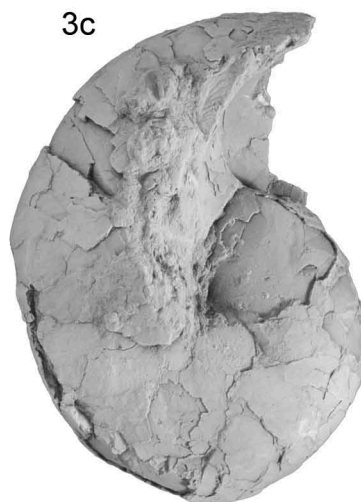
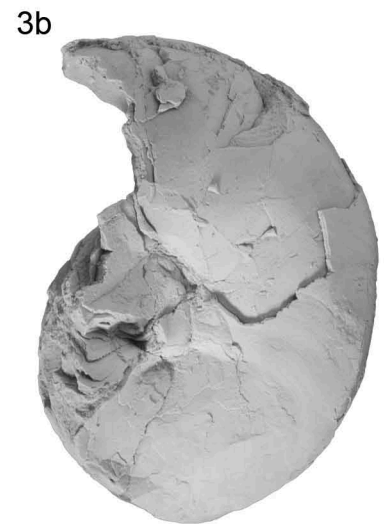
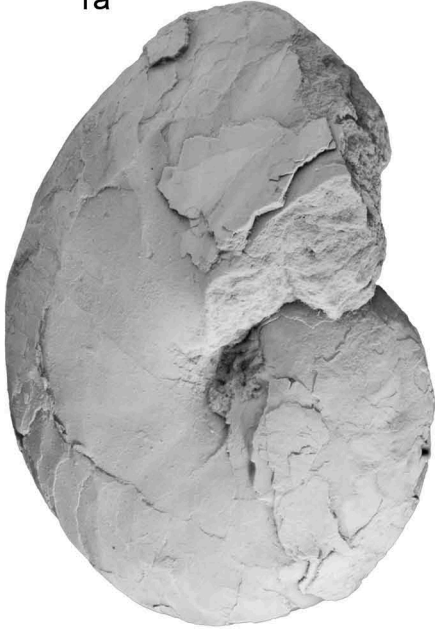


Plate 7

Figs. 1 a–d: *Angulithes (Angulithes) neubergicus* (REDTENBACHER, 1873), syntype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1873/001/0005/01, natural size.

Scale bar = 1 cm.

1a



1b



1c



1d



Plate 8

Figs. 1 a–d: *Angulithes (Angulithes) neubergicus* (REDTENBACHER, 1873), syntype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1873/001/0005/02, natural size.

Scale bar = 1 cm.



Plate 9

Figs. 1 a–c: *Eutrephoceras sublaevigatum* (D'ORBIGNY, 1840), holotype of *Nautilus resupinatus* REDTENBACHER, 1873,
a) ventral view,
b, c) lateral views,
coll. no. GBA 1873/001/0004, x 1,5.

Figs. 2 a–d: *Pseudophyllites* cf. *indra* (FORBES, 1846), holotype of *Ammonites anaspastus* REDTENBACHER, 1873,
a) ventral view,
b), d) lateral views,
c) frontal view,
coll. no. GBA 1873/001/0016, natural size.

Figs. 3 a–d: *Peroniceras* (*Zuluiceras*) *bajuvaricum* (REDTENBACHER, 1873), lectotype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no.: GBA 1873/001/0012, natural size.

Scale bar = 1 cm.

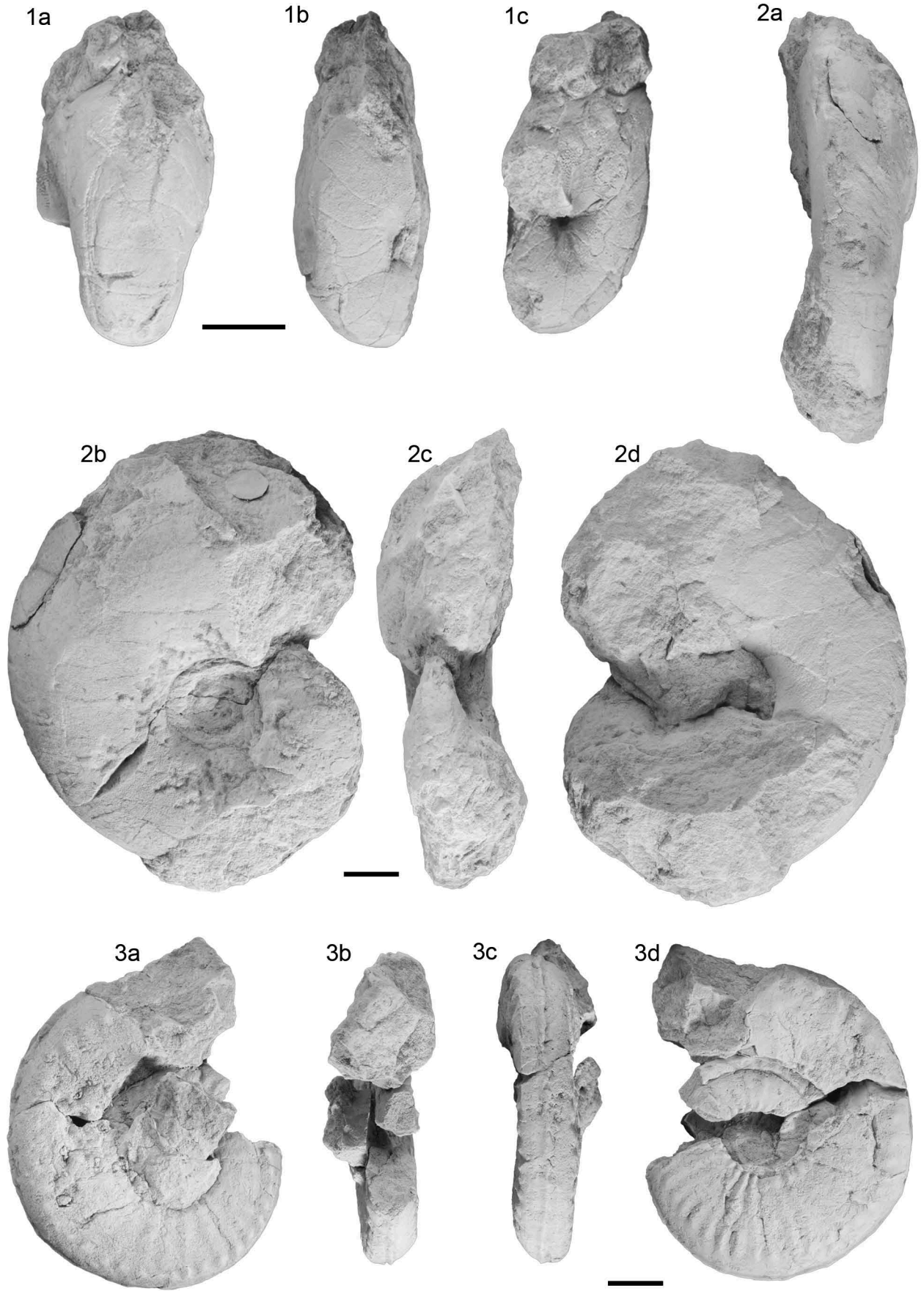


Plate 10

Figs. 1 a–c: *Pseudokossmaticeras brandti* (REDTENBACHER, 1873), holotype,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1873/001/0011, natural size.

Scale bar = 1 cm.

1a



1b



1c

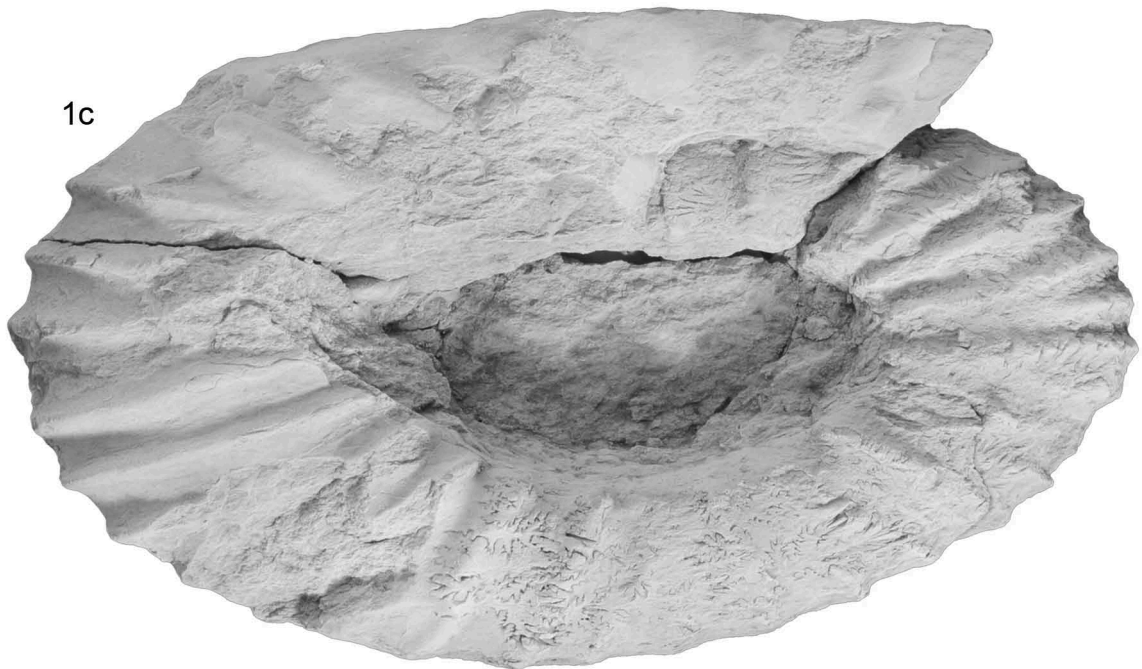


Plate 11

Figs. 1 a–d: *Peroniceras (Peroniceras) czoernigi* (REDTENBACHER, 1873), lectotype,
a), b) lateral views,
c) frontal view,
d) ventral view,
coll. no. GBA 1873/001/0010/01, natural size.

Figs. 2 a–c: *Peroniceras (Peroniceras) czoernigi* (REDTENBACHER, 1873), paralectotype,
a), b) lateral views,
c) ventral view,
coll. no. GBA 1873/001/0010/02, natural size.

Scale bar = 1 cm.

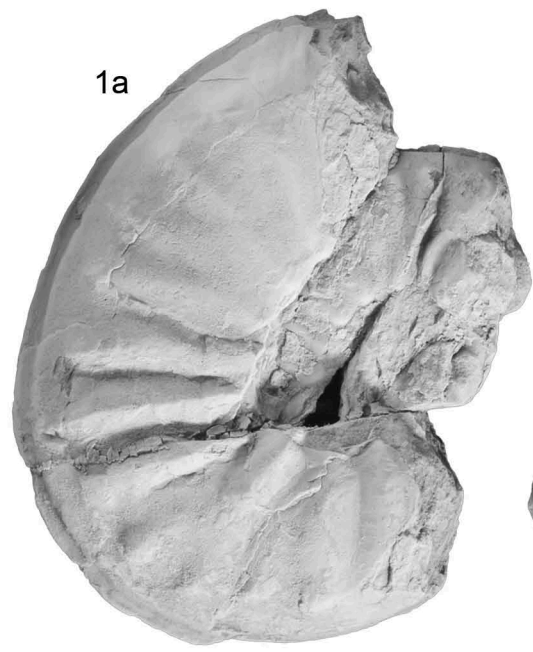


Plate 12

Figs. 1 a–c: *Pseudokosmaticeras duereri* (REDTENBACHER, 1873), holotype,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1873/001/0022, natural size.

Figs. 2 a–c: *Pachydiscus (Pachydiscus) epiplectus* (REDTENBACHER, 1873), paralectotype,
a), c) lateral views,
b) frontal view,
coll. no. GBA 1873/001/0024, natural size.

Figs. 3 a–b: *Protexanites (Protexanites) eugnamtus* (REDTENBACHER, 1873), holotype,
a) lateral view,
b) ventral view,
coll. no. GBA 1873/001/0021, natural size.

Scale bar = 1 cm.

1a



1b



1c



2a



2b



2c



3a



3b



Plate 13

Figs. 1 a–d: *Tissotioides (Tissotioides) haplophyllus* (REDTENBACHER, 1873), holotype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1873/001/0007, natural size.

Fig. 2: *Hauericeras lagarum* (REDTENBACHER, 1873), syntype,
lateral view,
coll. no. GBA 1873/001/0015, natural size.

Figs. 3 a–c: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866), lectotype of *Ammonites Päon* REDTENBACHER, 1873,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1873/001/0009/01, natural size.

Figs. 4 a–b: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866), paralectotype of *Ammonites Päon* REDTENBACHER, 1873,
a) lateral view,
b) ventral view,
coll. no. GBA 1873/001/0009/02, x 2.

Scale bar = 1 cm.

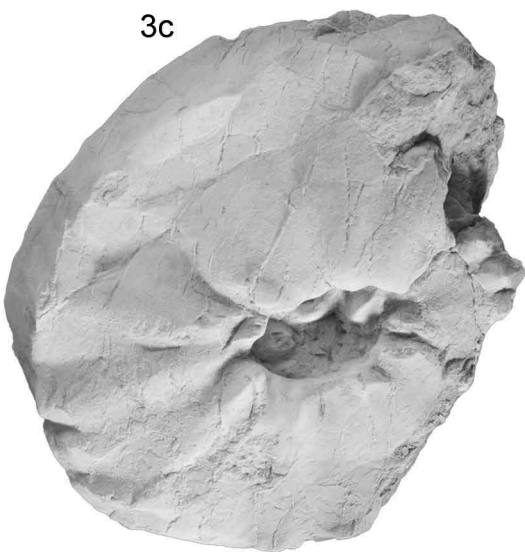
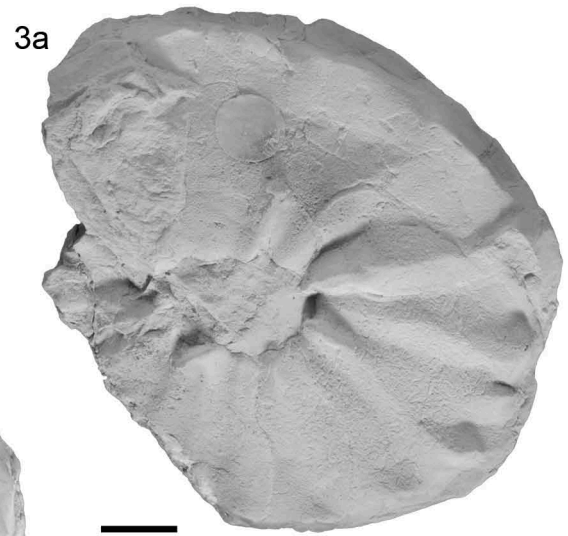
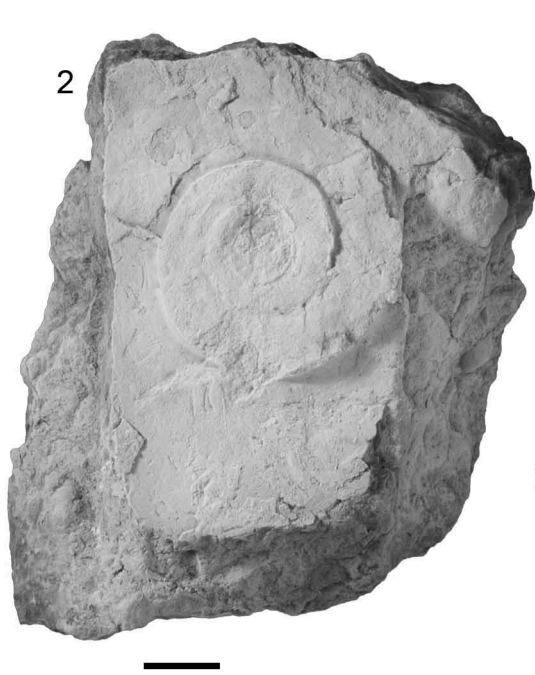
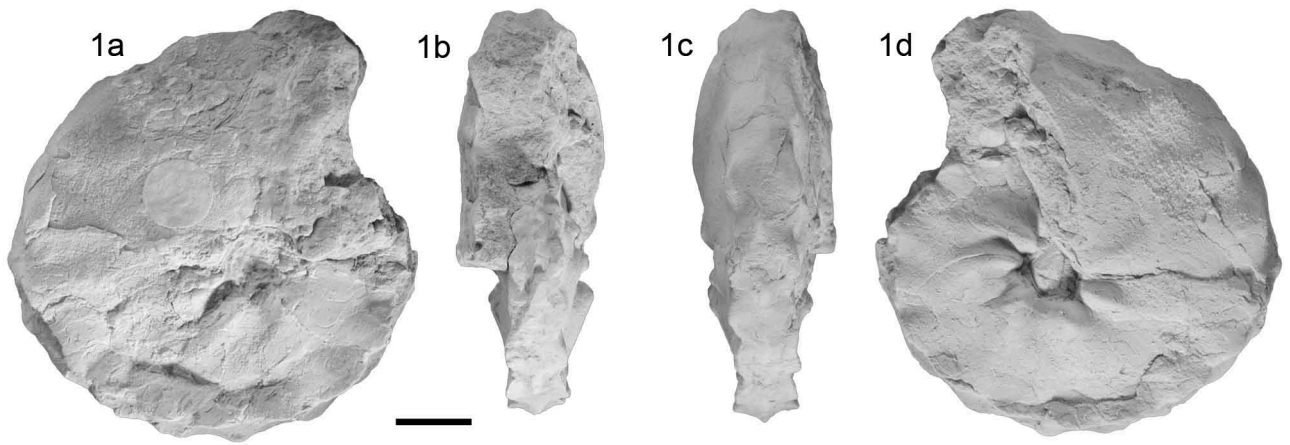


Plate 14

Figs. 1 a–d: *Pseudophyllites postremus* (REDTENBACHER, 1873), lectotype,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1873/001/0018, natural size.

Figs. 2 a–d: *Peroniceras (Zuluiceras) propoetidum* (REDTENBACHER, 1873), holotype,
a) frontal view,
b) ventral view,
c), d) lateral views,
coll. no. GBA 1873/001/0020, natural size.

Scale bar = 1 cm.

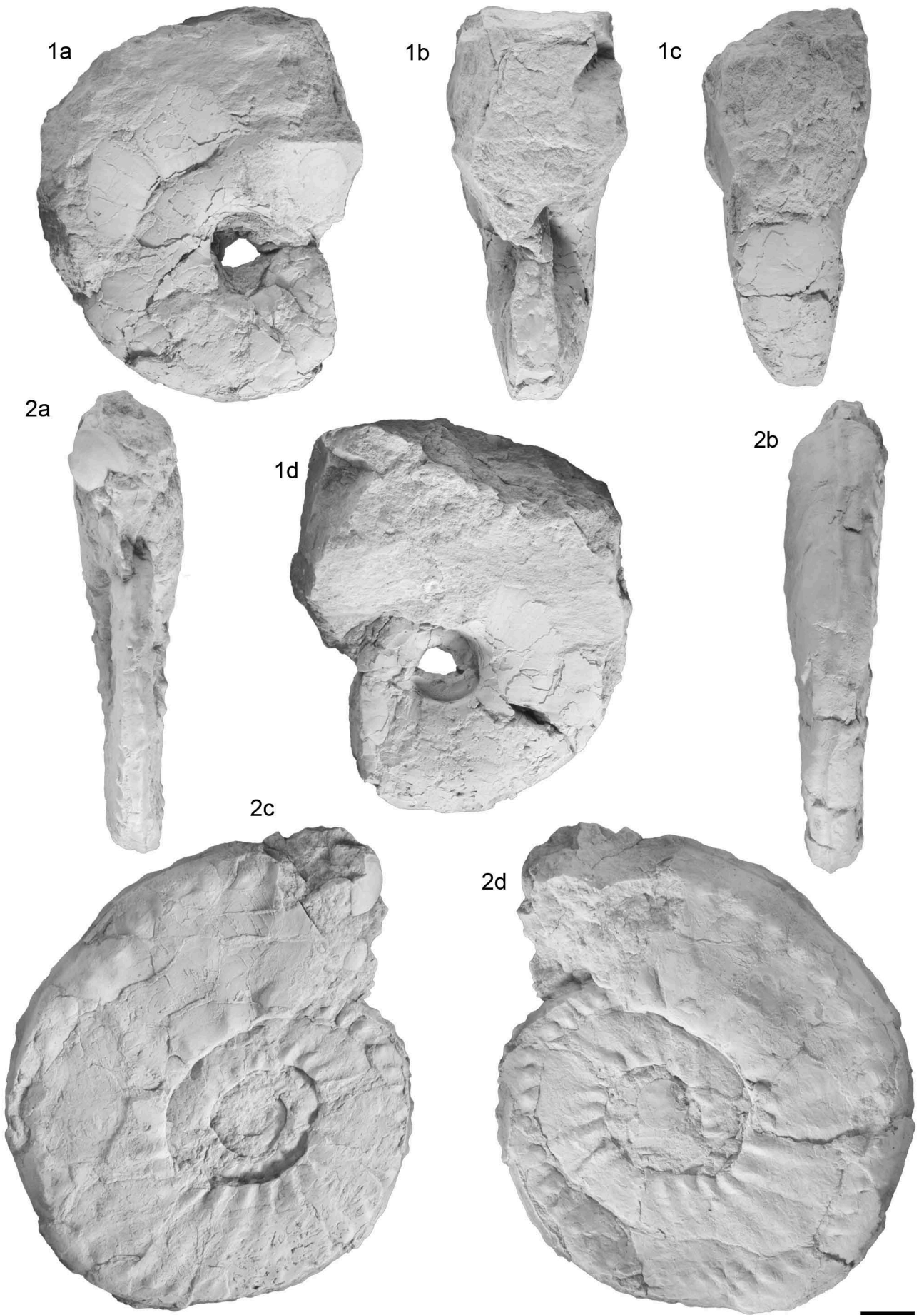


Plate 15

Figs. 1 a–d: *Texanites quinquenodosus* (REDTENBACHER, 1873), lectotype,
a), d) lateral views,
b) ventral view,
c) frontal view,
coll. no. GBA 1873/001/0013/01, x 0.8.

Scale bar = 1 cm.

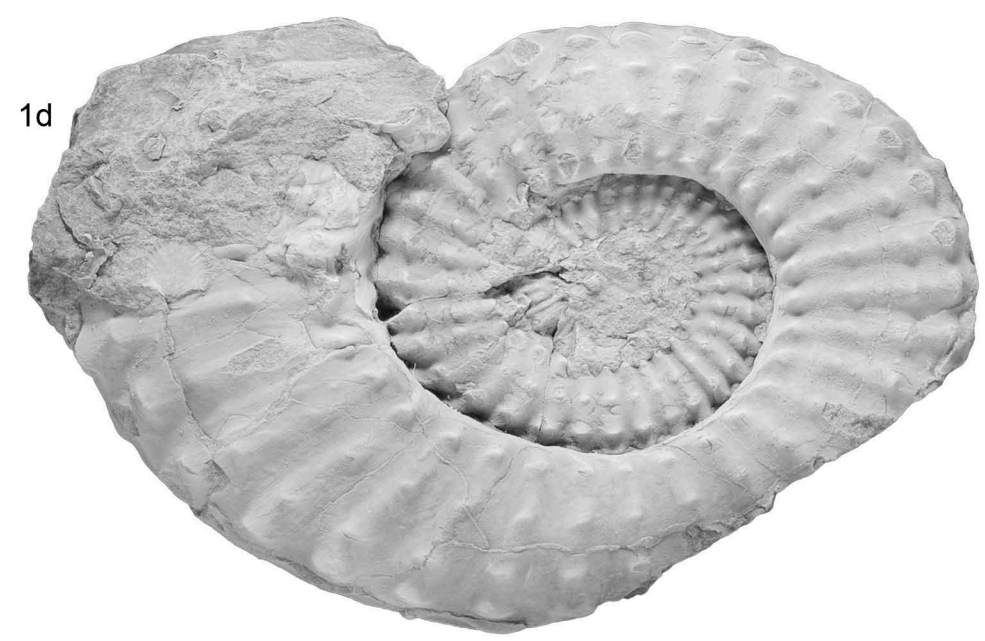


Plate 16

Figs. 1 a–d: *Texanites quinquenodosus* (REDTENBACHER, 1873), paralectotype,
a), b) lateral views,
c) frontal view,
d) ventral view,
coll. no. GBA 1873/001/0013/02, natural size.

Figs. 2 a–c: *Hauericeras schlueteri* (REDTENBACHER, 1873), holotype,
a), b) lateral views,
c) ventral view,
coll. no. GBA 1873/001/0017, x 1.5.

Figs. 3 a–c: *Menuites sturi* (REDTENBACHER, 1873), holotype,
a), c) lateral views,
b) ventral view,
coll. no. GBA 1873/001/0033, x 2.

Scale bar = 1 cm.

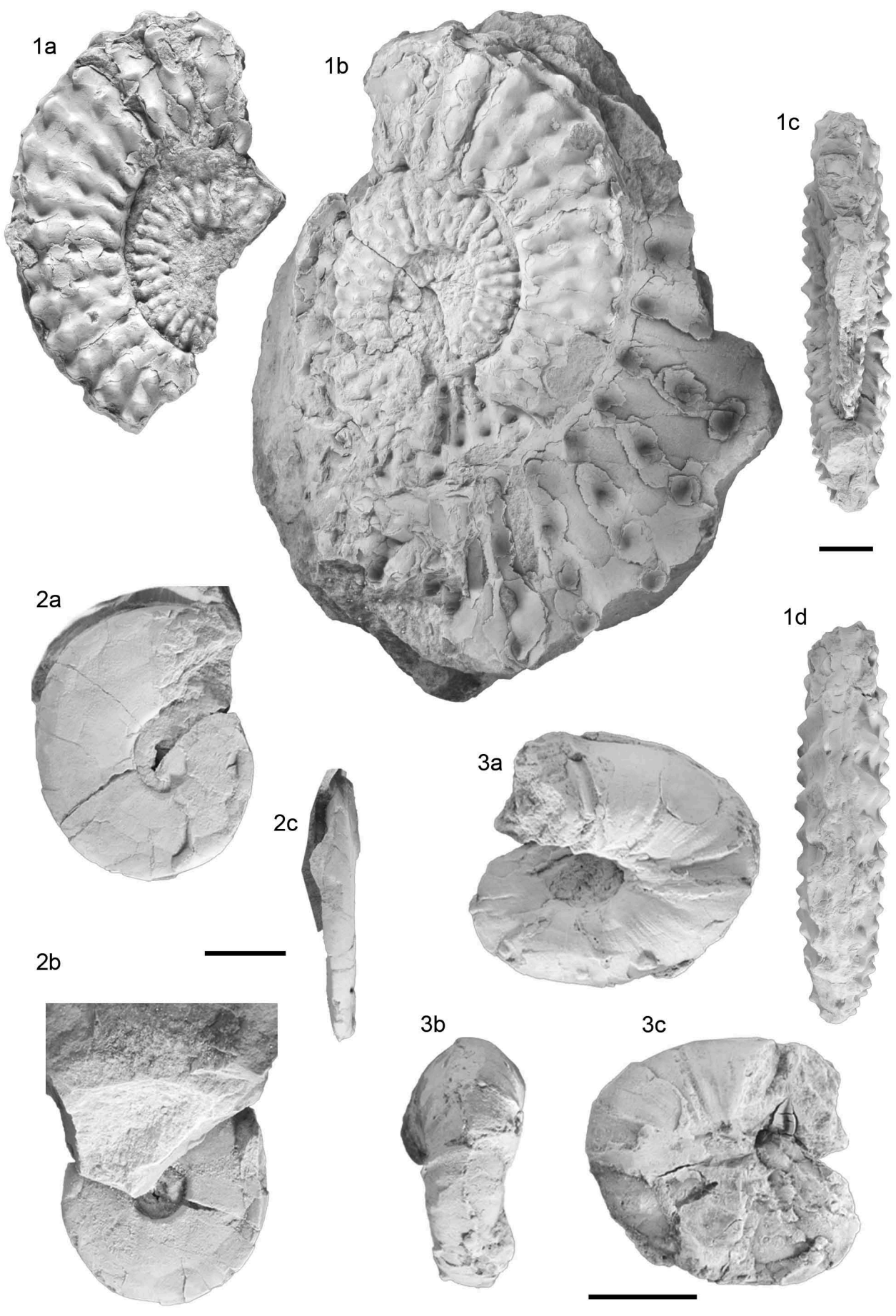


Plate 17

Figs. 1 a–d: *Barroisiceras (Barroisiceras) haberfellneri* (HAUER, 1866), holotype of *Barroisiceras haberfellneri hemitissotiformis* PLÖCHINGER, 1955,
a), d) lateral views,
b) frontal view,
c) ventral view,
coll. no. GBA 1955/004/0001, natural size.

Scale bar = 1 cm.

