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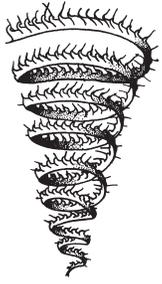
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Cover figure: *Subnebrodites planula* Spath,
1925, lectotype, from southern Germany



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THE UPPER OXFORDIAN AND LOWER KIMMERIDGIAN AMMONITE GENERA *IDOCERAS* BURCKHARDT, 1906, AND *SUBNEBRODITES* SPATH, 1925

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ABSTRACT

The type species of the genera *Idoceras* Burckhardt and *Subnebrodites* Spath are clarified in order to preserve the current universal usage of the Planula Zone in the Upper Oxfordian and the Balderus Zone in the Lower Kimmeridgian of the Submediterranean Province. To protect both zones, the identification of *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, is investigated and found to be a *nomen nudum*.

Key words: Ammonoidea, Perisphinctoidea, Ataxioceratinae, Ataxoceratinae.

INTRODUCTION

This publication is to clarify the nomenclature of the type species of the genera *Idoceras* and *Subnebrodites* and thereby preserve the use of *Subnebrodites planula* and *Idoceras balderum* as index species of the top biostratigraphical zone of the Upper Oxfordian and the bottom biostratigraphical zone of the Lower Kimmeridgian, respectively, in the Submediterranean Province.

Idoceras and *Subnebrodites* are central to attempts to correlate and fix a unified Oxfordian–Kimmeridgian boundary for the Boreal and Tethyan Realms. Especially during the last two decades, they have been used in a large number of papers, memoirs, and monographs dealing with the Upper Oxfordian and Lower Kimmeridgian in Europe and elsewhere.

During revisions currently in progress for the Jurassic Ammonoidea volume of the *Treatise on Invertebrate Paleontology*, ambiguity appeared about the type species of *Subnebrodites* Spath, 1925, long neglected or considered to be a synonym of *Idoceras* Burckhardt, 1906. The search for an answer led us to question the validity of the type species of *Idoceras*. Resolution of these problems is important because the type species of both genera are currently used as index

species of zones of the Upper Oxfordian and Lower Kimmeridgian in the Submediterranean Province.

IDOCERAS AND *SUBNEBRODITES* AND THEIR TYPE SPECIES

The genus *Idoceras* was proposed by Burckhardt (1906, p. 38) for 13 new species in Mexico belonging to the two mainly European groups of *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, and *Ammonites balderus* Oppel, 1863, but without fixing a type species. In discussing Burckhardt's genus, Spath (1925, p. 129) referred to “the true *Idoceras* of the *balderum* group,” a statement that has been accepted as a valid subsequent designation of *Ammonites balderus* Oppel as the type species of *Idoceras*. Spath also noted that the “early evolute *planula* ‘group’ and the late involute *balderum* ‘group’ are separable . . . not only morphologically but also stratigraphically,” and he therefore proposed the new genus *Subnebrodites* with the following text: “It is thus advisable to distinguish the *planula*-group by a new name *Subnebrodites*, nov., the type to be the species to which belongs a Wüttemberg example (848) from the collection of the late Dr. T. Wright, agreeing with *Ammonites planula* (Hehl), Zieten, as figured by Quenstedt (*Ammoniten des Schwäbischen Jura*, 1888, p.

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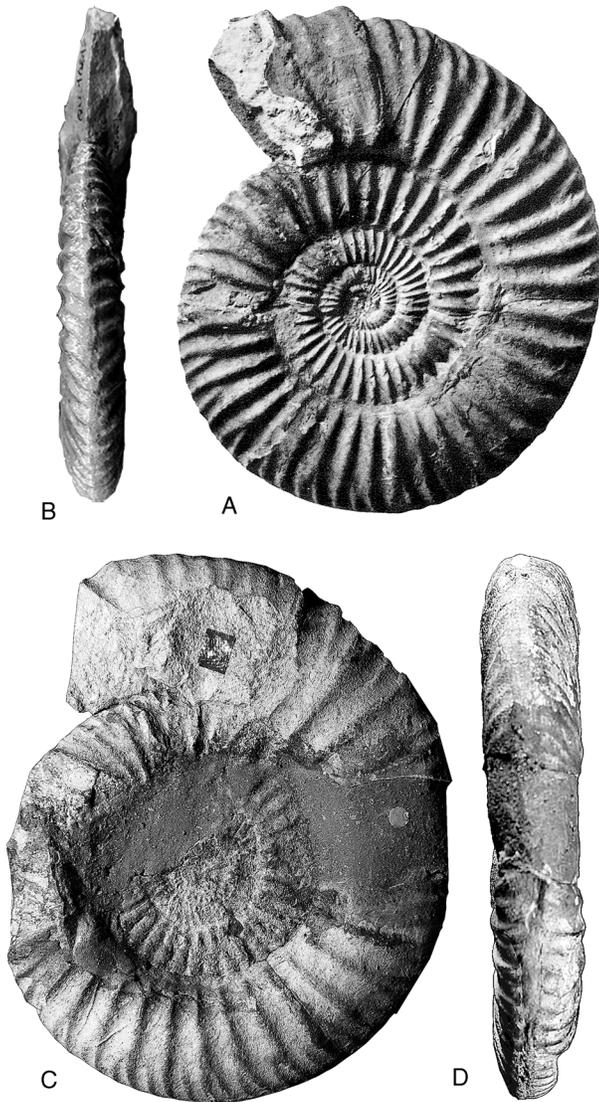


Figure 1. *Subnebrodites planula* Spath. A–B, lectotype, microconch, Wasseralfingen, Württemberg, Germany, $\times 0.72$; A, Ziegler, 1959, pl. 1,6; B, Geologisches Universität Tübingen, Germany, Ce 5/108/2; C–D, paralectotype, NHMUK C.26579, probably a macroconch, Württemberg, Germany, $\times 0.72$ (The Natural History Museum, London, England).

974, pl. 108, fig. 2 only). In spite of the differences in the drawings, this appears to be Hehl's original type form".

Quenstedt identified the specimen figured in his pl. 108,2, as *Ammonites planula* Zieten *gigas*, and in selecting pl. 108,2 only, Spath was deliberately misidentifying the type species. Such cases are covered by Article 67.13.1 (and the related Articles 11.10, 50.1.2 and 70.4) of the Code of Zoological Nomenclature (ICZN, 1999, p. 69), which states that a type species fixed by the deliberate misidentification of a previous established name "is deemed to be a new nominal species" proposed by that author. So the type species of *Subnebrodites* is *S. planula* Spath, 1925, *nom. nov. pro Ammonites planula* Zieten *gigas* Quenstedt, 1888 in 1887–1888, pl. 108,2, *non Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, p. 9, by original designation.

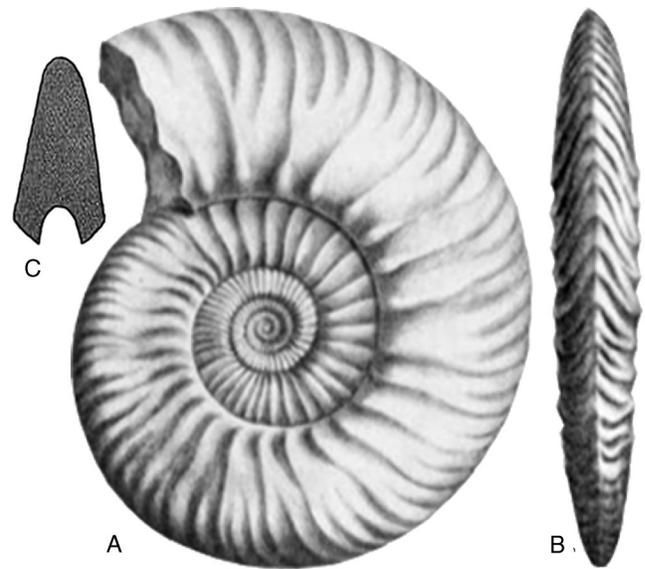


Figure 2A–C. *Ammonites planula* Hehl in Zieten, holotype, Donzdorf, Württemberg, Germany, $\times 0.6$ (Zieten, 1830, pl. 7,5a–c).

As proposed by Spath, the type series of *Subnebrodites planula* Spath, 1925 consists of two specimens: the lectotype (Fig. 1A, 1B) designated herein, figured by Quenstedt, 1888 in 1887–1888, pl. 108,2 (the original specimen is in the Geologisches Institut Universität Tübingen, Ce 5/108/2), and the paralectotype (Fig. 1C, 1D) a Württemberg specimen in the collection of Dr. T. Wright (no. 848; now in The Natural History Museum, London, England, register number NHMUK C.26579), which closely resembles the lectotype. *S. planula* Spath is evolute, with oval whorl sides and a rounded venter; moderately strong, straight primary ribs, mostly bifurcate at the ventro-lateral shoulder into secondaries that curve gently forwards on the venter, ending at a smooth, mid-ventral band; a few primary ribs remain single. This is the identity of the species that has given its name to the *Subnebrodites planula* Zone of the Upper Oxfordian in the Submediterranean Province.

The identity of *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, p. 9, pl. 7,5 remains to be established. Zieten's figures (Fig. 2A–C) are of an ammonite that is more involute than *Subnebrodites*, has higher, more quickly expanding whorls, slightly curved or sinuous primary ribs dividing lower on the upper half of the whorl into two or three secondaries that curve more strongly forwards, no constrictions, and small, radially elongated tubercles on the primary ribs at the umbilical edge. The whorl section is trapezoidal towards a narrowly rounded venter (Fig. 2C) or a bluntly angled venter (Fig. 2B). This comparison suggests that Zieten's ammonite is at least specifically different from *Subnebrodites planula* Spath, 1925, and it could belong to a different genus (possibly *Idoceras*). For these reasons we disagree with Spath's (1925, p. 129) statement that "In spite of the differences in the drawings, this [Quenstedt, 1888 in 1887–1888, pl. 108,2] appears to be Hehl's original type form." But the form of the venter in Zieten's drawings is inconsistent and suggests

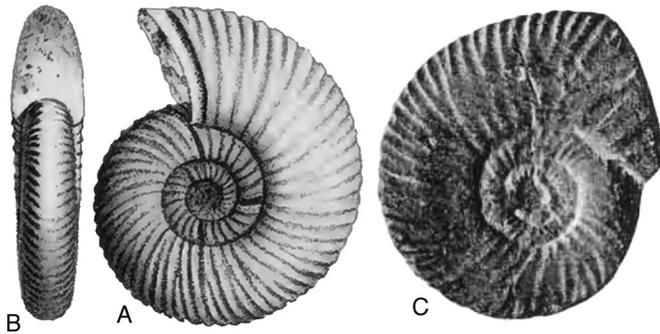


Figure 3. *Idoceras balderum* (Oppel), Aargau, Bremgarten, Switzerland; A–B, holotype $\times 1$ (Oppel, 1863, pl. 67,2); C, plaster cast of holotype, $\times 1$ (Wegele, 1929, pl. 9,7).

that the original specimen might have been crushed or distorted. According to Schairer (1989, p. 101), Hehl's collection was purchased by Quenstedt and housed in the University of Tübingen, but the specimen cannot now be found there and must be considered lost. In the absence of the original specimen and the inconsistency of Zieten's drawings, our opinion is that *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, is not identifiable from the original description and figures and is therefore a *nomen nudum*.

Idoceras Burckhardt, 1906 (type species *Ammonites balderus* Oppel, 1863) is more involute than *Subnebrodites*, with higher whorls, an oval whorl section, rounded venter, and straight to gently curving ribs, some single, others dividing on the upper half of the whorl into forwardly curving secondaries that end at the smooth central part of the venter; there are about three constrictions per whorl, which follow the line of the ribs (Fig. 3A, 3B).

So, it is important to preserve *Subnebrodites planula* Spath, 1925 (*nom. nov.* for *Ammonites planula* Quenstedt, 1888 in 1887–1888, pl. 108,2 only, *non* *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833) as the type species of *Subnebrodites* on account of its long use and particularly as index species of the Planula Zone Upper Oxfordian; and to confirm and stabilize the use of *I. balderum* (Oppel) as index species of the Balderum Zone Lower Kimmeridgian.

SUBNEBRODITES PLANULA AND IDOCERAS BALDERUM AS ZONAL INDEX SPECIES IN THE STANDARD ZONAL SCHEME OF THE SUBMEDITERRANEAN PROVINCE

The Planula Zone was first used by Engel (1908, p. 404), but its later proposal by Wegele (1928 in 1928–1929, p. 145) was the source of the universal use of both Planula Zone and Planula Subzone in the Upper Oxfordian for the past 85 years. The index species is usually identified as *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, but the figured specimens to which authors always refer are: *Ammonites planula gigas* Quenstedt, 1888 in 1887–1888, pl. 108,2 (a microconch) and *Ammonites planula cornutus* Quenstedt, 1888 in 1887–1888, pl. 108,13 (a macroconch), as first pointed out by Énay (1966, p. 570–571). Now that the original of Quenstedt, 1888 in 1887–1888, pl. 108,2 has been designated as the lectotype

of *Subnebrodites planula* Spath, 1925, the Planula Zone is protected against being referred back to *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, of which *Subnebrodites planula* Spath, 1925, is not a homonym.

The Balderum Zone was also first used by Engel (1908, p. 404), but its modern universal usage in the past 50 years is based on the later proposal by Karvé-Corvinus (1966, p. 130). If it is considered that *Ammonites planula* Hehl in Zieten, 1830 in 1830–1833, might be the macroconch dimorph of *Idoceras balderum*, the only way to prevent the Balderum Zone from being replaced by another Planula Zone in the Lower Kimmeridgian is to either declare Hehl's species unidentifiable and therefore a *nomen nudum*, or apply to the ICZN for a ruling that would suppress Hehl's species for the Purpose of Homonymy. As has been shown above, Hehl's species cannot be satisfactorily identified from the original description and figures, and the original specimen is lost, so application to the ICZN for a ruling is not necessary.

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