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Historic Pennsylvanian Ammonoids From Iowa

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Abstract: The Pennsylvanian goniatite species *Wiedeyoceras sanctijohnanis* (Wiedey) was described in 1929 on the basis of two specimens from Greene County, Iowa, collected by O. H. St. John about 1865. An additional lot of specimens representing this species has been secured from a locality only about four miles northwest of the original site. The new material serves to give a better understanding of this fossil and a basis for comparison with comparable specimens from Missouri and elsewhere.

**INTRODUCTION**

Late Paleozoic ammonoids are rare throughout the northern Midcontinent region; only seven specimens in three species at three localities have been described from Iowa. However, some of the first Carboniferous ammonoids to be discovered in America, and the second to be reported in Iowa were secured by Orestes H. St. John 100 years ago at the Bussey Coal Mine near the Raccoon River in Greene County. The history of these specimens in the following sixty years is uncertain, for they were not mentioned again until 1929, following rediscovery in the collections at Stanford University. The exact source of the specimens had also remained somewhat of a mystery until the past year when it was possible to duplicate the species at a locality just a few miles from the original site.

**ACKNOWLEDGMENTS**

The authors are indebted to Siemon W. Muller and Myra Keen for making the Stanford types available for study. Also, William Burger of Jefferson, Iowa, studied the site of the Greene County Coal and Mining Company operation and discovered the occurrence of the fossils there; Joe Strachan, previously the owner and manager of the mine, gave data on operations. Judge William Hanson, who now owns the old Bussey property, extended a cordial welcome; he and his son, Jay, assisted in examination of the rock exposures. Floyd W. Beghtel aided in reinterpretation of the type specimens, and James A. McCaleb participated in the field collection of new materials. Comparative materials from Illinois were loaned for study by Charles W. Collinson and Lois S. Kent.

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Figure 1. Index map of southeastern Greene County, Washington Township and a portion of adjacent Franklin Township. The Greene County Coal and Mining Company shaft is located about one-half mile south of Squirrel Hollow Park.

SYSTEMATICS

Superfamily GONIATITACEAE de Haan, 1825
Family HOMOCERATIDAE Spath, 1934
Genus WIEDEYOCERAS Miller, 1932

Type species: *Eumorphoceras sanctijohanis* Wiedey, 1929; original designation.

The initial presentation of this type species contained minor discrepancies which led to a misinterpretation of *Wiedeyoceras*; this Desmoinesian genus was subsequently identified with Upper Pennsylvanian and Lower Permian forms representing immature stages of *Gonioloboceras*. Eventually, species now referable to *Wiedeyoceras* were described from Illinois, Missouri, and Texas, as representatives of *Anthracoceras* Frech, 1899, a Late Mississippian and Early Pennsylvanian genus. A restudy of that genus by Miller & Furnish (1958) led to the proposal of *Gordonites* as a name for the Middle Pennsylvanian group. A re-
examination of the primary types of *Gordonites* and *Wiedeyoceras* reveals that the two are synonyms.

As herein emended, the genus *Wiedeyoceras* constitutes an ammonoid taxon of Morrowan to Desmoinesian age. Component species usually are found as small shells with a maximum diameter of about 50 mm.; the conch is subdiscoidal to subglobular and without conspicuous ornament. Biconvex growth lines may be fasciculate to form faint umbilical nodes. Well developed transverse constrictions are present on conchs 15 mm. or less in diameter; these constrictions vary in frequency to a maximum of 3 per volution. Umbilicus to diameter ratio decreased with growth of the shell; after the fourth or fifth volution, the ratio is only about 15 percent. Body chamber is one volution in length; the apertural margin was slightly flared, and the ventrolateral salients were accentuated at full maturity.

The suture of *Wiedeyoceras* has a simple goniatitid form. Saddles are rounded, and lobes are narrowly rounded to angular. Prongs of the ventral lobe are nearly equal or slightly smaller than the secondary ventral saddle and approximate one-fourth to one-third the area of the lateral lobe. The ventral saddle is only about one-half the height of adjacent saddles. The siphuncle appears to be relatively simple but prochoanitic.

Type *Wiedeyoceras sanctijohanis* was derived from the lower portion of the Desmoinesian Cherokee Group (Middle Pennsylvanian) in central Iowa, probably about the Whitebreast Coal horizon. Forms interpreted to be closely similar have been secured from comparable stratigraphic levels in Missouri and Oklahoma. Congeneric species have been described from the Desmoinesian of Illinois and Texas, and the Atokan and Morrowan of Arkansas. Others referred to this taxon occur in Nevada and Argentina. Additional undescribed material has been examined from Oklahoma. The rather generalized nature of shell characteristics suggests that the genus will not be a useful index fossil; it has not been recognized as an important link in a phylogenetic series.

**Wiedeyoceras sanctijohanis** (Wiedey)

*Figure 2*


*Wiedeyoceras sanctijohanis* (Wiedey) MILLER, 1932, Jour. Paleont., v. 6, p. 79, 83; MILLER & CLINE, 1934, ibid., v. 8, p. 179; PLUMMER & SCOTT, 1937, Texas Univ. Bull. 3701, p. 177, text-fig. 38; MILLER, 1950, Iowa Acad. Sci.,
Figure 2. Diagrammatic illustrations of *Wiedeyoceras sanctijohanis* (Wiedey) based upon specimens from the Pennsylvanian Cherokee Group at the Squirrel Hollow vicinity, Greene County. A, B, apertural and lateral views of a well preserved specimen (SUI 12386), X4. C, D, suture drawings of the figured specimen and an associated variant (SUI 12387), X8.

Description.—The original type specimens of *Wiedeyoceras sanctijohanis* are well preserved in pyritic dark limestone. The suture pattern on the holotype is reasonably clear. Also, a part of the shell is preserved. In general, specific characters represent those outlined for the genus.

The holotype of *W. sanctijohanis* appears to be complete and fully mature at nearly 60 mm. diameter. Except for fragments, all the other specimens examined are smaller.

Remarks.—Direct comparison of the type specimens of *Wiedeyoceras sanctijohanis* and *W. missouriense* reveals that these two species are closely related (Furnish & Beghtel, 1961, p. 293). A fairly large number of additional specimens that have become available since the original descriptions display a relatively small amount of intraspecific variation. *W. wanlessi*, described from Illinois, is also related to *W. sanctijohanis* but is distinctly different; the Illinois species appears to have reached a diameter of only about 20 mm. at maturity. Plummer & Scott (1937, p. 323) based their species in part upon specimens from the lower Cherokee of Missouri and the lower Strawn of Texas; no illustrations or specific localities are presented for these secondary types. The single limonitic internal mold from southern Oklahoma designated as type of *W. oklahomense* (Miller & Owen, 1939) constitutes a taxon which falls within a group including the type species.

Occurrence.—Generalized correlation of the beds containing *Wiedeyoceras sanctijohanis* and related forms in the Midcontinent has been established (Moore, et al., 1944). This group of fossils appears to be restricted to the lower Desmoinesian Stage.

The two type specimens of *Wiedeyoceras sanctijohanis* were secured from an exposure in a ravine near the Bussey Coal Mine about four miles southwest of Rippey, Greene County (NW 1/4 Sec. 29, T. 82 N., R. 29 W.). This mine probably ceased operation before 1900, but the stratigraphic sequence described from the ravine (St. John, 1870, p. 135) can still be observed; St. John incorrectly reported the locality in adjacent Section 30. Fossiliferous nodules occur in place about 4 feet above an 18-inch coal. Brachiopods and nautiloids have recently been found in the same dark concretionary layer which provided the goniatites and other fossils a hundred years ago. In our new collections, the pyritized shells associated with white crystalline calcite have the same preservation as the original types (Locality 2 of the index map, Text-figure 1).
Two shaft mines operated by the Riverside Coal Company were opened in the immediate vicinity of the old Bussey Mine. Others have been operated within a radius of a few miles, but the only one from which fossils have been secured is located about four miles north-northwest of the Bussey Mine. The refuse dumps of the Greene County Coal and Mining Company on the M. D. Elvin farm are relatively fresh, for the site has been abandoned for only about 15 years. Excavations from a shaft (SE ¼ Sec. 1, T. 82 N., R. 30 W.) east of the Raccoon River were carried for a radius of one-fourth mile. Two coals were mined, the upper one with a thickness of 4 feet at a depth of 140 feet and a better 5-foot coal about 20 feet below. Pyritic concretions associated with the coal have provided about 50 identifiable ammonoids; most are referable to *W. sanctijohanis* but are generally smaller than the types. Additionally, five small specimens of *Gastrioceras cf. montgomeryense* (Miller & Gurley, 1896) were found associated. Also, the types of the sporomorph *Cirratriradites maculatus* Wilson & Coe, 1940, were derived from coal in this mine.

The coal-bearing Pennsylvanian strata of Greene and Boone Counties in Iowa are somewhat dissociated from the outcrop area in southern Iowa and adjacent Missouri, where more detailed work has been completed (Weller, et al., 1942). Also, there may be local structural complications (St. John, 1870, p. 135), but all the fossils we are studying from Greene County are believed to have been derived from approximately the same stratigraphic level. L. M. Cline (personal communication) regards all the mineable coals, and directly associated strata which carry *Wiedeyoceras sanctijohanis*, as belonging in the lower Cherokee Group, lower Desmoinesian Stage of the Middle Pennsylvanian. Probably no more precise correlation is appropriate at this time.

In areas other than Iowa, forms related to *W. sanctijohanis* have been placed in a known sequence. The ammonoids originally described by Plummer & Scott as *Anthracoceras wanlessi* characterize a zone directly above the Colchester (No. 2) Coal in Fulton County, western Illinois (Wanless, 1958, p. 25). Identical forms have also been reported higher in the section above the Summum (No. 4) Coal (Ibid., p. 27). These two Illinois coals are in the Carbondale Group and correlate with the Whitebreast and Mulky coals of Iowa (Weller, et al., 1942); the Whitebreast is regarded as middle Cherokee Group and the Mulky as basal Appanoose Group.

In Missouri, the types of *Anthracoceras missouriense* Miller & Owen, 1939, were secured from concretions below the Weir-Pittsburg (Jordan) Coal in the basal Cabaniss Subgroup, middle
Cherokee Group, of Henry County (James A. Martin, personal communication). Occurrences of possibly conspecific forms in southern Oklahoma and northern Texas are in the Boggy Formation, upper Krebs Subgroup, middle Cherokee Group (Miller & Owen, 1939) and in the lower Strawn Group (Plummer & Scott, 1937). All these strata fall in the lower Desmoinesian Stage (Moore, et al., 1944).

**Type specimens.**—The holotype (originally designated) and the single paratype of *Wiedeyoceras sanctijohanis* (Wiedey) are deposited in the collections of the School of Geology, Stanford University (Acc. No. 5614); a plaster cast of the holotype is at the University of Iowa (10939). About 40 small specimens of *W. sanctijohanis*, from the same general horizon and locality as the original types, Greene County, are deposited at the University of Iowa (12386, 12387, and 12388).

**Literature Cited**


