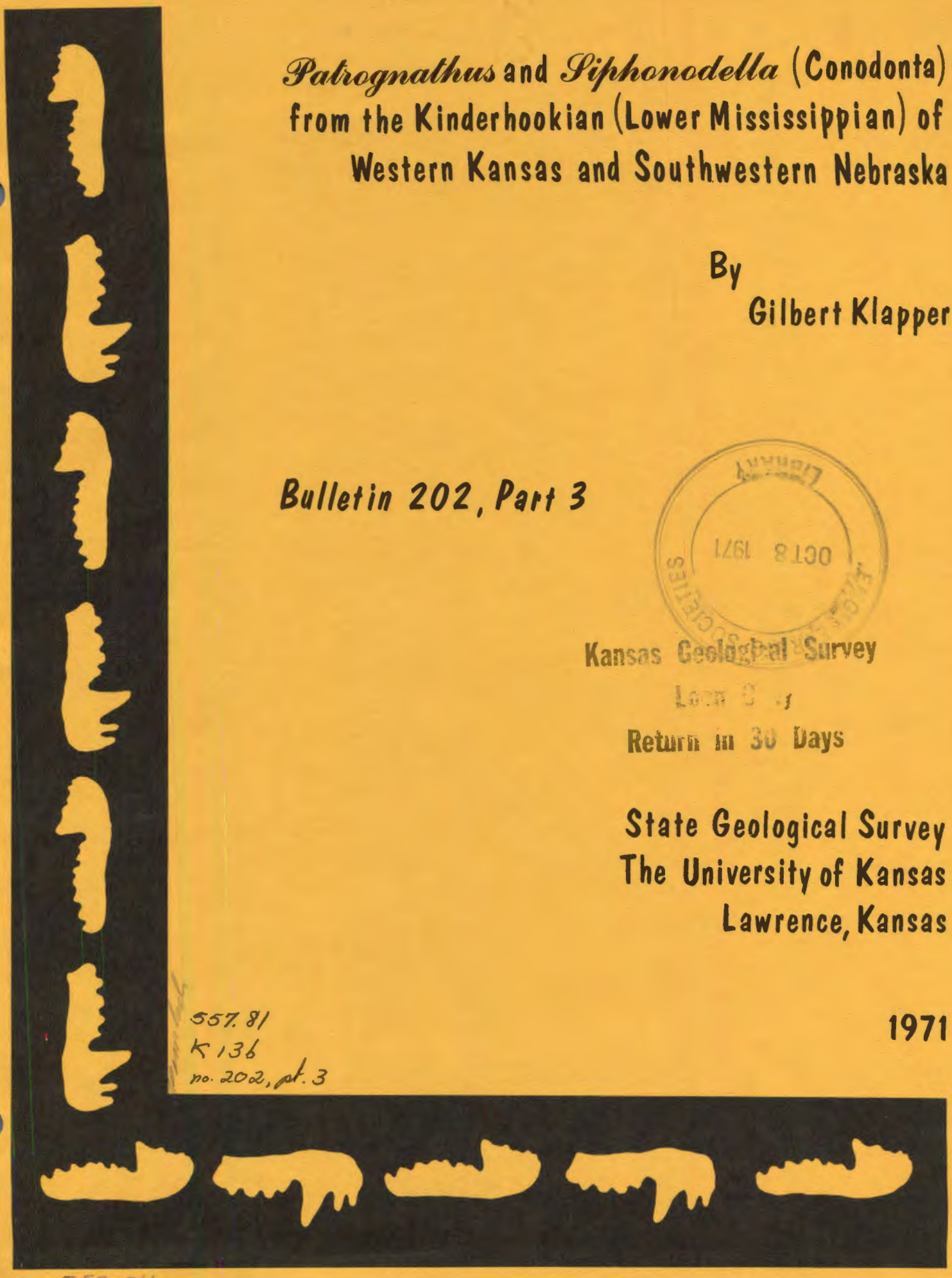

Patrognathus and *Siphonodella* (Conodonta) from the Kinderhookian (Lower Mississippian) of Western Kansas and Southwestern Nebraska

By
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ABSTRACT

Late Kinderhookian conodont faunas occur in the subsurface of Kansas and Nebraska. *Patrognathus andersoni* is a new species that is associated with late Kinderhookian phylogenetic developments of *Siphonodella* in a well core from Logan County, Kansas, and also 300 feet above the base of the Lodgepole Limestone at Browns Gulch, Montana. Other occurrences of *P. andersoni* in the subsurface and in the Gilmore City Limestone of Iowa appear to be stratigraphically higher than the *Siphonodella* succession, but are assumed to be late Kinderhookian in the absence of evidence to the contrary.

INTRODUCTION

Late Kinderhookian (Early Mississipian) strata in wells in western Kansas and southwestern Nebraska (Fig. 1) have yielded small conodont faunas. Strata assigned to the Gilmore City Limestone (Goebel, 1968, p. 1746) in Sinclair No. 1 Mercer and Mobil No. 1 Hogsett cores (loc. 1 and 3; Locality Register, p. 6) contain a fauna dominated by *Patrognathus andersoni* sp. nov. The specimens from the Mercer core were previously identified as *?Scaphignathus* (Goebel, 1968, p. 1746, following my suggestion that the form in question was not *Scaphignathus* Helms) and later as *Clydagnathus* n. sp. B (Klapper *et al.*, 1971, p. 309). The Mercer and Hogsett forms, however, constitute a new species, *Patrognathus andersoni*, distinct from species of *Clydagnathus*. *Patrognathus andersoni* also occurs in the type Gilmore City Limestone of Iowa (Anderson, 1969), supporting the physical correlation of strata in the Mercer and Hogsett wells with the Iowa formation.

The purpose of the present report, therefore, is to describe *Patrognathus andersoni* from the Mercer and Hogsett cores and its additional occurrence with species of *Siphonodella* in the Texas No. 1 Smith (loc. 2; Locality Register). The latter core provides a means of relating *P. andersoni* to the better known *Siphonodella* sequence and an opportunity to review the systematics of late Kinderhookian species of *Siphonodella*.

Acknowledgments

I am grateful to Edwin D. Goebel, State Geological Survey of Kansas, Lawrence, who furnished the conodont faunas from the Kansas and Nebraska cores. Charles A. Sandberg, U. S. Geological Survey, Denver, graciously led me to the two Montana Lodgepole Limestone localities (loc. 4 and 5, see Locality Register). H. Richard Lane, Amoco Production Company, Tulsa, loaned conodonts collected by Alan B. Shaw from the Lodgepole at Browns Gulch, Blaine County, Montana. I am grateful to G. M. Philip, University of New England, Armidale, New South Wales, Australia, for discussing aspects of *Siphonodella* taxonomy.

FAUNAL ANALYSIS

The Upper Mississippi Valley Kinderhookian conodont sequence has been discussed by Collinson *et al.* (1962), who listed faunas from northern and central Missouri and western Illinois sections. The upper Kinderhookian and Osagian conodont successions on the southern flank of the Ozark uplift in southwestern Missouri, northern Arkansas, and northeastern Oklahoma have been described in detail by Thompson & Fellows (1970). The phylogenetic lineages of species of *Siphonodella* (Collinson *et al.*, 1962, chart 2), which are partially duplicated in Wyoming sections (Sandberg & Klapper, 1967), are among the key aspects of the Kinderhookian sequence.

Heretofore, *Patrognathus andersoni* has not been linked to the *Siphonodella* succession, but three localities now provide evidence on the relative stratigraphic position of this species. *Patrognathus andersoni* occurs at 5188 feet in the Texas No. 1 Smith well (loc.

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TABLE 1.—Distribution and number of conodonts in the Texas No. 1 Smith (loc. 2).

	5199′	5197′	5196′	5195′	5194′	5193′	5192′	5191′	5190′	5189′	5188′	5187′	5186′	5185′
Siphonodella quadruplicata	1		3	7	1	2				2			2	2
S. *obsoleta*	1			1			1					2	2	1
S. sp. indet.	1			6	1			3			1	1	8	6
S. (juvenile specimens)	2				3		3		1	1			2	2
Polygnathus inornatus	1													
indet. compound fragments	2	1	3	16	11	15	5	6	10	5	7	3	10	3
Polygnathus communis communis		1	5	3	3	3	3	1	1	6	1	1	1	3
Spathognathodus sp. indet.		1		2	1		1				1			
S. *macer*			1			1		1				1		1
Elictognathus laceratus			1	2									2	1
Ligonodina sp.			1		2	2	3	2	1		1		1	2
Hindeodella sp.			1		1	1	1	1	2	2	1		1	1
Falcodus sp.			1		2		1						1	
Hibbardella sp.			1									1		
Siphonodella cooperi				4						2		1		1
Polygnathus longiposticus				1						2			2	1
P. inornatus sensu Branson & Mehl				1	1	1		1						1
Spathognathodus crassidentatus				3	2								1	
Neoprioniodus sp.				2		1		2	2	3	2		2	
Diplododella sp.				1					1					
Bryantodus sp.				2				1						
Ozarkodina sp.				1	3		1		1		2	1	2	3
Angulodus sp.					3		1							
Siphonodella isosticha						3							1	
S. cf. S. *isosticha*						2							2	3
Polygnathus sp. indet.									1					
Spathognathodus abnormis									1					
Synprioniodina sp.									2					
Patrognathus andersoni											1			

Remarks.—A number of authors have attempted to distinguish *Polygnathus inornatus* from *P. lobatus* on the supposed presence in the latter of a lobe in the posterior outer margin. What Branson & Mehl (1938, p. 146) called "a marked tendency toward the development of a postero-laterally extending point or lobe" in the posterior outer margin is not, with one exception, a lobe as that term is used in conodont terminology (compare for example to *Polygnathus glaber bilobatus* Ziegler, 1962, pl. 10, fig. 4, 16, 21). Of the original specimens of *P. lobatus* Branson & Mehl (1938, pl. 34, fig. 44-47) only the one represented by fig. 45 has a lobe. References to *P. lobatus* by later authors conform to Branson & Mehl's specimens illustrated in their fig. 44, 46, 47 (fig. 47= holotype), which have a distinct constriction or sinus in the outer margin near the posterior termination of the platform. Exactly this same outline is present in E. R. Branson's types of *P. inornatus*. *Polygnathus lobatus*, thus, falls as a junior synonym of *P. inornatus* E. R. Branson.

Although this synonymy was advocated earlier (Voges, 1959, p. 291; Klapper, 1966, p. 19-20), I additionally followed E. B. Branson & Mehl (1934, pl. 24, fig. 5-7) in referring their specimens, and similar forms, to *P. inornatus*. It now seems clear that *P. inornatus* of E. B. Branson & Mehl is different from *P. inornatus* E. R. Branson, as follows: the former has a virtually straight blade and carina that divide an almost bilaterally symmetrical platform, whereas *P. inornatus* E. R. Branson has an asymmetrical platform, with a sinus in the posterior outer margin and characteristically a sinuous posterior carina. Both forms have a short free blade and strongly upturned anterior margins.

POLYGNATHUS INORNATUS *sensu* Branson & Mehl

Pl. 1, fig. 11, 12

Polygnathus inornata E. R. Branson. Branson & Mehl, 1934, p. 293, pl. 24, fig. 5-7; Rexroad & Scott, 1964, p. 35, pl. 2, fig. 19, 20; Klapper, 1966, p. 19-20, pl. 4, fig. 2, 4 [only]; Canis, 1968, p. 544, pl. 72, fig. 25; Straka, 1968, p. 30-32, pl. 1, fig. 16, 17; pl. 5, fig. 6, 8 [only].

Polygnathus symmetrica Branson. Straka, 1968, p. 35, pl. 1, fig. 11, 13 [only].

Polygnathus inornatus inornatus Branson & Mehl [*sic*]. Rhodes *et al.*, 1969, p. 186, pl. 10, fig. 4-6; Druce, 1969, p. 98, pl. 20, fig. 1-3.

Remarks.—The question of the authorship of *Polygnathus inornatus* is critical, if, in fact, E. B. Branson & Mehl's Bushberg specimens belong to a different form species from E. R. Branson's Hannibal specimens, as newly advocated here. Branson & Mehl (1934, p. 293) cited E. R. Branson as author, but this is not sufficient according to Art. 50 (ICZN), for their differentiation of *P. inornatus* from *P. longiposticus* would have validated *P. inornatus* had E. R. Branson's paper never been published. Both papers, however, were published simultaneously as part of the fourth number of Vol. 8 of the University of Missouri Studies. Neither author(s) has priority until the action of the "first reviser," which would determine the relative priority of authorship [Art. 24(a), ICZN, which surely must apply to authorship as well as to synonyms]. Here, I construe "first reviser" to mean the first author after 1934 who placed E. B. Branson & Mehl's Bushberg specimens in synonymy with E. R. Branson's Hannibal specimens. The first revisers are E. B. Branson & Mehl (1938, p. 146) who referred one of the original Hannibal (pl. 33, fig. 15) and two of the original Bushberg (pl. 33, fig. 51, 52) specimens to *P. inornatus* and again cited E. R. Branson as author. Cooper's action (1939, p. 400) is identical. Therefore, E. R. Branson is the author of *P. inornatus*, and page precedence in the original volume has no relevance.

Consequently, *Polygnathus inornatus sensu* Branson & Mehl is left without a name. It is possible that a name introduced either by Cooper (1939) or Youngquist & Patterson (1949) might apply equally to the specimens under discussion, but this is not confirmed as yet.

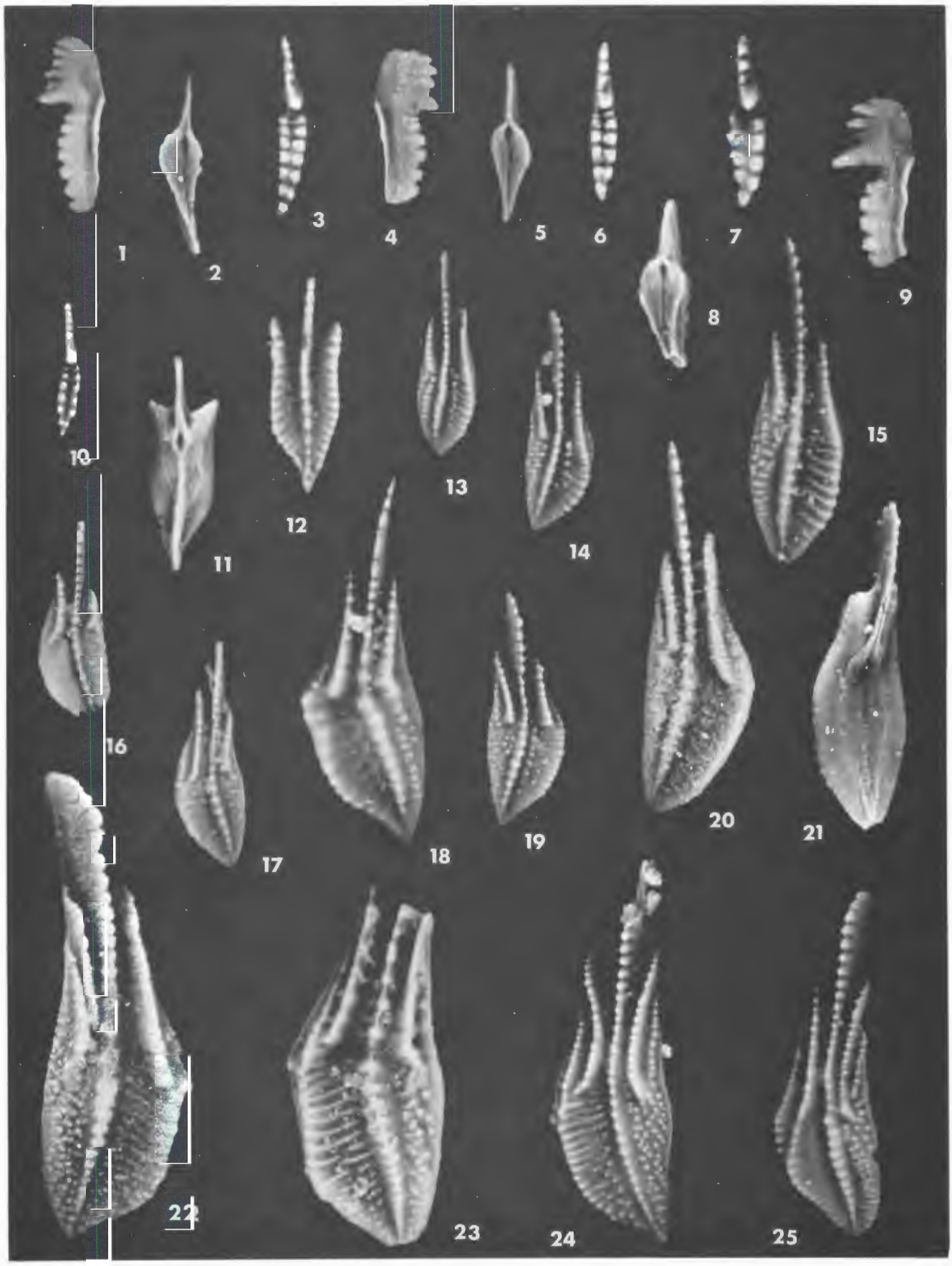
Genus PATROGNATHUS Rhodes, Austin, and Druce, 1969

Patrognathus Rhodes *et al.*, 1969, p. 178-179.

Type species.—*Patrognathus variabilis* Rhodes *et al.*, 1969, p. 179-180, pl. 2, fig. 8-11.

Remarks.—*Patrognathus* has a longer free blade than that of *Clydagnathus* Rhodes *et al.* (1969) and lacks a fixed blade, whereas in *Clydagnathus* at least one denticle, and more commonly two or three comprise a fixed blade. The anterior blade denticles of *Patrognathus* are more or less uniform in height or rise gradually to the posterior (in front of the high posteriormost denticle). Characteristically the blade denticles of *Clydagnathus* decline abruptly to the anterior. The anterior part of the blade is medial in *Patrognathus*, but characteristically is on the right side in *Clydagnathus*.

Rhodes *et al.* (1969, p. 178) regarded *Patrognathus* as broadly homeomorphic with *Taphrognathus* Branson & Mehl and *Streptognathodus* Stauffer & Plummer [in the context of their reference to Rexroad (1958), I assume that the Chesteran (Upper Mississippian) form now called *Adetognathus unicornis* (Rexroad & Burton) was the intended citation]. *Patrognathus*, then represented only by *P. variabilis*, was distinguished by Rhodes *et al.* from *Taphrognathus* on the basis of the wider basal cavity in the former. Yet some specimens of *T. varians* Branson & Mehl (*e.g.*, Thompson & Goebel, 1969, pl. 5, fig. 7, 8) have almost as wide a cavity as *P. variabilis*. With the inclusion in *Patrognathus* of *P. andersoni* sp. nov., which has a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