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FRANCIS DE CASTELNAU'S  
*ESSAI SUR LE SYSTÈME SILURIEN DE L'AMÉRIQUE  
SEPTENTRIONALE*  
AND THE STATUS OF HIS *SPIRIFER HURONIENSIS*

BY  
GEORGE M. EHLERS and JEAN D. WRIGHT



From the  
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MUSEUM OF PALEONTOLOGY  
UNIVERSITY OF MICHIGAN  
ANN ARBOR

# CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

*Director:* LEWIS B. KELLUM

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## VOLUME XIII

1. The Type Species of *Spinocyrtia* Fredericks and New Species of this Brachiopod Genus from Southwestern Ontario, by George M. Ehlers and Jean D. Wright. Pages 1-32, with 11 plates.
2. Silurian Ostracods collected by Dr. Carl Ludwig Rominger from Glacial Deposits in Germany, Parts I-III, by Robert V. Kesling and Philip L. Wagner. Pages 33-79, with 8 plates.
3. A Revision of A. W. Grabau's Species of *Mucrospirifer* from the Middle Devonian Traverse Group of Michigan, by Edwin C. Stumm. Pages 81-94, with 3 plates.
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5. The Appendicular Skeleton of the Permian Embolomeroous Amphibian *Archeria*, by Alfred Sherwood Romer. Pages 103-159, with 17 figures.
6. A New Calamite from Colorado, by Chester A. Arnold. Pages 161-173, with 4 plates.
7. Francis de Castelnau's *Essai sur le système silurien de l'Amerique septentrionale* and the Status of his *Spirifer huroniensis*, by George M. Ehlers and Jean D. Wright. Pages 175-180, with 2 plates.

FRANCIS DE CASTELNAU'S *ESSAI SUR LE SYSTÈME SILURIEN DE L'AMÉRIQUE SEPTENTRIONALE* AND THE STATUS OF HIS *SPIRIFER HURONIENSIS*

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INTRODUCTION

THIS paper reports progress made on a revision of the classification of fossils described in de Castelnau's *Essai sur le système silurien de l'Amérique septentrionale*, and discusses the status of *Spirifer huroniensis* de Castelnau.

The authors are grateful to Dr. Jean Roger, Director of the Centre d'Études et de Documentation Paléontologiques, and to Dr. Raymond Furon of the Muséum National d'Histoire Naturelle, both in Paris, without whose help this investigation would have been impossible. They also wish to thank Dr. Robert V. Kesling of the Museum of Paleontology of the University of Michigan for his help in preparing illustrations for this paper, and they are indebted to him, to Dr. Chester A. Arnold, and to Dr. Lewis B. Kellum for reading the manuscript critically.

FOSSILS DESCRIBED IN DE CASTELNAU'S *Essai*

In 1843 Francis, Comte de Castelnau, published a memoir entitled *Essai sur le système silurien de l'Amérique septentrionale*.<sup>\*</sup> This work summarized for the Royal Academy of Sciences the author's "observations . . . collected during nearly five years of travel in northern America." De Castelnau's geological conclusions and his descriptions of the fossils that he assembled on this journey have been frequently cited since the publication of his book. Many workers have been under the impression that de Castelnau's specimens (originally deposited in the Museum of

\* P. Bertrand, Paris; 56 pp., 27 pls.

Natural History in Paris) were lost. However, recent correspondence with Dr. Jean Roger, Director of the Centre d'Études et de Documentation Paléontologiques, and with Dr. Raymond Furon of the Muséum National d'Histoire Naturelle, both in Paris, has disclosed that part of this collection is still intact: 52 of the 138 species listed by de Castelnau in his *Essai* are represented by specimens at the Laboratoire de Géologie of the Museum.

We are currently engaged in restudying de Castelnau's fossils. A translation of his memoir has been completed by the junior author, and the paleontological work is in progress. We plan to publish photographs of the fossils with the translation and our reclassification.

#### STATUS OF *Spirifer huroniensis* DE CASTELNAU

In a recent paper (Ehlers and Wright, 1955, p. 16) we indicated that the brachiopod *Spirifer huroniensis* de Castelnau may be synonymous with our species *Spinocyrtia carinata*. We reached this conclusion because de Castelnau's description and illustrations of the syntypes of his species (see de Castelnau, p. 41, and his Pl. 12, Figs. 6, 6a-c) suggest a *Spinocyrtia*. In addition, de Castelnau gave the locality from which the types came as the "bords de lac Huron." Inasmuch as *Spinocyrtia carinata* occurs in a limestone of a conspicuous outcrop on the shore of Lake Huron at Stony Point, Ontario, Canada, it seemed possible that de Castelnau's specimens might have been found there. Consequently, we placed *Spirifer huroniensis* in doubtful synonymy with *Spinocyrtia carinata*, regretting that de Castelnau's types had been reported lost.

It was gratifying to learn that the types of *Spirifer huroniensis* exist in the de Castelnau collection. Through the kindness and cooperation of Dr. Furon, these specimens were sent to us for study. Examination of the specimens shows that, though they are unquestionably *Spinocyrtia*, they are not *Spinocyrtia carinata*.

The syntypes of *Spirifer huroniensis* are poorly preserved. One is a shell with incomplete pedicle and brachial valves (No. 7.L.396, Laboratoire de Géologie, Muséum National d'Histoire Naturelle, Paris; plaster casts in the Museum of Paleontology, University of Michigan, No. 33919, and in the United States National Museum). During the course of compaction of overlying sediments the brachial valve of this syntype was crushed and moved laterally and posteriorly (Pl. I, Figs. 2-4). As a result of this distortion, the anterior part of the sulcus of the pedicle valve is shown in the view of the brachial valve and much of the interarea of the pedicle valve is hidden in the same view (Pl. I, Fig. 2). Parts of the calcified valves are missing as a result of weathering which occurred after the

release of the specimen from its rock matrix. The second syntype (also numbered No. 7.L.396, Laboratoire de Géologie, Muséum National d'Histoire Naturelle, Paris; plaster casts in the Museum of Paleontology, University of Michigan, No. 33920, and in the United States National Museum) is a much worn, incomplete pedicle valve, the interior of which is filled with a very dark gray shale (Pl. I, Figs. 5 and 6).

Although crushed, the structures of the syntype with conjoined valves are sufficiently well preserved to indicate its specific identity. The pedicle valve (Pl. I, Fig. 1), which is much less distorted than the brachial valve, is morphologically like that of *Spinocyrtia granulosa* (Conrad). Its sulcus is deep and concave with a shallow median depression. Two demissicostae are fairly well shown on one side of the median depression, that adjacent to the median depression being quite distinct. The demissicostae on the other side of the median depression are not so well defined. Each of the costae bounding the sulcus is similar to the costae of *Spinocyrtia granulosa*. The bifurcation of these costae is well shown despite poor preservation. The costae on the lateral slopes are like those of *Spinocyrtia granulosa*. It is impossible to determine the number originally present because parts of the shell composing the posterolateral slopes of the valve are missing. The number of costae on one lateral slope of the valve is 17 or 18. The beak and interarea, though poorly preserved, are similar to those of *Spinocyrtia granulosa*. Before distortion the brachial valve (Pl. I, Fig. 2) undoubtedly resembled that of *Spinocyrtia granulosa* in having a moderately high and rounded fold with a relatively shallow median depression. The beak and almost the entire interarea are concealed by the posterior part of the valve, which has been pushed over these structures. Minute characters on the surface of the shell are poorly preserved except in the sulcus and at a few places on the lateral slopes of the shell. Tear-shaped granules with distinct linear arrangement and growth lines are well shown in the sulcus (Pl. I, Fig. 7) and are locally present, but much worn, on the lateral slopes. The granules and growth lines are like those of *Spinocyrtia granulosa*.

The pedicle valve comprising the second syntype has 17 or 18 costae on the lateral slopes, and a sulcus with a shallow median depression (Pl. I, Fig. 5). The beak is incurved but considerably worn. The interarea is moderately high and slightly concave; the delthyrium is open and approximately as high as it is wide. A small part of the sulcus shows tear-shaped granules. All of these structures are like those of *Spinocyrtia granulosa*. The demissicostae and bifurcation of the costae bounding the sulcus are not visible on the specimen. We presume that they have been obliterated by weathering.

The types of *Spirifer huroniensis* are composed of dark gray calcite. The outer surfaces of the valves are much darker than the calcite of the shell material. The syntype with conjoined valves has small accumulations of pyrite on the surface. Without doubt the types came from a very dark gray calcareous shale.

The locality from which the types of *Spirifer huroniensis* came is given differently on labels accompanying them. A circular white label attached to the syntype with conjoined valves cites the locality as "Ouisconsin" (= Wisconsin); a rectangular unattached label with this specimen bears the inscription "Bords du Lac Huron (U.S.A.)" (Pl. II, Figs. 1 and 2). The syntype consisting of a pedicle valve has an attached circular label citing "Ouisconsin" as the locality. A rectangular unattached label with this specimen is inscribed "Lac Huron—Lamerique Sept.le."

De Castelnau gave the locality only as the "bords de lac Huron" (p. 41). His lack of precision is understandable. It must be recognized that he traveled a large and little-known region for nearly five years. During his journey he went from the Atlantic coast to the Middle West and from Quebec to Florida, studying particularly the region of the Great Lakes. His collection of fossils was augmented by gifts from other collectors, as he acknowledges in his memoir.

His indefinite description of localities is illustrated by the following excerpts. Referring to *Productus antiquatus* Sowerby, he writes (p. 39): "I brought it back from the shores of Lake Huron, and do not remember well the circumstances under which I found it." On page 44, in his description of *Amphidesma delafeldii*, he writes: ". . . it is only with the greatest doubt that I refer this species to the Silurian formation; it was given to me as coming from the State of New York, but I have every reason to believe that it comes from the Tertiary rocks from the banks of the Potomac . . ."

Although neither the museum labels nor the memoir record precisely the locality at which the types of *Spirifer huroniensis* were found, the color and composition of the specimens strongly suggest that they came from western New York rather than from Wisconsin or the shores of Lake Huron. Brachiopods somewhat similar to *S. huroniensis* have been found in Middle Devonian strata of Wisconsin. Some of them are preserved in medium gray and light buff dolomites and limestones and others in gray shales (see Cleland, 1911, pp. 5-21, and Raasch, 1935, pp. 261-267); none, however has a dark gray shell like those of de Castelnau's types. The shells of his specimens are much darker than those of a *Spinocyrtia* present in the Middle Devonian Norway Point formation which is exposed along the Thunder Bay River at several places 3 to 7 miles west of Alpena, Michigan. Furthermore, his types are specifically distinct from the *Spino-*

*cyrtia* of the Norway Point formation. As we have previously stated, *Spirifer huroniensis* is not conspecific with *Spinocyrtia carinata*. The color of the shells and of the enclosing matrices of specimens of these species also is different. The shells of *Spinocyrtia carinata* from the Ipperwash limestone of Stony Point on the Canadian shore of Lake Huron consist of much lighter gray calcite than the shells of de Castelneau's types. The former occur in a light to medium gray glauconitic limestone, some of which is greenish gray, whereas the latter were undoubtedly obtained from a very dark gray shale. Except for the Ipperwash limestone at Stony Point, no *Spinocyrtia*-bearing strata are known to occur on the Canadian shore of Lake Huron.

The color of de Castelneau's types is identical with that of specimens of *Spinocyrtia* found in the Wanakah shale member of the Ludlowville formation of the Middle Devonian Hamilton group of western New York. Outcrops of this shale occur along the Lake Erie shore between Eighteen Mile Creek and Buffalo, New York, and at several places near and east of Buffalo. That the type of *Spirifer huroniensis* may have come from the Wanakah shale is supported by the fact that de Castelneau listed many fossils of his collection as coming from the State of New York and some of them as "des bords du lac Erie."

From the foregoing, it seems certain that *Spirifer huroniensis* de Castelneau, 1843, is conspecific with *Delthyris granulosa* Conrad, 1839, the type species of the genus *Spinocyrtia*. Furthermore, we believe that de Castelneau's types of *Spirifer huroniensis* came from western New York and very likely from the *Stropheodonta demissa* bed of the Wanakah shale (Ehlers and Wright, 1955, p. 10).

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- RAASCH, G. O. 1935. Devonian of Wisconsin. In: Guidebook, Ninth Annual Field Conference, The Kansas Geological Society in cooperation with the Iowa Geol. Surv., State Geol. Surv. Illinois, Wisconsin Geol. and Nat. Hist. Surv., and Minnesota Geol. Surv., pp. 261-267, Fig. 207. Produced by McCormick-Armstrong Co., Wichita, Kansas.

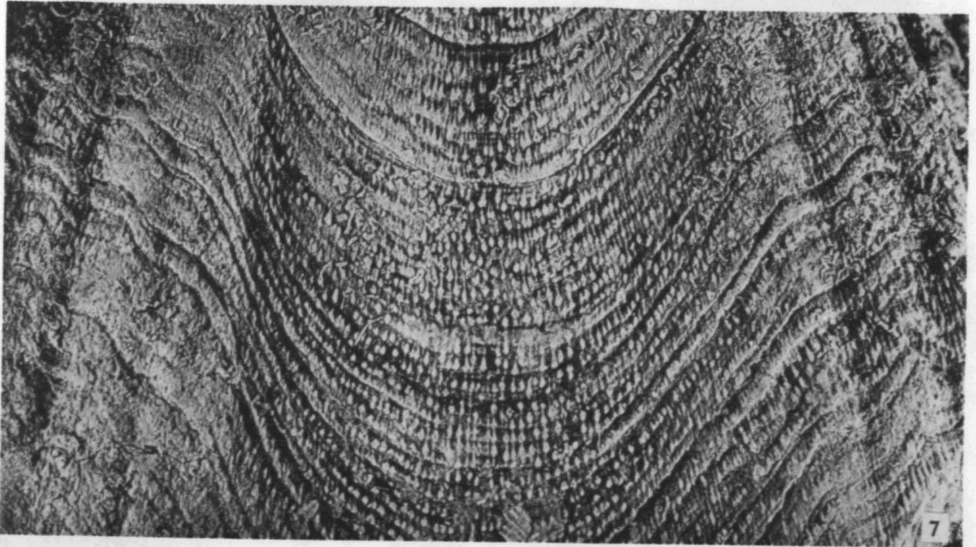
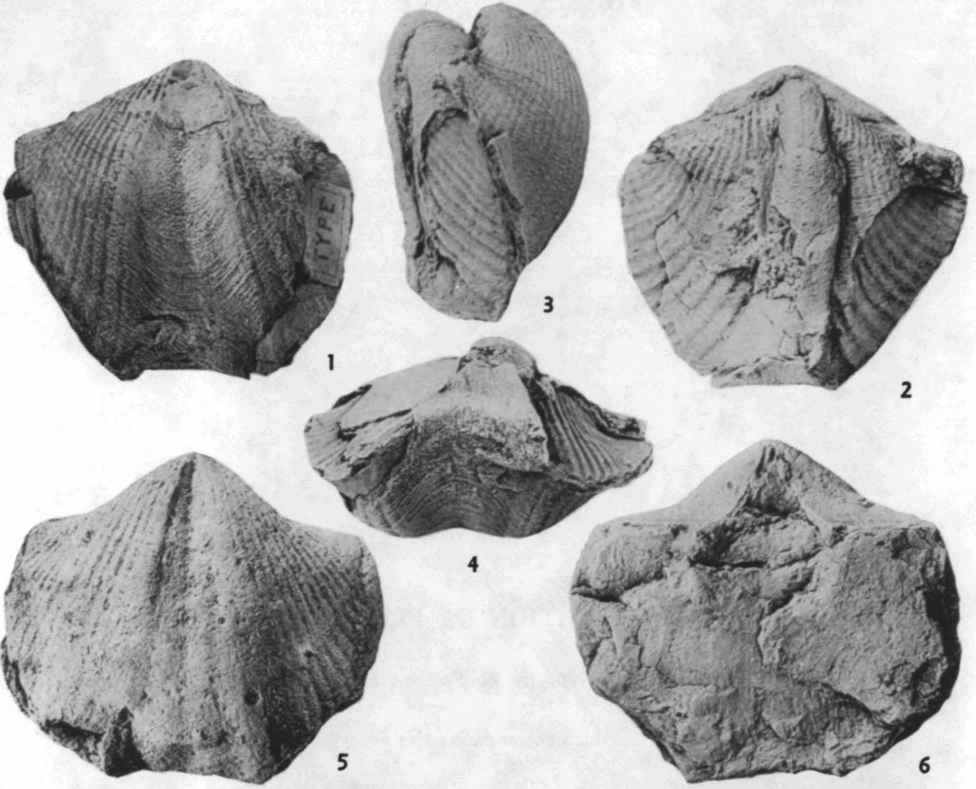
## EXPLANATION OF PLATE I

(All figures  $\times 1$ , except Fig. 7)*Spinocyrtia granulosa* (Conrad)

- FIG. 1. View of pedicle valve of the syntype of *Spirifer huroniensis* de Castelnau with conjoined valves, showing sulcus and rounded costae. Tear-shaped granules in linear arrangement well indicated in sulcus.
- FIG. 2. View of brachial valve of same specimen, showing distorted, high, rounded fold with shallow median depression. Anterior part of sulcus of pedicle valve shown; most of interarea of this valve not visible.
- FIG. 3. Lateral view of same specimen, showing distortion of brachial valve and convexity of pedicle valve.
- FIG. 4. Anterior view of same specimen, showing anterior part of sulcus of pedicle valve, deflected as the result of crushing.
- FIG. 5. View of much worn, incomplete pedicle valve, the second syntype of *Spirifer huroniensis* de Castelnau, showing sulcus with shallow median depression. Tear-shaped granules distinguishable in anterior part of sulcus.
- FIG. 6. Another view of same specimen, showing interarea and delthyrium.
- FIG. 7. Partial view of sulcus of the syntype with conjoined valves, showing growth lines and alignment of tear-shaped granules. Shallow median depression of sulcus indicated by dark band in central part of view. Bifurcation of one of the costae bounding sulcus shown at left.  $\times 5$ .



PLATE I



*SPIRIFER HURONIENSIS*

EXPLANATION OF PLATE II

FIG. 1. Label attached to syntype of *Spirifer huroniensis* de Castelnau with conjoined valves.

FIG. 2. Unattached label which accompanies this syntype.

PLATE II



FIG. 1

Spirifer TYPE  
Huronensis de Cast.  
Bords du Lac Huron (U.S.A).  
Coll. de Castelnau - 72. 396  

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FIG. 2

