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TWO SPECIES OF A NEW BRACHIOPOD GENUS  
FROM MIDDLE DEVONIAN BEDS OF  
ONTARIO AND MICHIGAN

BY

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MUSEUM OF PALEONTOLOGY  
THE UNIVERSITY OF MICHIGAN  
ANN ARBOR

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Illustrated types:

*Trochalocyrtina flemingi*

Holotype USNM 213924 - Widder Fm., Hungry Hollow, Arkona, Ontario, collected by Charles Southworth; shows deltidial plates (one bent inward), tichorhinum, growth lines, vertical ridges in interarea, and spinules in sulcus; discovered in weathered state.

Paratype USNM 213925 - Widder Fm., Tile yard, Thedford, Ont., collected by Charles Southworth, 1944; shows good deltidial plates, tichorhinum, and spinules in sulcus.

Paratype USNM 213926 - Widder Fm., No. 4 hill, Arkona, Ont., collected by G. A. Cooper; shows faint vertical ridges in interarea.

Paratype USNM 213927 - Widder Fm., Lot 8, Arkona, Ont., collected by E. P. Wright; best example of spinules in sulcus.

Paratype UMMP 61618 - Widder Fm., "vicinity of Arkona," Ont., collected by Charles Southworth.

Paratype UMMP 61619 - Widder Fm., Hungry Hollow, Arkona, Ont., collected by Charles Southworth; good deltidial plates, tichorhinum with *Hederella*.

Paratype UMMP 61620 - Widder Fm., Fleming's field, Thedford, Ont., collected by Jean D. Wright; shows spinules in sulcus.

*Trochalocyrtina ehlersi*

Holotype USNM 213933 - Potter Farm Fm., Evergreen Cemetery in Alpena, Michigan, collected by G. A. Cooper and P. E. Cloud; shows deltidial plates, tichorhinum, interarea ridges, and spinules in sulcus.

Paratype USNM 213934 - same as holotype; shows distinct ridges in interarea.

Paratype USNM 213935 - same as holotype; shows remnants of deltidial plates, tichorhinum, and spinules on surfaces of both valves.

Paratype UMMP 61621 - same as holotype; shows deltidial plates, tichorhinum.

Paratype UMMP 61622 - same as holotype; shows remnants of deltidial plates, tichorhinum, and spinules in sulcus.

Paratype UMMP 61623 - same as holotype; shows tichorhinum and spinules on entire surface.

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ABSTRACT -- A new genus, *Trochalocyrtina*, is created for small and rare Middle Devonian brachiopods. It differs from the well-known *Cyrtina* in (1) rounded, not angular, form; (2) interarea simple, not divided into perideltidial areas; and (3) deltidium partly covered by two disjunct deltidial plates, not by a pseudodeltidium. Of the two known species, *Trochalocyrtina flemingi* from Ontario is larger than *T. ehlersi* from northeastern Michigan, its growth lines are more conspicuous, and its dorsal (brachial) valve is proportionately longer.

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INTRODUCTION

WHILE COLLECTING FOSSILS in the Thedford-Arkona region of southwestern Ontario in the late 1940's and early 1950's, a small distinctive brachiopod was found, rarely, in the Widder Formation. It resembled slightly a *Cyrtina* but was rounded, not angular; its interarea was not distinctly divided like that of *Cyrtina* into two perideltidial areas, and it lacked the pseudodeltidium present in *Cyrtina*.

All of the specimens of this fossil found by Mr. Charles Southworth of Thedford and by the author and her husband were sent to Dr. G. Arthur Cooper, then Curator of Invertebrate Paleontology and Paleobotany at the United States National Museum, Washington, for future identification. So scarce were these brachiopods that only twelve specimens were collected in that area over a period of perhaps a half dozen years, one of them found by Dr. Cooper himself.

On a collecting trip in northern Michigan, Dr. Cooper and Dr. Preston E. Cloud found many specimens of a smaller, more delicate species of this same genus in Alpena County. These, too, were deposited in the National Museum.

In view of the fact that these fossils were always referred to as "rounded *Cyrtinas*," it seems appropriate to name this new genus *Trochalocyrtina*, perpetuating its nickname in Greek. It and the two new species are here described.

The author is indebted to Dr. Cooper, now Paleobiologist Emeritus, Department of Paleobiology at the National Museum of Natural History, Smithsonian Institution, for the privilege of working on these little brachiopods, and for his help and criticisms in the writing of this paper. She is grateful to Dr. Robert V. Kesling of the Museum of Paleontology, The University of Michigan, for his typing of final copy for offset and for other assistance in the publication of the paper, and to Karl Kutasi for the photography.

#### LOCALITIES

1. Fleming's field -- on east side of the Ridge Road just north of 21 Sideroad, about  $\frac{1}{2}$  mile north and about  $\frac{3}{4}$  mile east of Thedford, Ontario.
2. Tile yard -- about 1 mile north of center of Thedford, Ontario, and about  $\frac{1}{8}$  mile east of road leading north from Thedford.
3. Hungry Hollow -- banks of the Ausable River, about 2 miles east and about  $\frac{1}{4}$  mile north of Arkona, Ontario.
4. No. 4 Hill -- about  $\frac{3}{8}$  mile east of Highway 7 and about 2 miles north of Arkona, Ontario.
5. Lot 8 -- bank of the Ausable River, about  $1\frac{1}{2}$  miles southwest of the north-south road crossing Highway 7 at Sylvan, Ontario, and about 2 miles south of Sylvan.
6. Evergreen Cemetery -- northwest corner of cemetery in Alpena, NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 21, T31N, R8E, Alpena County, Michigan.

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#### EXPLANATION OF PLATE 1

All figures x 4

FIGS. 1-10 -- *Trochalocyrtina flemingi* sp. nov. 1-5, posterior, dorsal, anterior, ventral, and lateral views of USNM 213924, holotype. 6-10, posterior, dorsal, anterior, ventral, and lateral views of USNM 213925, paratype.

FIGS. 11-15 -- *Trochalocyrtina ehlersi* sp. nov. 11-15, posterior, dorsal, anterior, ventral, and lateral views of USNM 213933, holotype.

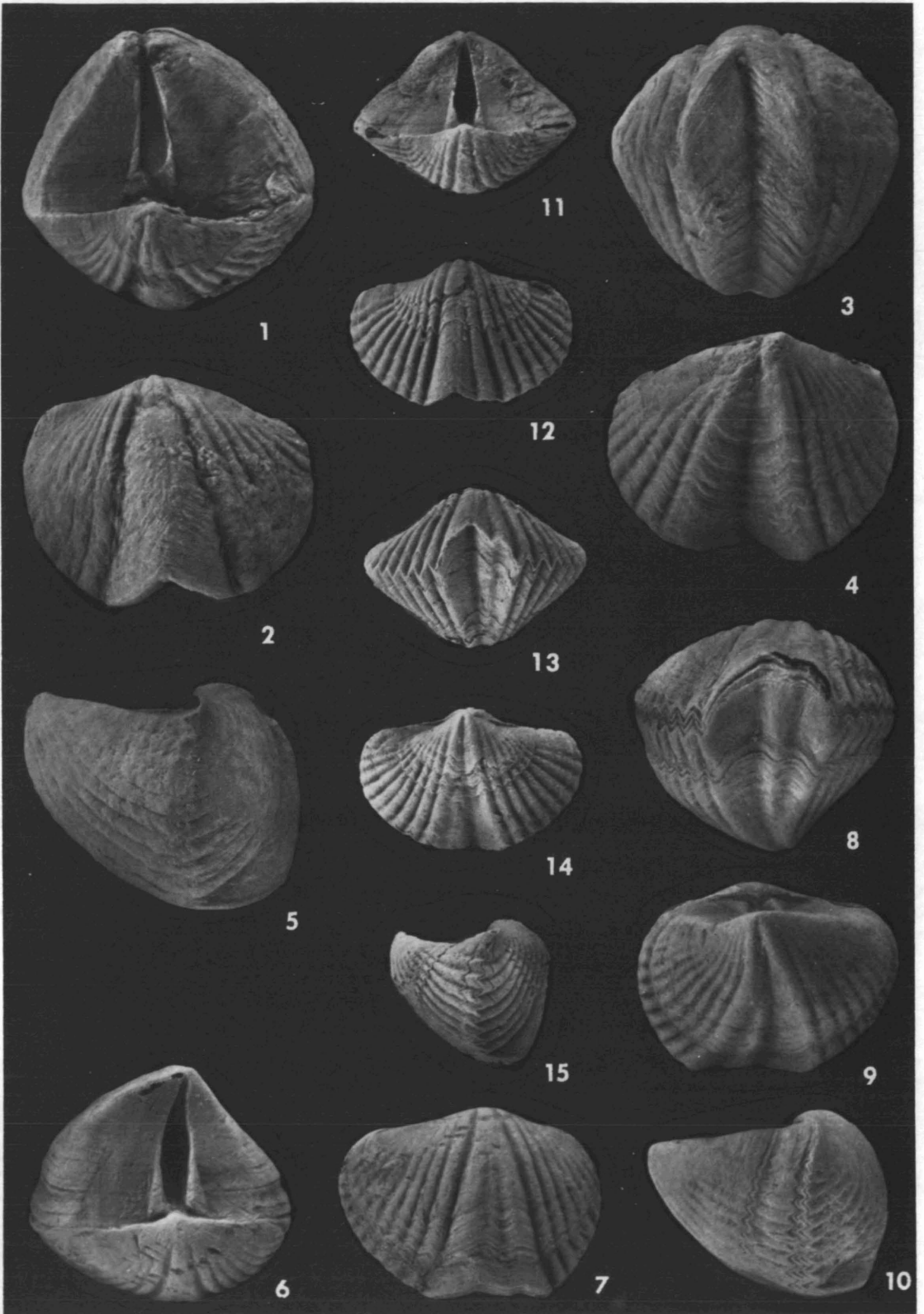


PLATE 1

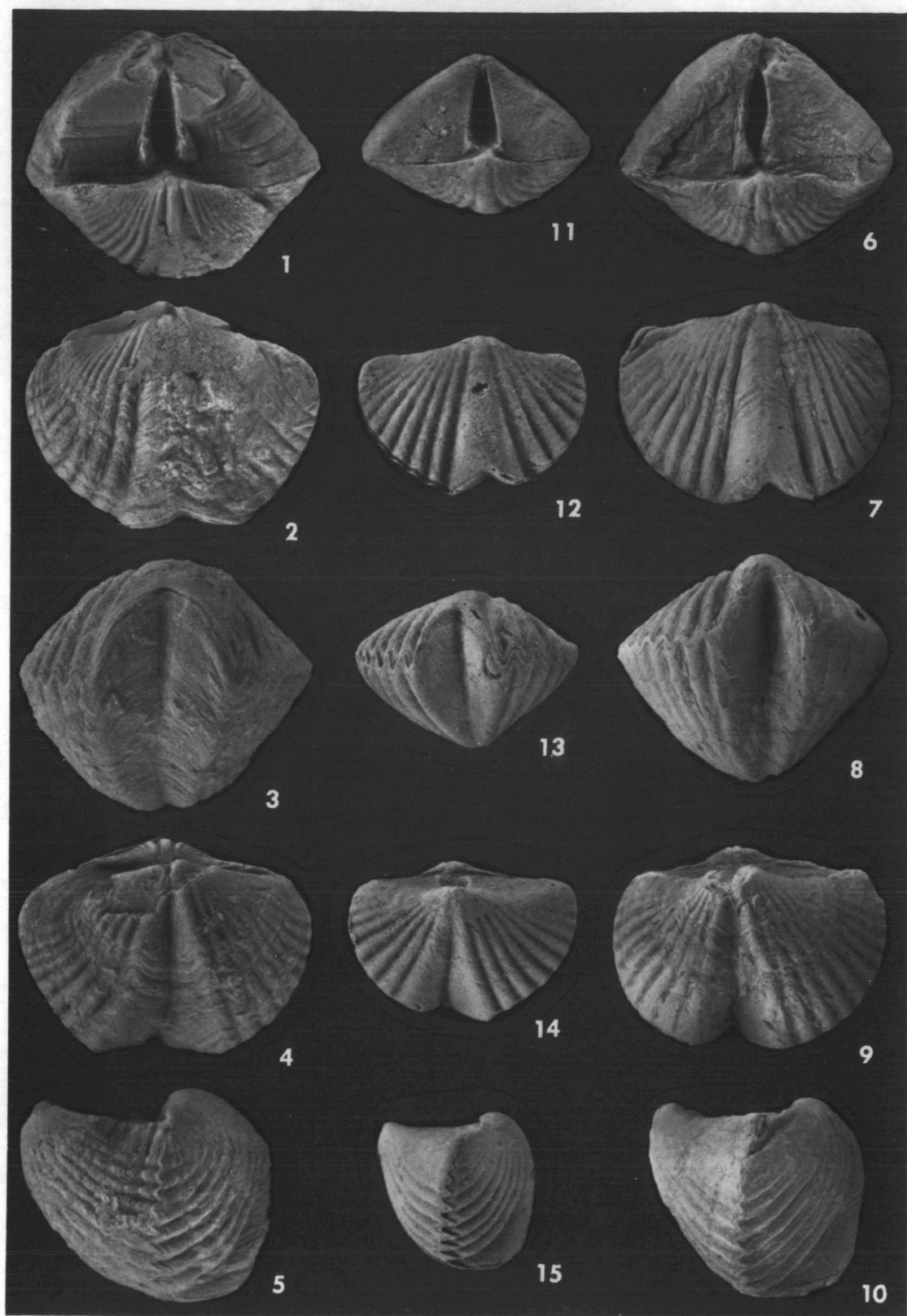


PLATE 2

## SYSTEMATIC PALEONTOLOGY

## Phylum BRACHIOPODA

## Class ARTICULATA

## Order SPIRIFERIDA Waagen, 1883

## Suborder SPIRIFERIDINA Waagen, 1883

## Superfamily Suessiacea Waagen, 1883

## Family Cyrtinidae Fredericks, 1912

## TROCHALOCYRTINA gen. nov.

Type species: *Trochalocyrtina flemingi*

*Description.*-- Small, resembling *Cyrtina* in form but with these differences: it is rounded, not angular; its interarea is simple, not divided into two perideltidial areas; and its deltidium is partially covered by two basally located disjunct deltidial plates, not by a pseudodeltidium as in *Cyrtina*. Brachial valve strongly convex. Micro-ornament and interiors as in *Cyrtina*.

## TROCHALOCYRTINA FLEMINGI sp. nov.

Pl. 1, figs. 1-10; pl. 2, figs. 1-10; pl. 3, figs. 1-10; pl. 4, figs. 1-5

*Description.*-- Small, rounded cyrtinoid in form, conspicuously biconvex; cardinal extremities generally rounded, a few subangular. Hinge line straight; greatest shell width slightly anterior to hinge line. Surface lateral to fold and sulcus marked by 7 to 10 costae, 8 or 9 in majority of specimens examined. Costae separated by furrows having about same width as costae. Fine spinules visible on surface of well-preserved specimens. Growth lamellae most prominent near anterior commissure which, except at junction of fold and sulcus, is continuously curved.

Pedicle valve convex, with deep subangular sulcus, having a

## EXPLANATION OF PLATE 2

All figures x 4

FIGS. 1-10 -- *Trochalocyrtina flemingi* sp. nov. 1-5, posterior, dorsal, anterior, ventral, and lateral views of USNM 213926, paratype. 6-10, posterior, dorsal, anterior, ventral, and lateral views of UMMP 61618, paratype.

FIGS. 11-15 -- *Trochalocyrtina ehlersi* sp. nov. 11-15, posterior, dorsal, anterior, ventral, and lateral views of UMMP 61621, paratype.

Measurements of *Trochalocyrtina flemingi* (in mm)

Type	Greatest Width	Length of Brachial Valve	Thickness
Holotype USNM 213924	12	10	12
Paratype USNM 213925	10.5	8	10
Paratype USNM 213926	13	9	10
Paratype USNM 213927	12	8	7.5
Paratype UMMP 61618	11	9	8.5
Paratype UMMP 61619	11	9.5	9
Paratype UMMP 61620	12	10	9.5
Paratype USNM 213928	12	10.5	11
Paratype USNM 213929	10	9	8
Paratype USNM 213930	12.5	9	9
Paratype USNM 213931	10	8	8
Paratype USNM 213932	13	9	11

median depression in most specimens. Beak slightly incurved. Interarea wider than high, very slightly concave; growth lines distinct in well-preserved specimens, some showing very thin, vertical interrupted ridges. Delthyrium partly closed by disjunct deltidial plates near base of deltidium. Edge of tichorhinum visible in delthyrium.

Brachial valve subrectangular in outline, with moderate convexity. Fold broad, low, and rounded, with slight median depression in some specimens. Beak small, scarcely rising above hinge line. Interarea linear.

*Remarks.* -- *Trochalocyrtina flemingi* differs from *T. ehlersi* found in Alpena, Michigan, in being larger and more robust, its concentric growth lines being more conspicuous. The dorsal valve of these two species is of different proportions; that of *T. flemingi* has a length about 0.8 the width, whereas the L/W ratio of *T. ehlersi* is 0.67.

#### EXPLANATION OF PLATE 3

All figures x 4

FIGS. 1-10 -- *Trochalocyrtina flemingi* sp. nov. 1-5, posterior, dorsal, anterior, ventral, and lateral views of UMMP 61620, paratype. 6-10, posterior, dorsal, anterior, ventral, and lateral views of USNM 213927, paratype.

FIGS. 11-15 -- *Trochalocyrtina ehlersi* sp. nov. 11-15, posterior, dorsal, anterior, ventral, and lateral views of USNM 213935, paratype.



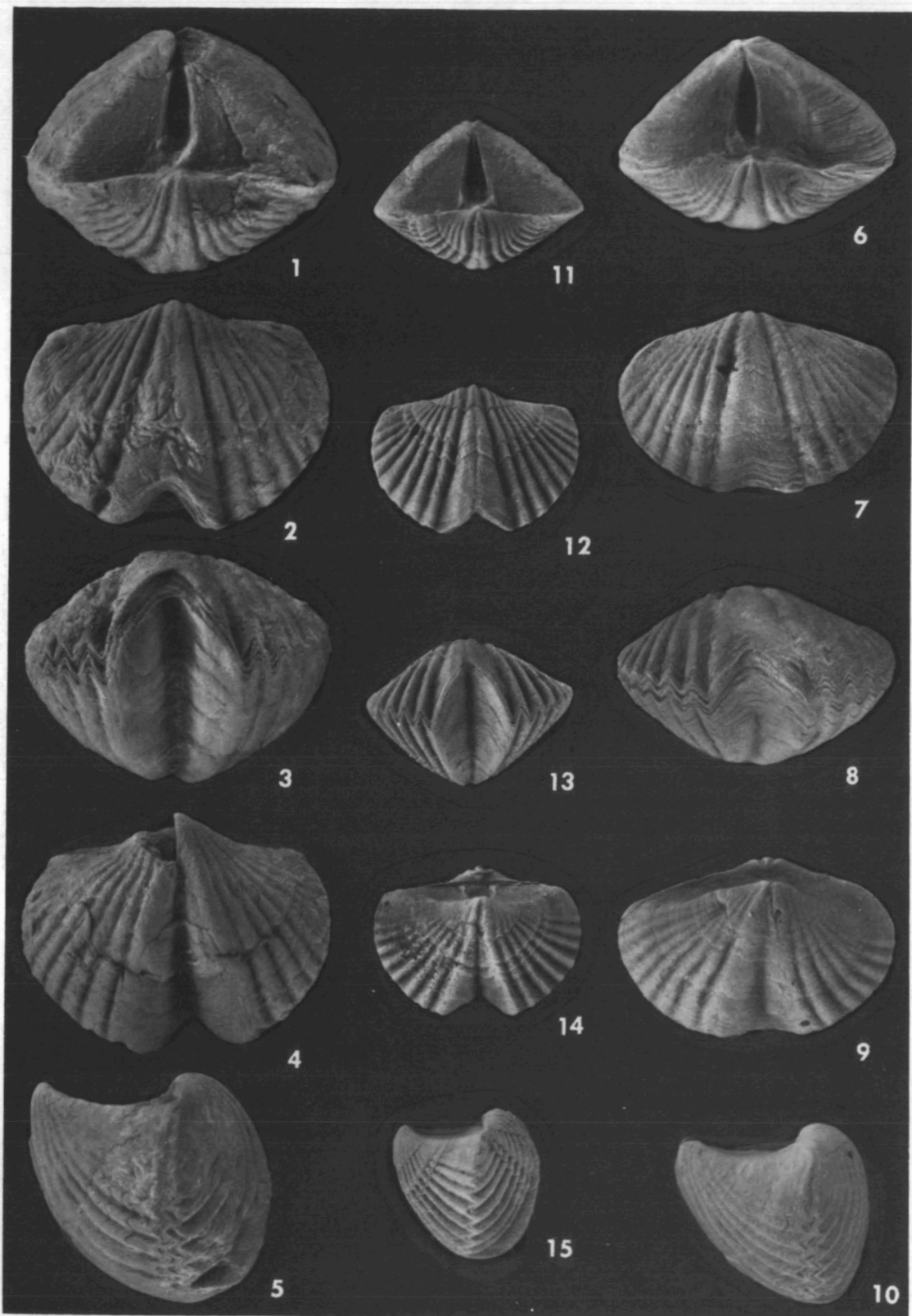


PLATE 3

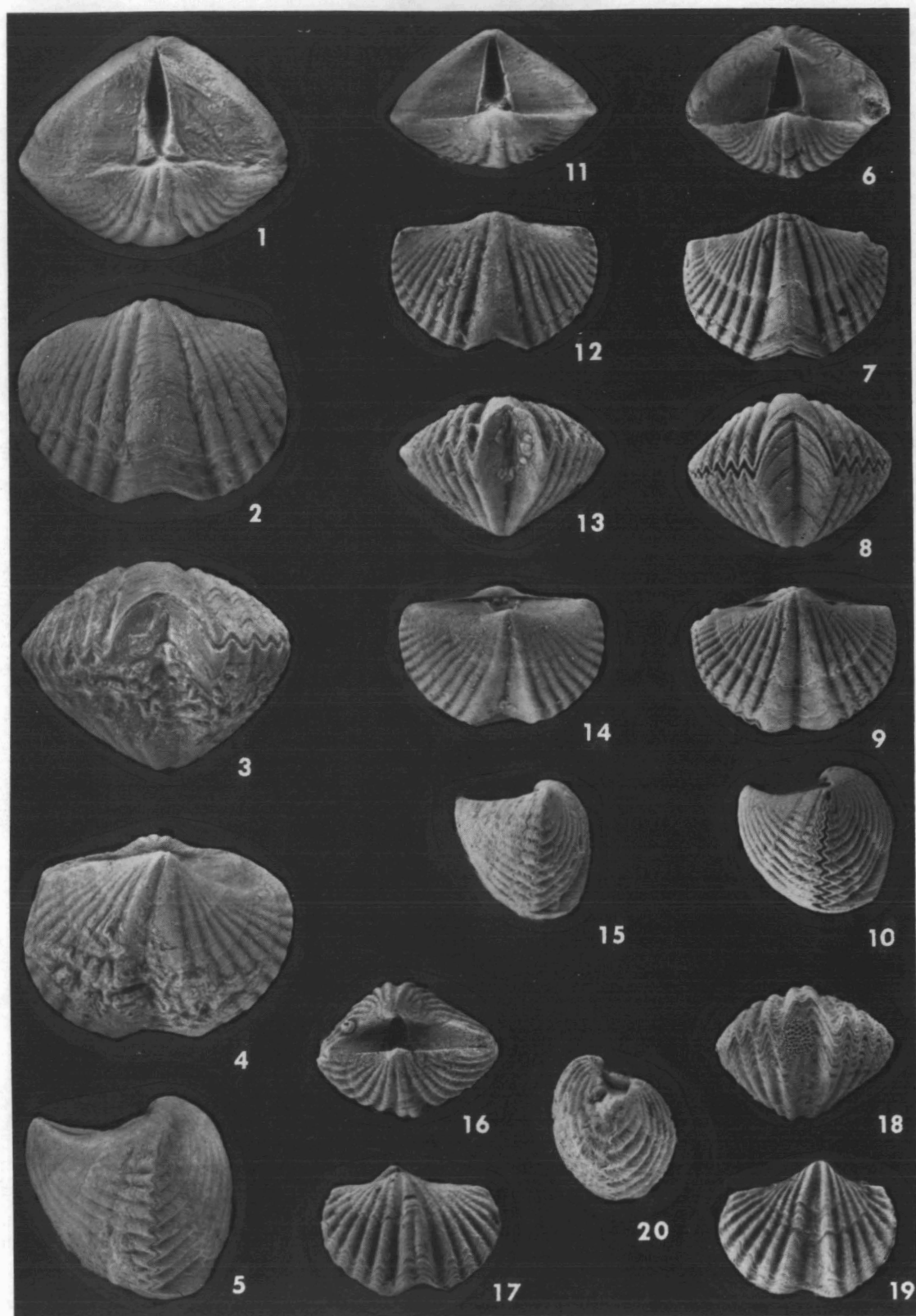


PLATE 4

This species is named in honor of Mr. Fred Fleming in gratitude for permission to collect on his farmland near Thedford.

*Occurrence.*-- Middle Devonian Hamilton Group, Widder Formation, Thedford-Arkona region of southwestern Ontario. Localities 1-5.

*Types.*-- Holotype USNM 213924 and paratypes USNM 213925 through 213932 inclusive are in the National Museum of Natural History, Smithsonian Institution. Paratypes UMMP 61618-61620 are in the Museum of Paleontology, The University of Michigan.

#### TROCHALOCYRTINA EHLERSI sp. nov.

Pl. 1, figs. 11-15; pl. 2, figs. 11-15; pl. 3, figs. 11-15; pl. 4, figs. 6-20

*Description.*-- Small, roundly cyrtinoid in form but conspicuously biconvex; cardinal extremities generally rounded, a few subangular. Hinge line straight, greatest shell width slightly anterior to hinge line. Surface lateral to fold and sulcus marked by 7 to 9 rounded costae, 9 in most specimens examined. Surfaces of costae, furrows, fold, and sulcus covered with narrow, elongate spines arranged in radial lines. Growth lamellae most prominent near anterior commissure which, except at junction of fold and sulcus, is continuously curved.

Pedicle valve convex, with subangular sulcus having median depression. Beak slightly incurved in most specimens. Interarea wider than high, very slightly concave. Growth lines faint; very thin vertical ridges visible in some specimens. Delthyrium partly closed by basally located disjunct deltidial plates. Edge of tichorhinum visible in delthyrium.

Brachial valve narrowly subrectangular in outline, moderately convex. Fold broad, low, rounded, with shallow median depression. Beak small, scarcely rising above hinge line. Interarea linear.

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#### EXPLANATION OF PLATE 4

All figures x 4

FIGS. 1-5 -- *Trochalocyrtina flemingi* sp. nov. 1-5, posterior, dorsal, anterior, ventral, and lateral views of UMMP 61619, paratype.

FIGS. 6-20 -- *Trochalocyrtina ehlersi* sp. nov. Posterior, dorsal, anterior, ventral, and lateral views of UMMP 61623, UMMP 61622, and USNM 213934, all paratypes.

Measurements of *Trochalocyrtina ehlersi* sp. nov.

Type	Greatest Width	Length of Brachial Valve	Thickness
Holotype USNM 213933	9	6	6.5
Paratype USNM 213934	7.5	5.5	5
Paratype USNM 213935	8.5	6.5	6.5
Paratype UMMP 61621	9.5	6.5	6
Paratype UMMP 61622	8.5	6	5.5
Paratype UMMP 61623	9	6	6
Paratype USNM 213936	9.5	6.5	6.5
Paratype USNM 213937	8.5	6	6.5
Paratype USNM 213938	10	6.5	6.5
Paratype USNM 213939	(beak sectioned; not measured)		

*Remarks.* -- *Trochalocyrtina ehlersi* differs from *T. flemingi* found in southwestern Ontario in being smaller and having a much smoother surface.

This species is named for Professor Emeritus George M. Ehlers of The University of Michigan, long renowned for his knowledge of the paleontology of both northern Michigan and southwestern Ontario.

*Occurrence.* -- Middle Devonian Traverse Group, Potter Farm Formation, Alpena County, Michigan. Locality 6.

*Types.* -- Holotype USNM 213933 and paratypes USNM 213934 through 213939 inclusive are in the National Museum of Natural History, Smithsonian Institution. Paratypes UMMP 61621-61623 are in the Museum of Paleontology, The University of Michigan.

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