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CHECK LIST OF FOSSIL INVERTEBRATES DESCRIBED FROM THE MIDDLE DEVONIAN ROCKS OF THE THEDFORD-ARKONA REGION OF SOUTHWESTERN ONTARIO

BY

ERWIN C. STUMM and JEAN D. WRIGHT

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ANN ARBOR

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CONTENTS

Introduction 81
Acknowledgments 82
Stratigraphy 83
Geographical glossary 84
List of species occurring in each formation 87
Check list of fossil invertebrates 88
Arkona shale 88
Hungry Hollow formation 97
Widder formation 111
Ipperwash limestone 119
Stratigraphic position unknown 122
Literature cited 123
Museum catalogues in which fossils from the Thedford-Arkona region are listed 132

INTRODUCTION

THE fossiliferous rocks of Middle Devonian age in the Thedford-Arkona region of Lambton and Middlesex counties, southwestern Ontario, Canada, have been of interest to geologists for over a century. One of the earliest records of that interest is Alexander Murray's Report of Progress as Assistant Provincial Geologist (1857, p. 130) in which he mentioned finding, with James Hall, "a nearly complete section of the Hamilton group on the banks of some of the tributaries of the River Sable (south)." More than one hundred and seventy publications have described, listed, or referred to fossils from these beds; the titles of these publications appear in the Literature Cited section of this paper.

This check list has been compiled in an effort to assist research workers in obtaining helpful paleontological information from the voluminous literature. All species of fossil invertebrates described from the Thedford-Arkona region are listed and classified, with previous generic names given parenthetically after the currently used names. The numbers following the names of species refer to publications in which the species are mentioned (see Literature Cited).

The species have been listed under the headings of the four exposed stratigraphic units of this region which, in ascending order, are the Arkona shale, the Hungry Hollow formation, the Widder formation, and the Ipperwash limestone. If no definite horizon was indicated in the reference, the stratigraphic position has been assigned by the authors, when possible, on the basis of their own collecting experience in the region over a period of many years; when this was impossible, the species have been listed in a fifth category entitled "Stratigraphic Position Unknown." A table listing the number of species occurring in each formation immediately precedes the check list.

On consulting the references appended, one unfamiliar with the history of the Thedford-Arkona region and its geology will be confused by both the old geographic and stratigraphic terms, many of which are obsolete. In some cases the location of early collecting places can be found only with difficulty. The once thriving village of Widder, so often mentioned in the literature, no longer exists; only a few scattered houses remain to mark its former site. The Geographic Glossary will assist in the reading of the older reports.

The names of the fossil-bearing rocks of this region have undergone changes also. A chart (Table I) shows the changes in the nomenclature of the stratigraphic units. Inasmuch as the "Widder beds" previous to 1941 included the strata now differentiated as the Hungry Hollow formation, it has been difficult to assign to the proper horizon some of the species reported as occurring in the "Widder shale."

The authors believe that, in some instances, fossils given definite stratigraphic position in the literature were wrongly placed due to the collector's failure to recognize that these fossils had been incorporated in talus material.

Acknowledgments

The authors wish to express their appreciation to all who assisted them in the preparation of this paper. Thanks are extended to Dr. George M. Ehlers and Dr. Robert V. Kesling of the Museum of Paleontology of the University of Michigan, and to Mr. Irving G. Reimann, Director of the Exhibit Museum of that university, for their help and criticism; to Dr. G. Arthur Cooper of the United States National Museum for his assistance in checking some of the specimens in that museum; to Dr. J. J. Galloway of Indiana University for assigning proper stratigraphic positions to some of the stromatoporoids; and to Mr. Raymond R. Hibbard, Research Associate in Invertebrate Paleontology, Buffalo Society of Natural Sci-

ences, for similar assistance in regard to some bryozoans. The interest and advice of Mr. Charles Southworth of Thedford, whose knowledge of both the fossils and the rocks of the region reflects more than sixty years of collecting and study, are much appreciated.

The authors are indebted to Dr. Chester A. Arnold, Dr. George M. Ehlers, and Dr. Lewis B. Kellum for a critical reading of the manuscript.

STRATIGRAPHY

The fossiliferous beds of the Middle Devonian Hamilton group exposed in the Thedford-Arkona region have been classified variously; changes in the stratigraphic nomenclature are indicated in Table I.

In this paper the terminology used by Cooper and others (1942) is followed with the exception of the term "Widder shale." For this the writers prefer to use the term "Widder formation," because there is a considerable quantity of limestone as well as shale in this stratigraphic unit.

TABLE I

CHANGES IN STRATIGRAPHIC NOMENCLATURE

Early Workers	Calvin 1888	Schuchert 1895	Stauffer 1915	Grabau 1917	[1]Cooper and Warthin, 1941	Cooper and Others, 1942
Hamilton Group			Ipperwash limestone			Ipperwash limestone
			Petrolia shale			Petrolia shale
	Upper division	Upper third of the section	Widder beds		Widder formation	Widder shale
	Middle division of the Hamilton section	Middle third of the section		Encrinal limestone	Hungry Hollow formation	Hungry Hollow formation
	Lower division	Lower third of the section	Olentangy shale	Arkona beds		Arkona shale

[1] G. A. Cooper and A. S. Warthin, 1941, "New Middle Devonian Stratigraphic Names," *Journ. Wash. Acad. Sciences,* Vol. 31, No. 6, p. 260.

At no place in the Thedford-Arkona region can a complete section of the strata indicated in Table I be seen. The Arkona shale, the Hungry Hollow formation, and the Widder formation crop out, either alone or in juxtaposition, in many exposures cut by the Ausable River (the "River Sable" of Murray) or its tributaries, in roadside ditches, and in fields. The Petrolia shale is known only from well logs and, according to Stauffer (1915, p. 11), is "...not well exposed anywhere within the province." The best outcrop of the Ipperwash limestone occurs at Stony Point on the shore of Lake Huron, about six miles northwest of Thedford and about two and one-half miles northeast of the village of Ravenswood; small exposures of it have been found in the fields near Ravenswood.

The formations exposed in the Thedford-Arkona region have been correlated with the Skaneateles and Ludlowville formations of the Hamilton group of New York (Cooper and others, 1942, Chart No. 4). The Arkona shale is of Skaneateles age; the Hungry Hollow formation is correlated with the Centerfield limestone at the base of the Ludlowville formation; and the Widder formation and Ipperwash limestone are correlated with the middle Ludlowville. The Ipperwash limestone is most closely related to the *Pleurodictyum* bed of the Wanakah shale member of the Ludlowville formation of western New York.

GEOGRAPHICAL GLOSSARY

Arkona: a village in Bosanquet Township, Lambton County, Ontario, on King's Highway 7, near which are several of the fossiliferous outcrops.

Austin's Mill (Murray, 1857, p. 130): at that date located "on the 4th lot of the 1st range of Bosanquet," now known locally as No. 4 Hill. The mill is no longer standing.

Bartlett's Mills (Nicholson, 1874 = ref. No. 94, p. 16): at that date located at what is now called locally "Hungry Hollow." The mill is not in use.

Bosanquet: a township in Lambton County, in which are Thedford, Arkona, and Ravenswood; often referred to in the early geological reports.

Canada West (or C.W.): popular name for Upper Canada, now Ontario. It was so called because of its position west of the Ottawa River, the boundary between Upper and Lower Canada when separated in 1791.

Crinoid Hill (Stauffer, 1938, p. 416; Locality 155): a high bank of the Ausable River, about three-quarters of a mile east of Hungry Hollow. It was given this name by Dr. Merrill A. Stainbrook and Mr. Charles Southworth in 1931 when they had an exceptional day's collecting and picked up 31 specimens of crinoids at that place.

Robert Frazer's place (Stauffer, 1938, p. 416: Locality 158; (the owner spells the name "Fraser"): a farm extending to the Ausable River, about one mile east of Hungry Hollow. With permission, fossils have been collected along the river bank on this property.

Grand Trunk Railway cut (Nicholson, 1875 = ref. No. 100, p. 37): the Canadian National Railway cut about one mile east of Thedford. This is now almost entirely overgrown.

Hungry Hollow: the present local name for the gorge cut by the Ausable River about two miles northeast of Arkona. This is the best and largest exposure of the fossiliferous beds.

Hunniford's fields (Williams, 1913, p. 107): east of Thedford, north of the Canadian National Railway tracks; now overgrown.

James Bell quarry (Stauffer, 1939, p. 501): a short distance north of the Canadian National Railway cut about one mile east of Thedford; today mostly overgrown.

Jones' Mill (Murray, 1857, p. 130): at that date located "on the 3rd lot, south boundary of Bosanquet, on the bank of a small tributary of the Sable." This locality is now known as Rock Glen; the mill is no longer standing.

Lot 8 (Stauffer, 1938, p. 416; Locality 162): an exposure on the Ausable River, about three miles north and about one and one-quarter miles east of Arkona.

"The 25th lot of the 3rd range of Bosanquet, on the banks of a small tributary of the Sable" (Murray, 1857, p. 130): a small exposure near the present tileyard of Thedford, one mile north of the center of the village.

Lowe's Mill, Township of Bosanquet (Billings, 1861, p. 53): the location of this mill could not be ascertained.

Marsh's Mill (Stauffer, 1915, p. 156): the name at that date given to the mill formerly called "Bartlett's," located at Hungry Hollow.

Marshall's Mills (Shimer and Grabau, 1902, p. 150): a later name for the mill formerly called "Bartlett's."

No. 4 Hill (Stauffer, 1915, p. 169): an exposure about two and one-third miles north of Arkona, and about one-half mile east of King's Highway 7. Stauffer in this reference erroneously cites the mill there as Jones' Mill, but on a previous page (Stauffer, p. 10) refers to it correctly as Austin's Mill.

Paisley farm, Port Frank road (Stauffer, 1939, p. 504): a small exposure of shale on a hillside, about three and one-half miles northwest of Thedford, west of King's Highway 82.

Ravenswood: a village on King's Highway 21, about five and one-half miles northwest of Thedford, in Bosanquet Township. Nicholson (1875 = ref. No. 98, p. 82) mentioned brachiopods collected by G. J. Hinde from the "Hamilton Formation of Ravenswood."

Rivière au Sable (or aux Sables): an early name for the Ausable River, which meanders through Middlesex and Lambton counties, exposing the fossil-bearing strata in many places.

Rock Glen: a wooded glen about one mile north of Arkona and about one mile east of King's Highway 7, along a tributary of the Ausable River. This is a favorite collecting place.

Stony Point: a small prominent outcrop of limestone forming a point on the shore of Lake Huron in Provincial Park, about two miles northwest of the Ipperwash Military Camp.

Thedford: a village in Bosanquet Township, on King's Highway 82, originally known as Widder Station(*q.v.*). The townsite was laid out in 1860 on property belonging to Nelson Southworth, an uncle of Charles Southworth, the well-known local collector. It was named for Thetford, Vermont, from which the donor of the townsite had come, but due to the Town Clerk's penmanship, the name was thought by the Post Office Department to be spelled with a "d."

Upper Canada: that part of Canada lying west of the Ottawa River when Canada was divided into two parts by the British Parliament in 1791. Its popular name, Canada West, was retained in the early reports for some time after Canada was reunited in 1840.

West Williams: a township in Middlesex County, adjoining Bosanquet Township in Lambton County, and mentioned in many of the early geological reports.

Widder: a village formerly situated in Bosanquet Township on the "Ridge Road" (now part of King's Highway 82), approximately one mile east of the present village of Thedford. It was named in honor of Frederick Widder, Senior Commissioner of the Canada Company in the middle of the 19th century. Widder, once a thriving community, began to decline after the village of Thedford was established (*q.v.*). Mr. Charles Southworth recalls that about 1890 Widder included two general stores, three hotels, a tannery, a pottery, a wagon shop, and a mill; in 1957, only one cross street and five houses of the old village remain.

Widder Station: a settlement which grew up around the station of the Grand Trunk Railway (now the Canadian National Railway), west of the village of Widder. The name was later changed to Thedford.

List of Species Occurring In Each Formation

The following table (Table II) gives the number of species of each group that has been reported for each formation.

TABLE II

Number of Species Occurring In Each Formation

	Arkona Shale	Hungry Hollow Formation	Widder Formation	Ipperwash Limestone	Strat. Position Unknown
Porifera					
Silicispongia		2	1		
Incertae Sedis			1		
Anthozoa					
Tetracoralla	14	29	2	3	
Tabulata	6	44	11	3	
Stromatoporoidea		7			
Echinodermata					
Edrioasteroidea	1				
Blastoidea	3	16	5		
Crinoidea	14	13	2	2	
Stelleroidea	1				
Annelida					
Sedentaria	1	6	4		
Scolecodonts	33		17	11	
Bryozoa	30	73	38	12	8
Brachiopoda					
Inarticulata	1	7	4		
Articulata	36	66	38	17	
Mollusca					
Pelecypoda	16	6	13	2	
Gastropoda	13	12	12	2	1
Cephalopoda	7	6	11	2	
Incertae Sedis	9	3	4	2	
Arthropoda					
Trilobita	3	5	5	1	1
Ostracoda	37	41	28		22
Incertae Sedis					1
Conodonts	33	5	12		
Totals	258	341	208	57	33

CHECK LIST OF FOSSIL INVERTEBRATES

(Numbers refer to Literature Cited; letters to Museum Catalogues)

Arkona Shale

Anthozoa:

Tetracoralla:

Microcyclus bifidus Stumm 6, 138, 149, 152
Microcyclus canadensis Stauffer 138
Microcyclus crenulatus Stauffer 138
Microcyclus grandis Stauffer 138
Microcyclus? ignotus Stauffer 138
Microcyclus laticostatus Stauffer 138
Microcyclus microdiscus Stauffer 138
Microcyclus ontarioensis Stauffer 138
Microcyclus? sinuatus Stauffer 138
Microcyclus southworthi Stauffer 138
Microcyclus striolatus Stauffer 138
Microcyclus thedfordensis Bassler 4, 6, 128, 138, 146, 149, 150, 152
as *M. discus* Meek and Worthen 41, 55, 84, 94, 96, 127, 133, 134, 164, 167, 168, 169
Microcyclus venustus Stauffer 138
Xenocyathellus thedfordensis (Stewart) (*Homalophyllum*) 4, 6, 85, 141, 150, 152

Tabulata:

Alveolites subramosus Rominger 117
Aulocystis ramosa (Whiteaves) (*Roemeria, Drymopora*) 133, 147, 167
"Ceratopora" "agglomerata" Grabau 133
"Ceratopora" sp. cf. *C. partita* (Winchell) 117
**Platyaxum fischeri* (Billings) (*Alveolites, Cladopora, Coenites, Pachypora*) 117
Trachypora? proboscidalis (Rominger) (*Dendropora*) 117

Echinodermata:

Edrioasteroidea:

Agelacrinites southworthi Bassler 3, 9

* Probably from the Hungry Hollow formation.

Blastoidea:

**Pentremitidea decipiens* Reimann 120
**Pentremitidea nuciformis* Reimann 120
Pentremitidea southworthi Reimann 9, 119

Crinoidea:

Ancyrocrinus sp. 169
Ancyrocrinus bulbosus Hall 43, 127, 133, 138
Arthracantha carpenteri (Hinde) (*Hystricrinus*) 9, 20, 43, 67, 78, 143, 171
as *A. punctobrachiata* Williams 9, 55, 127, 128, 133, 134, 146, 160, 164, 167, 168, 169, 170, H
Atractocrinus concinnus Kirk 81
Botryocrinus arkonensis Goldring 49
Botryocrinus crassus (Whiteaves) (*Homocrinus*) 9, 11, 43, 45, 48, 127, 128, 133, 164, 167
Botryocrinus reimanni Goldring 9
Cadiscocrinus southworthi Kirk 80
Corocrinus? calypso (Hall) (*Actinocrinus*) 9, 44, 78
as *Gennaeocrinus arkonensis* Whiteaves 9, 127, 133, 134, 167, H
Decadocrinus wrightae Goldring 50
Gennaeocrinus mourantae Goldring 9, 44, 48, 50
†*Megistocrinus concavus* Wachsmuth 117
Poteriocrinus sp. 133
Poteriocrinus? arkonensis Goldring 9, 44

Stelleroidea:

Devonaster eucharis (Hall) (*Palaeaster*) 126, 127, 128, 133, 134, 167

Annelida:

Sedentaria:

Spirorbis omphalodes Goldfuss 96, 128, 133, 164, 165, 167

Scolecodonts:

Arabellites sp. a Stauffer 136
Arabellites sp. b Stauffer 136

* Mr. Irving G. Reimann, in a personal communication to the authors, writes: "These species, through a mistake, were originally described as from the Hungry Hollow formation; later collecting has proved that they came from the Arkona shale."

† Probably from the Hungry Hollow formation.

Arabellites ausablensis Stauffer 136
Arabellites comis Eller 32, 136
Arabellites cultriformis Stauffer 136
Arabellites cushingi Stauffer 137
as *A. minutus* Stauffer 136
Arabellites politus Hinde 66, 127, 128, 133, 136, 164, 167
Arabellites productus Stauffer 136
Arabellites similis var. *arcuatus* Hinde 22, 66, 127, 133, 164, 167
Arabellites spinosus Stauffer 136
Eunicites? alveolatus Hinde 66, 127, 133, 136, 164, 167
Eunicites angulatus Eller 136
Eunicites grandis Stauffer 128, 136
Eunicites nanus Hinde 66, 127, 128, 133, 136, 164, 167
Eunicites palmatus Hinde 66, 127, 128, 133, 136, 164, 167
Eunicites perplanus Stauffer 136
Eunicites tumidus Hinde 66, 127, 128, 133, 136, 164, 167
Glycerites devonicus Stauffer 136
Ildraites anatinus (Stauffer) (*Arabellites*) 32, 136
Leodicites magnificus (Stauffer) (*Arabellites*) 32, 128, 136
Lumbriconereites sp. 136
Lumbriconereites spectabilis Stauffer 136
Nereidavus sp. 136
Nereidavus ontarioensis Stauffer 32, 128, 136
Nereidavus planus Stauffer 128, 136
Nereidavus solitarius Hinde 66, 127, 128, 133, 136, 164, 167
Nothrites sulcatus Stauffer 136
Oenonites compactus Hinde 66, 127, 133, 136, 164, 167
Protarabellites canadensis Stauffer 128, 136
Protarabellites diminutus Stauffer 136
Protarabellites excelsus Stauffer 128, 136
Protarabellites giganteus Stauffer 128, 136
Ungulites sp. 136

Bryozoa:

Allonema fusiforme (Nicholson and Etheridge) (*Ascodictyon*) 2, 55, 109, 113, 127, 128, 133, 159, 164, 167
Eliasopora stellatum (Nicholson and Etheridge) (*Ascodictyon*) 55, 109, 113, 127, 128, 133, 138, 159, 164, 165, 167
Eridotrypella obliqua (Ulrich) (*Batostomella, Eridotrypa*) 133
Fistuliphragma spinulifera (Rominger) (*Fistulipora*) 133
Fistulipora corrugata Ulrich 117
Fistulipora crassa Rominger 122

Fistulipora stellifera Ulrich 117
Hederella canadensis (Nicholson) (*Alecto? Aulopora?*) 113, 128, 133, 139
Hederella cirrhosa Hall 133, 139
Hederella filiformis (Billings) (*Aulopora*) 133
Hederella hibbardi Bassler 5
Hederella magna Hall 5, 133
Hederella thedfordensis Bassler 5
Leioclema minutum (Rominger) (*Lioclema*) 158
Leptotrypella quadrangularis (Nicholson) (*Chaetetes, Paleschara, Leptotrypa*) 133
Leptotrypella spinulifera (Fritz) (*Amplexopora*) 39, E
Pinacotrypa variapora (Hall) (*Thallostigma, Fistulipora, Fistuliporina*) 127, 133, 167
Polypora arkonensis S. A. Miller=*P. tuberculata* Nicholson 127
Polypora latitruncata (Hall) (*Fenestella*) 113, 127
Ropalonaria lambtonensis (Fritz) (*Rhopalonaria*) 41
Ropalonaria medialis (Ulrich and Bassler) (*Rhopalonaria*) 159, H
Ropalonaria tenuis (Ulrich and Bassler) (*Rhopalonaria*) 2, 55, 128, 159, H
Scalaripora approximata Ulrich 117
Scalaripora canadensis Whiteaves 113, 127, 133, 167, H
Scalaripora separata Ulrich 117
Streblotrypa hamiltonensis (Nicholson) (*Ceriopora, Callopora, Acanthoclema, Rhombopora*) 133, 139
Sulcoretopora incisurata (Hall) (*Stictopora, Cystodictya*) 113, 127, 133, 139, 167
Sulcoretopora sp. cf. *S. incisurata* (Hall) 40, 117
Sulcoretopora rectalinea (Hall and Simpson) (*Cystidictya, Stictopora*) 63, 65, 113, 127, 133, 167, B
Vinella devonica Cleland 133

Brachiopoda:

Inarticulata:

Orbiculoidea lodiensis media Hall 133
Petrocrania hamiltoniae (Hall) (*Craniella*) 133

Articulata:

**Athyris fultonensis* (Swallow) (*Spirigera*) 127
**Athyris vittata* Hall 133, 139
**Atrypa* sp. 93

* Probably from the Hungry Hollow formation.

Camarotoechia sappho (Hall) (*Rhynchonella*) 133
Chonetes sp. 93
Chontes coronatus (Conrad) (*Strophomena*) 55, 125, 127, 133, 164, 167
Chonetes deflectus Hall 133, 134
Chonetes lepidus Hall 133, 134, 164, 167
Chonetes lineatus (Conrad) (*Strophomena*) 20, 94, 96, 127, 167
Chonetes scitulus Hall 127, 128, 133, 134, 138, 164, 167, 168, 169
Chonetes sp. cf. *C. scitulus* Hall 117
Chonetes vicinus (Castelnau) (Leptaena) 127, 167
Chonetes sp. cf. *C. vicinus* (Castelnau) 117
Cyrtina hamiltonensis (Hall) (*Cyrtia*) 109, 125, 127, 128, 133, 134, 139, 164, 165, 167
Cyrtina sp. cf. *C. hamiltonensis* (Hall) 117
Cyrtina hamiltonensis recta Hall 127
"Leptaena" sp. 93
Leptalosia sp. cf. *L. radicans* (Winchell) (*Crania, Strophalosia*) 128
Mucrospirifer arkonensis (Shimer and Grabau) (*Spirifer*) 22, 117, 118, 127, 133, 138, 168, 169
as *Spirifer mucronatus* (Conrad) 20, 51, 56, 93, 94, 109, 133, 134
Nudirostra sp. 24
Nudirostra laura (Billings) (*Rhynchonella, Leiorhynchus, Liorhynchus*) 18, 55, 125, 128, 133, 168, 169
Parazyga hirsuta (Hall) (*Atrypa, Trematospira*) 133, 134
Pentamerella sp. 117
Pentamerella pavilionensis (Hall) (*Pentamerus*) 127
Pholidostrophia nacrea (Hall) (*Strophomena, Strophodonta*) as *P. iowensis* (Owen) 125, 127, 134
Productella spinulicosta (Hall) (*Productus*) 133, 134, 139
Productella truncata (Hall) (*Productus, Strophalosia*) 55, 125, 127, 133, 167
Rhipidomella penelope (Hall) (*Orthis*) 127
Rhipidomella vanuxemi (Hall) (*Orthis*) 127
Schuchertella sp. 168
Schuchertella arctostriata (Hall) (*Streptorhynchus, Orthothetes, Schellwienella*)=*O. chemungensis* var. *arctostriatus* (Hall) 118, 127, 133, 167, 168

* Probably from the Hungry Hollow formation.

Schuchertella perversa (Hall) (*Streptorhynchus, Orthothetes, Schellwienella*)=*O. chemungensis* var. *perversus* (Hall) 55, 125, 127, 128, 133, 134, 164, 167
Spinocyrtia mourantae Ehlers and Wright 31
as *S. granulosa* (Conrad) (*Delthyris, Spirifer*) 127, 128, 167
Stropheodonta demissa (Conrad) (*Strophodonta*) 118, 125, 127, 133, 138, 165, 168, 169
Strophodonta extenuata extenuata Imbrie 68
Strophodonta extenuata ferronensis Imbrie 68

Mollusca:

Pelecypoda:

Actinopteria boydi (Conrad) (*Avicula, Pterinea*) 55, 127, 128, 133, 165, 167
Aviculopecten sp. 133
Cornellites flabellum (Conrad) (*Avicula, Pterinea*) 55, 164, 165, 167
Glyptodesma erectum (Conrad) (*Avicula, Actinodesma*) 128, 133, 134, 139
Grammysia arcuata (Conrad) (*Posidonia?*) 127, 128, 133, 164, 167
**Leiopteria rafinesquii* Hall 55, 128, 133, 167
Nucula sp. 133
Nucula lirata (Conrad) (*Nuculites*) 55, 127, 128, 133, 134, 138, 167
Nuculana rostellata (Conrad) (*Nuculites, Leda*) 53, 55, 127, 128, 133, 134, 146, 167
Nuculites triqueter Conrad 53, 55, 127, 128, 133, 134, 167
Nyassa arguta Hall 55, 127, 133, 167
Orthonota parvula Hall 127, 133, 167
Palaeoneilo emarginata (Conrad) (*Nuculites*) 133, 138
Palaeoneilo plana Hall 55, 127, 133, 167
Paracyclas lirata (Conrad) (*Posidonia, Lucina*) 55, 127, 128, 133, 134, 167
Sphenotus solenoides (Hall) (*Sanguinolites*) 133

* Whiteaves (1898, p. 397) refers to Schuchert's specimen of *Leiopteria rafinesquii* as coming from the "Upper third of the section" at Bartlett's Mills; the label of this specimen, No. 26493 at the United States National Museum, gives the horizon as "Lower third."

Gastropoda:

Bellerophon triliratus? Hall 133, 134
Bembexia capillaria (Conrad) (*Pleurotomaria, Gyroma*) 118, 127, 167
Naticonema lineata (Conrad) (*Platyostoma, Diaphorostoma*) 127
Platyceras arkonense Shimer and Grabau 55, 127, 171
as *P.* sp. cf. *P. dumosum* Conrad 20, 67, 94
as *P. rarispinum* Hall 133, 134, 139
Platyceras bartlettense Yochelson and Kopf 171
Platyceras bucculentum Hall 55, 118, 127, 133, 168, 169
**Platyceras erectum* Hall (*Acroculia*) 55, 133, 134, 164, 167
Platyceras sp. cf. *P. erectum* Hall 67
**Platyceras subspinosum* Hall 133, 134
Platyceras thetis Hall 127, 133
"Pleurotomaria" sp. 12, 87
"Pleurotomaria" arkonensis Whiteaves 133, 167
"Pleurotomaria" delicatula? Hall 133, 134

Cephalopoda:

Arkonoceras arkonense (Whiteaves) (*Orthoceras*) 36, 127, 167
Bactrites arkonensis Whiteaves = *B. obliqueseptatus?* var. *arkonensis* Whiteaves 53, 55, 79, 89, 90, 127, 128, 133, 134, 146, 167, 168, 169
Dolorthoceras exile (Hall) (*Orthoceras*) 98, 127, 164, 167
Michelinoceras? subulatum (Hall) (*Orthoceras*) 79, 127, 128, 133, 167
"Orthoceras" sp. 87, 133
Tornoceras sp. 87 (as *Agoniatites* sp. 90)
Tornoceras uniangulare (Conrad) (*Goniatites*) 53, 58, 79, 89, 90, 98, 127, 128, 133, 134, 140, 146, 164, 167, 168, 169

Incertae Sedis:

Coleolus tenuicinctus (Hall) (*Coleoprion*) 40
Coleoprion? tenuis Hall 58, 127, 133, 167
Hyolithes aclis Hall 127, 133, 167
Styliolina fissurella (Hall) (*Tentaculites, Styliola*) 40, 133, 134, 139, 168
Tentaculites sp. 94, 96
Tentaculites attenuatus Hall 20, 40, 55, 58, 127, 128, 133, 134, 164, 167, 168, 169

* Probably from the Hungry Hollow formation, or misidentified.

Tentaculites attenuatus Hall (var.) 117
Tentaculites bellulus Hall 40, 58, 133, 134, 138, 139
Tentaculites gracilistriatus Hall 40

Arthropoda:

Trilobita:

Dechenella alpenensis Stumm 153
Greenops arkonensis Stumm 153
Phacops rana arkonensis Stumm 153
as *P. rana* (Green) = *Calymene bufo* var. *rana* Green 20, 27, 94, 96, 127, 128, 133, 134, 164, 167, 168, 169, J
as *P. bufo* (Green) 87

Ostracoda:

Aechmina sp. 75
Aechmina sp. cf. *A. choanobasota* Kesling 75
Aechmina phantastica Kesling 75
Aechminaria sp. 75
Aechminaria hormathota Kesling 75
Aechminaria sp. cf. *A. hormathota* Kesling 75
"*Arcyzona subquadratus* (Ulrich)" (*Amphissites*) 8, 23, 157, 162
Barychilina walcotti (Jones) (*Primitia? Kirkbya?*) 8, 22, 70, 71, 76, 133, 167
Boursella trilobata Turner 81, 157
Bufina lineata Turner 23, 157
Cornigella immotipedata Kesling 73
Ctenoloculina acanthina Kesling 74
Ctenoloculina cicatricosa (Warthin) (*Tetradella*) 23, 162
Ctenoloculina eurybathrota Kesling 74, 77
Ctenoloculina platyzanclota Kesling 74
Ctenoloculina thliberilobota Kesling 74
Dizygopleura trisinuata Van Pelt 157, 162
Euglyphella sigmoidalis (Jones) (*Strepula*) 23
Falsipollex valgus Kesling 74
Hollina pyxidata Kesling 74
Hollinella kolmodini (Jones) (*Hollina*) 8, 86
Hollinella pumila Kesling 74
Hollinella senticosa Kesling 74
Jenningsina catenulata (Van Pelt) (*Graphiodactylus*) 23
Kirkbyella bellipuncta (Van Pelt) (*Amphissites*) 23, 157
Poloniella cingulata Warthin 23, 157

Ponderodictya punctulifera (Hall) (*Cytherellina, Cythere? Hamiltonella, Leperditia, Primitiopsis*) 8, 23, 40, 55, 69, 70, 71, 96, 118, 127, 133, 134, 157, 167
Sigynus dictyotus Kesling 75
?Subligaculum sp. 74
Subligaculum calcaratum Kesling 74
Tetrasacculus magnivelatus Kesling and McMillan 74
Tetrastorthynx diabolicus Kesling 73
Tmemolophus margarotus Kesling 73
Ulrichia conradi Jones 8, 22, 23, 70, 71, 74, 127, 128, 133, 157, 162, 167
Ulrichia illinearis Kesling 73
Xystinotus subnodatus (Turner) (*Ulrichia*) 73, 157
Xystinotus wrightorum Kesling 73

Conodonts:

Acodus formosus Stauffer 33*a*, 135
Acodus inopinatus Stauffer 33*a*, 135
Bryantodus ausablensis Stauffer 33*a*, 135
Bryantodus bryanti Stauffer 33*a*, 135
Bryantodus eriensis Stauffer 33*a*, 135
Bryantodus stratfordensis Stauffer 33*a*, 135
Cardiodella? leviculus (Stauffer) (*Cardiolus*) 33*a*, 135
Cervicornoides alternatus Stauffer 33*a*, 135
Cervicornoides heterodentatus Stauffer 33*a*, 135
Ctenognathus elegans Stauffer 33*a*, 135
Cyrtoniodus worthingtonensis Stauffer 33*a*, 135
Euprioniodina sp. 33*a*, 135
Euprioniodina? sp. 33*a*, 135
Hindeodella beta Stauffer 33*a*, 135
Hindeodella lambtonensis Stauffer 33*a*, 135
Hindeodella milleri Stauffer 33*a*, 135
Hindeodella modesta Stauffer 33*a*, 135
Hindeodella priscilla Stauffer 33*a*, 135
Icriodus arkonensis Stauffer 33*a*, 135
Icriodus cymbiformis? Branson and Mehl 33*a*, 135
Icriodus elegantulus Stauffer 33*a*, 135
Icriodus expansus Branson and Mehl 33*a*, 135
Icriodus latericrescens Branson and Mehl 33*a*, 135
Ligonodina hindei Ulrich and Bassler 33*a*, 135
Lonchodina sp. 33*a*, 135

Lonchodina disjuncta Stauffer 33*a*, 135
Plectodina sp. 33*a*, 135
Polygnathus decorosus Stauffer 33*a*, 135
Polygnathus sanduskiensis Stauffer 33*a*, 135
Polygnathus strongi Stauffer 33*a*, 135
Polygnathus webbi Stauffer 33*a*, 135
Prioniodus bownockeri Stauffer 33*a*, 135
Trichonodella hoffmani (Stauffer) (*Tricognathus*) 33*a*, 135

Hungry Hollow Formation

Porifera:

Silicispongia:

Astraeospongia hamiltonensis Meek and Worthen 127, 133, 165, 167
"Supposed bundles of spicules" 167

Anthozoa:

Tetracoralla:

Aulacophyllum perlamellosum? (Hall) (*Cyathophyllum*) 133
Bethanyphyllum robustum (Hall) (*Cyathophyllum*) 6, 55, 128
Bethanyphyllum sp. cf. *B. robustum* (Hall) 127
Billingsastraea canadensis Ehlers and Stumm
as *B. verneuilli* (Edwards and Haime) (*Phillipsastraea*) 6, 83, 84, 127, 128, 133, 167, 168
Billingsastraea southworthi Ehlers and Stumm 30, 152
Blothrophyllum conatum (Hall) (*Cyathophyllum*) 6, 55, 127, 133, 167, 168
Cyathophyllum distortum Hall 13
Cyathophyllum zenkeri Billings 6, 98, 133, 164, 167
Cyathophyllum sp. cf. *C. zenkeri* Billings 127
Cystiphylloides sp. 91, 133
Cystiphylloides americanum (Edwards and Haime) (*Cystiphyllum*) 12, 13, 20, 51, 57, 87, 96, 123, 128, A
as *Cystiphyllum vesiculosum auctt.* not Goldfuss 83, 84, 94, 95, 96, 98, 100, 114, 115, 127, 133, 134, 139, 164, 167, 168, 169
as *C. cylindricum* Hall 6, 91, 93
Cystiphylloides conifollis (Hall) (*Cystiphyllum*) 6, 55, 57, 127, 128, 133, 164, 167, A, J

Cystiphylloides superbum (Nicholson) (*Cystiphyllum*) 6, 12, 98, 99, 127, 133, 164, 167
Eridophyllum sp. 91
Eridophyllum archiaci (Billings) (*Diphyphyllum, Crepidophyllum, Craspedophyllum*) = *Axinura canadensis* Castelnau 6, 12, 15, 20, 29, 51, 55, 84, 85, 87, 98, 123, 127, 128, 133, 134, 150, 152, 164, 167, 168, 169
as *E. strictum* Edwards and Haime 6, 98, 127, 133, 164, 167
Eridophyllum subcaespitosum (Nicholson) (*Craspedophyllum, Crepidophyllum, Heliophyllum*) 6, 12, 29, 55, 94, 95, 96, 102, 127, 133, 152, 164, 167
Hadrophyllum woodi Grabau 6
Heliophyllum sp. 91, 102
Heliophyllum confluens Hall 6, 55, 133, 169
Heliophyllum halli Edwards and Haime (*Cyathophyllum*) 6, 12, 14, 20, 21, 51, 55, 84, 87, 94, 95, 96, 98, 100, 101, 102, 114, 115, 118, 123, 127, 128, 129, 133, 134, 139, 164, 167, 168, 169, A, F
Heliophyllum infoviatum (Davis) (*Cyathophyllum*) 6, 133
Heliophyllum juvene (Rominger) (*Cyathophyllum*) 6, 20, 51, 123, 129, 133, 167
as *H. tenuiseptatum* (Billings) (*Cyathophyllum*) 6, 12, 14, 55, 84, 87, 101, 115, 127, 128, 129, 133, 164, 167
Heterophrentis prolifica (Billings) (*Zaphrentis, Streptelasma*) 6, 12, 18, 21, 55, 84, 87, 94, 96, 115, 123, 127, 128, 133, 134, 139, 142, 164, 167, 168, 169
Heterophrentis simplex (Hall) (*Strombodes, Zaphrentis*) 6, 128
as *Zaphrentis cornicula* Lesueur 98, 127, 133, 164
as *Z. phrygia* Rafinesque and Clifford 6, 98, 167
Hexagonaria percarinata Sloss (*Prismatophyllum*)
as *Acervularia profunda* Hall 133, 164, 167
as *Prismatophyllum* sp. 25
as *Prismatophyllum davidsoni* (Edwards and Haime) 6, 127, 133
Homalophyllum exiguum (Billings) (*Zaphrentis, Cyathophyllum, Heliophyllum*) 6, 96, 127, 133, 164, 167
Microcyclus erraticus Stumm 6, 138, 149, 152
**Microcyclus thedfordensis* Bassler
as *M. discus* Meek and Worthen 20, 127, 133

* Probably from the Arkona shale.

Odontophyllum convergens (Hall) (*Aulacophyllum, Heliophyllum*) 6, 148, 152
as *Aulacophyllum sulcatum* (Orbigny) 6, 133

Tabulata:

Alveolites sp. 51, 91
Alveolites goldfussi Billings 6, 12, 15, 20, 25, 34, 55, 82, 87, 94, 96, 103, 115, 123, 127, 128, 133, 147, 164, 167, 168, 169
Antholites speciosus Davis 151
Aulocystis dichotoma (Grabau) (*Ceratopora*) 6, 55, 118, 127, 133, 134
Aulocystis intermedia (Nicholson) (*Ceratopora, Syringopora, Drymopora*) 6, 55, 82, 94, 96, 118, 127, 133, 134, 142, 147, 164, 167
Aulocystis "nobilis" (Billings) (*Ceratopora, Syringopora, Drymopora*) 6, 82, 123, 133, 134, 164, 167
**Aulocystis ramosa* (Whiteaves) (*Roemeria, Drymopora*) 127, 167
Aulopora sp. 91, 95, 133
Aulopora? canadensis Nicholson 94, 96, 164
Aulopora cornuta Billings 55, 94, 96, 133, 164
Aulopora elleri Fenton and Fenton 6
as *A. "serpens"* Goldfuss 55, 118, 127, 133, 134, 139, 165, 167
Aulopora "tubaeformis" Goldfuss 55, 133
Cladochonus antiquus (Whiteaves) (*Monilopora*) 6, 52, 55, 127, 128, 133, 147, 167
Cladopora alpenensis Rominger 6, 133
Cladopora cryptodens (Billings) (*Alveolites, Coenites*) 6, 133
Cladopora labiosa (Billings) (*Alveolites, Coenites*) 6, 133
Cladopora roemeri (Billings) (*Alveolites, Coenites*) 6, 12, 15, 55, 82, 87, 94, 96, 123, 127, 133, 134, 147, 164, 165, 167
Emmonsia arbuscula (Hall) (*Favosites*) 6, 20, 124, 133, 147, 167
Emmonsia radiciformis (Rominger) (*Favosites*) 6, 133
Favosites sp. 51, 91
Favosites alpenensis Winchell 6, 127, 133, 134, 167
Favosites alpenensis calveri Swann 154
Favosites argus Hall 34, 147
Favosites billingsi Rominger 6, 20, 82, 103, 115, 123, 124, 127, 133, 147, 164, 167, 168
Favosites clausus Rominger 6, 55, 82, 103, 123, 127, 133, 164, 167

* Probably from the Arkona shale.

Favosites digitatus Rominger 6, 55, 82, 127, 133
Favosites hamiltoniae Hall 6, 55, 128, 133
as *F. gothlandicus* Lamarck 15, 87, 96, 164
Favosites "limitaris" Rominger 55, 133
Favosites milne-edwardsi Ross 124
Favosites nitella Winchell 6, 133
Favosites placenta Rominger 6, 20, 25, 34, 55, 57, 115, 123, 124, 127, 128, 133, 134, 147, 164, 167, 168, 169
Favosites "polymorpha" Goldfuss 87, 164
Favosites radiatus Rominger 6, 133
Favosites rotundituba Davis 124, 147
as *F. canadensis* (Billings) (*Fistulipora*) 6, 94, 96, 104, 133, 164
Favosites tuberosus Rominger 103, 133, 164
Favosites turbinatus Billings 6, 15, 25, 34, 55, 82, 87, 94, 96, 118, 124, 127, 128, 133, 134, 147, 164, 167, 168, 169
as *F. hemisphericus* of American authors 15, 87, 96, 164
Platyaxum fischeri (Billings) (*Alveolites, Cladopora, Coenites, Pachypora*) 6, 12, 15, 55, 82, 87, 94, 96, 103, 109, 123, 127, 128, 133, 147, 164, 167, 168
Platyaxum frondosum (Nicholson) (*Alveolites, Cladopora, Pachypora*) 6, 12, 20, 82, 94, 95, 96, 103, 110, 127, 133, 147, 164, 167, 168, 169
as *Cladopora canadensis* Rominger 6, 123, 134
Pleurodictyum insigne (Rominger) (*Michelinia*) 6, 133
Striatopora linnaeana Billings 6, 12, 15, 55, 82, 87, 94, 96, 103, 123, 124, 127, 133, 147, 164, 167, 168, 169
Syringopora perelegans? Billings 133
Thamnopora "cervicornis" (Edwards and Haime) (*Favosites, Pachypora*) 87, 164, 165
Thamnoptychia romingeri (Ross) = *Dendropora ornata* Rominger, *Striatopora limbata* (Eaton), *Trachypora ornata* (Rominger) 6, 55, 123, 124, 127, 128, 133, 164, 167
Trachypora elegantula Billings (*Dendropora*) 6, 12, 15, 55, 82, 87, 94, 96, 103, 123, 124, 127, 128, 133, 134, 147, 164, 167, 168, 169

Stromatoporoidea:

Clathrodictyon retiforme (Nicholson and Murie) (*Stylodictyon*) 107, 112, 116, 127, 133, 164, 166, 167, D
Stromatopora nulliporoides Nicholson 98, 108, 164

Stromatoporella elevata Parks 116, D
Stromatoporella granulata (Nicholson) (*Stromatopora*) 55, 94, 96, 97, 105, 106, 112, 116, 127, 128, 133, 164, 166, 167, D
Stromatoporella granulata distans Parks 116, D
Stromatoporella incrustans (Hall and Whitfield) (*Stromatopora, Coenostroma*) 127, 133, 166, 167
Stromatoporella mammillata (Nicholson) (*Stromatopora*) 96, 127, 133, 167

Echinodermata:

Blastoidea:

Codaster canadensis Billings 9, 16, 17, 127, 133, 164, 167, 168
Codaster hindei Etheridge and Carpenter 9, 33, C
Devonoblastus whiteavesi Reimann, 9, 119, E
as *Granatocrinus leda* Whiteaves 127, 133, 164, 167
Eleutherocrinus cassedayi Shumard and Yandell 9, 25, 117, 127, 133, 164, 167, 168
Eleutherocrinus sp. cf. *E. cassedayi* Shumard and Yandell 120
Nucleocrinus elegans Conrad 9, 20, 78, 127, 133, 164, 167, 168, C
as *N. canadensis* Montgomery 10, 91
"Pentremites" sp. 168, 169
"Pentremites" lycorias Hall 20, 127, 133, 167
"Pentremites" roemeri Shumard 12, 87
Pentremitidea cummingsi Reimann 9, 119, 120, E
Pentremitidea dotis Reimann 120
Pentremitidea filosa Whiteaves 9, 55, 120, 127, 128, 133, 164, 167
Pentremitidea filosa var. *angusta* Reimann 120
Pentremitidea ovalis Reimann 120
Pleuroschisma ontario Reimann 120
Troosticrinus? dubium Reimann 120

Crinoidea:

Dolatocrinus sp. 25, 127, 133, 167
Dolatocrinus bulbaceous Miller and Gurley 132
as *D. subaculeatus* Whiteaves 127, 133, 167
Dolatocrinus sp. cf. *D. bulbaceous* Miller and Gurley 48
Dolatocrinus canadensis Whiteaves 9, 127, 132, 133, 160, 164, 167
Dolatocrinus sp. cf. *D. indianensis* Miller and Gurley 132
Dolatocrinus lamellosus Hall 133, 164
Dolatocrinus lineolatus Miller and Gurley 9, 170
Dolatocrinus liratus Hall 133, 134, 164

Dolatocrinus triadactylus Barris 9
Gilbertsocrinus spinigerus (Hall) (*Trematocrinus, Goniasteroidocrinus, Ollacrinus*) 9, 43, 55, 127, 128, 133, 160, 164, 167
Megistocrinus sp. 25, 164
Megistocrinus depressus? Hall 9, 170
Megistocrinus rugosus Lyon and Casseday 9, 127, 133, 164, 167

Annelida:

Sedentaria:

Autodetus lindstroemi Clarke 127, 133, 167
Cornulites intermedia (Nicholson) (*Ortonia*) 12, 55, 94, 95, 96, 127, 133, 164, 167
Spirorbis angulatus Hall 98, 127, 128, 133, 164, 167
Spirorbis arkonensis Nicholson 12, 55, 94, 95, 96, 128, 133, 139, 164, 165, 167
Spirorbis omphalodes Goldfuss 55, 94, 95, 96, 127, 128, 133, 164, 165, 167, 168
Spirorbis spinuliferus Nicholson 98, 127, 133, 164, 167

Bryozoa:

Anastomopora cinctuta (Hall) (*Fenestella, Reteporidra, Lyropora*) 42, 59, 62, 133
as *Reteporella cinctata* (Hall) H
Anastomopora perundata (Hall) (*Fenestella, Polypora, Reteporidra*) 42, 133, B
Botryllopora socialis Nicholson 12, 55, 61, 65, 94, 95, 96, 113, 127, 128, 133, 139, 158, 164, 167
Coscinella elegantula Hall and Simpson 7, 55, 65, 113, 127, 167, B
Coscinotrypa striatum (Hall and Simpson) (*Coscinium*) 65, 113, 127, 133, 167
Fenestella arkonensis Whiteaves 42, 113, 127, 133, 167, 168, 169
as *F. tenuiceps* Nicholson 94, 96, 164
Fenestella emaciata Hall 42, 133
Fenestella magnifica Nicholson 42, 133
Fenestella nicholsoni Whiteaves 42, 113, 127, 133, 167
as *F. cribrosa* Nicholson 94
Fenestrapora biperforata Hall 133
Fistulipora huronensis (Nicholson) (*Ceramopora, Ceriopora, Limaria*) 12, 98, 100, 113, 127, 133, 164, 165, 167
Fistulipora incrassata (Nicholson) (*Callopora*) 20, 94, 95, 96, 103, 113, 133

Fistulipora vesiculata (Hall and Simpson) (*Lichenalia*) 139
Fistuliporella utricula (Rominger) (*Fistulipora*) 2, 113, 127, 133
Hederella bilineata Bassler 5
Hederella canadensis (Nicholson) (*Alecto? Aulopora?*) 55, 113, 133, 139, 165, 167
Hederella cirrhosa Hall 5, 127, 133, 139, 167
**Hederella concinna* Bassler 5
Hederella delicatula Bassler 5
Hederella filiformis (Billings) (*Aulopora*) 5, 7, 65, 113, 127, 128, 133, 134, 165, 167
Hederella germana Bassler 5
Hederella magna Hall 5, 127, 133, 139, 167
**Hederella major* Bassler 5
Hederella parallela Bassler 5
**Hederella parvirugosa* Bassler 5
**Hederella persimilis* Bassler 5
Hederella rectifurcata Bassler 5
Hederella regularis Bassler 5
Hederella robusta Bassler 5
Hederella rugosa Bassler 5
Hederella thedfordensis Bassler 5
Hederella vagans Bassler 5
Hemitrypa cribrosa (Hall) (*Fenestella*) 42, 94, 96, 133
**Hernodia davisi* Bassler 5
Intrapora cosciniformis (Nicholson) (*Ptilodictya, Coscinium, Coscinella*) 12, 98, 100, 113, 127, 133, 158, 164, 167
Leioclema digitatum (Hall) (*Lioclema*) 133
Leioclema minutissimum (Nicholson) (*Callopora, Lioclema*) 98, 113, 127, 133, 164, 167
Leioclema multaculeatum (Hall) (*Thallostigma, Fistulipora, Lioclema*) = *Fistuliporina multiculeata* Simpson 133
Leptotrypella barrandei (Nicholson) (*Chaetetes, Monticulipora, Heterotrypa, Amplexopora*) 7, 12, 94, 95, 96, 104, 113, 127, 133, 164, 167
Leptotrypella moniliformis (Nicholson) (*Chaetetes, Monticulipora, Heterotrypa, Amplexopora*) 12, 28, 94, 95, 96, 103, 104, 113, 127, 133, 164, 167
Leptotrypella quadrangularis (Nicholson) (*Chaetetes, Paleschara, Leptotrypa*) 28, 94, 95, 96, 127, 133, 164, 165, 167

* May be from the Widder formation.

Lichenalia stellata Hall 65, 127, 167
Loculipora perforata (Hall) (*Fenestella*) 42, 133
Orthopora carinata Hall and Simpson (*Trematopora, Rhombopora*) 65, 113, 133, 167, B
Orthopora elongata Hall and Simpson (*Trematopora, Rhombopora*) 133
Paleschara? reticulata Hall 133
Pinacotrypa elegans (Rominger) (*Fistulipora*) 122, 127, 167
Pinacotrypa stellata (Hall) (*Fistulipora*) 133
Pinacotrypa variapora (Hall) (*Thallostigma, Fistulipora, Fistuliporina*) 60, 61, 65, 113, 127, 133, 167, B
Polypora sp. 133
Polypora arkonensis S. A. Miller 42, 94, 113, 133, 164, 167
as *P. tuberculata* Nicholson 12, 94, 95, 96, 164
Polypora fistulata (Hall) (*Fenestella*) 42, 55, 59, 62, 118, 133
Polypora latitruncata (Hall) (*Fenestella*) 42, 59, 62, 113, 133, B
Polypora multiplex (Hall) (*Fenestella*) 42, 133
Polypora mutabilis? (Hall) (*Fenestella*) 133
Polypora robusta? (Hall) (*Fenestella*) 133
Polypora striata (Hall) (*Ptilopora*) 55, 60, 61, 63, 65, 113, 127, 128, 133, 167, B
**Reptaria stolonifera* Rollé 5
Reteporina prisca (Goldfuss) (*Retepora*) 42, 94, 96, 113, 127, 133, 164, 167
Reteporina striata (Hall) (*Fenestella*) 42, 133
Rhombopora subannulata Ulrich 133
Semicoscinium davidsoni (Nicholson) (*Fenestella*) 12, 42, 98, 113, 127, 133, 164, 167
Semicoscinium labiatum (Hall) (*Fenestella*) 42, 113, 127, 133
as *Fenestella hemicycla* Hall 62, B
Semiopora bistigmata Hall 7, 63, 65, 113, 127, 133, 167, B
Streblotrypa hamiltonensis (Nicholson) (*Ceriopora, Acanthoclema, Rhombopora, Callopora*) 12, 55, 65, 95, 96, 113, 118, 128, 133, 134, 164, 167, B
Sulcoretopora sp. 133
Sulcoretopora hamiltonensis (Ulrich) (*Cystodictya*) 133
Sulcoretopora incisurata (Hall) (*Stictopora, Cystodictya*) 55, 113, 128, 133, 139, 167

* May be from the Widder formation.

Taeniopora exigua Nicholson 7, 12, 55, 60, 65, 88, 94, 95, 96, 113, 127, 128, 133, 134, 164, 167

Taeniopora penniformis Nicholson 12, 55, 94, 95, 96, 113, 127, 133, 164, 167

Taeniopora subcarinata (Hall) (*Stictoporidra*) 133

Unitrypa scalaris (Hall) (*Fenestella*) 42, 55, 59, 62, 113, 128, 133, B

Vinella devonica Cleland 133

Brachiopoda:

Inarticulata:

Craniops hamiltoniae (Hall) (*Pholidops*) 118, 127, 133, 134

Lingula ligea Hall 55, 125, 127, 133, 164, 167

Lingula thedfordensis Whiteaves 125, 127, 164, 167

**Orbiculoidea doria* (Hall) (*Discinia*) 12, 56, 125, 127, 133, 164, 167

Petrocrania hamiltoniae (Hall) (*Craniella*) 98, 118, 127, 128, 133, 139, 164, 165, 167

Philhedra crenistriata (Hall) (*Crania*) 94, 96, 118, 127, 128, 133, 164, 167

Philhedra favincola (Hall and Clarke) (*Crania*) 133

Articulata:

Ambocoelia umbonata (Conrad) (*Orthis*) 118, 128, 133, 134, 139, 164, 167

Athyris sp. 91

Athyris fultonensis (Swallow) (*Spirigera*) 118, 127, 167, 168, 169

Athyris? rostrata Hall (*Spirigera*) 12, 15, 96

Athyris spiriferoides (Eaton) (*Terebratula*) 15, 21, 96, 125, 133, 164

as *Spirigera concentrica* (von Buch) (*Terebratula*) 12, 87

Athyris sp. cf. *A. spiriferoides* (Eaton) 127

Athyris vittata Hall 133, 134, 139

Atrypa reticularis (Linnaeus) (*Anomia, Anomites, Spirigerina, Terebratula*) 15, 20, 21, 51, 56, 87, 94, 96, 115, 118, 127, 133, 134, 139, 165

Atrypa spinosa Hall 56, 127, 133, 167

Brachyspirifer audaculus (Conrad) (*Delthyris, Spirifer*) 118, 127, 133, 139, 167

Callipleura nobilis (Hall) (*Rhynchospira, Trematospira, Cyclorhina, Retzia*) 25, 59, 125, 127, 128, 133, 146, 164, 167

* May be from the Widder formation.

Camarophoria sp. 25
Camarospira sp. 25
Camarotoechia horsfordi (Hall) (*Rhynchonella*) 127
Camarotoechia sappho (Hall) (*Rhynchonella*) 118, 127, 133, 167
Camarotoechia thedfordensis Whiteaves 25, 127, 133, 167, 168, 169
Chonetes sp. 15, 87, 91
Chonetes coronatus (Conrad) (*Strophomena*) 25, 133, 134, 139, 164, 167
Chonetes deflectus Hall 133
Chonetes lepidus Hall (*Strophomena*) 15, 87, 94, 96, 118, 127, 133, 134, 164, 167, 168
Chonetes scitulus Hall 94, 96, 118, 128, 133, 164, 167
Cranaena sp. 133
Cranaena harmonia (Hall) (*Terebratula, Eunella*) 127, 133, 167
Cranaena lincklaeni (Hall) (*Terebratula, Eunella*) 133
Cranaena ontario (Hall) (*Terebratula*) 133
Cranaena romingeri (Hall) (*Terebratula*) 127, 133, 167
Cryptonella sp. 127
Cryptonella attenuata (Whiteaves) (*Eunella*) 25, 127, 128, 133, 146, 167
Cyrtina sp. 91
Cyrtina hamiltonensis (Hall) (*Cyrtia*) 12, 15, 87, 96, 115, 118, 125, 127, 133, 139, 164, 165, 167, 168, 169
Delthyris sculptilis Hall 15, 25, 55, 87, 98, 118, 125, 127, 133, 134, 146, 164, 167
Douvellina inaequistriata (Conrad) (*Strophomena, Stropheodonta*) = *Stropheodonta inaequiradiata* (Hall) 15, 25, 55, 87, 94, 96, 125, 127, 128, 133, 164, 167
Elytha fimbriata (Conrad) (*Delthyris, Spirifer, Reticularia*) 15, 20, 25, 51, 56, 94, 118, 127, 128, 133, 164, 167
Fimbrispirifer venustus (Hall) (*Spirifer*) 25, 128, 146
as *F. divaricatus* (Hall) (*Spirifer*) 127, 133, 134, 167
Leptalosia radicans (Winchell) (*Crania, Strophalosia*) 127, 167
Longispira mucronata (Hall) (*Strophomena, Chonetes*) 55, 133
Megastrophia concava (Hall) (*Strophomena, Stropheodonta*) 118, 127, 128, 133, 134, 164, 167
Mucrospirifer sp. 91
Mucrospirifer thedfordensis (Shimer and Grabau) (*Spirifer*) 54, 92, 118, 127, 128, 133, 168, 169
as *M. mucronatus* (Conrad) (*Delthyris, Spirifer*) 12, 13, 15, 19, 21, 55, 56, 87, 93, 95, 96, 118, 121, 125, 133, 134,

164, 167, F, J
as *Spirifer consobrinus* (Orbigny) 127, 133, 167
as *Spirifer pennatus* (Atwater) 115
Nucleospira concinna (Hall) (*Atrypa*) 25, 55, 118, 125, 127, 128, 133, 164
**Nudirostra laura* (Billings) (*Rhynchonella, Leiorhynchus, Liorhynchus*) 15, 18, 55, 87, 118, 125, 127, 133, 134, 164, 167, 168, 169
**Nudirostra multicosta* (Hall) (*Rhynchonella, Leiorhynchus, Liorhynchus*) 12, 56, 95, 96, J
Parazyga hirsuta (Hall) (*Atrypa, Trematospira*) 12, 15, 25, 55, 56, 125, 128, 133, 146, 167
as *Athyris chloe* Billings (*Retzia*) 12, 87, 164
Parazyga sp. cf. *P. hirsuta* (Hall) 127
†*Pentagonia biplicata* (Hall) (*Meristella*) 25, 55, 125, 127, 128, 133, 167
Pentamerella pavilionensis (Hall) (*Pentamerus*) 128, 133, 167
as ‡*Gypidula laeviuscula* Hall 127, 133, 167
Pholidostrophia nacrea (Hall) (*Strophomena, Stropheodonta*) 56, 128, 164
as *P. iowensis* (Owen) 55, 115, 118, 125, 127, 133, 134, 139, 167, 168, 169
Productella productoides (Murchison) (*Productus*) 125, 133, 134, 167
Productella sp. cf. *P. productoides* (Murchison) 127
Productella spinulicosta (Hall) (*Productus*) 133, 139, 165
Productella truncata (Hall) (*Productus, Strophalosia*) 125, 133, 164, 167
Protoleptostrophia perplana (Conrad) (*Strophomena, Stropheodonta*) 12, 15, 118, 125, 127, 128, 133, 134, 139, 164, 165, 167
Rhipidomella penelope (Hall) (*Orthis*) 115, 118, 127, 128, 133, 134, 139, 167, 168, 169

* Probably from the Widder formation.

† Listed erroneously as *P. unisulcata,* an Onondaga species, by some authors; as *P. bisulcata* by others. See Hall, 1867, *Pal. N.Y.,* Vol. IV, p. 311.

‡ Dr. G. Arthur Cooper checked Schuchert's specimen listed by Whiteaves, No. 26509 at the U. S. National Museum; he writes that "it is the common *Pentamerella* from the Hungry Hollow formation."

Rhipidomella vanuxemi (Hall) (*Orthis*) 12, 15, 21, 55, 87, 94, 96, 115, 118, 125, 127, 133, 134, 139, 164, 167
Rhipidothyris lepida (Hall) (*Rhynchospira, "Trigeria"*) 118, 127, 133
Rhynchospira eugenia (Billings) (*Retzia*) 127
Schuchertella anomala (Winchell) (*Crania, Streptorhynchus, Orthothetes, Schellwienella*) 127, 133, 167
Schuchertella perversa (Hall) (*Streptorhynchus, Orthothetes, Schellwienella* = *O. chemungensis* var. *perversus* (Hall) 87, 125, 128, 133, 134, 164, 167
Spinocyrtia sp. 31
Spinocyrtia granulosa (Conrad) (*Delthyris, Spirifer*) 133
Stenoscisma kernahani (Whiteaves) (*Pugnax, Camarophoria*) 117, 127, 128, 133, 146, 167
Stropheodonta sp. 91
Stropheodonta demissa (Conrad) (*Strophomena*) 1, 96, 118, 125, 127, 133, 134, 139, 164, 165, 167
Stropheodonta plicata (Hall) (*Strophodonta*) 125, 127, 133, 164, 167
Tropidoleptus carinatus (Conrad) (*Strophomena*) 25, 118, 127, 133, 167

Mollusca:

Pelecypoda:

Actinopteria boydi (Conrad) (*Avicula, Pterinea*) 55, 127, 128, 133, 165, 167
Cornellites flabellum (Conrad) (*Avicula, Pterinea*) 127, 133, 134, 139, 164, 165, 167
Cypricardinia indenta (Conrad) (*Cypricardites*) 128, 133
Limoptera macroptera (Conrad) (*Lima*) 55, 127, 128, 133, 167
Paracyclas lirata (Conrad) (*Posidonia, Lucina*) 128, 167
Pterinopecten princeps (Conrad) (*Monotis, Avicula, Aviculopecten*) 118, 133

Gastropoda:

Euomphalus laxus Hall (*Phanerotinus*) 127, 133, 167
Naticonema lineata (Conrad) (*Platyostoma, Diaphorostoma*) 118, 127, 133, 139, 164, 167
Naticonema plicatum (Whiteaves) (*Diaphorostoma*) 127, 133, 164, 167
Platyceras sp. 133

**Platyceras arkonense* Shimer and Grabau 55, 127, 133
as *P. rarispinum* Hall = *P. dumosum* var. *rarispinum* Hall 96, 133, 139, 164, 167
Platyceras carinatum Hall 55, 133, 139, 164, 167
Platyceras conicum Hall 55, 58, 127, 128, 133, 164, 167
Platyceras erectum (Hall) (*Acroculia*) 55, 133, 134, 164, 167
Platyceras quinquesinuatum Ulrich 127, 133, 164, 167
Platyceras subspinosum Hall 127, 133, 168, 169
†*Platyceras turbinatum* (Hall) (*Platyostoma, Diaphorostoma*) 127, 128, 167
Turbonopsis shumardi (Hall) (*Turbo*) 127, 133, 164, 167

Cephalopoda:
**Dolorthoceras exile* (Hall) (*Orthoceras*) 133
‡*Dolorthoceras lambtonense* (Whiteaves) (*Orthoceras*) 133
‡*Dolorthoceras* sp. cf. *D. lambtonense* (Whiteaves) 127
Stereotoceras lentiexpansum Flower 37
Tornoceras discoideum (Hall) (*Goniatites, Paradoceras*) 133
**Tornoceras uniangulare* (Conrad) (*Goniatites*) 133

Incertae Sedis:
Styliolina fissurella (Hall) (*Tentaculites, Styliola*) 127, 133, 139
**Tentaculites attenuatus* Hall 133
**Tentaculites bellulus* Hall 133, 134, 139

Arthropoda:

Trilobita:
Dechenella rowi arkonensis Stumm 153
as *Proetus rowi* (Green) (*Calymene*) 127, 128, 167
Greenops boothi (Green) (*Cryphaeus*) 94, 96, 118, 127, 133, 153, 164, 167
Phacops iowensis southworthi Stumm 153
Phacops rana (Green) = *Calymene bufo* var. *rana* Green 20, 27, 64, 94, 96, 127, 133, 134, 153, 164, 167, 168, J
as *P. bufo* (Green) 21, 87

* Found in the Arkona shale, not in this formation.

† Whiteaves (1898, p. 400) refers to specimens of this species found by Schuchert in the "Lower third of the section," and deposited in the U. S. National Museum, No. 26483. Dr. G. Arthur Cooper kindly checked the label of this number, and reports that it reads "Middle third of the section" at Bartlett's Mills, which agrees with the stratigraphic position of this species when found today.

‡ Found in the Widder formation, not in this formation.

**Proetus "crassimarginatus"* Hall 127, 167

Ostracoda:

Arcyzona conatus (Coryell and Malkin) (*Amphissites*) 26, 162
Arcyzona diadematus (Van Pelt) (*Amphissites*) 26
?Arcyzona simplicissimus (Knight) (*Amphissites*) 23, 26
Arcyzona tenuis (Warthin) = *A. simplicissimus* (Coryell and Malkin) *non* (Knight); see Warthin 1938, card 103. 162
Bairdia summacuminata Coryell and Malkin 26, 128
Bairdites deltasulcata Coryell and Malkin 26
Birdsallella devonica Coryell and Malkin 26
Bollia hindei Jones 26, 144, 162
Bollia widderensis Coryell and Malkin 23, 26
Bufina elata Coryell and Malkin 26, 163
Bufina elongata Coryell and Malkin 26, 155, 163
Cavellina cuneata Coryell and Malkin 26
Cavellina subplana Coryell and Malkin 26
Ctenobolbina papillosa? Ulrich 26, 144, 162
Ctenoloculina cicatricosa (Warthin) (*Tetradella*) 23, 26, 128, 155, 157, 162
Euglyphella sp. 23
Euglyphella compressa Coryell and Malkin 26, 163
Euglyphella jenningsi Coryell and Malkin 26, 163
Euglyphella projecta Coryell and Malkin 23, 26, 163
Euglyphella sigmoidalis (Jones) (*Strepula*) 26, 128, 155, 157, 163
Healdia arkonensis Coryell and Malkin 23, 26
Janetina harrietensis Coryell and Malkin 26
Jenningsina catenulata (Van Pelt) (*Graphiodactylus*) 23, 26, 155
Kirkbyella unicornis Coryell and Malkin 23, 26, 144, 162
Menoeidina sp. 23
?Ponderodictya bispinulata (Stewart) (*Cytherella?*) 26, 128
Ponderodictya pentacornis Coryell and Malkin 26
Ponderodictya punctulifera (Hall) (*Cytherella, Cythere? Leperditia, Primitiopsis*) 8, 23, 40, 55, 94, 96, 118, 127, 133, 157, 164, 167
?Ponderodictya unicornis (Van Pelt) (*Primitiopsis*) 26, 145

* Whiteaves (1898, p. 410) refers to a specimen of this species found by Schuchert in the "Lower third of the section" at Bartlett's Mills. Dr. G. Arthur Cooper kindly examined the label of this specimen, No. 26461 at the U. S. National Museum, and states that it reads "Middle third." It is probably a specimen of *P. canadensis* Stumm.

Quasillites fordei Coryell and Malkin 26, 155
Quasillites obliquus Coryell and Malkin 23, 26, 155, 157
Richina subcircularis Coryell and Malkin 26, 162
Richina truncata Coryell and Malkin 23, 25, 26, 162
Ropolonellus papillatus Van Pelt 23, 26, 163
Rudderina extensa Coryell and Malkin 23, 26, 163
Spinovina distributa Coryell and Malkin 26, 155, 157
Strepulites mooki Coryell and Malkin 23, 26, 163
Strepulites tischleri Coley 23
Tubulibairdia windomensis Swartz and Oriel 23
Ulrichia fragilis Warthin 23
Ulrichia spinifera Coryell and Malkin 26

Conodonts:

Acodus inopinatus Stauffer 33a, 135
Hindeodella sp. 33a, 135
Hindeodella lambtonensis Stauffer 33a, 135
Hindeodella modesta Stauffer 33a, 135
Polygnathus decorosus Stauffer 33a, 135

Widder Formation

Porifera:

Silicispongia:

"Supposed *Cliona* borings" 167

Incertae Sedis:

Receptaculites neptuni Defrance 127, 133, 164, 167

Anthozoa:

Tetracoralla:

Billingsastraea canadensis Ehlers and Stumm 30, 152
Billingsastraea southworthi Ehlers and Stumm 30, 152

Tabulata:

Aulocystis dichotoma (Grabau) (*Ceratopora*) 133, 134
Aulocystis intermedia (Nicholson) (*Ceratopora, Syringopora, Drymopora*) 82, 94, 127, 133, 134, 164, 167, 168, 169
Aulocystis jacksoni (Grabau) (*Ceratopora, Drymopora*) 6, 133, 139

Aulocystis "nobilis" (Billings) (*Ceratopora, Syringopora, Drymopora*) 82, 127, 133, 134, 164, 167
Aulopora sp. 133
Aulopora elleri Fenton and Fenton
as *A. "serpens"* Goldfuss 127, 133, 134, 165, 167
"Ceratopora" "agglomerata" Grabau 133
Cladochonus antiquus (Whiteaves) (*Monilopora*) 133, 147, 167
**Favosites alpenensis* Winchell 127
Syringopora perelegans Billings 133
Trachypora elegantula Billings (*Dendropora*) 82, 127, 133

Echinodermata:

Blastoidea:

Codaster canadensis Billings 133
"Pentremites" sp. 168
Pentremitidea alveata Reimann 120
Pentremitidea filosa Whiteaves 133
Pentremitidea preciosa Reimann 120

Crinoidea:

Arthracantha carpenteri (Hinde) (*Hystricrinus*) 139
Eutaxocrinus whiteavesi Springer 9, 46, 128, 131
as *Taxocrinus lobatus* var. Whiteaves (not Hall) 20, 127, 133, 164, 167, 170

Annelida:

Sedentaria:

Spirorbis sp. 58
Spirorbis arkonensis Nicholson 127, 128, 133, 164, 165, 167
Spirorbis omphalodes Goldfuss 94, 127, 128, 133, 164, 165, 167
Spirorbis spinuliferus Nicholson 127, 133, 164, 167

Scolecodonts:

Arabellites comis Eller 32, 136
Arabellites cultriformis Stauffer 136
Arabellites falciformis Stauffer 136
Arabellites hamiltonensis (Stauffer) (*Protarabellites*) 32, 128, 136
Arabellites jubatus Stauffer 136
Arabellites magnisulcatus Stauffer 136

* From the Hungry Hollow formation, or drift.

Arabellites milleri Stauffer 137
as *A. modestus* Stauffer 136
Arabellites oblatus Stauffer 136
Arabellites prosseri Stauffer 137
as *A. priscus* Stauffer 128, 136
Arabellites southworthi Stauffer 137
as *A. robustus* Stauffer 136
Eunicites? delicatulus Stauffer 136
Eunicites serratus Stauffer 136
Eunicites? sublamellosus Stauffer 136
Ildraites anatinus (Stauffer) (*Arabellites*) 32, 136
Leodicites magnificus (Stauffer) (*Arabellites*) 32, 128, 136
Nereidavus inornatus Stauffer 136
Nereidavus ontarioensis Stauffer 32, 136

Bryozoa:

Botryllopora socialis Nicholson 61, 65, 96, 133, 158, 164, 167
Coscinotrypa striatum (Hall and Simpson) (*Coscinium*) 65, 113, 127, 167
Eridotrypella obliqua (Ulrich) (*Batostomella, Eridotrypa*) 133
Fenestella arkonensis Whiteaves = *F. tenuiceps* Nicholson 133
Fenestella emaciata Hall 42
Fenestella magnifica Nicholson 42
Fistuliphragma spinulifera (Rominger) (*Fistulipora*) 133, 167
Fistulipora incrassata (Nicholson) (*Callopora*) 20, 51, 94, 96, 103, 113, 127, 164
Fistulipora monticulata Ulrich 133
Fistulipora romingeri Nicholson and Foord 2, 113, 127, 167
Fistulipora vesiculata (Hall and Simpson) (*Lichenalia*) 133
Fistuliporella utricula (Rominger) (*Fistulipora*) 12, 111, 113, 122, 127, 133, 164, 167
Hederella canadensis (Nicholson) (*Alecto? Aulopora?*) 113, 127, 133, 139, 165
Hederella cirrhosa Hall 127, 133, 139
**Hederella concinna* Bassler 5
Hederella filiformis (Billings) (*Aulopora*) 5, 7, 65, 113, 127, 133, 134, 165
**Hederella major* Bassler 5
**Hederella parvirugosa* Bassler 5

* Possibly from the Hungry Hollow formation.

**Hederella persimilis* Bassler 5
**Hernodia davisi* Bassler 5
Leptotrypella barrandei (Nicholson) (*Chaetetes, Monticulipora, Amplexopora, Heterotrypa*) 7, 12, 94, 95, 96, 113, 127, 133, 164, 167
Leptotrypella moniliformis (Nicholson) (*Chaetetes, Monticulipora, Amplexopora, Heterotrypa*) 12, 94, 95, 96, 113, 127, 133, 164, 167
Leptotrypella quadrangularis (Nicholson) (*Chaetetes, Paleschara, Leptotrypa*) 133
Orthopora carinata Hall and Simpson 65, 113, 127, 133, 167
Orthopora lineata Hall and Simpson 133
Paleschara sp. 127
Paleschara? reticulata Hall 133
Pinacotrypa stellata (Hall) (*Fistulipora*) 127, 133
Pinacotrypa variapora (Hall) (*Thallostigma, Fistulipora, Fistuliporina*) 60, 61, 113, 133, 167
Polypora sp. 133
**Reptaria stolonifera* Rollé 5
Reteporina striata (Hall) (*Fenestella*) 42, 60, 133, 139
Semicoscinium davidsoni (Nicholson) (*Fenestella*) 100
Stictopora incrassata Hall (*Cystodictya*) 63, 65, 113, 127, 133, 167, B
Streblotrypa hamiltonensis (Nicholson) (*Ceriopora, Acanthoclema, Rhombopora, Callopora*) 12, 65, 94, 96, 113, 127, 133, 134, 139, 167
Sulcoretopora hamiltonensis (Ulrich) (*Cystodictya*) 133
Sulcoretopora incisurata (Hall) (*Stictopora, Cystodictya*) 133
Sulcoretopora meeki (Nicholson) (*Ptilodictya, Cystodictya*) 12, 94, 95, 96, 113, 127, 133, 164, 167

Brachiopoda:

Inarticulata:

Lingula ligea Hall 133
Lingula thedjordensis Whiteaves 125, 164, 167
**Orbiculoidea doria* (Hall) (*Discinia*) 12, 56, 125, 127, 133, 164, 167
Petrocrania hamiltoniae (Hall) (*Craniella*) 133, 139, 165

* May be from the Hungry Hollow formation.

Articulata:

Ambocoelia umbonata (Conrad) (*Orthis*) 127, 133, 134, 139, 164, 167

Athyris fultonensis (Swallow) (*Spirigera*) 118, 127, 168, 169

Athyris spiriferoides (Eaton) (*Terebratula*) 20, 51, 55, 56, 94, 96, 115, 125, 133, 164, 167

as *Spirigera concentrica* (von Buch) (*Terebratula*) 12, 21

Athyris sp. cf. *A. spiriferoides* (Eaton) 127

Athyris vittata Hall 133, 134, 139

Atrypa reticularis (Linnaeus) (*Anomia, Anomites, Spirigerina, Terebratula*) 56, 96, 127, 133, 134, 139, 164, 165, 167

**Callipleura nobilis* (Hall) (*Rhynchospira, Trematospira, Retzia, Cyclorhina*) 133

Camarotoechia sappho (Hall) (*Rhynchonella*) 133

Chonetes deflectus Hall 133

Chonetes lepidus Hall 96, 127, 133, 134, 164, 167, 168, 169

Chonetes scitulus Hall 20, 51, 96, 127, 133, 164, 167

Chonetes vicinus (Castelnau) (*Leptaena*) 127, 168, 169

Cranaena lincklaeni (Hall) (*Terebratula, Eunella*) 133

Cranaena simulator (Hall) (*Terebratula, Eunella*) 12, 56, 125, 128, 133, 167

Cyrtina hamiltonensis (Hall) (*Cyrtia*) 12, 20, 51, 56, 94, 96, 115, 118, 125, 127, 128, 133, 139, 164, 165, 167, 168, B, F, J

Cyrtina hamiltonensis recta Hall 127

Douvellina inaequistriata (Conrad) (*Strophomena, Stropheodonta*) 96, 125, 133, 167

Douvellina sp. cf. *D. inaequistriata* (Conrad) 127

"Eunella" sp. 168

Megastrophia concava (Hall) (*Strophomena, Stropheodonta*) 127, 128, 133, 134, 164, 167, 168, 169

Meristella sp. 168

Meristella barrisi Hall 127, 133, 167

†*Meristella haskinsi* Hall 125, 127, 133, 164

Meristella rostrata (Hall) (*Atrypa*) 12, 87, 94, 125, 127, 133, 164, 167

Mucrospirifer thedfordensis (Shimer and Grabau) (*Spirifer*) 94, 115, 118, 127, 128, 133, 168, 169

* Found in the Hungry Hollow formation only.

† May be from the Hungry Hollow formation.

as *M. mucronatus* (Conrad) 13, 51, 56, 93, 96, 125, 133, 134, 164, 167, F, J

as *Spirifer* sp. cf. *S. consobrinus* (Orbigny) 127

Nudirostra huronensis (Nicholson) (*Rhynchonella, Leiorhynchus, Liorhynchus*) 12, 94, 95, 96, 127, 164

Nudirostra iris? (Hall) (*Rhynchonella, Leiorhynchus*) 127, 167

Nudirostra laura (Billings) (*Rhynchonella, Leiorhynchus*) 18, 20, 55, 87, 118, 127, 128, 133, 134, 164, 167, 168, 169, B

Nudirostra multicosta (Hall) (*Rhynchonella, Leiorhynchus*) 12, 51, 56, 94, 95, 96, 128, J

Pentamerella pavilionensis? (Hall) (*Pentamerus*) 128, 167

Pholidostrophia nacrea (Hall) (*Strophomena, Stropheodonta*) 12, 20, 51, 56, 128, 164

as *P. iowensis* (Owen) 118, 125, 127, 133, 134, 139, 167, 168

Protoleptostrophia perplana (Conrad) (*Strophomena, Leptostrophia, Stropheodonta*) 125, 127, 133, 134, 139, 164, 165, 167

**Rhipidomella vanuxemi* (Hall) (*Orthis*) 133, 134, 139

Schuchertella arctostriata (Hall) (*Streptorhynchus, Orthothetes, Schellwienella*) = *O. chemungensis* var. *arctostriatus* (Hall) 118, 127, 133, 169

Schuchertella perversa (Hall) (*Streptorhynchus, Orthothetes, Schellwienella*) = *O. chemungensis* var. *perversus* (Hall) 125, 127, 128, 133, 134

Spinocyrtia parvigranulata Ehlers and Wright 31

†*"Spirifer" euryteines* Owen = *S. parryana* Hall 12, 15, 55, 87, 125, 127, 139, 164, 167

Stropheodonta demissa (Conrad) (*Strophodonta*) 96, 118, 125, 127, 133, 134, 139, 164, 165, 167, 168

Mollusca:

Pelecypoda:

Actinopteria boydi (Conrad) (*Avicula, Pterinea*) 55, 127, 128, 133, 165, 167

Aviculopecten bellus (Conrad) (*Avicula*) 133

Buchiola speciosa (Hall) (*Avicula, Cardiola, Glyptocardia*) 133

Cornellites flabellum (Conrad) (*Avicula, Pterinea*) 127, 133, 134, 165, 168, 169

* Not found in the Widder formation.

† Possibly from the Hungry Hollow formation.

Cypricardella bellistriata (Conrad) (*Microdon, Eodon, Microdonella*) 127, 133, 167
Elymella nuculoides Hall 133
Grammysia globosa Hall 133
Grammysia? lirata Hall 133
Nucula bellistriata (Conrad) (*Nuculites*) 133
Nucula lirata (Conrad) (*Nuculites*) 133
Nuculites triqueter Conrad 127, 133
Pterinopecten princeps (Conrad) (*Monotis, Avicula, Aviculopecten*) 127, 133
Tellinopsis subemarginata (Conrad) (*Nuculites*) 133

Gastropoda:

Bembexia capillaria (Conrad) (*Pleurotomaria, Gyroma*) 133
Bembexia sulcomarginata (Conrad) (*Pleurotomaria*) 133
Euomphalus laxus Hall (*Phanerotinus*) 133
Naticonema lineata (Conrad) (*Platyostoma, Diaphorostoma*) 133
Platyceras sp. 168
**Platyceras bucculentum* Hall 139
Platyceras carinatum Hall 133
Platyceras erectum Hall (*Acroculia*) 133
Platyceras rarispinum Hall = *P. dumosum* var. *rarispinum* Hall 133
Platyceras thetis Hall 133
"Pleurotomaria" sp. cf. *"P." arkonensis* Whiteaves 127
Trepospira rotalia (Hall) (*Pleurotomaria*) 133

Cephalopoda:

†*Arkonoceras arkonense* (Whiteaves) (*Orthoceras, Michelinoceras*) 79, 133
†*Bactrites arkonensis* Whiteaves 133
Cyrtogomphus thedfordensis Flower 35, 79
Dolorthoceras exile (Hall) (*Orthoceras*) 133
Dolorthoceras lambtonense (Whiteaves) (*Orthoceras*) 79, 133, 167, H
Michelinoceras? anax (Billings) (*Orthoceras*) 18, 79, 133, 164, 167
Michelinoceras? subulatum (Hall) (*Orthoceras*) 133
"Nautilus" sp. 133

* Possibly from the Hungry Hollow formation.
† These are found only in the Arkona shale; probably misidentified.

Nephriticeras bucinum (Hall) (*Nautilus*) 38, 133
Orthoceras sp. 58, 87, G
Tornoceras discoideum (Hall) (*Goniatites, Paradoceras*) 89, 133
Tornoceras uniangulare (Conrad) (*Goniatites*) 115, 127, 133

Incertae Sedis:

Styliolina fissurella (Hall) (*Tentaculites, Styliola*) 127, 133, 139
**Tentaculites attenuatus* Hall 127, 133
**Tentaculites bellulus* Hall 133, 134, 139
**Tentaculites* sp. cf. *T. gracilistriatus* Hall 127

Arthropoda:

Trilobita:

Dechenella rowi arkonensis Stumm 153
Dipleura dekayi Green 153
Greenops boothi (Green) (*Cryphaeus*) 20, 94, 96, 127, 133, 153, 164, 167, 168, 169
Phacops rana (Green) (*Calymene*) 94, 96, 127, 133, 134, 153, 164, 167, 168, 169
Proetus canadensis Stumm 153

Ostracoda:

"*Arcyzona subquadratus* (Ulrich)" (*Amphissites*) 8, 23, 157, 162
Bairdia devonica? (Ulrich) (*Bythocypris*) 133
Bairdia summacuminata Coryell and Malkin 23
Barychilina walcotti (Jones) (*Primitia? Kirkbya?*) 127
Bollia hindei Jones 156
Bufina bicornuta (Ulrich) (*Moorea*) 8, 55, 133, 163
Bufina elata Coryell and Malkin 23
Bufina elongata Coryell and Malkin 23
Coelonella scapha (Stewart) (*Isochilina*) 23
Ctenoloculina cicatricosa (Warthin) (*Tetradella*) 23, 157, 162
Dizygopleura trisinuata Van Pelt 23, 157
Euglyphella sp. 23
Jenningsina catenulata (Van Pelt) (*Graphiodactylus*) 23
Kirkbyella bellipuncta (Van Pelt) (*Amphissites*) 23, 157
Lucasella spinulifera Stewart 23
Menoeidina sp. 23
Menoeidina scopeli Coley 23

* Probably from the Arkona shale.

Monoceratina casei Warthin 23, 162
Octonaria crescentiformis Van Pelt 23
Ponderodictya punctulifera (Hall) (*Cytherellina, Cythere? Leperditia, Primitiopsis*) 8, 23, 40, 55, 94, 96, 118, 127, 133, 157, 164, 167
Primitiella fabacea (Jones) (*Isochilina*) 133
Punctoprimitia simplex (Stewart) (*Haploprimitia*) 23
Quasillites obliquus Coryell and Malkin 23, 157
Richina truncata Coryell and Malkin 23
Tetrasacculus bilobus Stewart 23
Thrallella cristata Swartz and Oriel 23
Ulrichia conradi Jones 23
Ulrichia fragilis Warthin 23, 161, 162

Conodonts:

Bryantodus ignotus Stauffer 33*a*, 135
Euprioniodina sp. 33*a*, 135
Euprioniodina? sp. 33*a*, 135
Hindeodella fishingerensis Stauffer 33*a*, 135
Hindeodella lambtonensis Stauffer 33*a*, 135
Hindeodella milleri Stauffer 33*a*, 135
Ligonodina sp. A Stauffer 33*a*, 135
Ligonodina? sp. 33*a*, 135
Plectodina sp. 33*a*, 135
Plectodina aculeata Stauffer 33*a*, 135
Polygnathus decorosus Stauffer 33*a*, 135
Polygnathus sanduskiensis Stauffer 33*a*, 135

Ipperwash Limestone

Anthozoa:

Tetracoralla:

Billingsastraea canadensis Ehlers and Stumm 30, 152
Heliophyllum halli Edwards and Haime 133
Cystiphylloides americanus (Edwards and Haime) (*Cystiphyllum*) as *Cystiphyllum vesiculosum* Goldfuss 133, 169

Tabulata:

Aulocystis "nobilis" (Billings) (*Ceratopora, Syringopora, Drymopora*) 133

Aulocystis ramosa (Whiteaves) (*Roemeria, Drymopora*) 6, 115, 147, 167
Trachypora alternans Rominger (*Dendropora*) 133

Echinodermata:

Crinoidea:

Ancyrocrinus sp. 130
Ancyrocrinus bulbosus Hall 9, 47, 115, 127, 133, 164, 167, 169

Annelida:

Scolecodonts:

Arabellites arcuatus Hinde 136
Arabellites dauphinensis Stauffer 136
Arabellites falciformis Stauffer 136
Arabellites lautus Stauffer 136
Arabellites pectinellus Stauffer 136
Diopatraites conformis Eller 136
Eunicites? delicatulus Stauffer 136
Eunicites placidus Stauffer 136
Nereidavus inornatus Stauffer 136
Nereidavus ontarioensis Stauffer 128, 136
Protarabellites canadensis Stauffer 128, 136

Bryozoa:

Eridotrypella appressa? (Ulrich) (*Monotrypella, Eridotrypa*) 133
Fenestella sp. 115
Fenestellid bryozoa 169
Fenestella emaciata Hall 42, 133
Hemitrypa cribrosa (Hall) (*Fenestella*) 42, 133
Loculipora perforata (Hall) (*Fenestella*) 133
Pinacotrypa stellata (Hall) (*Fistulipora*) 133
Polypora arkonensis S. A. Miller
as *P. tuberculata* Nicholson 115
Reteporina hamiltonensis? (Prout) (*Retepora, Polypora*) 133
Reteporina striata (Hall) (*Fenestella*) 133
Streblotrypa hamiltonensis (Nicholson) (*Ceriopora, Rhombopora, Callopora, Acanthoclema*) 133
Sulcoretopora incisurata (Hall) (*Stictopora, Cystodictya*) 133

Brachiopoda:

Articulata:

Athyris spiriferoides (Eaton) (*Terebratula*) 133

Atrypa reticularis (Linnaeus) (*Anomia, Anomites, Terebratula, Spirigerina*) 115, 133
Camarotoechia horsfordi? (Hall) (*Rhynchonella*) 133, 167
Chonetes lineatus (Conrad) (*Strophomena*) 115
Cyrtina hamiltonensis (Hall) (*Cyrtia*) 133
Megastrophia concava (Hall) (*Strophomena, Stropheodonta*) 24, 115, 128, 133, 169
Mucrospirifer mucronatus (Conrad) (*Spirifer*) 133, 169
as *Spirifer pennatus* (Atwater) 115
Pholidostrophia nacrea (Hall) (*Strophomena, Stropheodonta*)
as *P. iowensis* (Owen) 133, 169
Protoleptostrophia perplana (Conrad) (*Strophomena, Stropheodonta*) 128, 133, 169
Rhipidomella penelope (Hall) (*Orthis*) 24, 115, 133, 167
Rhipidomella vanuxemi (Hall) (*Orthis*) 115, 133
Spinocyrtia carinata Ehlers and Wright 31
as *S. granulosa* (Conrad) (*Delthyris, Spirifer*) 24, 128, 133, 169
Spinocyrtia granulifera (Hall) (*Delthyris, Spirifer*) 98, 164
Spinocyrtia ravenswoodensis Ehlers and Wright 31
Spinocyrtia tumidigranulata Ehlers and Wright 31
Stropheodonta demissa (Conrad) (*Strophodonta*) 115, 133, 169
Tropidoleptus carinatus (Conrad) (*Strophomena*) 24, 133

Mollusca:

Pelecypoda:

Cornellites flabellum (Conrad) (*Avicula, Pterinea*) 24, 115, 133
Limoptera macroptera (Conrad) (*Lima*) 115

Gastropoda:

Loxonema delphicola Hall 133
Platyceras carinatum Hall 133

Cephalopoda:

Michelinoceras? eriense (Hall) (*Orthoceras*) 133
Tornoceras uniangulare (Conrad) (*Goniatites*) 133

Incertae Sedis:

Tentaculites attenuatus? Hall 133
Tentaculites bellulus Hall 169

Arthropoda:

Trilobita:

Phacops rana (Green) (*Calymene*) = *C. bufo* var. *rana* Green 115, 133
as *P. bufo* (Green) 87, 169

Stratigraphic Position Unknown

Bryozoa:

Fenestrapora occidentalis Ulrich 42
Fistulipora ramosa (Hall and Simpson) (*Lichenalia*) 65, 113, 127, 133, 167, B
Fistulipora subtrigona (Hall and Simpson) (*Lichenalia*) 65, 113, 127, 133, 167, B
Intrapora puteolata Hall 88
Leioclema subtilis Hall (*Thallostigma, Fistulipora, Lioclema*) 60, 61, 65, 113, 127, 167, B
Paleschara intercella Hall B
"Phyllopora" sp. 158
"Stenopora" sp. 91

Mollusca:

Gastropoda:

Loxonema sp. 127, 167

Arthropoda:

Trilobita:

Dalmanites sp. 87

Ostracoda:

"Arcyzona parallela (Ulrich)" (*Kirkbya, Amphissites*) 157
"Bollia abnormis Ulrich" 8
"Bollia obesa Ulrich" 8
Dizygopleura euglyphea Warthin 157
Dizygopleura sculptura Turner 157
Entomis sp. 157
Eukloedenella doverensis Turner 157
Haploprimitia punctata Turner 157
Hollinella sp. 157
"Hollinella granifera (Ulrich)" (*Bollia, Hollina*) 157

Hollinella subcircularis Turner 157
Jenningsina concentrica Turner 157
Lucasella mundula Stewart 157
Menoeidina arcuata Turner 157
Menoeidina subreniformis Stewart 157
Octonaria sp. cf. *O. crescentiformis* Van Pelt 157
Octonaria quadricostata Van Pelt 157
Poloniella cingulata Warthin 157
Ponderodictya ohioensis (Stewart) (*Hamiltonella*) 157
Quasillites fordei Coryell and Malkin, var. *minimus* Turner 157
Quasillites reticulata Turner 157
Ulrichia fragilis Warthin, var. *subnodata* Turner 157

Incertae Sedis:

Elymocaris hindei Jones and Woodward 72, 127, 133, 167

LITERATURE CITED

1. Arbor, M. A. 1940. The Relation of the Valves to the Pedicle in the Strophomenid Brachiopods. Geol. Mag., Vol. 77, No. 2, pp. 161–74, 3 text figs.
2. Bassler, R. S. 1911. Bryozoa. *In* The Fossils and Stratigraphy of the Middle Devonic of Wisconsin, by H. F. Cleland. Wisc. Geol. and Nat. Hist. Surv., Bull. 21, Sci. Ser. 6, pp. 49–67, Pls. 5–11.
3. Bassler, R. S. 1936. New Species of American Edrioasteroidea. Smithsonian Misc. Coll., Vol. 95, No. 6, Publ. 3385, 33 pp., 7 pls.
4. Bassler, R. S. 1937. The Paleozoic Rugose Coral Family Paleocyclidae. Journ. Paleontol., Vol. 11, No. 3, pp. 189–201, 3 pls.
5. Bassler, R. S. 1939. The Hederelloidea, a Suborder of Paleozoic Cyclostomatous Bryozoa. Proc. U. S. Nat. Mus., Vol. 87, Publ. 3068, pp. 25–91, 16 pls.
6. Bassler, R. S. 1950. Faunal Lists and Descriptions of Paleozoic Corals. Geol. Soc. Amer., Mem. 44, 315 pp., 20 pls.
7. Bassler, R. S. 1953. Bryozoa. Part G *in* Treatise on Invertebrate Paleontology. Geol. Soc. Amer., 253 pp., 175 figs.
8. Bassler, R. S., and Kellett, B. 1934. Bibliographic Index of Paleozoic Ostracoda. Geol. Soc. Amer., Spec. Paper No. 1, 500 pp.
9. Bassler, R. S., and Moodey, M. W. 1943. Bibliographic and Faunal Index of Paleozoic Pelmatozoan Echinoderms. Geol. Soc. Amer., Spec. Paper No. 45, 733 pp.
10. Bather, F. A. 1899. The Genera and Species of Blastoidea, with a List of the Specimens in the British Museum (Nat. Hist.) London: Printed by Order of the Trustees. 70 pp.
11. Bather, F. A. 1906. The Species of Botryocrinus. Ottawa Naturalist, Vol. 20, No. 5, pp. 93–104.
12. Bigsby, J. J. 1878. Thesaurus devonico-carboniferus. The Flora and Fauna of the Devonian and Carboniferous Periods. ... London: John van Voorst. 447 pp.

13. BILLINGS, E. 1857. Fossils of the Hamilton Group. Can. Nat., Vol. 1, pp. 473–79, 8 text figs.
14. BILLINGS, E. 1859. On the Fossil Corals of the Devonian Rocks of Canada West. Can. Journ., New Ser., Vol. 4, No. 20, pp. 97–140, 29 figs.
15. BILLINGS, E. 1860–1861. On the Devonian Fossils of Canada West. Rept. Geol. Surv. Can., Can. Journ., May 1860, pp. 1–34; Mar. 1861, pp. 34–44; May 1861, pp. 45–65; July 1861, pp. 66–99; 1 pl., 133 text figs.
16. BILLINGS, E. 1869. Notes on the Structure of the Crinoidea, Cystidea and Blastoidea. Amer. Journ. Sci., Ser. 2, Vol. 48, pp. 69–83, 15 figs.
17. BILLINGS, E. 1874. Palaeozoic Fossils, Vol. 2, Pt. 1. Geol. Surv. Can., 144 pp., 9 pls.
18. BILLINGS, E. 1875. On Some New or Little Known Fossils from the Silurian and Devonian Rocks of Ontario. Can. Nat. and Quart. Journ. Sci., New Ser., Vol. 7, No. 4, pp. 230–40.
19. CALEY, J. F. 1943. Palaeozoic Geology of the London Area, Ontario. Can. Dept. Mines and Resources, Geol. Surv., Mem. 237, pp. 51–59.
20. CALVIN, S. 1888. Observations on the Vertical Range of Certain Species of Fossils of the Hamilton Period, in Western Ontario. Amer. Geologist, Vol. 1, No. 2, pp. 81–86.
21. CHAPMAN, E. J. 1876. An Outline of the Geology of Canada: Based on a Subdivision of the Provinces into Natural Areas. Toronto: Copp, Clark and Co. 104 pp., 12 pls., and maps.
22. CLELAND, H. F. 1911. The Fossils and Stratigraphy of the Middle Devonic of Wisconsin. Wisc. Geol. and Nat. Hist. Surv., Bull. 21, Sci. Ser. 6, 222 pp., 53 pls.
23. COLEY, T. B. 1954. Stratigraphic Distribution and Correlation of Some Middle Devonian Ostracoda. Journ. Paleontol., Vol. 28, No. 4, pp. 452–64, 1 pl., 2 figs.
24. COOPER, G. A., and others. 1942. Correlation of the Devonian Sedimentary Formations of North America. Bull. Geol. Soc. Amer., Vol. 53, No. 12, Pt. 1, pp. 1729–94, 1 pl., 1 fig.
25. COOPER, G. A., and WARTHIN, A. S. 1942. New Devonian (Hamilton) Correlations. Bull. Geol. Soc. Amer., Vol. 53, No. 6, pp. 873–88, 3 figs.
26. CORYELL, H. N., and MALKIN, D. S. 1936. Some Hamilton Ostracodes from Arkona, Ontario. Amer. Mus. Novit., No. 891, pp. 1–20, 2 pls.
27. DELO, D. M. 1940. Phacopid Trilobites of North America. Geol. Soc. Amer., Spec. Paper No. 29, 135 pp., 13 pls.
28. DUNCAN, H. M. 1939. Trepostomatous Bryozoa from the Traverse Group of Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 5, No. 10, pp. 171–270, 16 pls., 1 map.
29. EHLERS, G. M., and STUMM, E. C. 1949. Corals of the Devonian Traverse Group of Michigan. Pt. 2. *Cylindrophyllum, Depasophyllum, Disphyllum, Eridophyllum,* and *Synaptophyllum*. Contrib. Mus. Paleontol. Univ. Mich., Vol. 8, No. 3, pp. 21–41, 8 pls.
30. EHLERS, G. M., and STUMM, E. C. 1953. Species of the Tetracoral Genus Billingsastraea from the Middle Devonian of New York and Other Regions. Bull. Buffalo Soc. Nat. Sci., Vol. 21, No. 2, pp. 1–11, 6 pls.
31. EHLERS, G. M., and WRIGHT, J. D. 1955. The Type Species of *Spinocyrtia* Fredericks and New Species of This Brachiopod Genus from Southwestern

Ontario. Contrib. Mus. Paleontol. Univ. Mich., Vol. 13, No. 1, 32 pp., 11 pls., 1 map.

32. ELLER, E. R. 1941. Scolecodonts from the Windom, Middle Devonian, of Western New York. Ann. Carnegie Mus., Vol. 28, pp. 323–40, 2 pls.
33. ETHERIDGE, R., and CARPENTER, P. H. 1882. On Certain Points in the Morphology of the Blastoidea, with Descriptions of Some New Genera and Species. Ann. Mag. Nat. Hist., Ser. 5, Vol. 9, pp. 213–52.
33a. FAY, R. O. 1952. Catalogue of Conodonts. Univ. Kans. Paleontol. Contrib., Vertebrata, art. 3, pp. 1–206.
34. FENTON, C. L., and FENTON, M. A. 1936. The "Tabulate" Corals of Hall's "Illustrations of Devonian Fossils." Ann. Carnegie Mus., Vol. 25, pp. 17–58, 8 pls.
35. FLOWER, R. H. 1938. Devonian Brevicones of New York and Adjacent Areas. Palaeontograph. Amer., Vol. 2, No. 9, 84 pp., 4 pls.
36. FLOWER, R. H. 1945. Classification of Devonian Nautiloids. Amer. Midl. Nat., Vol. 33, No. 3, pp. 675–724, 5 pls.
37. FLOWER, R. H. 1950. Stereotoceras and the Brevicoceratidae. Palaeontograph. Amer., Vol. 3, No. 24, 24 pp., 6 pls.
38. FOERSTE, A. F. 1927. Devonian Cephalopods from Alpena in Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 2, No. 9, pp. 189–208, 5 pls.
39. FRITZ, M. A. 1930. Two New Species of Fossils from the Palaeozoic Rocks of Ontario. Trans. Royal Can. Inst., Vol. 17, Pt. 2, No. 38, pp. 223–25, 1 pl.
40. FRITZ, M. A. 1939. Devonian Fossil Zones in Wells from Southwestern Ontario. Bull. Geol. Soc. Amer., Vol. 50, pp. 79–88, 3 figs.
41. FRITZ, M. A. 1954. *Rhopalonaria lambtonensis,* n. s. Journ. Paleontol., Vol. 28, No. 1, pp. 118–19, 1 fig.
42. FRITZ, M. A., and STEWART, G. A. 1937. Fenestrellinidae. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–251.
43. GOLDRING, W. 1923. The Devonian Crinoids of the State of New York. New York State Mus., Mem. 16, 670 pp., 60 pls.
44. GOLDRING, W. 1934. Some Hamilton Crinoids of New York and Canada. Bull. Buffalo Soc. Nat. Sci., Vol. 15, No. 3, pp. 182–200, 2 pls.
45. GOLDRING, W. 1935. New and Previously Known Middle Devonian Crinoids of New York. Ann. Carnegie Mus., Vol. 24, pp. 349–68, 3 pls.
46. GOLDRING, W. 1936. Some Hamilton (Devonian) Crinoids from New York. Journ. Paleontol., Vol. 10, No. 1, pp. 14–22, 2 pls.
47. GOLDRING, W. 1942. Crown of Ancyrocrinus bulbosus Hall. Bull. Buffalo Soc. Nat. Sci., Vol. 17, No. 3, pp. 13–18, 1 pl., 2 figs.
48. GOLDRING, W. 1945. Notes on *Thamnocrinus springeri* Goldring and Other Hamilton Crinoids. Amer. Journ. Sci., Vol. 243, No. 2, pp. 57–65, 1 pl.
49. GOLDRING, W. 1950. Devonian Crinoids: New and Old. Bull. Wagner Free Instit. Sci., Vol. 25, No. 4, pp. 29–37, 2 pls.
50. GOLDRING, W. 1954. Devonian Crinoids: New and Old, II. New York State Mus., Circ. 37, 51 pp., 6 pls.
51. GRABAU, A. W. 1898. The Faunas of the Hamilton Group of Eighteen-Mile Creek and Vicinity in Western New York. 16th Ann. Rept. State Geologist [New York], pp. 231–339, 5 pls.
52. GRABAU, A. W. 1899. Moniloporidae, a New Family of Palaeozoic Corals. Proc. Boston Soc. Nat. Hist., Vol. 28, pp. 409–24, 4 pls.

53. GRABAU, A. W. 1917. Age and Stratigraphic Relations of the Olentangy Shale of Central Ohio, with Remarks on the Prout Limestone and So-called Olentangy Shales of Northern Ohio. Journ. Geol., Vol. 25, No. 4, pp. 337–43.

54. GRABAU, A. W., and REED, M. 1912. Mutations of *Spirifer mucronatus* (abstract). Proc. Internat. Zool. Cong. 7, Boston, 1907, pp. 767–68. (Advance print, 1910.)

55. GRABAU, A. W., and SHIMER, H. W. 1909. North American Index Fossils: Invertebrates. 2 vols. New York: A. G. Seiler and Co.

56. HALL, J. 1867. Descriptions and Figures of the Fossil Brachiopoda of the Upper Helderberg, Hamilton, Portage, and Chemung Groups. N. Y. Geol. Surv., Paleontol., Vol. 4, Pt. 1, 428 pp., 69 pls.

57. HALL, J. 1876. Illustrations of Devonian Fossils: Corals of the Upper Helderberg and Hamilton Groups. N. Y. Geol. Surv., Paleontol., 43 pls.

58. HALL, J. 1879. Descriptions of Gasteropoda, Pteropoda and Cephalopoda of the Upper Helderberg, Hamilton, Portage and Chemung Groups. N. Y. Geol. Surv., Paleontol., Vol. 5, Pt. 2: 2 vols., text (492 pp.) and plates (119).

59. HALL, J. 1883. Bryozoa (Fenestellidae) of the Hamilton Group. 36th Ann. Rept. on the N. Y. State Museum of Nat. Hist., pp. 57–72.

60. HALL, J. 1883. Bryozoans of the Upper Helderberg and Hamilton Groups (Including Only the Genera Preceding the Fenestellidae). Trans. Albany Inst., Vol. 10, pp. 145–97.

61. HALL, J. 1884. Descriptions of the Bryozoans of the Hamilton Group (Fenestellidae Excepted). 3d Ann. Rept. of the State Geol. [N.Y.] for the Year 1883, pp. 5–61.

62. HALL, J. 1887. Descriptions of Fenestellidae of the Hamilton Group of New York. 6th Ann. Rept. of the State Geol. [N.Y.] for the Year 1886, pp. 41–70, 7 pls.

63. HALL, J. 1891. Continuation of Descriptions of Bryozoa, Not Printed in Volume VI, Palaeontology of New York, for the Report of the State Geologist, 1890. 10th Ann. Rept. of the State Geol. [N.Y.] for the Year 1890, pp. 35–57.

64. HALL, J., and CLARKE, J. M. 1888. Descriptions of the Trilobites and Other Crustacea of the Oriskany, Upper Helderberg, Hamilton, Portage, Chemung and Catskill Groups. N. Y. Geol. Surv., Paleontol., Vol. 7, 236 pp. 46 pls.

65. HALL, J., and SIMPSON, G. B. 1887. Corals and Bryozoa: Text and Plates, Containing Descriptions and Figures of Species from the Lower Helderberg, Upper Helderberg and Hamilton Groups. N. Y. Geol. Surv., Palaeontology, Vol. 6, 298 pp., 66 pls.

66. HINDE, G. J. 1879. On Annelid Jaws from the Cambro-Silurian, Silurian, and Devonian Formations in Canada ... Quart. Journ. Geol. Soc. London, Vol. 35, pp. 370–89, 3 pls.

67. HINDE, G. J. 1885. Description of a New Species of Crinoids with Articulating Spines. Ann. Mag. Nat. Hist., Ser. 5, Vol. 15, No. 87, pp. 157–73, 1 pl.

68. IMBRIE, J. 1955. New Species of Brachiopods from the Traverse Group (Devonian) of Michigan. Amer. Mus. Novit., No. 1754, 7 pp., 2 pls.

69. JONES, T. R. 1890. On Some Palaeozoic Ostracoda from North America, Wales, and Ireland. Quart. Journ. Geol. Soc. London, Vol. 46, pp. 1–30, 4 pls.

70. JONES, T. R. 1890. On Some Devonian and Silurian Ostracoda from North America, France, and the Bosphorus. Quart. Journ. Geol. Soc. London, Vol. 46, pp. 534–56, 2 pls., 2 figs.

71. JONES, T. R. 1891. On Some Ostracoda from the Cambro-Silurian, Silurian, and Devonian Rocks. Contrib. Can. Micropalaeontol., Pt. 3, pp. 59–99, 4 pls.
72. JONES, T. R., and WOODWARD, H. 1894. On Some Fossil Phyllopoda. Geol. Mag., New Ser., Dec. 4, Vol. 1, No. 7, pp. 289–94, 1 pl.
73. KESLING, R. V. 1953. Ostracods of the Family Drepanellidae from the Arkona Shale of Ontario. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 8, pp. 193–202, 1 pl.
74. KESLING, R. V. 1953. Ostracods of the Family Hollinidae from the Arkona Shale of Ontario. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 9, pp. 203–19, 4 pls.
75. KESLING, R. V. 1953. Ostracods of the Family Aechminidae from the Arkona Shale of Southern Ontario. Contrib. Mus. Paleontol. Univ. Mich., Vol. 11, No. 1, pp. 1–10, 1 pl.
76. KESLING, R. V. 1954. Ostracods from the Middle Devonian Dundee Limestone in Northwestern Ohio. Contrib. Mus. Paleontol. Univ. Mich., Vol. 11, No. 8, pp. 167–86, 3 pls.
77. KESLING, R. V., and TABOR, N. R. 1953. Ostracods of the Family Hollinidae from the Genshaw Formation of Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 5, pp. 83–100, 3 pls.
78. KIER, P. M. 1952. Echinoderms of the Middle Devonian Silica Formation of Ohio. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 4, pp. 58–81, 4 pls.
79. KINDLE, E. M., and MILLER, A. K. 1939. Bibliographic Index of North American Devonian Cephalopoda. Geol. Soc. Amer., Spec. Paper No. 23, 179 pp.
80. KIRK, E. 1945. Four New Genera of Camerate Crinoids from the Devonian. Amer. Journ. Sci., Vol. 243, pp. 341–55, 1 pl.
81. KIRK, E. 1948. Two New Inadunate Crinoid Genera from the Middle Devonian. Amer. Journ. Sci., Vol. 246, pp. 701–10, 1 pl.
82. LAMBE, L. M. 1899. A Revision of the Genera and Species of Canadian Palaeozoic Corals. Pt. 1, The Madreporaria Perforata and the Alcyonaria. Contrib. Can. Palaeontol., Vol. 4, pp. 1–96, 5 pls.
83. LAMBE, L. M. 1899. On Some Species of Canadian Palaeozoic Corals. Ottawa Naturalist, Vol. 12, No. 12, pp. 237–58.
84. LAMBE, L. M. 1900. A Revision of the Genera and Species of Canadian Palaeozoic Corals. Pt. 2, The Madreporaria Aporosa and the Madreporaria Rugosa. Contrib. Can. Palaeontol., Vol. 4, pp. 97–197, 13 pls.
85. LANG, W. D., SMITH, S., and THOMAS, H. D. 1940. Index of Palaeozoic Coral Genera. London: Brit. Mus. Nat. Hist. 231 pp.
86. LEVINSON, S. A. 1950. The Hingement of Paleozoic Ostracoda and Its Bearing on Orientation. Journ. Paleontol., Vol. 24, No. 1, pp. 63–75, 16 figs.
87. LOGAN, W. E. 1863. The Hamilton Formation of Ontario. *In* Geology of Canada, 1863, pp. 382–87.
88. MCNAIR, A. H. 1937. Cryptostomatous Bryozoa from the Middle Devonian Traverse Group of Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 5, No. 9, pp. 103–70, 14 pls., 1 fig.
89. MILLER, A. K. 1936. Ammonoidea. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–50.
90. MILLER, A. K. 1938. Devonian Ammonoids of America. Geol. Soc. Amer., Spec. Paper No. 14, 262 pp., 39 pls., 41 figs.

91. MONTGOMERY, H. 1883. A Blastoid Found in the Devonian Rocks of Ontario. Can. Naturalist, New Ser., Vol. 10, pp. 80–84, 2 figs.

92. MOOK, C. C. 1915. Statistical Study of Variation in *Spirifer mucronatus*. Ann. New York Acad. Sci., Vol. 26, pp. 175–214.

93. MURRAY, A. 1857. Hamilton and Portage and Chemung Groups. *In* Report for the Year 1855, of Alexander Murray, Esq., Assistant Provincial Geologist ... Rept. of Progress for the Years 1853–54–55–56. Geol. Surv. Can., pp. 129–32.

94. NICHOLSON, H. A. 1874. Report upon the Palaeontology of the Province of Ontario. Toronto: Hunter, Rose and Co. 133 pp., 8 pls.

95. NICHOLSON, H. A. 1874. Descriptions of New Fossils from the Devonian Formation of Canada West. Geol. Mag., Ser. 2, Vol. 1, pp. 10–16, 54–60, 117–26, 159–63, 197–201; 4 pls.

96. NICHOLSON, H. A. 1874. Summary of Recent Researches on the Palaeontology of the Province of Ontario. Can. Journ., New Ser., Vol. 14, No. 2, pp. 125–36.

97. NICHOLSON, H. A. 1874. On the Affinities of the Genus *Stromatopora*, with Descriptions of Two New Species. Ann. Mag. Nat. Hist., Ser. 4, Vol. 13, pp. 4–14, 3 figs.

98. NICHOLSON, H. A. 1875. Report upon the Palaeontology of the Province of Ontario. Toronto: Hunter, Rose and Co. 96 pp., 4 pls.

99. NICHOLSON, H. A. 1875. Descriptions of New Species of *Cystiphyllum* from the Devonian Rocks of North America. Geol. Mag., New Ser., Dec. 2, Vol. 2, pp. 30–33, 1 pl.

100. NICHOLSON, H. A. 1875. Descriptions of New Species and of a New Genus of Polyzoa from the Palaeozoic Rocks of North America. Geol. Mag., New Ser., Dec. 2, Vol. 2, pp. 33–38, 1 pl.

101. NICHOLSON, H. A. 1875. Descriptions of New Fossils from the Devonian Rocks of Western Ontario. Can. Nat. and Quart. Journ. Sci., New Ser., Vol. 7, No. 2, pp. 138–47.

102. NICHOLSON, H. A. 1878. On the Minute Structure of the Corals of the Genera *Heliophyllum* and *Crepidophyllum*. Ann. Mag. Nat. Hist., Ser. 5, Vol. 1, pp. 44–54, 1 fig.

103. NICHOLSON, H. A. 1879. On the Structure and Affinities of the "Tabulate Corals" of the Palaeozoic Period. Edinburgh and London: Wm. Blackwood and Sons. 342 pp., 15 pls.

104. NICHOLSON, H. A. 1881. On the Structure and Affinities of the Genus Monticulipora and Its Sub-genera. Edinburgh and London: Wm. Blackwood and Sons. 240 pp., 6 pls.

105. NICHOLSON, H. A. 1886. On Some New or Imperfectly-known Species of Stromatoporoids, Pt. 2. Ann. Mag. Nat. Hist., Ser. 5, Vol. 18, pp. 8-22, 2 pls.

106. NICHOLSON, H. A. 1886–1892. A Monograph of the British Stromatoporoids. 4 parts, 234 pp., 29 pls.

107. NICHOLSON, H. A. 1887. On Some New or Imperfectly-known Species of Stromatoporoids, Pt. 3. Ann. Mag. Nat. Hist., Ser. 5, Vol. 19, pp. 1–17, 3 pls.

108. NICHOLSON, H. A. 1891. On Some New or Imperfectly-known Species of Stromatoporoids, Pt. 4. Ann. Mag. Nat. Hist., Ser. 6, Vol. 7, pp. 309–28, 3 pls.

109. NICHOLSON, H. A., and ETHERIDGE, R. 1877. On *Ascodictyon*, a New Provis-

ional and Anomalous Genus of Palaeozoic Fossils. Ann. Mag. Nat. Hist., Ser. 4, Vol. 19, pp. 463–68, 1 pl.

110. NICHOLSON, H. A., and ETHERIDGE, R. 1878. Notes on the Genus *Alveolites,* Lamarck, and on Some Allied Forms of Palaeozoic Corals. Journ. Linn. Soc., Zool., Vol. 13, pp. 353–70, 2 pls.
111. NICHOLSON, H. A., and FOORD, A. H. 1885. On the Genus *Fistulipora,* M'Coy, with Descriptions of Several Species. Ann. Mag. Nat. Hist., Ser. 5, Vol. 16, pp. 496–517, 4 pls.
112. NICHOLSON, H. A., and MURIE, J. 1879. On the Minute Structure of *Stromatopora* and its Allies. Journ. Linn. Soc., Zool., Vol. 14, pp. 187–246, 4 pls.
113. NICKLES, J. M., and BASSLER, R. S. 1900. A Synopsis of American Fossil Bryozoa, including Bibliography and Synonymy. U. S. Geol. Surv., Bull. 173, 663 pp.
114. OLIVER, W. A., Jr. 1951. Middle Devonian Coral Beds of Central New York. Amer. Journ. Sci., Vol. 249, pp. 705–28, 2 pls., 6 figs.
115. PARKS, W. A. 1903. Fossiliferous Rocks of Southwest Ontario. Ont. Bureau of Mines, Rept. 12, pp. 141–56.
116. PARKS, W. A. 1936. Devonian Stromatoporoids of North America. Univ. Toronto Studies, Geol. Ser., No. 39, Pt. 1, 125 pp., 19 pls.
117. POHL, E. R. 1930. The Middle Devonian Traverse Group of Rocks in Michigan, a Summary of Existing Knowledge. Proc. U. S. Nat. Mus., Vol. 76, Art. 14, No. 2811, 34 pp., 2 pls.
118. RAYMOND, P. E. 1904. The Tropidoleptus Fauna at Canandaigua Lake, New York, with the Ontogeny of Twenty Species. Ann. Carnegie Mus., Vol. 3, pp. 79–177, 8 pls.
119. REIMANN, I. G. 1935. New Species and Some New Occurrences of Middle Devonian Blastoids. Bull. Buffalo Soc. Nat. Sci., Vol. 17, No. 1, pp. 23–45, 4 pls.
120. REIMANN, I. G. 1945. New Devonian Blastoids. Bull. Buffalo Soc. Nat. Sci., Vol. 19, No. 2, pp. 22–42, 5 pls.
121. ROGER, J. 1952. Classe des Brachiopodes. Vol. 2 *In* Traité de Paléontologie, by J. Piveteau. Paris. 160 pp., 12 pls.
122. ROMINGER, C. 1866. Observations on *Chaetetes* and Some Related Genera, in Regard to Their Systematic Position; with an Appended Description of Some New Species. . . . Proc. Acad. Nat. Sci. Philadelphia, pp. 113–23.
123. ROMINGER, C. 1876. Paleontology, Fossil Corals. Mich. Geol. Surv., Vol. 3, Pt. 2, 161 pp., 55 pls.
124. ROSS, M. H. 1953. The Favositidae of the Hamilton Group (Middle Devonian of New York). Bull. Buffalo Soc. Nat. Sci., Vol. 21, No. 2, pp. 37–89, 16 pls., 9 figs.
125. SCHUCHERT, C. 1897. A Synopsis of American Fossil Brachiopoda, Including Bibliography and Synonymy. U. S. Geol. Surv., Bull. 87, 464 pp.
126. SCHUCHERT, C. 1915. Revision of Paleozoic Stelleroidea with Special Reference to North American Asteroidea. U. S. Nat. Mus., Bull. 88, 311 pp., 38 pls.
127. SHIMER, H. W., and GRABAU, A. W. 1902. The Hamilton Group of Thedford, Ontario. Bull. Geol. Soc. Amer., Vol. 13, pp. 149–86.
128. SHIMER, H. W., and SHROCK, R. R. 1944. Index Fossils of North America. New York: John Wiley and Sons, Inc. 837 pp., 303 pls.

129. SLOSS, L. L. 1939. Devonian Rugose Corals from the Traverse Beds of Michigan. Journ. Paleontol., Vol. 13, No. 1, pp. 52–73, 4 pls., 8 text figs.

130. SPRINGER, F. 1917. On the Crinoid Genus Scyphocrinus and Its Bulbous Root Camarocrinus. Smithsonian Inst., Pub. 2440, 74 pp., 9 pls.

131. SPRINGER, F. 1920. The Crinoidea Flexibilia. Smithsonian Instit., 2 vol. (text, 486 pp.; plates, 76 pp.).

132. SPRINGER, F. 1921. The Fossil Crinoid Genus Dolatocrinus and Its Allies. U. S. Nat. Mus., Bull. 115, 78 pp., 16 pls.

133. STAUFFER, C. R. 1915. The Devonian of Southwestern Ontario. Can. Dept. Mines, Geol. Surv., Mem. 34, 341 pp.

134. STAUFFER, C. R. 1916. The Relationships of the Olentangy Shales and Associated Devonian Deposits of Northern Ohio. Journ. Geol., Vol. 24, No.5, pp. 476-87.

135. STAUFFER, C. R. 1938. Conodonts of the Olentangy Shale. Journ. Paleontol., Vol. 12, No. 5, pp. 411–43, 6 pls.

136. STAUFFER, C. R. 1939. Middle Devonian Polychaeta from the Lake Erie District. Journ. Paleontol., Vol. 13, No. 5, pp. 500–511, 2 pls.

137. STAUFFER, C. R. 1940. Preoccupied Specific Names of Arabellites. Journ. Paleontol., Vol. 14, No. 3, p. 285.

138. STAUFFER, C. R. 1952. The Coral Microcyclus and Some of Its Devonian Species. Can. Dept. Mines and Tech. Surveys, Geol. Surv. Can., Bull. 24, 33 pp., 8 pls.

139. STEWART, G. A. 1927. Fauna of the Silica Shale of Lucas County. Geol. Surv. Ohio, Ser. 4, Bull. 32, 76 pp., 5 pls.

140. STEWART, G. A. 1930. Additional Species from the Silica Shale of Lucas County, Ohio. Ohio Journ. Sci., Vol. 30, No. 1, pp. 52–58, 1 pl.

141. STEWART, G. A. 1936. A New Coral from the Olentangy Shale of Ontario. Amer. Midl. Nat., Vol. 17, pp. 878–80, 4 figs.

142. STEWART, G. A. 1938. Middle Devonian Corals of Ohio. Geol. Soc. Amer., Spec. Paper No. 8, 120 pp., 20 pls.

143. STEWART, G. A. 1940. Crinoids from the Silica Shale, Devonian, of Ohio. Ohio Journ. Sci., Vol. 40, No. 2, pp. 53–62, 1 pl.

144. STEWART, G. A. 1950. Ostracoda from Middle Devonian Bone Beds in Central Ohio. Journ. Paleontol., Vol. 24, No. 6, pp. 652–66, 2 pls.

145. STEWART, G. A., and HENDRIX, W. E. 1945. Ostracoda of the Plum Brook Shale, Erie County, Ohio. Journ. Paleontol., Vol. 19, No. 2, pp. 87–95, 1 pl.

146. STUMM, E. C. 1942. Fauna and Stratigraphic Relations of the Prout Limestone and Plum Brook Shale of Northern Ohio. Journ. Paleontol., Vol. 16, No. 5, pp. 549–63, 5 pls., 1 fig.

147. STUMM, E. C. 1947–1950. Tabulata. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–405.

148. STUMM, E. C. 1948. A Revision of the Aulacophylloid Tetracoral Genus Odontophyllum. Contrib. Mus. Paleontol. Univ. Mich., Vol. 7, No. 3, pp. 51–61, 2 pls.

149. STUMM, E. C. 1949. Three New Devonian Species of *Microcyclus* from Michigan and Ontario. Journ. Paleontol., Vol. 23, No. 5, pp. 507–9, 1 pl.

150. STUMM, E. C. 1949. Revision of the Families and Genera of the Devonian Tetracorals. Geol. Soc. Amer., Mem. 40, 92 pp., 25 pls.

151. STUMM, E. C. 1950. Corals of the Devonian Traverse Group of Michigan. Pt. 3. *Antholites, Pleurodictyum,* and *Procteria.* Contrib. Mus. Paleontol. Univ. Mich., Vol. 8, No. 8, pp. 205–20, 5 pls.

152. STUMM, E. C. 1951–1955. Tetracoralla. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–337.

153. STUMM, E. C. 1953. Trilobites of the Devonian Traverse Group of Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 6, pp. 101–57, 12 pls., 1 map.

154. SWANN, D. H. 1947. The *Favosites alpenensis* Lineage in the Middle Devonian Traverse Group of Michigan. Contrib. Mus. Paleontol. Univ. Mich., Vol. 6, No. 9, pp. 235–318, 17 pls., 1 fig.

155. SWARTZ, F. M., and ORIEL, S. E. 1948. Ostracoda from Middle Devonian Windom Beds in Western New York. Journ. Paleontol., Vol. 22, No. 5, pp. 541–66, 3 pls., 4 figs.

156. SWARTZ, F. M., and SWAIN, F. M. 1941. Ostracodes of the Middle Devonian Onondaga Beds of Central Pennsylvania. Bull. Geol. Soc. Amer., Vol. 52, pp. 381–458, 8 pls., 2 figs.

157. TURNER, M. C. 1939. Middle Devonian Ostracoda from Oil Wells in Southwestern Ontario. Bull. Amer. Paleontol., Vol. 25, No. 88, pp. 5–31, 1 pl.

158. ULRICH, E. O. 1890. Palaeozoic Bryozoa. Illinois Geol. Surv., Vol. 8, Pt. 2, Sec. 6, pp. 283–688, 50 pls.

159. ULRICH, E. O., and BASSLER, R. S. 1904. A Revision of the Paleozoic Bryozoa. Pt. 1, On Genera and Species of Ctenostomata. Smithsonian Misc. Coll., Vol. 45, pp. 256–94, 4 pls.

160. WACHSMUTH, C., and SPRINGER, F. 1897. The North American Crinoidea Camerata. Harvard Coll. Mus. Comp. Zool., Mem. 20 and 21, 837 pp., 83 pls.

161. WARTHIN, A. S., JR. 1934. Common Ostracoda of the Traverse Group. Contrib. Mus. Paleontol, Univ. Mich., Vol. 4, No. 12, pp. 205–26, 1 pl.

162. WARTHIN, A. S., JR. 1937. Beyrichiacea. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–105.

163. WARTHIN, A. S., JR. 1945. Thlipsuridae. *In* Type Invertebrate Fossils of North America (Devonian). Philadelphia: Wagner Free Instit. Sci. Cards 1–82.

164. WHITEAVES, J. F. 1889. On Some Fossils from the Hamilton Formation of Ontario, with a List of the Species at Present Known from That Formation and Province. Canada Geol. Surv., Contrib. Can. Palaeontol., Vol. 1, Pt. 2, pp. 91–125, 5 pls.

165. WHITEAVES, J. F. 1891. The Fossils of the Devonian Rocks of the Mackenzie River Basin. Contrib. Can. Palaeontol., Vol. 1, Pt. 3, pp. 197–253, 6 pls.

166. WHITEAVES, J. F. 1896. Canadian Stromatoporoids. Can. Rec. Sci., Vol. 7, No. 3, pp. 129–46.

167. WHITEAVES, J. F. 1898. On Some Additional or Imperfectly Understood Fossils from the Hamilton Formation of Ontario, with a Revised List of the Species Therefrom. Contrib. Can. Palaeontol., Geol. Surv. Can., Vol. 1, Pt. 5, No. 7, pp. 361–436, 3 pls.

168. WILLIAMS, M. Y. 1913. The Hamilton Formation at Thedford and Vicinity. *In* Guide Book No. 4 (Excursions in Southwestern Ontario). Geol. Surv. Can., pp. 101–10.

169. WILLIAMS, M. Y. 1914. Thedford and Vicinity, Ontario. Summ. Rept. Geol. Surv., Dept. Mines ... 1912. Ottawa: Sessional Paper No. 26, pp. 282–85.

170. Wood, E. 1904. On New and Old Middle Devonic Crinoids. Smithsonian Misc. Coll., Vol. 47, No. 1471, pp. 56–84, 2 pls.

171. Yochelson, E. L., and Kopf, R. W. 1956. A New Devonian Spinose Platyceratid Gastropod. Journ. Paleontol., Vol. 30, No. 5, pp. 1170–72, 1 pl.

MUSEUM CATALOGUES IN WHICH FOSSILS FROM THE THEDFORD-ARKONA REGION ARE LISTED

A. Clarke, J. M. 1907. Catalogue of Type Specimens of Paleozoic Fossils: Supplement 3. Appendix B *in* 3rd Report of the Director of the Science Division [New York State Museum] 1906, pp. 125–78.

B. Clarke, J. M., and Ruedemann, R. 1903. Catalogue of Type Specimens of Paleozoic Fossils in New York State Museum. N. Y. St. Mus., Bull. 65, Paleontol. 8, 847 pp.

C. Etheridge, R., and Carpenter, P. H. 1886. Catalogue of the Blastoidea in the Geological Department of the British Museum (Nat. Hist.). London: Printed by Order of the Trustees. 322 pp., 20 pls.

D. Fritz. M. A. 1941. Catalogue of Types in the Royal Ontario Museum of Palaeontology, Pt. 1. Contrib. Royal Ontario Mus. Palaeontol., No. 5, 50 pp.

E. Fritz, M. A. 1942. Catalogue of Types in the Royal Ontario Museum of Palaeontology, Pt. 2. Contrib. Royal Ontario Mus. Palaeontol., No. 6, 30 pp.

F. Hall, J. 1884. List of the Species in Each of Ten Duplicate Collections of Fossils Prepared by the New York State Museum of Natural History ... 35th Ann. Rept. N. Y. State Mus. Nat. Hist., Appendix C, pp. 29–32.

G. Hall, J. 1884. List of Species and Specimens of Cephalopoda from the Schoharie Grit, Upper Helderberg, Marcellus Shale, Hamilton, Tully Limestone, Genesee Slate, Portage, Chemung and Waverly Groups ... 35th Ann. Rept. N. Y. State Mus. Nat. Hist., Appendix D, pp. 33–66.

H. Merrill, G. P. 1905. Catalogue of the Type and Figured Specimens of Fossils, Minerals, Rocks and Ores. Pt. 1. Fossil Invertebrates. Bull. U. S. Nat. Mus., No. 53, Pt. 1, 704 pp.

J. Whitfield, R. P., and Hovey, E. C. 1900. Catalogue of the Types and Figured Specimens in the Palaeontological Collection of the Geological Department, American Museum of Natural History. Pt. 3. Beginning with the Oriskany Sandstone. Bull. Amer. Mus. Nat. Hist., Vol. 11, pp. 190–356.

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