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Summary of fossils, Scraggly Lake area

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REPORT ON THE OCCURRENCE OF CONODONTS FROM THE SADDLE POND INLIER,
NORTH-CENTRAL MAINE, USA

BY

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DIVISION OF STRATIGRAPHY

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1991
INTRODUCTION

This report presents the results of a preliminary search for conodonts from the Saddle Pond region, Maine. The work is part of the mapping project on the Saddle Pond Inlier (Hibbard 1991).

Material

Eight samples have been processed and searched for the content of conodonts. These are:

- **HS-4**: Limestone clast from shaley conglomerate (Grey-lightgrey wackestone, crinoids dominate).
- **HS-22**: Carbonate bed within basaltic volcanic unit (Darkgrey to black, dense to finegrained, crystalline limestone with veins of white sparry calcite).
- **HS-32**: Carbonate from volcanic conglomerate. (Lightgrey, recrystallized coarsegrained limestone in green shaly matrix).
- **HS-34**: Carbonate clast in rounded cobble conglomerate (Grey, calcareous silt or fine sand).
- **HS-41B**: Calcareous rock from pillow lava unit (Calcareous volcanoclastic(?) sediment with sparry calcite)
- **HS-43**: Calcareous rock from pillow lava unit (Volcanoclastic(?) sediment with sparry calcite).
- **HS-47**: Carbonate clast (fossiliferous) in rounded cobble conglomerate (Darkgreen-black calcareous siltstone(?)).
- **HS-50**: (Lightgrey sparry limestone, ?crinoids. Sample HS-50 resembles sample HS-4)

Procedure and results

Each sample was processed using standard technique (e.g. Stouge & Boyce 1983). After a first round of processing additional material were dissolved for the largest sample (HS-22), where the material was adequate in amount.

The acidresidue has been separated with heavy liquid and the heavy residue was inspected and the conodonts were picked manually under the microscope.
HS-4
426 gms of rock (= total sample) have been dissolved.
The sample did not yield conodonts.

HS-22
700 gms of rock have been dissolved.
No conodonts found.

HS-32
69 gms of rock (= total sample) have been dissolved.
No conodonts found.

HS-34
500 gms of rock (= total sample) have been dissolved.
Conodont fauna:
(?)Kockeella sp. 3 spms.

Age of conodont fauna:
Kockeella Walliser, 1957 has a stratigraphic
distribution from Upper Llandovery to Ludlow (Silurian).

Remarks:
The conodont elements have a CAI (Color Alteration Index
of Epstein et al. 1977) of 5 which suggest that the host
rock has been heated up to over 300 degrees Celsius.

Other fauna elements:
The sample yielded silicified remains of a trilobite,
a gastropod and one ostracod.

HS-41B
500 gms of rock (= total sample) have been dissolved.
No conodonts were found.

HS-43
78 gms (= total sample) have been dissolved.
No conodonts were found.

HS-47
79 gms (= total sample) have been dissolved.
No conodonts were found.

HS-50
386 gms (= total sample) have been dissolved.
No conodonts were found.

Conclusion and further research

In this first attempt to find conodonts from the Saddle Pond
region one sample out of eight yielded a small conodont fauna referred
to the Silurian (Upper Llandovery-Ludlow) System. This positive
evidence for the occurrence of conodonts in the region supports the
idea of further research in the region.
Most of the samples investigated in this study were indeed small
- weighting from 70 gms to 700 gms (rare) - and large samples (1 kg.)
are recommended in order to obtain the number of conodonts needed for evaluation of the microfauna. One conclusion of this project is that more information on the microfauna are hidden in the Saddle Pond rocks.

Therefore the following suggestions are given for further research:

1) In general, the collection of larger samples are recommended from this region.

2) Recollection of the samples: HS-4, HS-32, HS-34, HS-36.

3) Additional material from other localities within the region should be tested.

References:


Palynomorph evidence for the age of the Trout Valley Formation of northern Maine, U.S.A.; report to James Hibbard, Dept. of Marine Earth and Atmospheric Sciences, North Carolina State University, Raleigh, North Carolina.

The relevant parts of any manuscript prepared for publication that paraphrase or quote from this report should be referred to the Eastern Palaeontology Section for possible revision.

Introduction:

Plant remains from the Trout Valley Formation were first studied by Dorf and Rankin (1962). Subsequently several authors reported and described plant remains (including some new species) from these beds, and Andrews et al. (1977) described carbonized spores from a locality on Trout Brook. Kasper et al. (1988) summarized the history of these findings and their geological and evolutionary significance, and pointed out the similarity of both the plant megafossils and the spores of the Trout Brook Formation to the apparently nearly contemporaneous floras of northern New Brunswick and the Gaspé Peninsula.

Early estimates of the age of the Trout Valley Formation based on plants, spores, and stratigraphic relationships placed it in the late Emsian or early Eifelian. Kasper and Forbes (1979) favoured early Middle Devonian (Eifelian) age because of the presence of the "hitherto Middle Devonian genus" Leclercgia. They also pointed out the "...increasing similarity of the Trout Valley flora to that of the north shore of New Brunswick..." (op. cit., p. 57). The stratigraphic range of the plant Leclercgia and the age of plant beds of northern New Brunswick thus were, in their opinion, particularly relevant to determining the age of the Trout Valley Formation. Richardson and McGregor (1986) included the Trout Valley Formation in the Grandispora douglasstownense-Anzurosphera eurypterota spore assemblage zone (which spans the upper Emsian and lowermost Eifelian), based on correlations with the stratotype sequences of the German Eifel region.

Spores identified from the Trout Valley Formation:

The spores are highly coalified (Thermal Alteration Index 4- to 4), and many remain opaque even after oxidation in the laboratory. Their walls are commonly pitted and corroded; details of exinal sculpture, on which precise identification may depend, have been significantly altered diagenetically on most specimens. Therefore, although the assemblage is reasonably diverse, few taxa can be identified without question.

Andrews et al. (1977) listed 6 taxa, and I have identified a few more in slides of spores from the Trout Valley Formation in my own files (GSC locality no. 0-105776, precise provenance unknown). The following is a composite list of taxa from both sources:

Acinosporites lindlarensis Riegel, 1968 var. lindlarensis
?Ancyrospora sp.

 cf. Apiculasporites perpusillus (Naumova) McGregor, 1973
 ?Apiculiretusispores plicata (Allen) Streel, 1967
 Apiculiretusispores sp.
 Calamospora sp.
 cf. Clivosispora verrucata McGregor, 1973 var. verrucata
 Deltoidospores sp. cf. D. priddyi (Berry) McGregor, 1973
 ?Diatomozonotriletes oligodontus Chibrikova, 1962
 ?Dibolisporites wetteldorfensis Lanninger, 1968
 Emphanisporites annulatus McGregor, 1961
 E. rotatus McGregor, 1961
 Grandispora douglastownense McGregor, 1973
 Grandispora spp. (2 species)
 Lophotrilites devonicus (Naumova ex Chibrikova) McGregor and
 Camfield, 1982
 Retusotriletes maculatus? McGregor and Camfield, 1976
 Tholispores sp. cf. T. chulus (Cramer) McGregor, 1973 var. chulus
 ?Verrucosisporites polygonalis Lanninger, 1968

Age:

The spore assemblage includes a number of questionably identified
species whose stratigraphic ranges terminate in the upper Emsian in
eastern North America and western Europe, i.e. cf. Clivosispora
verrucata var. verrucata, ?Dibolisporites wetteldorfensis, Retusotriletes maculatus?, and ?Verrucosisporites polygonalis. It
also contains anchor-spined spores (?Ancyrospora) and
Grandisporites douglastownense, which have not been reliably
reported below the uppermost Emsian. Moreover, zonally significant
taxa that are common in lower but not lowermost Eifelian rocks
virtually world-wide have not been found in the Trout Valley
Formation, e.g., G. velata, Acinosporites acanthomammillatus,
Rhabdosporites langii, Corystisporites spp., Densosporites sp.
Therefore it seems reasonable to conclude that the palyniferous
beds of the Trout Valley Formation are not older than latest Emsian
and not younger than very early Eifelian.

Two alternatives within this age range are possible. If the
"pre-Eifelian" taxa cited above are depositionally in situ, the
most likely age would be very late Emsian, correlative with the
upper Wetteldorf Foremation or the lower Heisdorf Formation of the
German Eifel region (see Riegel, 1982). The ranges of these
"pre-Eifelian" taxa are known to overlap the lower limits of G.
douglastownense and ancyrate spores in eastern Canada (McGregor,
1977; McGregor and Camfield, 1976). Alternatively, if the
"pre-Eifelian" taxa are recycled, the enclosing rocks could be as
young as early Eifelian. The presence of ?Diatomozonotriletes
oligodontus and Lophotrilites devonicus suggests this alternative,
as neither species has been reported from pre-Eifelian rocks in
North America or western Europe. However, these two taxa have
rarely been reported, so their ranges are not well established. On
present evidence I cannot confirm that the older spores are
reworked.

Leclercgia, referred to by Kasper and Forbes (1979), is not a
reliable indicator of Eifelian age. At least two species of Leclercqia produced Acinosporites lindlarensis var. lindlarensis spores. Identical spores commonly occur dispersed in upper Emsian and lower Givetian rocks (Richardson et al., in press); and Kasper et al. (1988, p. 119) noted that Leclercqia "...occurs in late Lower Devonian strata in northern New Brunswick."

Thus, the spore-bearing beds of the Trout Valley Formation are either very late Emsian or very early Eifelian. They correlate well with the Grandispora douglastownense-Ancyrospora eurypterota Assemblage Zone (Richardson and McGregor, 1986), which includes beds on both sides of the Lower/Middle Devonian boundary. In terms of the standard conodont zonation, they equate with some part of the Polygnathus costatus patulus Zone or the P. costatus partitus Zone.

Related North American floras:

In Maine, spore-bearing strata on the west side of St. Froid Lake, and on Red River in the Winterville Quadrangle, are within the same age range. Other strata in the Winterville region, and plant-bearing beds near Mapleton, are younger, i.e. in the early to late Eifelian range. Those investigated from near Ashland and in the Eagle Lake region are older (late Siegenian to early Emsian). These conclusions are based on unpublished data from samples collected with and obtained from Ely Mencher, then with the Massachusetts Institute of Technology, in 1962-1968.

In eastern Canada the douglastownense-eurypterota Zone and the underlying annulatus-sextantii Zone occur in the Campbellton and Lagarde Formations on the south and north sides, respectively, of the lower Restigouche River in northern New Brunswick and southeastern Quebec, and in the Battery Point Formation of eastern Gaspé (McGregor, 1977 and unpublished; Richardson and McGregor, 1986). The douglastownense-eurypterota Zone is present in the McAdam Lake Formation of Cape Breton Island and the Wapske Formation of central New Brunswick (Richardson and McGregor, 1986; McGregor, unpublished), and in the Sextant and lower Kwataboahegan formations of the Moose River Basin in northern Ontario (McGregor and Camfield, 1976).

References:


D.C. McGregor

Geological Survey of Canada
Eastern Paleontology Section
Ottawa, Ontario

November 23, 1992
GRAND LAKE SEBOEIS GROUP

R. Neuman identifications:

Sample A-36: Frost Pond 1:24,000 quad., Piscataquis County, T7R9, UTM grid location, 0508.24E, 5120.05N.

A few brachiopods, including a chonetid and an unidentified species of Atrypa. The latter indicate a Silurian or Early Devonian age.

This assessment refined to Upper Llandovery-Early Devonian by A. Boucot.

Sample A-4: Trout Brook Mountain 1:24,000 quad., Penobscot County, T7R8, UTM grid location 0514.80E, 5118.96N.

The following brachiopods were identified (listed taxonomically, following the classification of the treatise of Invertebrate Paleontology, Part I. The number of specimens identified is indicated in parentheses): Ptychopleurella sp. (1), Dictyonella sp. (1), entetelacicans indet. (13), Isolithus sp. (1), Dicoelosia cf. D. biloba (Linnaeus) (5), Plectodonta (Plectodonta) sp. (2), Leptaena sp. (3), chonetid? sp. (1), atrypacean gen. indet. (1), Atrypina? sp. (1), delthyrid? gen. indet. (1).

Indicates Late Silurian (Ludlow) to Early Devonian (Lochkov) age.

This assessment refined by A. Boucot to Upper Silurian.

W. Oliver identifications:

Sample A-50: Trout Brook Mountain 1:24,000 quad., Piscataquis County, T7 R9, UTM grid 0511.60E, 5119.365N.

Stauromatidium sp. cf. S. marylandicum (Swartz), 1923., rugose corals, favositid corals.

Age: I am confident of the Pridolian-Lochkovian range and lean slightly toward a Lochkovian age.

S. Stouge identifications:

Sample HS-34: Trout Brook Mountain 1:24,000 quad., Piscataquis County. Clast in conglomerate.

Conodont fauna: (?) Kockelella sp. (3)

Age of conodont fauna: Kockelella Walliser, 1957, has a stratigraphic distribution from Upper Llandovery to Ludlow.

Other fauna elements: trilobite, gastropod, and an ostracod.

MILLIMAGASSETT LAKE FORMATION

A. Boucot identification:

Sample SB-44: Grand Lake Seboeis 1:24,000 quad., Penobscot County.

This one is hard to date. It's somewhere in the Upper Silurian-Heldeberg interval - assuming that one wouldn't expect Coelospora and a strophonellid in the local Oriskanian beds. I got a large Coelospora sp., "Neumenella" ?? sp., trilobites, tetracorals, pelmatozoan debris, "Camarotoechia" sp., Strophonella? sp., dalmanellid.
Dear Jim,

Sorry to take so long to get this fossil information to you. I thought it was going to be harder to put together than it was and I was under a bit of pressure this spring/summer to finish the transit synthesis paper which I did just before coming up here for 2 weeks vacation.

I also have the assembled information which I can deal with later, so hope the get to you in time to be useful when Newman is with you. The only question in the list is N-42. My field notes clearly say that I made a fossil collection for Boscut from "crinoidal spits on brick red matrix & angulocameria liinaria" from N-41 (above maroon grite if right side up)

My notes for N-42 refer to "liinaria confertum & but no mention of fossils." The E+P report from Boscut refers to locality N-42. My memory cannot help on this.

I tried to get my thesis copied at Kenbo's. They refused saying it recent can't nothing said that left would not copy a significant amount of copyrighted material. Actually it was my wife who took it down and may not have readily pushed the young clerk to fore. I haven't had a chance to do anything further.

My proposal to the USGS for a new project is to revisit the Traveler Flyschite in the summer of 1992 and publish the Traveler Mountain quad (minus the falible land indoor).

Hope your summer is going well and I wish I could be there with you rather than in Washington! I am, however, enjoying taking out my frustrations here by cutting down lots of trees. Some full more cooperatively than other.
Fossil Localities: Saddle Pond Inlet, Traveler Mountain quad

X-2 Boucot oral 3/24/61 Lower Ludlow
written 2/21/62 Ludlow

X-42 Boucot 7/12/62 "I suspect is most likely of Silurian age,
see letter although this is certainly not proved and it might be Lower Devonian

X-95 Limestone pebble conglomerate; fossils are in the pebbles
Oliver 2/29/62 & 2/27/63 Upper Llandovery to Ludlow (Corals)
Boucot 7/12/62 Siluro-Devonian

X-96 Oliver 5/29/62 either Silurian or Devonian (Corals & Stromatoporoids)

X-100 Oliver 2/17/63 Silurian or Devonian? Upper Silurian? (corals)

X-102 Oliver 2/17/63 Middle or Upper Silurian
Boucot 7/12/62 Lower Ludlow

C-61-4 Boucot 7/12/62 Silurian (C 3 to Ludlow)

C-61-54 Oliver 2/17/63 Ordovician or Silurian, probably Silurian

8/5/91
D. Cohen
January 19, 1992

Dear Jim & Bob:

By now you both probably figured that Jim's collections vanished utterly into the Corvallis Black Hole! Not quite that bad. Got off my fat rump today, unwrapped collections of A-36 & A-4, and had a look at them. First off, BOTH collections, as Bob said in his January 9, 1991 report about A-36, are on the kinda small side. So...if Jim really needs some authoritative dates on these babies I would recommend recollecting. Get about 100 pounds of good, fossiliferous blocks for the old rock splitter treatment plus acid soaks. I'd be happy to have a go if Bob ain't in the mood. 0o...impressions:

A-36. Bob mentioned a few bracs including a chonetid and an Atrypa. There certainly is a shell of the kind I used to call Atrypa "reticularis" in the broad sense--its the big, plano-convex, costellate item. The chonetid is costellate, and might, just might be Eccentricosta, but its impossible to say that for sure--merely a stab in the dark. The high spired snail looks like Loxonema, which doesn't help much. There are several other genera represented by fragmentary costate and costellate bits that nobody in his right mind would say much about. So...if you are really interested--more stuff. As to age there is the possibility, IF the Eocenomegeton guess were to turn out correct, that you are dealing with Friddell age material, but Bob's statement of Silurian-Early Devonian could only be modified to Upper Llandovery-Early Devonian, which ain't much of a change, since earlier Llandovery is a rare article in the Northern Appalachians.

A-4, as Bob suggested, is an Upper Silurian item (I would rule out Devonian on the basis of the little encrinurid pygidium in the gelatin capsul). I would revise several of the identifications, as follows, but these do not affect the overall age assessment. The Dictyonella might well be a rostrospiral pedicle valve, the Salopina is Isorthis, one of the enteletaceans may be Resserella, and the delthyrid? may be an Atrypa, and the atrypacean gen. indet. I'd call Atrypa "reticularis". Again, bigger collections if you want more precise dates.

A-4 looks like a deeper water, Benthic Assemblage 4-5 item, whereas A-36 might well be a Benthic Assemblage 3 item (what did the corals turn out to be?).

Tomorrow I'll get rolling on Jim's shipment of unprepared material and should have a report for him within a week or two.

All the best to you both,

[Signature]
January 20, 1992

Dear Jim & Bob:

Actually got into the lab today and finished up the preliminary account of Jim's materials. There are three localities (SB-33, SB-44, and E-13; I assume that the SB-22 of Jim's letter to me of October 17, 1991 is actually SB-44—did you divide the number by two?). The three collections are all on the very smallish side, so that if you want more definitive results considerably bigger batches of material will be needed in the future. Here goes:

E-13. This is a Pridoli age locality, featuring Eccentriccosta sp. as the datable item, plus Coelosiphra sp., Howellella sp., Atrypa "reticularis", Leptostrophia? sp., "Camarotoechia" sp.
I would assign it to Benthic Assemblage 3, and predict that at least a half dozen additional genera would "emerge" from a 100 lb. sample.

SB-44. This is a hard one to date. Its somewhere in the Upper Silurian—Helderberg interval—assuming that one wouldn't expect Coelosiphra and a strophonellid in the local "riskian beds. I got a large Coelosiphra sp., "Neumanella"? sp., trilobites, tetracorals, pelmatozoan debris, "Camarotoechia" sp., Strophonella? sp., dalmanellid.
Probably a Benthic Assemblage 3-4 item, but not enough material to be sure. This was a pretty small collection—really need a lot more to be able to do anything definitive.

SB-33. Lissatrypa sp., Kessnerella sp., Dicoelosia sp., Coelosiphra sp., Dalejina? sp., Leptaenisa sp., trilobite, Leptaena "rhomboidalis", strophoendoniids. This is an Upper Silurian age collection. Probably belongs to Benthic Assemblage 4. A lot more material would certainly double the number of genera.

Do you want your corals sent to a specialist? If so, who?
Will be interested to see how the above information fits with your map and lithostratigraphy.

All the best,
April 6, 1992

To: Art Boucot
Jim Hibbard
Bob Neuman

From: Bill Oliver

Subject: Hibbard collections from Maine

Corals from two collections were forwarded to me by Art:

1) SB-44 consists of a single, fragmented, solitary rugose coral:


   Stumm's species is from the Hardwood Mtn. Fm., Moose River Synclinorium, Maine, and is Late Silurian in age. The genus is a Wenlockian-Ludlovian form that may or may not extend into the Pridolian: it is not known to occur in the Lochkovian. A related form, that I have variously listed as "Spongophyllumoides" and "Dubrovia," from the Lochkovian of the Appalachians, is quite different and may be a new genus.

   This age data, combined with Art's "Upper Silurian to Helderberg interval," indicates a Late Silurian age for the collection.

2) SB-33 includes several blocks containing scattered parts of a tabulate coral, probably a romingeriid, but possibly a syringooroid. I haven't pursued this, because Art states the collection to be Late Silurian and it is unlikely that the coral would prove to be anything but Silurian-Devonian.

With best wishes to all,

Wm. A. Oliver, Jr.
Dr. Arthur J. Boucot  
Department of Zoology  
Oregon State University  
Corvallis, OR 97333-5506

Dear Art:

Jim Hibbard tells me that you and he have been in contact, one of the results being that you have agreed to look at the brachiopods from his 1990 field work in Maine. I am sure that he told you that about a year ago, I broke up and decalcified the samples that he sent me. You will see in the attached copy of my report on this work that I suggested that he get in touch with you, and I am glad that he has done so.

Only two of the four samples that he sent yielded enough brachiopods to be potentially informative, his sample numbers A4 and A-36. The pieces containing the brachiopods that I saw are coming to you in two boxes, one for each: 35 pieces (or pairs of pieces) from A-4, 16 from A-36. I have not sent the corals, bryozoans, crinoid stems and other miscellany from either collection.

With regard to the paperwork for these samples (and everything else), things are not the way they used to be. There are no papers for them in either the Survey or Museum files. If the old Survey E&R system has not fallen apart, it has disappeared from my view. The Museum still maintains stratigraphic collections, housed at Silver Hill in Prince Georges County, in addition to the biological and type collections that are still on the Hall. I would guess that some of these specimens should be accessioned by the Museum and saved in the stratigraphic collection for archival purposes. For this purpose I ask that you put your identification label in the tray of each specimen worth saving and return them to me. The remainder should be returned to Jim or discarded.

Among the noticeable changes that one sees here is the thinness of the gray line where once stood large armies making maps, seeing rocks that had not hitherto been seen, and getting fossils from them with which to amaze their colleagues. Jim Hibbard is one of the few who still see virtue in such ventures, and I am particularly pleased that he has focused on the geology north of the Shin Pond area where I had worked, geology that I had seen enough of to know that the two areas were significantly different. He is doing an excellent job, and I am very glad that you will help him.
MEMO

To: Art Boucot
Jim Hibbard

From: Bill Oliver, P & S Branch, Washington

Subject: Hibbard collection from Maine

Corals from collection SB-44, northern Maine, were sent by Art with covering memo dated Sept. 25, 1992. This is in addition to the Spongophyllum sp. A of Stumm, 1963, that I identified earlier (April 6, 1992).

Five small rugose corals are more-or-less well preserved:

- Rhizophyllum sp. This is rather like the specimen that I illustrated in 1964 (PP 475-0, p. 156-7, figs. 5c-e), but much more complete and apparently lacking the radiciform processes.
- Spongophyllum sp. Possibly the same species as that of Apr. 6.

The other two rugosans are unidentified, but one is probably a second I. nordica.

In addition there are molds of heliolitid corals and bryozoans.

All of these determinations are very compatible with Art’s age determination of Ludlovian or Pridolian, more likely the latter. The previous Rhizophyllum was reported as Ludlovian; all of the others are similar or the same as species from the Hardwood Mountain Fm., Maine. Both I. nordica and Spongophyllum sp. are common in the Pridolian of the Appalachians.

With best wishes.

Wm. A. Oliver, Jr.
MEMO

To: Bob Neuman and James Hibbard

From: Bill Oliver

Subject: Corals from Maine

Corals from the locality of earlier collection A-50 -- Trout Brook Mountain 1:24000 quad., Piscataquis County, T7 R9 UTM grid 0511.60E, 5119.565N -- are either Pridolian (late Late Silurian) or Lochkovian (Helderbergian, early Early Devonian) in age, more likely the latter. They are identified as follows:

1) Stauromatidium sp. cf. S. marylandicum (Swartz), 1923. In the central and northern Appalachians, this genus and species are only known from the Pridolian part of the Keyser Limestone in Maryland and adjacent areas, and from the Beck Pond Limestone and equivalent units (Helderbergian) in Maine. See Pedder and Oliver, 1982, for description, discussion and illustrations; and Oliver, 1960, for the original discussions and illustrations of Maine material (described as Tryplasma).

2) Two additional rugose corals are undetermined and probably indeterminate.

3) Favisitid corals are common, mostly fragmental, and include both massive and branching colonies. Some of these are similar and possibly conspecific with the Helderbergian favisitids from the Beck Pond Limestone illustrated by Oliver, 1960, pl. 5. I don't put too much weight on this because favisitids tend to be long ranging and those from pre-Helderbergian rocks in Maine are largely undescribed.

Age: I am confident of the Pridolian-Lochkovian range and lean slightly toward a Lochkovian age for the reasons given.

References:
Oliver, W.A., Jr., 1960, Devonian rugose corals from northern Maine. USGS Bull. 1111-A.