



Fossil Localities of the Rattlesnake Creek, Western and Eastern Hayfork, and North Fork Terranes of the Klamath Mountains

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FOSSIL LOCALITIES OF THE RATTLESNAKE CREEK, WESTERN AND EASTERN HAYFORK, AND NORTH FORK TERRANES OF THE KLAMATH MOUNTAINS

By William P. Irwin and Charles D. Blome

INTRODUCTION

Significant collections of fossils from the Rattlesnake Creek, Western and Eastern Hayfork, and North Fork terranes (rocks known collectively as the western Paleozoic and Triassic belt (or TrPz)(Irwin, 1972)) of the Klamath Mountains were first made by J.S. Diller of the U.S. Geological Survey in the company of T.W. Stanton and James Storrs in 1902 (see Diller, 1903). These collections augmented a few earlier collections by Diller and Storrs. Some of these collections variously contained Chaetetids (corals or spongiomorphs?) and ammonites that were originally thought to be Devonian in age: A Devonian age for the Chaetetids now seems doubtful, and the ammonites are now known to be Triassic in age (Silberling and Irwin, 1962). These fossils were from discontinuous bodies of limestone in the Rattlesnake Creek terrane that were referred to by Diller (1903) as the “southwestern Devonian belt”. Discontinuous limestone bodies in the Eastern Hayfork and North Fork terranes, east of the so-called “southwestern Devonian belt”, yielded late Paleozoic fossils and were referred to by Diller (1903) as the “southwestern Carboniferous belt”.

Much additional sampling and paleontologic work has been done since Diller’s time, and the Paleozoic of the TrPz is now thought to be represented mainly by scattered small limestone bodies that contain late Paleozoic microfossils. These limestones are present in all the terranes except the Western Hayfork. Some of the late Paleozoic microfossils in the limestones of the Eastern Hayfork and North Fork terranes are of Tethyan faunal affinity and attest to the allochthonous and far-traveled nature of the terranes. Two limestone localities (105 and 108) in the Eastern Hayfork terrane contain Waagenophyllid corals that also are considered Tethyan. Conodonts also are found in many of the limestone bodies of the TrPz and in some of the chert. The color alteration index (CAI) of the conodonts in the TrPz ranges from 5 to 7, which indicates they have been heated to temperatures of 300° to 500°C (Irwin and others, 1983).

The advent of modern radiolarian studies, pioneered by Emile Pessagno and others in the late 1960’s, quickly followed the discovery of simple laboratory techniques for extracting radiolarians from chert. During the following decades, many chert localities in the terranes of the TrPz were sampled for radiolarians by various geologists and students. The TrPz chert has been found to be predominantly Triassic or Jurassic (or Mesozoic) in age and less commonly Paleozoic. The least sampled terrane, the Western Hayfork, contains four sampled radiolarian localities, three of which were identified as Mesozoic and one as Late Triassic to Early Jurassic. All of the other terranes of the TrPz contain chert with some Triassic and/or Jurassic radiolarian faunas, although the presence of Jurassic radiolarians in the Eastern Hayfork terrane is questionable. Chert with late Paleozoic radiolarians is sparsely present in the Eastern Hayfork and North Fork terranes, but is absent in the Rattlesnake Creek terrane. The oldest radiolarians recognized in the TrPz are Permian in age; the youngest are Early or Middle Jurassic. Chert containing Pliensbachian (Early Jurassic) radiolarians occurs in the North Fork terrane, and, interestingly, is also found in some Franciscan terranes of the Coast Ranges (see Blome and Irwin, 1983).

RATTLESNAKE CREEK TERRANE

Locality No. 1: Field No. 90-CB-1B (USGS DR 1111) and 90-CB-1C (USGS DR (1112)

Location: Mn prospect in Wimer quad, center NW1/4 sec 25, T 33 S, R 5 W; long 123° 14.6', lat 42° 40.7'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age of 90-CB-1B:

Radiolarians:

Canoptum sp. cf. *C. rugosum* Pessagno and Poisson

Canoptum sp.

?*Hsuum* sp.

?*Napora* sp.

Paronaella sp. (isolated arm)

A number of bipolar forms probably belonging to the family Pantanelliidae

All forms very poorly preserved

Age: ?Early Jurassic (Probably Sinumurian or Pliensbachian).

Fossils and age of 90-CB-1C

Radiolarians:

Canoptum anulatum Pessagno and Poisson

Canoptum sp.

Droltus sp.

Praeconocaryomma sp. aff. *P. media* Pessagno and Poisson

Age: Early Jurassic (late Sinemurian or Pliensbachian).

Locality No.2: Field No. 90-CB-2A (USGS DR 1113), and 90-CB-2B (USGS DR 1114)

Location: NE1/4 sec 14, T 36 S, R 8 W; long 123° 36.4', lat 42° 26.6'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age of 90-CB-2A:

Radiolarians:

Canoptum sp.

Other poorly preserved nassellarians

Age: Late Triassic or Early Jurassic

Fossils and age of 90-CB-2B:

Radiolarians:

?*Canutus* sp.

Canoptum annulatum Pessagno and Poisson

Eucyrtidiellum sp.

Katroma sp.

Praeconocaryomma sp. aff. *P. media* Pessagno and Poisson

Praeconocaryomma sp.

Age: Early Jurassic (Pliensbachian).

Locality No. 3: Field No. 86-CB-76

Location: NE1/4 SE1/4 sec 22, T 36 S, R 8 W; long 123° 37.3', lat 42° 25.4'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians of Early Jurassic age

Locality No. 4: Field No. 91-CB-13

Location: SW1/4 NE1/4 sec 34, T 36 S, R 8 W; long 123° 37.8', lat 42° 23.8'

Collected by W.P. Irwin and C.D. Blome

Fossils and age: Radiolarians, poorly preserved, of Early Jurassic age

Locality No. 5: Field No. 91-CB-12

Location: NW1/4 SE1/4 sec 34, T 36 S, R 8 W; long 123° 37.8', lat 42° 23.7'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians, poorly preserved, of Early Jurassic age

Locality No. 6: Field No. 91-CB-11

Location: NW1/4 SE1/4 sec 34, T 36 S, R 8 W; long 123° 37.7', lat 42° 23.6'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians of Early Jurassic age

Locality No. 7: Field No. 86-CB-75C (USGS DR 1051)

Location: NW1/4 SE1/4 sec 34, T 36 S, R 8 W; long 123° 37.6', lat 42° 23.6'; Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Sample No: 86CB-075C)

Radiolarians:

?*Bagotum* sp. aff. *B. modestum* Pessagno and Whalen

?*Bagotum* sp. (distinctive bean-shaped form)

?*Canutus* sp. cf. *C. blomei* Pessagno and Whalen

?*Praeconocaryomma* sp.

All forms very poorly preserved

Age: ?Early Jurassic (Sinemurian or Pliensbachian)

Locality No. 8: Field No. 91-CB-10 (USGS DR 1265)

Location: E1/2 SE1/4 sec 35, T 37 S, R 9 W; long 123° 43.1', lat 42° 18.2'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians

?*Canoptum* sp.

?*Droptus* sp.

?*Orbiculiforma* sp.

?*Pantanellium* sp.

All forms very poorly preserved

Age Range: Probably Early Jurassic (Sinemurian) to Middle Jurassic (Bajocian)

Locality No. 9: Field No. 91-CB-9 (USGS DR 1264)

Location: S1/2 NE1/4 sec 3, T 38 S, R 9 W; long 123° 44.5', lat 42° 17.7' Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians:

?*Canutus* sp.

?*Droptus* sp.

All forms very poorly preserved

Age: Probably Early to Middle Jurassic

Locality No.10: Field No. 91-CB-5AB

Location: NE1/4 NW1/4 sec 25, T38 S, R 9 W; long 123° 43.9', lat 42° 15.3'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians of Early Jurassic age

Locality No. 11: Field No. 91-CB-7AB

Location: NW1/4 NW1/4 sec 29, T 38 S, R 9 W; long 123° 47.6', lat 42° 14.5'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians of Early Jurassic age

This locality is close to locality CP-37 of Yule (1996) who reports the following radiolarian fauna of Late Kimmeridgian to Early Tithonian age:

Lupherium sp.

Praeconocaryomma magnimamma Pessagno and Poisson

Large spheres (unidentifiable)

Locality No. 12: Field No. 91-CB-6AD

Location: center NE1/4 sec 29, T 38 S, R 9 W; long 123° 46.9', lat 42° 14.3'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age: Radiolarians of Callovian? Age

This locality may be the same as locality CP-5 of Yule (1996) which is reported to contain "probable Canoptums" of Late Triassic (?) to ~Bajocian age (also see Roure and DeWever, 1983).

Locality No. 13; Field No. I-32-73

Location: Lime Rock, 3.8 km S 55 E of Kerby; center sec 14, T 39 S, R 8 W; long ~123° 36.10'; lat ~42°11.10'

Limestone collected by W.P. Irwin and S.P. Galanis, Jr.

Fossils and age: Conodonts identified as *E. abneptis* of Late Triassic age and CAI-6 by B.R. Wardlaw (in Irwin and others, 1983, Loc. 3). The foraminifer *Tetrataxis* sp. of Late Paleozoic age is reported by B. Mamet (written commun., Dec. 12, 1975). This limestone body was considered Devonian by J.S. Diller (Field notebook, 1905), and probably is the same as the one he described as containing "*Chaetetes* and a *Cyathophyllum*-like coral", which are forms he considered common to the so-called Devonian limestone along the South Fork of Trinity River in southern Klamath Mountains (Diller, 1903). [Ref.: Irwin and Galanis, 1976, Loc. 10]

Locality No.14: Field No. 90-CB-4B

Location: W1/2 NW1/4 sec 32, T40 S, R 7 W; long 123° 33.6', lat 42° 03.0'

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age:

Radiolarians:

?*Corum* sp.

?*Hsuum* sp.

Poorly-preserved nassellarians

Age: ?Jurassic

Locality No. 15; Field No. I-91-77 and 90-CB-4AB

Location: W1/2 NW1/4 sec 32, T 40 S, R 7 W; long 123° 33.6'; lat 42° 02.9'

Chert and siliceous tuff collected by W.P. Irwin and C.D. Blome

Fossils and age: Radiolarians identified in sample I-91-77 as Jurassic in age by D.L. Jones (Irwin and others, 1978, Loc. 35) and in samples 90-CB-4AB as Early Jurassic (Pliensbachian?) in age by C.D. Blome (Unpub. data, Jan. 22, 1993)

Locality No. 16; Field No. D-7064

Location: W side of Sucker Creek, SE1/4 SE1/4 sec 29, T 40 S, R 7 W; long ~123° 25.57'; lat ~42°03.26'

Limestone collected by J.S. Diller

Fossils and age: Two large club-shaped echinoid spines that are definitely Mesozoic (J.B. Reeside, written commun., Feb. 25, 1941). [Ref.: Irwin and Galanis, 1976, Loc. 13]

Locality No. 17; Field No. I-44-73

Location: 1 km S of Little Grayback; long 123° 32.09'; lat 41° 58.17'

Limestone collected by W.P. Irwin and S.P. Galanis, Jr.

Fossils and age: Conodonts identified as *E. bidentata* and *N. navicula* of Late Triassic age and CAI-5 by B.R. Wardlaw (in Irwin and others, 1983, Loc. 5). [Ref.: Irwin and Galanis, 1976, Loc. 22]

Locality No. 18; Field No. I-15-73

Location: 5.8 km S 80 E of Happy Camp; NE1/4 NE1/4 sec 17, T 16 N, R 8 E; long 123° 18.54'; lat 41° 46.96'

Limestone collected by W.P. Irwin

Fossils and age: Fragments of conodonts identified as Ordovician to Triassic in age and CAI 6-7 by B.R. Wardlaw (Irwin and others, 1983, Loc. 6). [Ref: Irwin and Galanis, 1976, Loc. 24]

Locality No. 19

Location: long ~123° 33.57'; lat ~41° 22.00'

Limestone collected by G.G. Gray.

Fossils and age: Conodonts identified as *Epigondolella* sp. of Late Triassic age by J. Barret (Gray, 1985)

Locality No. 20; Field No. I-19-73

Location: 7.7 km N 81° W of Willow Creek; NW1/4 SE1/4 NE1/4 sec 33, T 7 N, R 4 E; long 123° 43.28', lat 40° 56.98'

Limestone in landslide of Rattlesnake Creek terrane resting on Western Klamath terrane; collected by W.P. Irwin

Fossils and age: The following microfauna indicate a Late Carboniferous to Permian age (B.L. Mamet, written commun., December 18, 1975):

Earlandia sp.

Endothyrid ghosts

Endothyranella sp.

Fusulinid ghosts

Pseudoglomospira sp.

(Note; numerous hydrozoan plates)

Sample also contains fragments of conodonts identified as Ordovician to Triassic in age and CAI 6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 28).

This locality is near Diller's "Three Forks Creek" locality where the presence of *Chaetetes* and a *Cyathophyllum*-like coral was reported (Diller, 1903).

[Ref.: Irwin and Galanis, 1976, Loc. 41]

Locality No. 21; Field No. I-52-77

Location: long 123° 43.00', lat 40° 57.20'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Jurassic age (Irwin and others, 1978, Loc. 34; 1982, Loc. 73)

Locality No. 22; Field No. I-51-77

Location: long 123° 43.21', lat 40° 57.17'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Jurassic age (Irwin and others, 1978, Loc. 33; 1982, Loc. 74)

Locality No. 23; Field No. I-53-77

Location: long 123° 29.48', lat 40° 48.21'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Jurassic(?) age (Irwin and others, 1978, Loc. 32; 1982, Loc. 75)

Locality No. 24; Field No. I-54-77

Location: long 123° 29.82', lat 40° 46.60'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1978, Loc. 31; 1982, Loc. 76)

Locality No. 25; Field No. I-27-73

Location: 1.3 km N 20° W of Castle Rock; W1/2 NE1/4 sec 33, T 5 N, R 6 E; long 123° 30.6', lat 40° 46.2'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *E. bidentata* of Late Triassic age and CAI 6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 29). [Ref.: Irwin and Galanis, 1976, Loc. 48]

Locality No. 26; Field No. WC5 and WC6

Location: 1.2 km N 10° E of Castle Rock; W1/2 NW1/4 sec 34, T 5 N, R 6 E; long ~123° 30.10', lat ~40° 46.20'

Limestone collected by J.C. Young and R.H. Rachen (Young, 1978)

Fossils and age: The samples contain apterinellids, nodosariids, and *Pachyphloia* sp. of undoubtedly Permian age (B.L. Mamet, written commun., June 7, 1970). [Ref.: Irwin and Galanis, 1976, Loc. 49]

Locality No. 27; Field No. I-55-77

Location: long 123° 28.89', lat 40° 44.70'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1978, Loc. 30; Irwin and others, 1982, Loc. 77; Irwin, 1985, Loc. 1)

Locality No. 28; Field No. I-56-77

Location: long 123° 28.92', lat 40° 44.68'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Carnian to middle Norian age (Irwin and others, 1978, Loc. 29; Irwin and others, 1982, Loc. 78; Irwin, 1985, Loc. 2)

Locality No. 29; Field No. I-6-83 (USGS MR 4472)

Location: long 123° 27.58', lat 40° 42.58'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as ?*Corum* sp. of Mesozoic (probably Triassic) age by C.D. Blome. [Ref.: Irwin, 1985, Loc. 3]

Locality No. 30; Field No. I-7-83 (USGS MR 4473)

Location: long 123° 27.75', lat 40° 42.20'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified as of Late Triassic or Early Jurassic (Hettangian to Pliensbachian) age by C.D. Blome:

?*Archaeospongoprimum* sp.

Canoptum (?) *annulatum* Pessagno and Poisson

Other poorly preserved nassellarians

[Ref.: Irwin, 1985, Loc. 4]

Locality No. 31; Field No. I-8-83 (USGS MR 4474)

Location: long 123° 27.71', lat 40° 41.86'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified as of Early or Middle Jurassic age by C.D. Blome:

Archaeodictyomitra sp.

Hsuum sp.

Praeconocaryomma sp.

?*Canutus* sp.

[Ref.: Irwin, 1985, Loc. 5]

Locality No. 32; Field No. I-57-77

Location: long 123° 27.31', lat 40° 41.39'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1978, Loc. 28; 1982, Loc. 79; Irwin, 1985, Loc. 6)

Locality No. 33; Field No. I-58-77

Location: long 123 ° 27.25', lat 40° 40.98'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians and conodonts of Late Triassic age (Irwin and others, 1982, Loc. 80; Irwin and others, 1983, Loc. 30; Irwin, 1985, Loc. 7)

Locality No. 34; Field No. I-59-77

Location: long 123° 26.30', lat 40° 38.94'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age (Irwin and others, 1978, Loc. 27; Irwin and others, 1982, Loc. 81; Irwin, 1985, Loc. 8)

Locality No. 35; Field No. I-5-73

Location: 2.2 km S 10° E of Hyampom; SW1/4 NE1/4 sec 36, T 3 N, R 6 E; long 123° 26.88', lat 40° 35.88'

Chert collected by W.P. Irwin

Fossils and age: Platform fragments of conodonts identified as Devonian to Triassic age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 31; Irwin, 1985, Loc. 13). [Ref.: Irwin and Galanis, 1976, Loc. 54]

Locality No. 36; Field No. I-6-72

Location: long 123° 23.01', lat 40° 35.43'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *E. abneptis* and *N. navicula* of Late Triassic age and CAI 5-6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 33). [Ref.: Irwin and Galanis, 1976, Loc. 55; Irwin, 1985, Loc. 12]

Locality No. 37; Field No. I-32-81 (USGS MR 2638)

Location: long 123° 22.30', lat 40° 35.58'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as poorly preserved spumellarians and nassellarians of Mesozoic (Jurassic?) age by C.D. Blome.

[Refs: Irwin and others, 1982, Loc. 82; Irwin, 1985, Loc. 11]

Locality No. 38; Field No. I-12-71

Location: 2.5 km S 28° E of Camp Trinity; NW1/4 NW1/4 sec 35, T 3 N, R 7 E; long 123° 21.63', lat 40° 36.07'

Limestone collected by W.P. Irwin

Fossils and age: Fragments of conodonts identified as Ordovician to Triassic age and CAI 7 by B.R. Wardlaw (Irwin and others, 1983, Loc. 32). [Ref.: Irwin and Galanis, 1976, Loc. 59; Irwin, 1985, Loc. 9]

Locality No. 39; Field No. I-16-76

Location: long 123° 22.08', lat 40° 35.40'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Middle Triassic (Ladinian) age (Irwin and others, 1978, Loc. 26; Irwin and others, 1982, Loc. 83; Irwin, 1985, Loc. 10)

Locality No. 40; Field No. I-10-82

Location: long 123° 25.90', lat 40° 32.78'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians of Mesozoic (Jurassic?) age, identified by C.D. Blome:

?*Crucella* sp.

?*Emiluvia* sp.

Poorly preserved nassellarians

[Ref.: Irwin, 1985, Loc. 14]

Locality No. 41; Field No. I-33-81 (USGS MR 2639)

Location: long 123° 25.29', lat 40° 33.03'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as poorly preserved spumellarians and nassellarians of Mesozoic (Jurassic?) age by C.D. Blome.

[Refs: Irwin and others, 1982, Loc. 87; Irwin, 1985, Loc. 15]

Locality No. 42; Field No. I-24-81 (USGS MR 2626)

Location: long 123° 23.03', lat 40° 33.94'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as ?*Canoptum* sp. of Mesozoic (Jurassic?) age by C.D. Blome. [Refs: Irwin and others, 1982, Loc. 85; Irwin, 1985, Loc. 16]

Locality No. 43; Field No. I-30-81 (USGS MR 2637)

Location: long 123° 20.75', lat 40° 33.98'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as poorly preserved Spumellariina and Nassellariina of Mesozoic age by C.D. Blome. [Refs: Irwin and others, 1982, Loc. 85; Irwin, 1985, Loc. 17]

Locality No. 44; Field No. I-11-71

Location: 3.2 km N 13° E of Camp Carter; SE1/4 SW1/4 sec 7, T 31 N, R 8 E; long 123° 19.12', lat 40° 33.78'

Limestone collected by W.P. Irwin

Fossils and age: The sample was examined by B.L. Mamet and found to contain a microbiota similar to D-709, I-5-71, I-13-71, and "China Gulch":

Cornuspiridae

Dasycladaceae (*Macroporella*?)

Miliolidae

Nodosariidae

"The oldest possible age is Permian. But it could also be Early Mesozoic"(B.L. Mamet, written commun., March 2, 1972).

The sample also contains fragments of conodonts identified as Ordovician to Triassic in age and CAI 6-7 by B.R. Wardlaw (Irwin and others, 1983, Loc. 34). [Ref.: Irwin and Galanis, 1976, loc. 61; Irwin, 1985, Loc. 21]

Locality No. 45; Field No. I-31-81 (USGS MR 2642)

Location: long 123° 19.04', lat 40° 33.88'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified as Early Jurassic (Pliensbachian) to Middle Jurassic (Bathonian) in age by C.D. Blome:

Archaeodictyomitra sp.

Hsuum sp.

Paronaella sp.

[Refs: Irwin and others, 1982, Loc. 84; Irwin, 1985, Loc. 20]

Locality No. 46; Field No. I-5-71

Location: 5 km S 57° W of mouth of Rusch Creek; SW1/4 NE1/4 sec 7, T 31 N, R 8 E; long 123° 18.99', lat 40° 34.13'

Limestone collected by W.P. Irwin

Fossils and age: Sample contains a microbiota similar to D-709, I-11-71, I-13-71, and "China Gulch", as listed below, and is of Permian or Early Mesozoic age (B.L. Mamet, written commun., March 2, 1972):

Cornuspiridae

Dasycladaceae (*Macroporella*?)

Miliolidae

Nodosariidae

[Ref.: Irwin and Galanis, 1976, Loc. 60; Irwin, 1985, Loc. 18]

Locality No. 47; Field No. I-2-83 (USGS MR 4471)

Location: long 123° 23.51', lat 40° 31.02'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified as Early Jurassic (Pliensbachian or Toarcian?) in age by C.D. Blome:

?*Zartus* sp.

?*Droltus* sp.

Canutus blomei Pessagno and Whalen

[Ref: Irwin, 1985, Loc. 26]

Locality No. 48; Field No. I-35-81 (USGS MR 2640)

Location: long 123° 22.60', lat 40° 31.06'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as poorly preserved spumellarians and nassellarians of Mesozoic age by C.D. Blome.

[Refs: Irwin and others, 1982, Loc. 90; Irwin, 1985, Loc. 25]

Locality No. 49; Field No. I-36-81 (USGS MR 2641)

Location: long 123° 22.16', lat 40° 31.60'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as poorly preserved spumellarians and nassellarians of Mesozoic age by C.D. Blome.

[Refs: Irwin and others, 1982, Loc. 89; Irwin, 1985, Loc. 24]

Locality No. 50; Field No. I-5-72

Location: 2.8 km N 22° W of Indian Valley Guard Station; SE1/4 NE1/4 sec 23, T 2 N, R 7 E;
long 123° 21.00', lat 40° 32.55'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *E. bidentata* of Late Triassic age and CAI 6-7 by B.R. Wardlaw (Irwin and others, 1983, Loc. 35).

[Ref.: Irwin and Galanis, 1976, Loc. 62; Irwin, 1985, Loc. 22]

Locality No. 51; Field No. I-17-76

Location: long 123° 20.73', lat 40° 32.24'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 88; Irwin, 1985, Loc. 23)

Locality No. 52; Field No. I-32-84

Location: long 123° 18.19', lat 40° 31.87'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians ?*Capnodoce* sp. and ?*Corum* sp. of Mesozoic (?Triassic) age identified by C.D. Blome. [Ref.: Irwin, 1985, Loc. 27]

Locality No. 53; Field No. I-34-84

Location: long 123° 17.26', lat 40° 31.29'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians of Late Triassic (late Karnian to middle Norian) age:

Capnuchosphaera sp.

Corum (?) *perfectum* Blome

?*Pachus* sp.

[Ref.: Irwin, 1985, Loc. 28]

Locality No. 54; Field No. I-25-81 (USGS MR 2627)

Location: long 123° 15.74', lat 40° 30.57'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (Norian) to Middle Jurassic (Bathonian) in age:

Canoptum sp.

Gorgansium sp.

?*Ferresium* sp.

Pantanellium sp.

[Refs: Irwin and others, 1982, Loc. 92; Irwin, 1985, Loc. 30]

Locality No. 55; Field No. I-5-77

Location: long 123° 15.22', lat 40° 30.87'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age (Irwin and others, 1978, Loc. 25; Irwin and others, 1982, Loc. 91; Irwin, 1985, Loc. 29)

Locality No. 56; Field No. I-21-76

Location: long 123° 11.45', lat 40° 26.86'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic (Carnian or Norian) age (Irwin and others, 1978, Loc. 24; Irwin and others, 1982, Loc. 93; Irwin and others, 1985, Loc. 11)

Locality No. 57; Field No. I-37-76

Location: long 123° 9.70', lat 40° 25.64'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age, including *Acanthocircus* sp. (D.L. Jones and E.A. Pessagno, Jr., written commun., March 1977). [Refs: Irwin and others, 1978, Loc. 23; Irwin and others, 1982, Loc. 94; Irwin and others, 1985, Loc. 12]

Locality No. 58; Field No. P1358

Location: 1.3 km S 46° W of Glade Campground; long 123° 16.08', lat 40° 25.32'

Limestone collected by W.P. Irwin

Fossils and age: Microfauna includes good *Tetrataxis* and Apterinellids ghosts, and the possible age is Early Carboniferous to Permian age (B.L. Mamet, written commun., June 7, 1970). [Ref.: Irwin, 1972, Loc. 5; Irwin and others, 1974, Loc. 26; Irwin and Galanis, 1976, Loc. 94]

Locality No. 59; Field No. D-709 and I-7-71

Location: Marble Caves vicinity; 2.4 km N of Forest Glen; E1/2 sec 12, T 1 S, R 7 E; long ~123° 19.70', lat ~40° 23.60'

Limestone collected by J.S. Diller and T.W. Stanton

Fossils and age: The microfauna of D-709 is similar to I-5-71, I-11-71, I-13-71, and "China Gulch", as listed below, and indicates a Permian or early Mesozoic age (B.L. Mamet, written commun., March 2, 1972).

Cornuspiridae

Dasycladaceae (*Macroporella?*)

Miliolidae

Nodosariidae

Fragments of conodonts from sample I-7-71 were identified as Ordovician to Triassic in age and CAI 6 by B.R. Wardlaw (Irwin and others, 1983).

According to Luken (1985, Loc. 25), G.S. Stanley identified tabulozoans, red algae, calcareous sponges, montivaltid corals, a stylophyllid coral, and an endothyrid or rotalid foraminifer in sample D-709, and considers the presence of the stylophyllid coral to establish a Late Triassic or Early Jurassic age. [Ref.: Diller, 1903; Irwin, 1972, Loc. 4; Irwin and Galanis, 1976, Loc. 91]

Locality No. 60; Field No. I-13-71 and P-1313

Location: Center N1/2 sec 17, T 1 S, R 8 E; long 123° 17.79', lat 40° 22.97'

Limestone collected by W.P. Irwin

Fossils and age: Sample I-13-71 contains microfauna similar to D-709, I-5-71, I-11-71, and "China Gulch", as listed below, and is of Permian or early Mesozoic age (B.L. Mamet, written commun., March 2, 1972):

Cornuspiridae
Dasycladaceae (*Macroporella?*)
Miliolidae
Nodosariidae

Sample P-1313, collected within a few hundred feet downstream from the same or nearby limestone body as I-13-71, was examined by J.H. Johnson who reported (written comun., April 29, 1969), "The material certainly suggests Solenopora; however, the more I study it the more doubtful I become that it really is. I think it represents a coral of the general Chaetetes group." The age is undetermined.

[Ref.: Irwin and Galanis, 1976, Loc. 92]

Locality No. 61; Field No. I-8-77

Location: long 123° 6.88', lat 40° 23.48'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age (Irwin and others, 1978, Loc. 22; Irwin and others, 1982, Loc. 96; Irwin, 1985, Loc. 14)

Locality No. 62; Field No. I-39-76

Location: long 123° 5.73', lat 40° 23.54'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic and Jurassic age (Irwin and others, 1978, Loc. 21; Irwin and others, 1982, Loc. 95; Irwin and others, 1985, Loc. 13)

Locality No. 63; Field No. I-38-83 (USGS MR 4486)

Location: long 123° 12.30', lat 40° 21.90'

Chert collected by W.P. Irwin

Fossils and age: Sample contains poorly preserved radiolarians identified by C.D. Blome as nassellarians and spumellarians of Mesozoic age.

[Ref.: Irwin and others, 1985, Loc. 15]

Locality No. 64; Field No. I-47-84 (USGS MR 6216)

Location: long 123° 05.04', lat 40° 20.44'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (Norian) in age:

?Capnodoce sp.

Canoptum sp.

Kahlerosphaera (?) *norica* Kozur and Mostler

Renzium adversum Blome

[Ref.: Irwin and others, 1985, Loc. 16]

Locality No. 65; Field No. I-40-76 and I-46-84 (USGS MR 6215)

Location: long 123° 4.06', lat 40° 20.20'

Chert samples collected by W.P. Irwin

Fossils and age: Sample I-40-76 contains radiolarians of Early or Middle Jurassic age (Irwin and others, 1978, Loc. 20). Sample I-46-84 contains the following radiolarians identified by C.D. Blome as Early Jurassic in age:

Canoptum sp.

?*Canutus* sp.

?*Emiluvia* sp.

Undescribed 3-spined spumellarians possessing a spongy cortical shell

[Ref.: Irwin and others, 1982, Loc. 97; Irwin and others, 1985, Loc. 17]

Locality No. 66; Field No. Rc-1 Location: NE1/4 sec 4, T 28 N, R 11 W,
Limestone collected by M.D. Luken

Fossils and age: According to Luken (1985, Loc. 26) the limestone contains poorly preserved material similar to that at his locality 25, including sponges and corals, and is considered Triassic in age. This may be the same as Diller's (1903) chaetimid locality 703. [Ref.: Irwin, 1972, Fig. 2, Loc. 7; and Irwin and Galanis, 1976, Loc. 108]

Locality No. 67; Field No. I-43-77

Location: long 123° 5.51', lat 40° 18.53'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic(?) age (Irwin and others, 1982, Loc. 98; Irwin and others, 1985, Loc. 18)

Locality No. 68; Field No. I-49-83 (USGS MR 4479)

Location: long 123° 05.49', lat 40° 17.90'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (Carnian or Norian) in age:

Capnodoce sp.

Pseudoheliodiscus sp.

[Ref.: Irwin and others, 1985, Loc. 19]

Locality No. 69; Field No. I-75-83 (4489)

Location: long 123° 06.79', lat 40° 17.27'

Chert collected by W.P. Irwin

Fossils and age: Poorly preserved radiolarians identified by C.D. Blome as nassellarians and spumellarians of Mesozoic age. [Ref.: Irwin and others, 1985, Loc. 20]

Locality No. 70; Field No. I-40-83 (USGS MR 4487)

Location: long 123° 09.29', lat 40° 17.33'

Chert collected by W.P. Irwin

Fossils and age: Sample contains poorly preserved radiolarians identified by C.D. Blome as nassellarians and spumellarians of Mesozoic age. [Ref.: Irwin and others, 1985, Loc. 21]

Locality No. 71; Field No. I-57-83 (USGS MR 4482)

Location: long 123° 01.63', lat 40° 17.55'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Early Jurassic (Hettangian to Pliensbachian) in age:

Canoptum annulatum Pessagno and Poisson

Canoptum (?) praeannulatum Pessagno and Whalen

Pachyoncus sp.

Gorgansium sp.

[Ref.: Irwin and others, 1985, Loc. 22]

Locality No. 72; Field No. 61-1 (USGS f23058)

Location: 3.6 km N 51° W of White Rock Guard Station; E1/2 SW1/4 sec 13, T 28 N, R 11 W; long 123° 03.30', lat 40° 16.41'

Limestone collected by N.J. Silberling and W.P. Irwin

Fossils and age: The sample contains the small fusulinid *Staffella*, which elsewhere in the United States is found in Middle Pennsylvanian to Permian rocks (R.C. Douglass, written commun., February 8, 1963). [Ref.: Irwin, 1972, Loc. 8; Irwin and Galanis, 1976, Loc. 111; Irwin and others, 1985, Loc. 31]

Locality No. 73; Field No. I-46-83 (USGS MR 4476)

Location: long 123° 02.61', lat 40° 15.91'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (late/middle to late Norian) in age:

Capnodoce anapetes De Wever

Capnuhosphaera mexicana Pessagno

Sarla vetusta Pessagno

Pseudoheliodiscus sp.

[Ref.: Irwin and others, 1985, Loc. 30]

Locality No. 74; Field No. I-37-68

Location: 1.6 km N 70° W of White Rock Guard Station; SE1/4 SE1/4 sec 19, T 28 N, R 10 W; long 123° 02.45', lat 40° 15.50'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *E. multidentata* and *N. navicula* of Late Triassic age and CAI 5.5-6.5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 37). [Ref.: Irwin and Galanis, 1976, Loc. 116; Irwin and others, 1985, Loc. 29]

Locality No. 75; Field No. I-54-83 (USGS MR 4481)

Location: long 123° 01.29', lat 40° 16.39'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Mesozoic (Late Triassic?) in age:

Hagiastrum sp.

Paronaella sp.

?*Capnuhosphaera* sp.

[Ref.: Irwin and others, 1985, Loc. 23]

Locality No. 76; Field No. I-53-83 (USGS MR 4480)

Location: long 123° 01.23', lat 40° 16.32'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the radiolarian *Pseudoheliodiscus* sp. of Late Triassic (late middle Norian) to Early Jurassic (Pliensbachian) age: [Ref.: Irwin and others, 1985, Loc. 24]

Locality No. 77: Field No. I-33-68

Location: 1.7 km N 9° E of White Rock Guard Station; NE1/4 NW1/4 sec 20, T 28 N, R 10 W; long 123° 01.12', lat 40° 16.09'

Limestone collected by W.P. Irwin

Fossils and age: The sample was examined by C.W. Merriam who reported (written commun., December 31, 1968) that it contains a rugose coral that..."although well preserved, is much deformed. It is a *Billingsastraea*-like thamnastraeoid colonial genus lacking outer wall, differing from *Billingsastraea* in possessing much thickened tapering septa. The nearest form structurally known to me is a specimen collected from the Kennett limestone...For the present I would consider it to be of possible Devonian age. The dissepiments and character of septa would appear to eliminate any possibility of Mesozoic, in spite of the proximity of Triassic beds..."

[Ref.: Irwin, 1972, Loc. 12; Irwin and Galanis, 1976, Loc. 119; Irwin and others, 1985, Loc. 25]

Locality No. 78; Field No. I-52-83 (USGS MR 4478)

Location: long 123° 01.30', lat 40° 16.00'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (late Carnian to late middle Norian) in age:

Capnodoce sp.

Capnuchosphaera sp.

[Ref.: Irwin and others, 1985, Loc. 26]

Locality No. 79; Field No. D705 and 61-3

Location: 1.4 km N 25° W of White Rock Guard Station; S1/2 NE1/4 sec 19, T 28 N, R 10 W; long 123° 01.79', lat 40° 15.87'

Limestone collected by J.S. Diller and T.W. Stanton (D705), and by N.J. Silberling, D.L. Jones, and W.P. Irwin (61-3)

Fossils and age: Ammonites from sample D705 were considered Devonian by Charles Schuchert (Diller, 1903). The sample was reexamined by N.J. Silberling who considered the fossils to be Middle or Late Triassic, probably Late Triassic, in age (written commun., 1958; Irwin, 1960). Sample 61-3, collected presumably from the same limestone lense as D705, contains a fauna that is "...surprisingly diverse and well preserved...Of foremost age significance are the ammonites, which include:

Clionitites cf. *C. angulosus* (Mojsisovics)

Lecanites sp.

Styrites cf. *S. vermetus* (Dittmar)

Juvavites sp.

Arcestes sp.

Cladiscites cf. *C. pusillus* (Mojsisovics)

Megaphyllites cf. *M. jarbas* (Munster)

Placites cf. *P. placoides* (Mojsisovics)

Mojsvarites cf. *M. eugyrus* Mojsisovics)

"The ammonites for the most part belong to long-ranging genera including some that first appear in the upper Middle Triassic and others that range through the Upper Triassic. The association of genera, however, is distinctive and unlike that of any other known fauna from the Triassic of North America...The ammonites...represent a somewhat older part of the Carnian [early Late Triassic] than the rich late Carnian ammonite fauna...from the so-called Hosselkus Limestone about 60 miles to the northeast in the easternmost Klamath Mountains"(Silberling and Irwin, 1962). [Ref.: Irwin, 1972, Loc. 10; Irwin and Galanis, 1976, Loc. 117; Irwin and others, 1985, Loc. 27]

Locality No. 80; Field No. I-51-83 (USGS MR 4477)

Location; long 123° 01.66', lat 40° 15.43'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the radiolarian identified by C.D. Blome as *Gorgansium* sp. of Mesozoic (Triassic to Middle Jurassic) age.

[Ref.: Irwin and others, 1985, Loc. 28]

Locality No. 81; Field No. Rc-2

Location: Top of hill just N of main "Whiterocks" outcrop; NW1/4 SW1/4 sec 20, T 28 N, R 10 W.

Limestone collected by M.D. Luken

Fossils and age: Gastropods, red algae, and coral that is identical to the montlivaltid coral at Luken's locality 25; limestone considered Triassic in age (Luken, 1985, Loc. 28)

Locality No. 82; Field No. Rc-3

Location: NW1/4 SW1/4 sec 20, T 28 N, R 10 W

Limestone collected by M.D. Luken

Fossils and age: The limestone contains gastropods, red algae, fragments of pelecypods, brachiopods, and echinoderms, and a poorly preserved scleractinian coral, probably either *Margarasteria*? or *Phyllocoenia*, and is thought to be Middle to Late Triassic in age (Luken, 1985, Loc. 30)

WESTERN HAYFORK TERRANE

Locality No. 83; Field No. I-13-83 (USGS MR 4485)

Location: long 123° 18.60', lat 40° 43.42'

Chert collected by W.P. Irwin

Fossils and age: Sample contains poorly preserved radiolarians identified by C.D. Blome as nassellarians and spumellarians of Mesozoic age.

[Ref.: Irwin, 1985, Loc. 33]

Locality No. 84; Field No. I-1-83 (USGS MR 4470)

Location: long 123° 17.98', lat 40° 34.15'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as ?*Canoptum* of Mesozoic (Triassic or Jurassic) age. [Ref.: Irwin, 1985, Loc. 19]

Locality No. 85; Field No. I-20-82

Location: long 123° 05.53', lat 40° 28.97'

Chert collected by W.P. Irwin

Fossils and age: Sample contains the following radiolarians identified by C.D. Blome as Late Triassic (late Norian) to Early Jurassic (Hettangian) in age:

Betraccium deweveri Pessagno

Canoptum merum Pessagno and Whalen

Ferresium sp.

Pseudoheliodiscus magnimamma (Rust)

Relanus reefensis Pessagno and Whalen

[Ref.: Irwin and others, 1985, Loc. 1]

Locality No. 86; Field No. I-42-83 (USGS MR 4488)

Location: long 123° 01.27', lat 40° 24.77'

Chert collected by W.P. Irwin

Fossils and age: Poorly preserved radiolarians identified by C.D. Blome as nassellarians and spumellarians of Mesozoic age. [Ref.: Irwin and others, 1985, Loc. 6]

EASTERN HAYFORK TERRANE

Locality No. 87

Location; On Fawn Creek 0.9 mi west of Virgin Creek Guard Station; NE1/4 sec 3, T 7 N, R 7 E; long ~123° 21.87', lat ~41°01.45

Limestone collected by D.P. Cox and W.P. Pratt

Fossils and age: Segments of crinoid columnals and a fragment of coral. The fragment of coral is "from what appears to be a complexly dissepimented rugose coral of a general type I would not expect in corals older than Silurian or younger than Permian. My best guess is that this rock is of middle to late Paleozoic age, probably in the range from Devonian through

Carboniferous"(C.W. Merriam, written commun. October 24, 1969). Reported as probably similar in age (Silurian to Devonian) to the Eagle Creek locality (Cox and Pratt, 1973). [Ref.: Irwin and Galanis, 1976, Loc. 39]

Locality No. 88; Field No. I-6-73

Location: Panther Creek Camp; NW1/4 sec 18, T 6 N, R 7 E; long 123° 25.48', lat 40° 54.53'

Limestone collected by W.P. Irwin

Fossils and age: The following microfauna was identified and considered early Carboniferous, probably Tournaisian to Early Viséan, in age (B.L. Mamet, written commun., December 18, 1975):

Calcisphaera sp.

Earlandia sp.

Latiendothyra sp.

Latiendothyra of the group *L. Parakosvensis* (Lipina).

Latiendothyra latispiralis (Lipina).

Priscella? sp.

Septaglomospiranella sp.

Fragments of conodonts identified as Ordovician to Triassic age and CAI 5-6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 14). [Ref.: Irwin and Galanis, 1976, Loc. 47]

Locality No. 89; Field No. I-4-73

Location: 3.7 km N 40° W of Del Loma; NW1/4 SE1/4 sec 14, T 5 N, R 7 E; long 123° 21.54', lat 40° 48.20'

Limestone collected by W.P. Irwin

Fossils and age: The following microfauna was identified and considered late Carboniferous to Permian in age (B.L. Mamet, written commun., December 18, 1975):

Earlandia sp.

Deckerella? sp.

Endothyrid ghosts.

Endothyranella sp.

Palaeotextulariidae

Platform fragments of conodonts identified as late Paleozoic in age and CAI 5-6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 15). [Ref.: Irwin and Galanis, 1976, Loc. 51]

Locality No. 90; Field No. I-22-73

Location: Del Loma; E1/2 sec 25, T 5 N, R 7 E; long ~123° 19.80', lat ~40° 46.72'

Limestone collected by W.P. Irwin

Fossils and age: Sample contains *Climacammina* sp., endothyrid ghosts, and fusulinid ghosts, which indicate Late Carboniferous to Permian age (B.L. Mamet, written commun., December 18, 1975). Sample also contains conodonts identified as *Neognathodus* sp. of Pennsylvanian age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 16). [Ref.: Irwin and Galanis, 1976, Loc. 53]

Locality No. 91; Field No. I-5-74 (USGS f13535)

Location: 4.4 km S 52° E of Monument Peak; center W1/2 SW1/4 sec 18, T 33 N, R 12 W; long 123° 16.63', lat 40° 42.31'

Limestone collected by W.P. Irwin

Fossils and age: Sample contains the following foraminifers, which indicate a Pennsylvanian or Early Permian, probably Middle Pennsylvanian, age (R.C. Douglas, written commun., February 25, 1975):

Climacammina sp.

Bradyina sp.

Nankinella? sp.

Fusulinella sp. or *Pseudofusulinella* sp.

Sample also contains bryozoans and corals.

[Ref.: Irwin and Galanis, 1976, Loc. 124; Irwin, 1985, Loc. 32]

Locality No. 92; Field No. I-16-69

Location: 4.5 km S 26° W of Big Bar; SW1/4 SW1/4 sec 18, T 33 N, R 12 W; long 123° 16.49', lat 40° 42.23'

Limestone collected by W.P. Irwin

Fossils and age: Sample contains the foraminifer *Tetrataxis* sp. of late Paleozoic age (B.L. Mamet, written commun., December 18, 1975). [Ref.: Irwin and Galanis, 1976, Loc. 64; Irwin, 1985, Loc. 31]

Locality No. 93; Field No. I-14-77

Location: long 123° 6.30', lat 40° 41.09'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age (Irwin and others, 1978, Loc. 12; 1982, Loc. 63)

Locality No. 94; Field No. I-32-70 (USGS f24176)

Location: 6 km S 42° E of Squaw Camp; NW1/4 sec 35, T 34 N, R 11 W; long 123° 05.00', lat 40° 40.42'

Limestone collected by W.P. Irwin

Fossils and age: "The sections are full of physically-deformed fusulinids that have a schwagerinid wall and tight fluting at least in the lower part of the chambers. I cannot place them generically based on this material, but think an Early Permian age assignment is reasonable" (R.C. Douglass, written commun., October 1, 1970). The sample also contains conodonts identified as *S. behnkeni* of Early Permian (late Wolfcampian) age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 17).

A sample (Hf-13) collected by M.D. Luken contained fusulinids that appear similar to *Schwagerina* found in zones B-H of the McCloud Limestone (Skinner and Wilde, 1965), and also contained the small fusulinid *Schubertella?*, and is considered Early Permian in age (Luken, 1985, Loc. 1)

[Ref.: Irwin, 1972, Loc. 16; Irwin, 1974, Loc. 2; Irwin and Galanis, 1976, Loc. 77]

Locality No. 95; Field No. I-1-73

Location: 2.2 km N 59° W of Barker Mountain; NE1/4 NE1/4 sec 5, T 32 N, R 11 W; long 123° 07.73', lat 40° 39.63'

Limestone collected by W.P. Irwin

Fossils and age: Foraminifers and gastropods of Pennsylvanian or Permian age (A.K. Armstrong, oral commun., 1974). [Ref.: Irwin, 1974, Loc. 3; Irwin and Galanis, 1976, Loc. 75]

Locality No. 96; Field No. I-49-70

Location: Donaldson Creek, 10 km N 7° E of Hayfork; center sec 12, T 32 N, R 12 W (projected); long 123° 10.2', lat 40° 38.3'

Limestone collected by W.P. Irwin

Fossils and age: Fragments of conodonts identified as Ordovician to Triassic in age and CAI 5.5-6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 18)

Locality No. 97; Field No. I-11-70

Location: 1.5 km N 20° W of Thompson Peak; NE1/4 SE1/4 sec 14, T 32 N, R 12 W; long 123° 11.5', lat 40° 37.4'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *Epigondolella* sp. and *Neogondolella* sp. of Late Triassic age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 20)

[Ref.: Irwin and Galanis, 1976, Loc. 65]

Locality No. 98; Field No. I-15-70

Location: Barker Creek, 9 km N 33° E of Hayfork; NW1/4 SW1/4 sec 16, T 32 N, R 11 W; long 123° 07.3', lat 40° 37.4'

Limestone collected by W..P Irwin

Fossils and age: Fragments of conodonts identified as Ordovician to Triassic in age and CAI 6-7 by B.R. Wardlaw (Irwin and others, 1983, Loc. 19). [Ref.: Irwin and Galanis, 1976, Loc. 72]

Locality No. 99; Field No. I-19-70

Location: 8.7 km S 88° E of Hayfork; SW1/4 sec 11, T 31 N, R 11 W; long 123° 04.7', lat 40° 33.1'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *N. constricta* and *N. navicula* of Middle Triassic age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 21)

[Ref.: Irwin and Galanis, 1976, Loc. 71]

Locality No. 100; Field No. I-10-72

Location: 8 km S 70° E of Hayfork; NE1/4 NE1/4 sec 22, T 31 N, R 11 W; long 123° 05.5', 40° 31.9'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *Ne. bransoni* of Early Triassic age and CAI 5-5.5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 22)

[Ref.: Irwin and Galanis, 1976, Loc. 70]

Locality No. 101; Field No. I-26-81 and I-8-82

Location: long 123° 05.00', lat 40° 31.13'

Chert collected by W.P. Irwin

Fossils and age: Sample I-26-81 contains radiolarians of Permian age (Irwin and others, 1982, Loc. 64). Sample I-8-82 contains the following radiolarians of Permian (Guadalupian) age (B.L. Murchey, written commun., May 1983):

Follicucullus ventricosus Ormiston and Babcock, abundant casts

F. sp. aff. *F. ventricosus*, abundant casts

F. spp, undescribed, abundant casts

Latentifistulid fragments, common

sponge spicules, very rare

Locality No. 102; Field Nos. I-32-68 and I-18-70A-B

Location: Poorly exposed conglomerate in road cut ~150-200 m S of Mueller mine; NW1/4 NW1/4 sec 28 (projected), T 31 N, R 11 W; long 123° 07.22', lat 40° 30.88'

Limestone cobbles in conglomerate, collected by W.P. Irwin and D.L. Jones

Fossils and age: Well-preserved rugose corals were identified by C.W. Merriam (1961) as *Shastaphyllum?* sp. C, which was described as differing somewhat from *S. schucherti* n. gen., n.

sp., of the Late Silurian Gazelle Formation of the Yreka subterranean, and as bearing some resemblance to a coral, *Entelophylloides*, in the Silurian Roberts Mountain Formation of central Nevada.

Sample I-18-70A (USGS f24174) "contains ostracodes, bryozoa, gastropods, and some small forams including and undetermined textularid and *Tetrataxis* sp., an oblique section of *Pseudofusulinella* sp. and fragments of a fusulinid with schwagerinid wall structure. The sample is no older than Late Pennsylvanian and no younger than Early Permian" (R.C. Douglass, written commun., November 1, 1970).

Sample I-18-70B (USGS f24175) "contains the smaller foram *Climacammina* sp. and the fusulinids *Pseudofusulinella* sp. and *Schwagerina* sp. It is of Early Permian age" (R.C. Douglass, written commun., November 1, 1970).

Sample I-18-70 (USGS f24173) "contains abundant specimens of *Staffella* sp. that are partly silicified but relatively undeformed. Although the range of the genus is from earliest Pennsylvanian into the Permian, these specimens suggest an Early Pennsylvanian age" (R.C. Douglass, written commun., June 10, 1970).

Sample I-18-70 (USGS 24342-PC) "shows remarkable variety. There is no question of a late Paleozoic and almost certainly this is Wolfcampian. Gastropods from the McCloud [Limestone] have not been investigated in any detail. The odd bits which I have seen in the older USGS collections are similar, though far inferior, to the collection submitted. The faunal list follows" (E.L. Yochelson, written commun., December 2, 1970):

- ?Bryozoan fragments
- ?Echinoid spine
- Plagioglypta* sp.
- Dentalium* sp.
- "*Nucula*" sp.
- Permophorus* sp.
- Astartella* sp.
- ?*Euphemites* sp.
- Warthia* sp.
- ?*Knightites* (*Retispira*) sp.
- Euconospira*
- Worthenia* sp.
- Peruvispira* sp.
- Pleurotomariacean indent. (?2 genera)
- Omphatrochus* sp.
- Anomphalus* sp.
- Platyceras* (*Platyceras*) sp.
- Naticopsid gastropod new genus
- Stegocoelia* (*Taosia*) sp.
- Orthonema* sp.
- Meekospira* sp.
- Paleostylus* (*Pseudozygopleura*) sp.
- Highspired gastropod indent.
- Nautiloid indent. (nodose)

Sample I-18-70 also contains fragments of conodonts identified as Ordovician to Triassic in age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 23).

A sample (Hf-15) collected by D.M. Luken contained the fusulinids *Schwagerina* and *Pseudofusulinella*, the foraminifer *Climacammina*, brachiopod fragments, fenestrate bryozoans, crinoid columnals, and gastropods, and is considered Early Permian in age (Luken, 1985, Loc. 9).

[Ref.: Irwin, 1972, Loc. 15; Irwin, 1974, Loc. 5; Irwin and Galanis, 1976, Loc. 67]

Locality No. 103; Field No. I-10-68 and "China Gulch"

Location: China Gulch; 0.2 km S of mouth of Bridge Gulch; N1/2 sec 35, T 31 N, R 11 W; long 123° 04.68', lat 40° 30.15'

Limestone collected by W.P. Irwin

Fossils and age: Similar to samples D-709, I-5-71, I-11-71, I-13-71 collected at other localities, the microfauna includes the following forms, which indicate a Permian or early Mesozoic age (B.L. Mamet, written commun., March 2, 1972):

- Cornuspiridae
- Dasycladaceae (*Macroporella?*)
- Miliolidae
- Nodosariidae

The sample also contains the conodont identified as *Neogondolella* sp. of Triassic age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 24). [Ref.: Irwin and Galanis, 1976, Loc. 68]

Locality No. 104; Field No. W-318

Location: 3.1 km N 83° W of Squaw Flat; NW1/4 NW1/4 sec 22, T 31 N, R 10 W; long 122° 59.13', lat 40° 31.64'

Limestone collected by W.P. Irwin

Fossils and age: The microfauna includes the following forms and foraminifers of undoubtedly Permian (B.L. Mamet, written commun., June 7, 1970):

- Tetrataxis* sp.
- Pachyphloia* sp.
- Apterinellids
- Cornuspirids
- Nodosariids
- cf. *Protonodosaria* sp.
- Paleotextulariids

[Ref.: Irwin 1972, Loc. 17; Irwin and Galanis, 1976, Loc. 83]

Locality No. 105; Field No. T-63

Location: 3.1 km S 65° W of Squaw Flat; SE 1/4 NW1/4 sec 27, T 31 N, R 10 W; long 122° 58.90', lat 40° 30.68'

Limestone collected by R.W. Tabor

Fossils and age: The microfauna includes the following forms and indicates an undoubtedly Permian age (B.L. Mamet, written commun., June 7, 1970):

- Cribrogenerina* sp.
- Dasyclad algae
- Macroporella?* sp.
- Miliolids

Paleotextulariids

Sample Hf-27 collected by D.M. Luken included three different kinds of limestone. As described by Luken (1985, Loc. 12), the first kind contained: the large foraminifers *Cribrogenerina*, *Climacammina*, *Palaeotextularia*, and *Agathammina*; the small foraminifers *Pachyphloia*, *Globivalvulina*, *Fronkina*, *Geinitzina*, *Neoendothyra*, *Ammodiscus*, *Langella*, *Protonodosaria*, *Robuloides*, *Tuberitina*, and a uniserial textularid; the small fusulinids *Parareichelina*, *Codonofusiella?*, and *Reichelina* or *Sichotenella?*; also present are *Tubiphytes*, ostracodes, crinoid fragments, and echinoid spines. The second kind contained: the fusulinid *Staffella*; abundant algae, including *Gyroporella*, *Mizzia*, *Macroporella*, and *Succodium?*; the large foraminifers *Cribrogenerina*, *Climacammina*, *Agathammina*, *Pachyphloia*, and *Palaeotextularia*. The third kind is mainly algae (*Gyroporella?*), but also contains rare foraminifers, including *Staffella*, *Climacammina*, *Agathammina*, *Reichlina*, *Kahlerina?*, *Geinitzina*, and small nodosarids, and a coral, *Waagenophyllum*. The fossils are Late Permian (Djulfian) age (Luken, 1985) and represent a Tethyan Faunal Province (Stevens and others, 1987 and 1991).

[Ref.: Irwin, 1972, Loc. 18; Irwin and Galanis, 1976, Loc. 85]

Locality No. 106; Field No. W-312

Location: 2.6 km S 36° W of Squaw Flat; SW1/4 SW1/4 sec 26, T 31 N, R 10 W; long 122° 58.01', lat 40° 30.31'

Limestone collected by W.P. Irwin

Fossils and age: Corals and bryozoans or hydrozoans of questionable early Paleozoic age (A.K. Armstrong, written commun., December 31, 1969), late Paleozoic age (N.F. Sohl, written commun., March 19, 1971), or possibly Triassic age (Helen Duncan, written commun., January 11, 1963). The sample also contains fragments of conodonts identified as Ordovician to Triassic in age and CAI 6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 25).

Sample Hf-26 collected by D.M. Luken contained poorly preserved miliolid foraminifers, sponges, crinoid columnals, and *Tubiphytes*, which indicate a Triassic? age Luken, 1985, Loc. 13).

[Ref.: Irwin and Galanis, 1976, Loc. 86]

Locality No. 107; Field No. I-76-80 (USGS MR 1753)

Location: long 123° 02.39', lat 40° 28.62'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as Late Triassic (late Carnian? to late middle Norian) in age. [Refs.: Irwin and others, 1982, Loc. 66; Irwin and others, 1985, Loc. 2]

Locality No. 108; Field No. I-7-81

Location: On ridgecrest 700 m west of Potato Creek, center N1/2 sec 7, T 30 N, R 10 W; long 123° 02.07', lat 40° 28.30'

Limestone collected by M.K. Nestell and W.P. Irwin

Fossils and age: Sample contains a Late Permian (Djulfian) microfauna including the "fusuline genera *Reichelina* sp. cf. *R. media*, *Nankinella*, *Staffella*, and *Sphaerulina*"... and the nonfusuline "foraminifers *Colaniella*, *Pachyphloia*, *Langella*, *Geinitzina*, *Climacammina*, *Neoendothyra*, *Fronkina*, *Tuberitina*, *Globivalvulina*, *Agathammina*, *Robuloides*, and *Protonodosaria*. These genera are common constituents of Late Permian faunas in the Tethyan Faunal Province. A

number of these genera have not been reported from the Western Hemisphere... This fauna is the youngest Permian Tethyan fauna occurring in accreted terranes along the North America Pacific margin. It may also be the youngest Permian fauna reported from the Western Hemisphere" (Nestell and others, 1981). Sample Pc-1 collected by M.D. Luken (1985) contained a microfauna similar to the one reported by Nestell and others (1981), but with the addition of the foraminifers *Cribrogenerina*, *Deckerella*, *Palaeotextularia*, *Hemigordius*, *Lunacammina*, *Tetrataxis*, and *Cornuspira* (Luken, 1985, Loc. 15). The sample also contained the coral *Waagenophyllum klamathensis?* of Tethyan faunal affinity (Stevens and others, 1987). Sample Pc-8 collected by Luken contains a fauna that includes *Chaetetes?*, hydrozoans, algae?, gastropods, crinoid columnals, the foraminifers *Cribrogenerina*, *Palaeotextularia*, *Agathammina*, unknown endothyrids, an *Endothyranella*-type planispiral-uniserial foraminifer, and the fusulinid *Staffella?*, which indicates a Late Permian? age (Luken, 1985, Loc. 16).
[Ref.: Irwin and others, 1985, Loc. 3]

Locality No. 109; Field No. I-27-81 (USGS MR 2625)
Location: long 123° 02.18', lat 40° 28.22'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians identified by C.D. Blome as poorly preserved spumellarians and nassellarians of Mesozoic age. [Refs: Irwin and others, 1982, Loc.67; Irwin and others, 1985, Loc. 4]

Locality No. 110; Field No. I-68-80
Location: long 122° 54.40', lat 40° 29.65'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 65)

Locality No. 111; Field No. I-54-80 (USGS MR 1729)
Location: long 122° 55.25', lat 40° 28.35'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians identified by C.D. Blome as of Middle Triassic (Ladinian) age. [Ref.: Irwin and others, 1982, Loc. 68]

Locality No. 112; Field No. I-85-77
Location: long 122° 54.75', lat 40° 26.90'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of late Carnian to middle Norian age (Irwin and others, 1978, Loc. 17; 1982, Loc. 69)

Locality No. 113; Field No. I-31-73 (USGS f13534)
Location: On the S side of the divide, 1.8 km N 80° E of Deerlick Guard Station; S1/2 SW1/4 sec 17, T 30 N, R 9 W; long 122° 54.48', lat 40° 26.73'
Limestone collected by W.P. Irwin
Fossils and age: Fusulinids and other foraminifers identified as Pennsylvanian to Permian in age, but most likely Permian, by R.C. Douglass (written commun., February 25, 1975) are listed as follows:
Cribrogenerina sp.

Lunucammina sp.

Miliolids undet.

Staffella sp.

The following microfauna, and numerous hydrozoan plates, were identified as listed below and considered Late Permian in age by B.L. Mamet (written commun., December 18, 1975) who does not think it has ever been reported in America:

Apterrinellids

Climacammina sp.

Cribrogenerina sp.

Hemigordiopsis? sp.

Fusulinid ghosts

Langella sp.

Nodosariidae

Pachyphloia sp.

Palaeotextulariidae

Note; same facies and age as I-30-73

The sample also contained platform fragments of conodonts identified as Late Paleozoic in age and CAI 6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 26).

Sample (Hf-6) collected by M.D. Luken contained the following Late Permian microbiota: the fusulinid *Staffella* and the foraminifers *Agathammina*, *Cribrogenerina*, *Climacammina*, *Deckerella*, *Pachyphloia*, *Palaeotextularia*, *Hemigordius*, *Tetrataxis* or *Abadehella*, *Globivalvulina*, *Neoendothyra?*, and *Protonodosaria* (Luken, 1985, Loc. 19). [Ref.: Irwin and Galanis, 1976, Loc. 104]

Locality No. 114; Field No. I-17-81

Location: long 122° 55.82', lat 40° 26.50'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Ladinian or early Carnian age (Irwin and others, 1982, Loc. 70)

Locality No. 115; Field No. I-84-77

Location: ~700 m N 50 W of Hall City Cave; SW1/4 NE1/4 sec 32, T 30 N, R 10 W; long 123° 00.84', lat 40° 24.70'

Limestone collected by M.K. Nestell and W.P. Irwin

Fossils and age: Fusulinids (Tethyan) of Late Permian age (Nestell and others, 1981). [Ref.: Irwin and others, 1985, Loc. 5]

Locality No. 116; Field No. D702, 61-7, I-29-68, I-30-73, and I-83-77

Location: Hall City Cave; NE1/4 SE1/4 sec 32, T 30 N, R 10 W; long 123° 00.59', lat 40° 24.43'
Limestone samples collected by J.S. Diller, T.W. Stanton, D.P. Cox, N.J. Silberling, W.P. Irwin, M.K. Nestell

Fossils and age: Sample D702, collected by J.S. Diller and T.W. Stanton, was examined by G.H. Girty, who reported (*in* Diller, 1903) the presence of wide variety of forms he considered Carboniferous, including brachiopods, corals, bryozoans, and an ammonite (*Stacheoceras* n sp). The ammonite was considered by J.P. Smith to be probably Permian in age (Diller, 1903). Miller and others (1957) re-examined the ammonite, named it *Stacheoceras gordonii* M., F., & C., n. sp., and considered it to be Middle or Late Permian in age.

Samples collected by D.P. Cox were examined by L.G. Henbest (written commun., June 29, 1956) who gave the following report--"Primitive Miliolidae (?), two or more species of *Climacammina*, a species of fusulinellid(?), and apparently two species of fusulinids, representing *Staffella*, *Ozawainella*, or *Eoverbeekina* were recognized. Several complications are encountered here. The exact ranges of the above listed fusulinids in the circum-Pacific realm and Asia are variously problematic. The poor preservation of the *Staffella*-like species makes it difficult or impossible to eliminate the possibility that they are *Eoverbeekina* or a Permian relative thereof. The fossils are not older than Atoka, Pennsylvanian, and not younger than Middle Permian, inclusive. Permian instead of Pennsylvanian age seems most likely....."

Sample 61-7, collected by N.J. Silberling and W.P. Irwin, was examined by R.C. Douglass who reported (written commun., October 8, 1970) that it "contains broken and deformed specimens of a fusulinid probably referable to the genus *Cuniculinella* as described by Skinner and Wilde from the McCloud Ls. They found it in their zone F of the Wolfcampian part of their section."

Sample I-30-73 was examined by B.L. Mamet who listed the presence of the following microfauna as indicating a Late Permian age...and that it has "an extremely interesting microfauna, I do not think it has ever been reported in America." (written commun., December 18, 1975):

Cribrogenerina sp.
Climacammina sp.
Dasyclad algae
Hemigordiopsis sp
Fusulinid ghosts
Langella sp.
Nodosariidae
Pachyploia sp.
Palaeotextulariidae

Sample I-83-77, collected by M.K. Nestell and W.P. Irwin, is reported by Nestell and others (1981) to contain the "fusuline genera *Reichelina* sp. cf. *R. media*, *Nankinella*, *Staffella*, and *Sphaerulina*"... and the nonfusuline "foraminifers *Colaniella*, *Pachyploia*, *Langella*, *Geinitzina*, *Climacammina*, *Neoendothyra*, *Froncina*, *Tubertina*, *Globivalvulina*, *Agathammina*, *Robuloides*, and *Protonodosaria*. These genera are common constituents of Late Permian faunas in the Tethyan faunal province. A number of these genera have not been reported from the Western Hemisphere... This fauna is the youngest Permian Tethyan fauna occurring in accreted terranes along the North America Pacific margin. It may also be the youngest Permian fauna reported from the Western Hemisphere." Samples of the main cavernous limestone body, collected by M.D. Luken, contained the fusulinids *Reichelina*? and probably *Staffella*, and the foraminifers *Climacammina*, *Cribrogenerina*, *Agathammina*, *Globivalvulina*, *Palaeotextularia*, *Pachyploia*, and *Hemigordius*---a fauna which suggests a Late Permian (Djulfian) age (Luken, 1985, Loc. 24).

[Ref.: Irwin and Galanis, 1976, Loc.105; Irwin and others (1985, Loc.7 and 9]

Locality No. 117; Field No. I-82-77
Location: long 123° 00.59', lat 40° 24.43'
Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic or Jurassic age (Irwin and others, 1978, Loc. 18; Irwin and others, 1982, Loc. 71; Irwin and others, 1985, Loc. 8)

Locality No. 118; Field No. I-80-77

Location: long 123° 00.42', lat 40° 24.6'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians and conodonts of Middle or Late Triassic age (Irwin and others, 1978, Loc. 19; Irwin and others, 1982, Loc. 72; Irwin and others, 1983, Loc. 27; Irwin and others, 1985, Loc. 10)

UNDIVIDED HAYFORK TERRANE

Locality No. 119; Field No. WMF-2-39

Location: 4 mi W of Gold Hill; center sec 13, T 36 S, R 4 W; long ~123° 06.70'; lat ~42°26.07'

Limestone collected by W.M. Furnish

Fossils and age: A fragment probably of a pentagonal crinoid stem of Mesozoic(?) age (J.B. Reeside, Jr., written commun., Feb. 25, 1941). [Ref.: Irwin and Galanis, 1976, Loc. 4

Locality No. 120; Field No. I-37-73

Location: 3.2 km S 55 W of Gold Hill; NE1/4 NW1/4 sec 29, T 36 S, R 3 W; long ~123° 05.05'; lat ~42°25.09'

Limestone collected by W.P. Irwin and S.P. Galanis

Fossils and age: Platform fragments of conodonts identified by B.R. Wardlaw as Devonian to Triassic in age and CAI 5 (*in* Irwin and others, 1983, Loc. 1). [Ref.: Irwin and Galanis, 1976, Loc. 8]

Locality No. 121; Field No. WMF-4-39

Location: W side of Muddy Gulch; S1/2 sec 23, T 39 S, R 2 W; long 122° 53.72'; lat 40° 09.53'

Collected by W.M. Furnish

Fossils and age: Star-shaped columnals with coarse petaloid markings identified as *Isocrinus* sp. of Mesozoic age, and more probably Triassic than Jurassic (J.B. Reeside, written commun., Feb. 25, 1941): A tooth from a shark, *Acrodus* sp., which ranges from Middle Triassic to Late Cretaceous in North America but has not been found previously in Oregon (Bruce Welton, oral commun., Feb. 4, 1974). [Ref.: Irwin and Galanis, 1976, Loc. 18]

Locality No. 122; Field No. I-41-73

Location: NE1/4 SW1/4 sec 23, T 39 S, R 2 W; long 122° 54.40'; lat 42° 09.63'

Limestone collected by W.P. Irwin and S.P. Galanis, Jr.

Fossils and age: Pentagonal crinoid columnals of Mesozoic(?) age (Irwin and Galanis, 1976, Loc. 15).

Locality No. 123: Field No. 90-CB-3 (USGS DR 1115)

Location: SW1/4 NE1/4 sec 7, T 38 S, R 6 W; long 123° 27.0', lat 42° 15.8'(same loc. as limestone float I-1-90)

Chert collected by C.D. Blome and W.P. Irwin

Fossils and age:

Radiolarians:

?*Canutus* sp.

Poorly preserved nassellarians

All forms poorly preserved casts and molds

Age: ?Early Jurassic

Locality No. 124; Field No. I-42-73

Location: Muck quarry; SW1/4 NW1/4 sec 30, T 37 S, R 6 W; long ~123° 27.73'; lat ~42°19.53'
Limestone collected by W.P. Irwin and S.P. Galanis, Jr., 1973.

Fossils and age: Conodonts identified as *Epigondolella* sp. of Late Triassic age and CAI-5 by B.R. Wardlaw (*in* Irwin and others, 1983, Loc. 2). [Ref.: Irwin and Galanis, 1976, Loc. 2]

Locality No. 125; Field No. WMF-3-39 and I-43-73

Location: Marble Mountain quarry, 5.3 km S 6° E of Wilderville; center SW1/4 sec 19, T 37 S, R 6 W; long ~123° 27.50'; lat ~42°20.10'

Limestone collected by W.M. Furnish, 1939, and W.P. Irwin and S.P. Galanis, 1973.

Fossils; Sample WMF-3-39 was examined by J.B. Reeside (written commun., Feb. 25, 1941) who identified the following fossils:

Heptastylis sp. cf. *H. aquilae* Smith

Thecosmilia sp., a large species

Naticella? sp.

Echinoid spine, large, cidaroid

"Because of extensive recrystallization, the fossils in this rock are difficult to determine...

Nevertheless, this fauna appears to me to be clearly the widespread Upper Triassic coral fauna that J. P. Smith discussed extensively...I have reexamined the material collected at or near this locality by Storrs and Diller and studied by E. M. Kindle. It contains mostly the same species as the new collection, but there are in addition the internal mold of a cidarid echinoid that is definitely post-Paleozoic, and a sinistral gastropod that I have not determined." (J. B. Reeside, Jr., written commun., February 25, 1941). Sample I-43-73 contained small ichthyoliths (C.A. Repenning, oral commun., 1974).

Fossil age: Late Triassic. Previously considered to be Devonian (Diller and Kay, 1909; Diller, 1914). [Ref.: Irwin and Galanis, 1976, Loc. 1]

Locality No. 126; Field No. I-16-73

Location: 1.7 km N 20 E of Little Grayback; SW1/4 sec 33, T 19 N, R 6 E; long 123° 31.70'; lat 41° 59.55'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *Epigondolella* sp. and *Neogondolella* sp. of Late Triassic age and CIA-6 by B.R. Wardlaw (*in* Irwin and others, 1983, Loc. 4). [Ref.: Irwin and Galanis, 1976, Loc. 21]

Locality No. 127; Field No. I-33-73

Location: 4.2 km S 25° E of Happy Camp; SE1/4 SW1/4 sec 24, T 16 N, R 7 E; long 123° 21.39'; lat 41° 45.49'

Limestone collected by W.P. Irwin

Fossils and age: Conodonts identified as *Epigondolella* sp. and *Neogondolella* sp. of Late Triassic age and CAI 6-7 by B.R. Wardlaw (Irwin and others, 1983, Loc.7); one definite foraminifer (nodosaria?) of Pennsylvanian or younger age (A.K. Armstrong, oral commun., 1975). [Ref.: Irwin and Galanis, 1976, Loc. 25]

Locality No. 128; Field No. "C"

Location: NW1/4 NW1/4 sec 35, T 47 N, R 7 W; long 122° 37.84'; lat 41° 53.16'

Limestone collected by N. Mortimer

Fossils and age: Pelmatozoan remains, bryozoans, ?ostracodes, and productoid brachiopod spines (C.H. Stevens *in* Mortimer, 1984)

Fossil age: Early Permian (Mortimer, 1984)

Locality No. 129; Field No. "D"

Location: SE1/4 NE1/4 sec 10, T 46 N, R 7 W; long 122° 38.52'; lat 41° 51.18'

Limestone collected by N. Mortimer

Fossils and age: Partly preserved specimens of *Eoparafusulina?* of Early Permian age, which is "a common fossil in the McCloud limestone of the Eastern Klamath terrane but is also present in Early Permian rocks in the Tethyan Province" (C.H. Stevens, *in* Mortimer, 1984). [Ref.: Mortimer (1984)]

Locality No. 130; Field No. MMB-246-79A

Location: long ~123°25.15', lat ~41°21.02'

Limestone collected by C.G. Barnes

Fossils and age: Conodonts identified as *Idiognathoides* sp. of Early to Middle Pennsylvanian age and CAI 5 by B.R. Wardlaw (*in* Irwin and others, 1983, Loc. 9)

Locality No. 131; Field No. I-45-80B (USGS MR 1721) and MMD-112-79

Location: long 123° 16.80', lat 41° 16.47'

Chert collected independently by W.P. Irwin and M.M. Donato

Fossils and age: Radiolarians identified by C.D. Blome as Late Triassic (late Carnian? to late middle Norian age) in age (Irwin and others, 1982, Loc. 12), and conodonts identified as *N. polygnathiformis* of Late Triassic age and CAI 5 (B.R. Wardlaw *in* Irwin and others, 1983, Loc. 10)

Locality No. 132; Field No. I-18-77

Location: long 123° 17.34', lat 41° 14.40'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as Triassic or Jurassic in age (Irwin and others, 1978, Loc. 7; 1982, Loc. 13; Ando and others, 1983, Loc. 1)

Locality No. 133; Field No. I-25-80 (USGS MR 1253)

Location: long 123° 16.70', lat 41° 12.87'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as of Mesozoic (Triassic?) age. [Refs.: Irwin and others, 1982, Loc. 14; Ando and others, 1983, Loc. 2]

Locality No. 134; Field No. I-20-80

Location: long 123° 15.91', lat 41° 12.80'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 16; Ando and others, 1983, Loc. 3)

Locality No. 135; Field No. FWG-50-49

Location: Fork of Knownothing Creek; center S1/2 sec 31, T 10 N, R 8 E; long ~123°18.40', lat ~41°12.82'

Limestone collected by F.G. Wells

Fossils and age: "Limestone on Knownothing Creek...yields calcareous algae, stromatoporoids, and *Cladopora*, suggesting a Silurian and Devonian age", according to Merriam (1961). [Ref.: Irwin and Galanis, 1976, Loc. 30]

Locality No. 136; Field No. I-26-80

Location: long 123° 16.92', lat 41° 12.41'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age.

[Ref.: Irwin and others (1982, loc. 15); Ando and others (1983, Loc. 4)]

Locality No. 137; Field No. I-30-80 (USGS MR 1261)

Location: long 123° 17.96', lat 41° 9.67'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as of Middle Triassic (Ladinian) age; sample also contains conodonts [Refs.: Irwin and others, 1982, Loc. 38; Ando and others, 1983, Loc. 6]

Locality No. 138; Field No. I-27-80 (USGS MR 1256)

Location: long 123° 17.48' lat 41° 10.32'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Sample examined by C.D. Blome contains unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. [Refs.: Irwin and others (1982, Loc. 37); Ando and others (1983, Loc. 5)]

Locality No. 139

Location: 31/4 mi downstream from head of North Fork of Eagle Creek; NW1/4 sec 2, T 8 N, R 7 E; long ~123° 21.20', lat ~41°06.52

Limestone collected by D.P. Cox and W.P. Pratt

Fossils and age: Crinoid columnal segments, fenestellid bryozoans, and small rugose corals having the general appearance of a disphyllid were identified by C.W. Merriam, who stated (written commun., in Cox and Pratt, 1973) that "although Carboniferous cannot be ruled out, I am a little more inclined to think the rocks from which the fossils come may be in the Silurian-Devonian range". [Ref.: Irwin and Galanis, 1976, Loc. 32]

NORTH FORK TERRANE

Locality No. 140

Location: long 122° 36.80'; lat 41° 51.05'

Chert collected by N. Mortimer

Fossils and age: Radiolarians identified as Middle or Late Triassic in age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 141

Location: long 122° 35.82'; lat 41° 51.59'

Chert collected by N. Mortimer

Fossils and age: Radiolarians identified as Late Triassic or Early Jurassic in age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 142

Location: (1) long 122° 35.37', lat 41° 50.98'

(2) long 122° 35.31', lat 41° 50.99'

(3) long 122° 35.19', lat 41° 50.99'

Chert collected at three closely-spaced sample sites by N. Mortimer

Fossils and age: Radiolarians identified as Late Triassic or Early Jurassic in age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 143

Location: (1) long 122° 35.00', lat 41° 50.98'

(2) long 122° 34.87', lat 41° 50.88'

Chert collected at two closely-spaced sample sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 144

Location: long 122° 34.04'; lat 41° 51.34'

Chert collected by N. Mortimer contains radiolarians of Early or Middle Jurassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984).

Chert collected by W.P. Irwin and D.L. Jones at this same general locality near the mouth of Williams Creek (samples I-44-80, I-92-80, I-93-80, and I-95-80) contain the following radiolarians identified by C.D. Blome:

Sample I-92-80 (USGS MR 1768) contains the following radiolarians of Early Jurassic (Sinemurian or Pliensbachian) age:

Canutus sp. aff. *C. Izeensis* Pessagno and Whalen

Canutus sp.,

Sample I-93-80 (USGS MR 1769) contains the following Early Jurassic (Sinemurian or Pliensbachian) radiolarians ;

Pantanellium sp. aff. *P. cumshewaense* Pessagno and Blome

Praeconocaryomma magnimamma (Rust)

Canoptum sp.,

Canutus blomei Pessagno and Whalen

Canutus sp. aff. *C. indomitus* Pessagno and Whalen

Canutus rockfishensis Pessagno and Whalen

Canutus sp.

Droltus sp.

Droltus hecatensis Pessagno and Whalen

Lupherium sp.

Wrangellium sp.

Parvicingula sp.

Praeconocaryomma magnimamma Pessagno

Sample I-95-80 (USGS MR 1692), ~1 km NE of I-92-80, contains *Canoptum* sp. and *Canutus* sp. of Early Jurassic (Hettangian to Pliensbachian) age (Irwin and others, 1982, Loc. 2).

Sample I-44-80 contains North Fork fauna of Jurassic age (Irwin and others, 1982, Loc. 6).

Locality No. 145

Location: (1) long 122° 33.82'; lat 41° 51.72'

(2) long 122° 33.79'; lat 41° 51.79'

(3) long 122° 33.73'; lat 41° 51.88'

Chert collected at three closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Early or mid-Jurassic age at site No. 1, and Late Triassic or Early Jurassic age at sites No. 2 and No. 3 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 146

Location: (1) long 122° 33.67', lat 41° 51.93'

(2) long 122° 33.63', lat 41° 51.97'

Chert collected at two closely spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age at site No. 1, and Early or mid-Jurassic age at site No. 2 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 147; Field No. "B"

Location: SE1/4 NE1/4 sec 5, T 46 N, R 6 W; long 122° 33.50'; lat 41° 51.97'

Limestone collected by N. Mortimer

Fossils and age: "One sample contains poorly sorted, coated grains, with some oolites, in a cemented grainstone. Pelmatozoan fragments form the nuclei of several of the oolites. Two other samples contain a variety of fossils including the algae *Hikorocodium*, *Pycnaoporidium?* and *Succodium*, the foraminifers *Eotuberitina*, *Protonodosaria*, *Climacammina*, *Hemigordius*, *Kamurana*, *Schubertella?*, *Staffella* and *Agathammina* bryozoans; pelmatozoans fragments and possible brachiopod fragments...The age is late Permian"(C.H. Stevens, *in* Mortimer, 1984)

Nearby, in NW1/4 NW1/4 sec 4, T 46 N, R 6 W, Mortimer collected a single piece of limestone float (Field No. M-564) which according to Luken (1985, Loc. 32) contains a Tethyan fauna of Permian (Guadalupian) age, including: the fusulinid *Staffella*; the foraminifers *Cribrogenerina*, *Climacammina*, *Agathammina*, *Pachyphloia*, *Hemigordius*, *Glomospira*, and *Tuberitina*; the algae *Succodium*, *Hikorocodium*, *Parachaetetes*, and *Pynconopordium*; and gastropods and crinoid columnals.

Locality No. 148

Location: (1) long 122° 33.42', lat 41° 51.86'

(2) long 122° 33.43', lat 41° 51.85'

(3) long 122° 33.38', lat 41° 51.83'

(4) long 122° 33.49', lat 41° 51.75'

(5) long 122° 33.46', lat 41° 51.72'

(6) long 122° 33.43', lat 41° 51.63'

(7) long 122° 33.45', lat 41° 51.58'

Chert collected from seven closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians from all seven sites are Early Jurassic or mid-Jurassic in age (Bonita Murchey and D.L. Jones, *in* Mortimer, 1984). Sample I-43-80 collected by W.P. Irwin is part of this cluster and contains Jurassic radiolarians identified by D.L. Jones as *Praeconocaryomma* and *Archeodictyomitra* sp.

Locality No. 149

Location: long 122° 32.30'; lat 41° 51.20'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Middle or Late Triassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 150; Field No. I-42-80 and "A"

Location: 6.5 km S 6° E of Hornbrook; center N1/2 SW1/4 SE1/4 sec 9, T 46° N, R 6 W; long 122° 32.50'; lat 41° 50.87'

Limestone collected by M.A. Elliott (1971), re-collected by W.P. Irwin in 1980, and by N. Mortimer (1984, Loc. "A")

Fossils and age: Samples contain the fusulinid *Yabeina* of Late Permian age and Tethyan faunal affinity (Elliott and Bostwick, 1973) and is Guadalupian, probably late Guadalupian, in age (M.K. Nestell, pers. commun., *in* Mortimer, 1984); also contain *Parafusulina* and pelmatozoan fragments (C.H. Stevens, written commun., *in* Mortimer, 1984) [Ref.: Irwin and Galanis, 1976, Loc. 26]

Locality No. 151

Location; (1) long 122° 32.20', lat 41° 50.80'

(2) long 122° 32.10', lat 41° 50.75'

(3) long 122° 32.12', lat 41° 50.74'

(4) long 122° 32.19', lat 41° 50.69'

Chert collected at four closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Middle or Late Triassic age at sites No. 1 and No. 4, and Late Triassic or Early Jurassic age at sites No. 2 and No. 3 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 152

Location: (1) long 122° 31.87', lat 41° 50.68'

(2) long 122° 31.86', lat 41° 50.62'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Late Permian age at site No. 1, and Middle or Late Triassic at site No. 2 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 153

Location: (1) long 122° 31.87', lat 41° 50.53'

(2) long 122° 31.89', lat 41° 50.48'

(3) long 122° 31.88', lat 41° 50.44'

Chert collected at three closely-spaced localities by N. Mortimer.

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age at sites No. 1 and 3, and Middle or Late Triassic at site No. 2 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 154

Location: (1) long 122° 31.50', lat 41° 50.20'

(2) long 122° 31.73', lat 41° 50.07'

Chert collected at two closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age at sites No. 2, and Middle or Late Triassic at site No. 1 (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 155

Location: (1) long 122° 32.58', lat 41° 50.67'

(2) long 122° 32.56', lat 41° 50.71'

(3) long 122° 32.50', lat 41° 50.70'

Chert collected at three closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Middle or Late Triassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 156

Location: (1) long 122° 31.18', lat 41° 50.12'

(2) long 122° 32.23', lat 41° 50.07'

(3) long 122° 32.43', lat 41° 50.03'

(4) long 122° 32.60', lat 41° 50.07'

(5) long 122° 32.68', lat 41° 50.04'

Chert collected at five closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age at site No. 1, and Middle or Late Triassic at the other four sites (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 157

Location: Long 122° 32.79', lat 41° 49.58'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Middle or Late Triassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 158

Location: Long 122° 33.31', lat 41° 49.75'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 159

Location: (1) long 122° 33.26', lat 41° 50.06' : and (2) long 122° 33.41', lat 41° 50.04'

Chert collected at two closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Permian age at both sites (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 160

Location: (1) long 122° 34.90', lat 41° 50.67'

(2) long 122° 34.93', lat 41° 50.70'

Chert collected from two closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age at both sites (Benita Murchey and D. L. Jones, *in* Mortimer, 1984)

Locality No. 161

Location: long 122° 34.90', lat 41° 50.30'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 162

Location: (1) long 122° 35.48', lat 41° 50.54' (2) long 122° 35.54', lat 41° 50.65'

Chert collected at two closely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic at both localities (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 163

Location: long 122° 35.64', lat 41° 50.83'

Chert collected by N. Mortimer

Fossils and age: Radiolarians of Late Triassic or Early Jurassic age (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 164

Location: (1) long 122° 35.65', lat 41° 50.95' (2) long 122° 35.52', lat 41° 50.97'

Chert collected at two widely-spaced sites by N. Mortimer

Fossils and age: Radiolarians of Early or mid-Jurassic age at both sites (Benita Murchey and D.L. Jones, *in* Mortimer, 1984)

Locality No. 165; Field No. 8-78

Location: center NW1/4 sec 33, T 45 N, R 8 W; long 122° 46.93', lat 41° 54.04'

Chert collected by D.J. Borns(?)

Fossils and age: Radiolarians of Triassic age [Ref.: Irwin and others (1982, Loc. 9)]

Locality No. 166; Field No. 3-78

Location: N1/2 NE1/4 SW1/4 sec 5, T 44 N, R 8 W; long 122° 47.86', lat 41° 52.38'

Chert collected by D.J. Borns(?)

Fossils and age: Radiolarians of Triassic age [Ref.: Irwin and others (1982, Loc. 10)]

Locality No. 167; Field No. I-14-73

Location: 9.6 km N 70° W of Fort Jones; NW1/4 sec 26, T 44 N, R 10 W; long 122° 58.11', lat 41° 38.21'

Limestone collected by W.P. Irwin

Fossils and age: Fragments of conodonts identified as Ordovician to Triassic age in age and CAI 5-6 by B.R. Wardlaw (Irwin and others, 1983, Loc. 8). [Ref.: Irwin and Galanis, 1976, Loc. 27]

Locality No. 168; Field No. 245 (USGS 1031)

Location: NW1/4 NE1/4 NE1/4 sec 3, T 43 N, R 10 W; long 122° 58.63', lat 41° 36.80'

Chert collected by Don Elder

Fossils and age: The following radiolarians are identified by C. D. Blome as Late Triassic (Carnian) in age:

Pseudostylosphaera helicata (Nakaseko and Nishimura)

Pseudostylosphaera japonica (Nakaseko and Nishimura)

Triassocampe sp.

Locality No. 169; Field No. I-50-77

Location: SE1/4 SE1/4 sec 2, T 43 N, R 10 W; long 122° 57.45', lat 41° 36.19'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as Triassic or Jurassic age by D.L. Jones (Irwin and others, 1978, Loc. 6; 1982, Loc. 11)

Locality No. 170; Field No. 246 (USGS DR 1033)

Location: center N1/2 sec 1, T 43 N, R 10 W; long 122° 56.68', lat 41° 36.53'

Chert collected by Don Elder

Fossils and age: The following radiolarians are identified by C. D. Blome as Late Triassic (Norian; questionable late middle Norian) in age:

Cantalum sp.

Capnuchosphaera sp.

Pantanellium tozeri Pessagno

Saitoum sp.

Locality No. 171; Field No. 244 (USGS 1030)

Location: NW1/4 NW1/4 sec 6, T 43 N, R 9 W; long 122° 55.91', lat 41° 36.69'

Chert collected by Don Elder

Fossils and age: The following radiolarians are identified as Late? Triassic (Karnian or Norian) in age by C.D. Blome:

Canoptum sp.

?*Capnodoce* sp.

?*Praeconocaryomma* sp.

Sarla sp.

Locality No. 172; Field No. 242 (USGS DR 1028)

Location: SW1/4 SE1/4 SW1/4 sec 6, T 43 N, R 9 W; long 122° 55.72', lat 41° 36.87'

Chert collected by Don Elder

Fossils and age: Sample contains the following radiolarians identified as Late Triassic (?Carnian) in age by C.D. Blome:

Acanthocircus sp.

?*Eptingium* sp.

?*Pseudostylosphaera* sp.

Locality No. 173; Field No. 250 (USGS DR 1038) and 251 (USGS DR 1039)

Location: Sample No. 250; NW1/4 NE1/4 sec 18, T 43 N, R 9 W; long 122° 55.35', lat 41° 34.94'

Sample No. 251; NE1/4 NE1/4 sec 18, T 43 N, R 9 W; long 122° 55.12', lat 41° 34.94'

Chert collected from two closely-spaced localities by Don Elder

Fossils and age: Radiolarians were identified by C. D. Blome as *Triassocampe* sp. of Late Triassic age (sample No. 250), and as *Pseudostylosphaera(?) japonica* (Nakaseko and Nishimura) and *Triassocampe* sp. of Late Triassic (Karnian) age (sample No. 251).

Locality No. 174; Field Nos. 247, 248a, and 248b

Chert collected at two closely-spaced sites by Don Elder

Sample No. 247 (USGS DR 1034): W1/2 SW1/4 SW1/4 sec 18, T 43 N, R 9 W; long 122° 56.08', lat 41° 34.40': contains the following radiolarians identified by C. D. Blome as Late Triassic (early or middle Norian) in age and correlative with faunas assigned to the *Capnodoce* Zone (*Xipha striata* or *Latium paucum* Subzones of Blome, 1984):

Acanthocircus silverensis Blome

Capnodoce antiqua Blome

Capnuhosphaera sp.

Xipha pessagnoii Blome

Sample No. 248a (USGS DR 1035): SE1/4 SE1/4 SE1/4 sec 13, T 43 N, R 10 W; long 122° 56.22', lat 41° 34.23': contains the following radiolarians identified by C.D. Blome as Late Triassic (early or middle Norian) in age and are possibly a mixed fauna:

Capnuhosphaera soldieriensis Blome

Capnuhosphaera sp.

Castrum perornatum Blome

Plafkerium sp.

Triassocampe japonica (Nakaseko and Nishimura)

Sample 248b (USGS DR 1036): SE1/4 SE1/4 SE1/4 sec 13, T 43 N, R 10 W; long 122° 56.22', lat 41° 34.23': contains the following radiolarians identified by C.D. Blome as Late Triassic (late Carnian or early Norian) in age and is probably assignable to the *Justium novum* Subzone of the *Capnodoce* Zone of Blome (1984):

Capnodoce sp. (fragment)

Canoptum sp.

Capnuhosphaera sp. (fragment)

Castrum perornatum Blome

Corum perfectum Blome

Justium(?) novum Blome

Sarla sp.

Triassocampe sp.

Locality No. 175; Field No. I-86-80 (USGS MR 1763)

Location: long 123° 16.18', lat 41° 10.78

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as *?Capnuchosphaera* sp. and *?Triassocampe* sp. of Mesozoic (Triassic?) age. [Refs.: Irwin and others, 1982, Loc. 36; Ando and others, 1983, Loc. 7]

Locality No. 176; Field No. I-87-80 (USGS MR 1764)

Location: long 123° 16.24', lat 41° 10.23'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as of Middle Triassic (Ladinian) age. [Refs.: Irwin and others, 1982, Loc. 35; Ando and others, 1983, Loc. 7]

Locality No. 177; Field No. I-88-80 (USGS MR 1765)

Location: long 123° 16.23', lat 41° 9.78'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as of Late Triassic (late Carnian? to late middle Norian age. [Refs.: Irwin and others, 1982, Loc. 34; Ando and others, 1983, Loc. 8]

Locality No. 178; Field No. I-89-80 (USGS MR 1766)

Location: long 123° 13.32', lat 41° 12.13

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as *Eptingium manfredi* Dumitrica and *Triassocampe* sp. of Middle Triassic (Ladinian) age. [Refs: Irwin and others, 1982, Loc. 17; Ando and others, 1983, Loc. 9); Blome and Irwin, 1983, Loc. 1]

Locality No. 179; Field No. I-90-80

Location: long 123° 13.30', lat 41° 12.10'

Chert collected by W.P. Irwin

Fossils and age: Chert contains conodonts of Triassic age (Irwin and others, 1982, Loc. 18; Ando and others, 1983, Loc. 9; Blome and Irwin, 1983, Loc. 2)

Locality No. 180; Field No. I-19-77

Location: long 123° 12.94', lat 41° 11.90'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic age (Irwin and others, 1978, Loc. 8; Irwin and others, 1982, Loc. 19; Ando and others, 1983, Loc. 10; Blome and Irwin, 1983, Loc. 3)

Locality No. 181; Field No. I-20-77

Location: long 123° 12.82', lat 41° 11.72'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1978, Loc. 9; Irwin and others, 1982, Loc 20; Ando and others, 1983, Loc. 11; Blome and Irwin, 1983, Loc. 4)

Locality No.182; Field No. I-21-77 and I-18-80A (USGS MR 1251)

Location: long 123° 12.87', lat 41° 11.67'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as Late Triassic (late Carnian? to late middle Norian) in age. [Refs.: Irwin and others, 1978, Loc. 10; Irwin and others, 1982, Loc. 21; Ando and others, 1983, Loc. 11; Blome and Irwin, 1983, Loc. 4 and 5]

Locality No. 183; Field No. I-22-77 and I-17-80

Location: Quarry, 0.2 km W of Matthews Creek Campground; SE1/4 NE1/4 sec 9, T 38 N, R 12 W; long 123° 12.89', lat 41° 11.35'

Chert collected by W.P. Irwin

Fossils and age: Sample contains radiolarians of Middle Permian age (Irwin and others, 1978, Loc. 11; 1982, Loc. 22; Ando and others, 1983, Loc. 12; Blome and Irwin, 1983, Loc. 6), and conodonts identified as *N. bitteri* of Permian (Wordian) age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 11)

Locality No. 184; Field No. I-12-80A (USGS MR 1269) and I-12-80B (USGS MR 1298)

Location: Sample I-12-80A; long 123° 12.72', lat 41° 11.36'

Sample I-12-80B; long 123° 12.71', lat 41° 11.37'

Chert collected from two closely-spaced sites by W.P. Irwin and D.L. Jones

Fossils and age: Sample I-12-80A contains radiolarians of Late Triassic (late Carnian? to late middle Norian) age, and sample I-12-80B contains radiolarians identified by C.D. Blome as Middle Triassic (Ladinian) in age. [Refs.: Irwin and others, 1982, Loc 23; Blome and Irwin, 1983, Loc. 7]

Locality No. 185; Field No. I-13-80C (USGS MR 1372) and I-13-80D (USGS MR 1249)

Location: long 123° 12.52', lat 41° 11.40'

Chert collected at two closely-spaced localities by W.P. Irwin and D.L. Jones

Fossils and age: Sample I-13-80C contains the following radiolarians identified by C.D. Blome as Late Triassic? to Middle Jurassic in age:

Canoptum sp.

Gorgansium sp.

Praeconocaryomma sp.

?*Sarla* sp.

?*Canutus* sp.

Sample I-13-80D contains the following radiolarians identified by C.D. Blome as Early Jurassic (Hettangian) or Middle? Jurassic in age:

Praeconocaryomma sp.

Canoptum merum Pessagno and Whalen

Canoptum sp.

?*Droltus* sp.

[Refs: Irwin and others, 1982, Loc. 24; Ando and others, 1983, Loc. 13; Blome and Irwin, 1983, Loc. 8]

Locality No. 186; Field No. I-15-80 (USGS MR 1244)

Location: long 123° 11.45', lat 41° 11.47'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Sample examined by C.D. Blome contains unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. [Refs.: Irwin and others, 1982, Loc. 25; Ando and others, 1983, Loc. 14; Blome and Irwin, 1983, Loc. 9]

Locality No. 187; Field No. I-16-80 (USGS MR 1245)

Location: long 123° 10.79', lat 41° 11.32'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Sample examined by C.D. Blome contains unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. [Refs.: Irwin and others, 1982, Loc. 26; Blome and Irwin, 1983, Loc. 10]

Locality No. 188; Field No. I-85-80

Location: long 123° 12.52', lat 41° 9.16'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 32; Blome and Irwin, 1983, Loc. 16).

Locality No. 189

Field No. I-78-80 (USGS MR 1755): long 123° 12.62', lat 41° 9.08'

Field No. I-77-80B (USGS MR 1754): long 123° 12.62', lat 41° 9.05'

Field No. I-80-80 (USGS MR 1757): long 123° 12.68', lat 41° 9.04'

Field No. I-81-80 (USGS MR 1758): long 123° 12.69', lat 41° 9.02'

Field no. I-82-80, long 123° 12.74', lat 41° 9.02'

Field No. I-83-80 (USGS MR 1760): long 123° 12.72', lat 41° 9.02'

Field No. I-84-80 (USGS MR 1761): long 123° 12.60', lat 41° 9.07'

Chert collected at seven closely-spaced sites by W.P. Irwin and D.L. Jones

Fossils and age.--Sample I-78-80 contains the radiolarians *Praeconocaryomma* sp. and *Canoptum* sp. of Triassic or Jurassic age. Sample I-77-80B contains radiolarians of Mesozoic (Triassic?) age. Samples I-80-80 and I-81-80 contain unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. Sample I-82-80 contains radiolarians of Late Triassic age. Sample I-83-80 contains radiolarians of Late Triassic (late Carnian? to late middle Norian) age. Sample I-84-80 contains the radiolarians *Gorgansium* sp. and *Canoptum* sp. of Late Triassic or Early Jurassic age. [Refs.: C.D. Blome, written commun., July 15, 1981; Irwin and others, 1982, Loc. 33; Ando and others, 1983, Loc. 15; Blome and Irwin, 1983, Loc. 17]

Locality No. 190; Field No. I-10C-80 (USGS MR 1270)

Location: long 123° 11.55', lat 41° 8.68'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as *Sarla* sp. and *Triassocampe* sp. of Middle Triassic (Ladinian) to Late Triassic (late middle Norian) age: Sample contains unidentified conodonts. [Refs.: Irwin and others, 1982, Loc. 31; Ando and others, 1983, Loc. 19); Blome and Irwin, 1983, Loc. 15]

Locality No. 191; Field No. I-9-80

Location: long 123° 11.15', lat 41° 8.63'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians and conodonts of Triassic age (Irwin and others, 1982, Loc 30; Blome and Irwin, 1983, Loc. 14)

Locality No. 192; Field No. I-25-77 and I-8-80

Location: long 123° 10.70', lat 41° 8.54'

Chert collected by W.P. Irwin

Fossils and age: Conodonts identified as *Epigondolella* sp. of Late Triassic age by B.R. Wardlaw (Irwin and others, 1983, Loc.12), and radiolarians identified as Late Triassic (late Carnian? to late middle Norian in age by C.D. Blome. [Refs.: Irwin and others, 1982, Loc. 29; Blome and Irwin, 1983, Loc. 13]

Locality No. 193; Field No. I-7-80 (USGS MR 1371)

Location: long 123° 10.12', lat 41° 8.62'

Chert collected by W.P. Irwin and D.L. Jones

Fossils and age: Sample examined by C.D. Blome contains unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. [Refs.: Irwin and others, 1982, Loc. 28; Blome and Irwin, 1983, Loc. 12]

Locality No. 194; Field No. I-6-80 (USGS MR 1255)

Location: long 123° 9.97', lat 41° 8.55'

Chert collected by W. P. Irwin and D.L. Jones

Fossils and age: Radiolarians identified by C.D. Blome as Middle Triassic (Ladinian) to Late Triassic (late middle Norian) in age. [Refs.: Irwin and others, 1982, Loc. 27; Blome and Irwin, 1983, Loc. 11]

Locality No. 195; Field No. I-65-80

Location: long 123° 9.23', lat 40° 55.70'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1982, Loc. 39)

Locality No. 196; Field No. I-63-80

Location: long 123° 7.45', lat 40° 47.45'

Chert collected by W. P. Irwin

Fossils and age: Radiolarians of Triassic age (Irwin and others, 1982, Loc. 40; Blome and Irwin, 1983, Loc. 18)

Locality No. 197; Field No. I-1-72

Location: Mill Creek, 2.2 km S 23° W of Junction City; center W1/2 sec 13, T 33 N, R 11 W; long 123° 03.80', lat 40° 42.85'

Limestone collected by W.P. Irwin

Fossils and age: Abundant fossils in a loose block where a large limestone lense crosses Mill Creek at ~2000 ft altitude. Fossils include schwagerinid fusulinids of Early Permian (Wolfcamp) age (R.C. Douglass, written commun., August 14, 1972). Conodonts identified as *Neogondolella* sp. of Permian age and CAI 5 by B.R. Wardlaw (Irwin and others, 1983, Loc. 13). [Ref.: Irwin, 1974, Loc. 1; Irwin and Galanis, 1976, Loc. 78]

Locality No. 198; Field No. I-22-81
Location: long 123°4.07', lat 40° 42.29'
Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as *Parvicingula* sp. and *Paronaella* sp. of Middle Jurassic (Bajocian) to Late Jurassic (Tithonian) age.

[Refs: Irwin and others, 1982, Loc. 41; Blome and Irwin, 1983, Loc. 19]

Locality No. 199; Field No. I-11-76
Location: long 123° 1.89', lat 40° 37.98'
Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as *Eptingium* sp. of Middle or Late Triassic age by D.L. Jones and E.A. Pessagno, Jr. (Written commun., March 18, 1977).

[Refs: Irwin and others, 1977; 1978, Loc. 13; 1982, Loc. 42; Blome and Irwin, 1983, Loc. 20]

Locality No. 200; Field No. W-57-28c (USGS f12501)

Location: 2.3 km N 15° E Hayfork Summit; center sec 21, T 32 N, R 10 W; long 123° 00.10', lat 40° 36.87'

Limestone float collected by W.P. Irwin

Fossils and age: "In the rock slices submitted, it was possible to recognize that most of the specimens belong to a peculiar species of *Triticites* whose morphology has features that suggest early as well as late stages in the evolution of the genus. A few specimens even suggested a transitional stage into *Pseudofusulina*. A few of the fusulinids, seen only in odd sections, have some resemblance to *Dunbarinella*. Two fragmentary specimens resembling the juvenarium of *Schubertella* or the microspheric generation of a larger fusulinid were also recognizable. Late Pennsylvanian or early Permian seems to be as close a determination as can be made on the material at hand" (L.G. Henbest, written commun., April 15, 1958).

Float samples (Nf-1) collected by M.D. Luken contained fragments of schwagerinid fusulinids and *Schubertella*?, and fragments of crinoids and fenestrate bryozoans, and are considered Early Permian in age (Luken, 1985, Loc. 5).

[Ref.: Irwin, 1960; Irwin, 1972, Loc. 19; Irwin, 1974, Loc. 4; Irwin and Galanis, 1976, Loc. 123]

Locality No. 201; Field No. I-3-76
Location: long 123° 1.15', lat 40° 36.66
Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Early or Middle Jurassic age (Irwin and others, 1977; Irwin and others, 1978, Loc. 14; Irwin and others, 1982, Loc. 43; Blome and Irwin, 1983, Loc. 21)

Locality No. 202; Field No. I-10-76
Location: long 123° 0.29', lat 40° 36.07'
Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Early or Middle Jurassic age (Irwin and others, 1977; Irwin and others, 1978, Loc. 15; Irwin and others, 1982, Loc. 44; Blome and Irwin, 1983, Loc. 22)

Locality No. 203; Field No. I-1-76
Location: long 123° 1.02', lat 40° 35.72'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified as *Praeconocaryomma magnimamma* sp. and *Archaeodictyomitra* sp. of Jurassic (Toarcian to Zone 2A) age by D.L. Jones and E.A. Pessagno, Jr. (written commun., March 18, 1977). [Refs: Irwin and others, 1977; Irwin and others, 1978, Loc. 16; Irwin and others, 1982, Loc. 45; Blome and Irwin, 1983, Loc. 23]

Locality No. 204; Field No. I-70-80

Location: long 122° 55.85', lat 40° 32.88'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 50; Blome and Irwin, 1983, Loc. 28)

Locality No. 205; Field No. I-62-80

Location: long 122° 57.00', lat 40° 32.80'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Triassic age (Irwin and others, 1982, Loc. 49; Blome and Irwin, 1983, Loc. 27)

Locality No. 206; Field No. I-71-80

Location: long 122° 57.00', lat 40° 32.80'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, loc. 48; Blome and Irwin, 1983, Loc. 26)

Locality No. 207; Field No. I-72-80

Location: long 122° 57.49', lat 40° 32.88'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Permian age (Irwin and others, 1982, Loc. 46; Blome and Irwin, 1983, Loc. 24)

Locality No. 208; Field No. I-73-80 (USGS MR 1750)

Location: long 122° 57.40', lat 40° 32.84'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as Triassic or Jurassic in age. [Refs.: Irwin and others, 1982, Loc. 47; Blome and Irwin, 1983, Loc. 25]

Locality No. 209; Field No. T-11

Location: 1 km N 55° W of mouth of Johnson Gulch; SW1/4 SW1/4 sec 13, T 31 N, R 10 W; long 122° 57.00', lat 40° 31.90'

Limestone collected by R.W. Tabor

Fossils and age: Sample contains endothyrids ghosts referable to *Endothyra* of the group *E.prisca* and indicates an early Carboniferous to Permian age (Bernard Mamet, written commun., June 7, 1970). [Ref.: Irwin, 1972, Loc. 20; Irwin and Galanis, 1976, Loc. 82]

Locality No. 210; Field No. I-9-76

Location: long 122° 56.10', lat 40° 31.85'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 51; Blome and Irwin, 1983, Loc. 29)

Locality No. 211; Field No. W-324 (USGS f21947) and T-9

Location: In Browns Creek ~60 m upstream from the mouth of Maupin Gulch; SW1/4 SE1/4 sec 24, T 31 N, R 10 W; long 122° 56.55', lat 40° 31.10'

Limestone collected by W.P. Irwin and R.W. Tabor

Fossils and age: Microfossils were identified as textularid foraminifers and schwagerinid fusulinids by R.C. Douglas (written commun, August 10, 1961), who reports that "Two species of *Schwagerina* are probably represented, one elongate form with axial filling, the other more robust and without axial filling. The specimens are all distorted and are not easily compared with previously described species. Their general stage of evolution suggests early Permian age, McCloud equivalent." [Ref.: Irwin, 1972, Loc. 21; Irwin and Galanis, 1976, Loc. 88]

Locality No. 212; Field No. I-56-80

Location: long 122° 55.90', lat 40° 30.90'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 52; Blome and Irwin, 1983, Loc. 30)

Locality No. 213; Field No. I-57-80 (USGS MR 1732)

Location: long 122° 55.40', lat 40° 30.86'

Chert collected by W.P. Irwin

Fossils and age: Radiolarians identified by C.D. Blome as Late Triassic or Early Jurassic in age. [Refs.: Irwin and others, 1982, Loc. 53; Blome and Irwin, 1983, Loc. 31].

Locality No. 214; Field No. I-69-80 (USGS MR 1746)

Location: long 122° 54.30', lat 40° 29.80'

Chert collected by W.P. Irwin

Fossils and age: Sample examined by C.D. Blome contains unidentifiable spumellarian and nassellarian radiolarians of Mesozoic age. [Refs.: Irwin and others, 1982, Loc. 54; Blome and Irwin, 1983, Loc. 32]

Locality No. 215; Field No. I-15-81

Location: long 122° 53.90', lat 40° 29.05'

Chert collected by W.P. Irwin

Fossils and age: The following radiolarians were identified by C.D. Blome as late Carnian to late middle Norian in age:

Capnodoce anapetes DeWever

Capnodoce sp.

Capnuchosphaera colemani Blome

Capnuchosphaera sp.

Loffa sp.

Sarla sp.

[Refs: Irwin and others, 1982, Loc. 56; Blome and Irwin, 1983, Loc. 34]

Locality No. 216; Field No. I-16-81
Location: long 122° 53.60', lat 40° 29.23'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Mesozoic age (Irwin and others, 1982, Loc. 55; Blome and Irwin, 1983, Loc. 33)

Locality No. 217; Field No. I-55-80
Location: long 122° 54.70', lat 40° 28.68'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Late Triassic age (Irwin and others, 1982, Loc 57; Blome and Irwin, 1983, Loc. 35)

Locality No. 218; Field No. I-58-80
Location: long 122° 53.52', lat 40° 28.44'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Permian age (Irwin and others, 1982, Loc. 58; Blome and Irwin, 1983, Loc 36)

Locality No. 219; Field No. I-66-80
Location: long 122° 53.46', lat 40° 28.38'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Permian(?) age (Irwin and others, 1982, Loc. 59; Blome and Irwin, 1983, Loc. 37)

Locality No. 220; Field No. I-59-80
Location: long 122° 53.55', lat 40° 27.57'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Paleozoic(?) age (Irwin and others, 1982, Loc. 60; Blome and Irwin, 1983, Loc. 38)

Locality No. 221; Field No. I-60-80
Location: long 122° 53.55', lat 40° 27.50'
Chert collected by W.P. Irwin
Fossils and age: Radiolarians of Permian(?) age (Irwin and others, 1982, Loc. 61; Blome and Irwin, 1983, Loc. 39)

Locality No. 222; Chert collected at five closely-spaced sites by W.P. Irwin
Field No. I-14-81, long 122° 54.44', lat 40° 26.80'; Mesozoic
Field No. I-10-81, long 122° 53.23', lat 40° 26.72'; Early Jurassic (Sinemurian or Pliensbachian) in age
Field No. I-9-81, long 122° 54.12', lat 40° 26.72'; Early Jurassic (Sinemurian or Pliensbachian)
Field No. I-8-81 (USGS MR 2520); long 122° 54.10', lat 40° 26.72'; sample contains the following radiolarians identified by C.D. Blome as Early Jurassic (late Sinemurian/early Pliensbachian) in age:

Bagotum sp. aff. *B. modestum* Pessagno and Whalen

Canoptum dixonii Pessagno and Whalen

Canutus giganteus Pessagno and Whalen

Napora sp.

Trullus elkhornensis Pessagno and Blome

Field No. I-12-81 (USGS MR 2522); long 122° 54.40', lat 40° 26.82'; contains the following radiolarians identified by C.D. Blome as Early Jurassic (Sinemurian/Pliensbachian) in age:

Canoptum sp.

Canutus rockfishensis Pessagno and Whalen

Droltus (?) *laseekensis* Pessagno and Whalen

Droltus sp.

?*Turanta* sp.

[Refs: Irwin and others, 1982, Loc. 62; Blome and Irwin, 1983, Loc. 40]

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