

Meeker and Loyd Sandstone Members of the Mancos Shale Moffat and Rio Blanco Counties, Colorado

By JOHN R. DYNI *and* HENRY L. CULLINS

CONTRIBUTIONS TO STRATIGRAPHY

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CONTRIBUTIONS TO STRATIGRAPHY

MEEKER AND LOYD SANDSTONE MEMBERS OF THE MANCOS SHALE, MOFFAT AND RIO BLANCO COUNTIES, COLORADO

By JOHN R. DYNI and HENRY L. CULLINS

ABSTRACT

The Upper Cretaceous Meeker and Loyd Sandstone Members of the Mancos Shale are distinctive marine sandstone units in parts of Moffat and Rio Blanco Counties, Colo. No age-definitive fossils have been found in the Meeker Member. The Loyd Member is of early Montana age.

INTRODUCTION

Two distinctive units of marine sandstone of Late Cretaceous age in the upper part of the Mancos Shale crop out from the southeastern part of Axial Basin southwestward to near Meeker in Moffat and Rio Blanco Counties, Colo. (fig. 1). Konishi (1959) recently named these units the Meeker and Loyd Sandstone Members of the Mancos Shale. In this paper, the type locality of the Meeker Sandstone Member is established; and data on the fossil content, age, and distribution of the two members are presented.

MEEKER SANDSTONE MEMBER

The term "Meeker Sandstone" has been used informally for years by petroleum geologists for a sandstone that forms a prominent escarpment about 1,600 to 1,900 feet below the top of the Mancos Shale near Meeker, Colo. The term was first used by Hancock and Eby (1930, p. 199) but not formally named. Konishi (1959, p. 67) defined the Meeker Sandstone Member; however, he did not designate a type locality. The sandstone forms a broad southward-facing escarpment where it crosses Colorado State Highway 13 about 4 miles northeast of Meeker. A section, designated herein as the type section of the Meeker Sandstone Member (fig. 2) was measured where the sandstone is particularly well exposed along the escarpment west of the highway in the SE $\frac{1}{4}$ sec. 6, T. 1 N., R. 93 W., sixth principal meridian. Here, the member is 180 feet thick and its top is about 1,850 feet below the top of the Mancos Shale. The member consists of sandstone which is

light to medium gray and light yellowish gray, very fine grained, calcareous, silty, shaly, and laminated to predominantly very thin bedded. The upper and lower boundaries of the Meeker are gradational with sandy shale above and below the member.

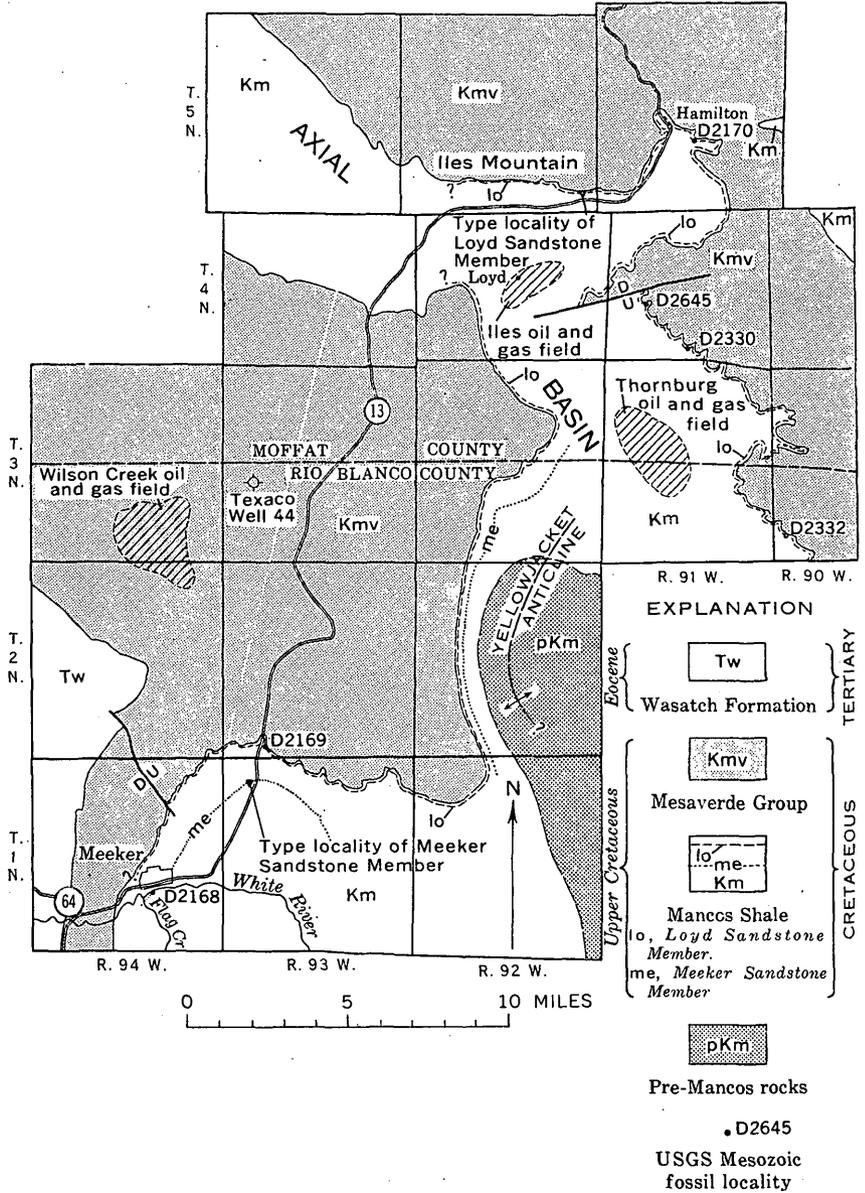


FIGURE 1.—Map showing approximate outcrops, type localities, and fossil localities of the Meeker and Loyd Sandstone Members of the Mancos Shale, Moffat and Rio Blanco Counties, Colo. Conventional symbols are used for contacts and faults.

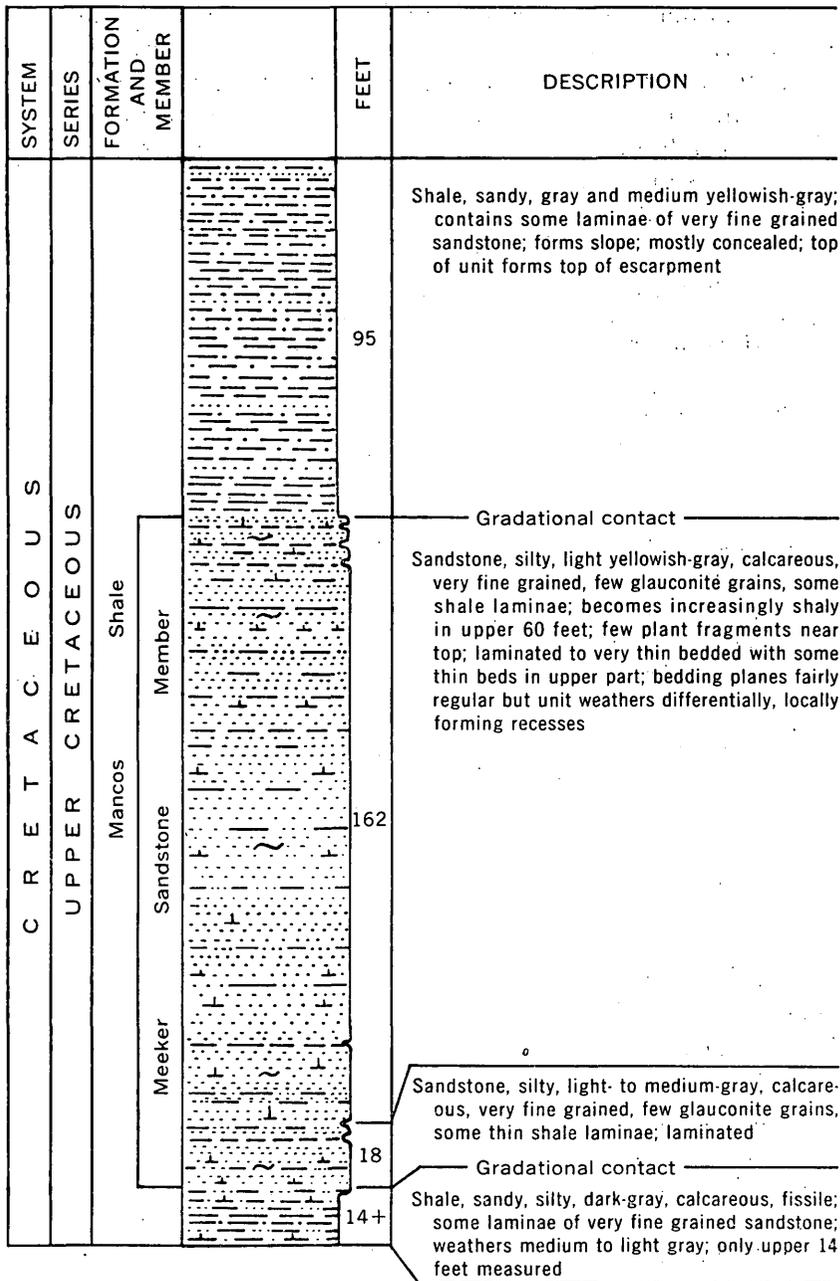


FIGURE 2.—Columnar section and description of the Meeker Sandstone Member at the type locality in the SE¼ sec. 6, T. 1 N., R. 93 W., Rio Blanco County, Colo. (Measured by J. R. Dyni and H. L. Cullins, May 1963.)

The sandstone in thin section is predominantly very fine grained but includes some silt-sized grains. It consists of an interlocking mosaic of quartz, calcite, cloudy feldspar, and chert grains cemented by secondary silica overgrowths on quartz grains, argillaceous material, and minor amounts of iron oxide and calcite. The approximate mineralogical composition by the point-count method (five thin sections, about 1,000 points per section) is as follows:

	Range (percent)		Range (percent)
Quartz (including over-		Chert.....	4-9
growths).....	49-54	Argillaceous material.....	9-15
Calcite (including cement).....	18-27	Iron oxide.....	1-3
Feldspar.....	5-8		

Minor accessories include biotite, chlorite, glauconite, collophane, tourmaline, zircon, and apatite.

Megafossils are not common; only a few fragments of *Inoceramus* sp., worm? burrow and trails, and an arthropod track were found in the Meeker Sandstone Member at the type locality and elsewhere along the outcrop. A nondiagnostic pelecypod, *Inoceramus* aff. *I. balticus* Boehm, was collected by Zapp and Cobban (written commun., Jan. 25, 1960) in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 27, T. 1 N., R. 94 W., near Meeker (USGS Mesozoic loc. D2168, fig. 1). Konishi (1959, p. 67) found foraminiferal tests. To date no age-definitive megafossils have been found in the Meeker. The member, however, may be correlative with the "sandy zone," a unit of probable early Montana age in the upper third of the Mancos Shale in western Colorado (Katich, 1959, p. 27 and fig. 1).

The Meeker Sandstone Member crops out from Flag Creek about half a mile southwest of Meeker northeastward to the type locality, thence southeastward to about the center of sec. 15, T. 1 N., R. 93 W., where it is concealed by terrace gravel deposits. North of the gravel deposits, the member forms a ridge along the steeply dipping west flank of the Yellowjacket anticline from the northern part of T. 1 N., R. 92 W., to sec. 14, T. 3 N., R. 92 W., near the Thornburg oil and gas field where it lenses out in the Mancos Shale.

The member is recognizable on electric logs of wells in the Wilson Creek oil and gas field about 10 miles north of Meeker. It is about 130 feet thick in the Texaco well 44 near the Wilson Creek field in sec. 19, T. 3 N., R. 93 W.

LOYD SANDSTONE MEMBER

Hancock (1925, p. 12) noted a distinctive fossiliferous greenish-gray sandstone about 100 feet below the top of the Mancos Shale in the Axial and Monument Butte quadrangles. The same unit was noted

by Hancock and Eby (1930, p. 199) in the Meeker quadrangle. Konishi (1959, p. 69-70) recently named this unit the Loyd Sandstone Member of the Mancos Shale after Loyd, the field camp at the Iles oil and gas field in T. 4 N., R. 92 W. The type locality described by Konishi (1959) is on the south slope of Iles Mountain in sec. 36, T. 5 N., R. 92 W., Moffat County, about half a mile north of Colorado State Highway 13 and about 13 miles south and west of Craig. Here, the Loyd Sandstone Member is about 100 feet thick, and its top is about 60 feet below the top of the Mancos Shale. The member consists of greenish-gray massive very fine to fine-grained calcareous partly nodular (or concretionary) sandstone that locally contains many invertebrate marine fossils. Bedding is indistinct, and the sandstone commonly weathers into brown rounded lumplike masses. The characteristic green color of the member is due to an abundance of chloritic mica. The lower part of the member grades downward into sandy shale, but the top of the member forms a relatively sharp boundary with the overlying shale (Konishi, 1959, p. 69-70).

Fossils collected from the Loyd Sandstone Member comprise a varied invertebrate fauna. Collections at USGS Mesozoic localities D2169 and D2170 were made by A. D. Zapp and W. A. Cobban, 1959; collections at localities D2330, D2332, and D2645 were made by G. H. Horn and J. R. Dyni, 1959-60. Fossil localities are shown on figure 1, and all collections were identified by W. A. Cobban. These fossils are as follows:

Pelecypods:

- Aphrodina?* sp.
- Astarte* sp.
- Cymella montanensis* Henderson
- Ethmocardium whitei* Dall
- Goniomya americana* Meek and Hayden
- Inoceramus pertenuis* Meek and Hayden
- Laternula* sp.
- Ostrea russelli* Landes
- Pachymya?* cf. *P. aurandi* Henderson
- Pecten* (*Syncyclonema*) cf. *P. simplicius* Conrad
- Pteria* (*Oxytoma*) *nebrascana* (Evans and Shumard)
- Tellina equilateralis* Meek and Hayden

Gastropods:

- Anisomyon* sp.
- Gyrodes?* sp.
- Turritella* sp.

Cephalopods:

- Baculites gilberti* Cobban
- Placenticerus* sp.

Baculites gilberti is noteworthy, for it marks a baculite subzone within the Zone of *Baculites perplexus* Cobban of early Montana (Campanian) age (Cobban, 1962).

The Loyd Sandstone Member is readily identifiable in the field and is a useful marker unit in mapping. The member is present throughout most of the southeastern part of Axial Basin and southwestward into the Meeker area. The senior writer traced the member southeast of Axial Basin into about sec. 6, T. 2 N., R. 90 W. (unsurveyed). It seems to be absent at Pagoda in sec. 31, T. 5 N., R. 89 W., about 13 miles east of the type locality (Konishi, 1959, p. 70). However, about 17 miles east of the type locality, in the central part of Routt County, a sandstone that may be correlative with the Loyd Sandstone Member crops out about 200 feet below the top of the Mancos Shale. Here, the sandstone is light grayish tan, massive, and about 50 feet thick, according to Bass, Eby, and Campbell (1955, p. 152). Fossils collected from this sandstone in the center sec. 8, T. 6 N., R. 86 W., on the east flank of the Tow Creek anticline include *Baculites perplexus* Cobban, *Inoceramus* aff. *I. pertenuis* Meek and Hayden, and *Ostrea* sp. (USGS Mesozoic loc. D4011; W. A. Cobban, written commun., May 14, 1963). The westward extent of the Loyd is not known. In the Elk Springs 15-minute quadrangle about 40 miles west of the type locality, a sandstone containing *Baculites gilberti* and lithologically similar to the Loyd of the type locality is present near the top of the Mancos Shale in the W $\frac{1}{2}$ sec. 33, T. 4 N., R. 98 W. Mapping by the senior writer indicates that the sandstone in the Elk Springs quadrangle is not continuous with the Loyd Sandstone Member of the type locality, although the sandstones are similar in age and stratigraphic position (Zapp and Cobban, 1960, fig. 112.2, cols. 3 and 4).

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