Copies of Archived Correspondence Pertinent to the Decision to Classify the Exposure at Point of Rocks, Morton County, Kansas, as Jurassic by the Kansas Geological Survey in 1967

Robert S. Sawin
Stratigraphic Research Section
Kansas Geological Survey

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Copies of memoranda related to the decision by the Kansas Geological Survey (KGS) Committee on Stratigraphic Nomenclature in 1967 to classify the rocks exposed at Point of Rocks, Morton County, Kansas, as Jurassic are held in the KGS archives in Lawrence, Kansas. The purpose of this report is to make these files more readily citable and to explain their significance as they relate to decisions that were made about the classification of the exposure at Point of Rocks leading up to publication of *The Stratigraphic Succession in Kansas* (Zeller, 1968) by the KGS.

In 1968, the KGS published *The Stratigraphic Succession in Kansas* (Zeller, 1968), which remains the accepted stratigraphic guide and chart for Kansas. The publication brought together for the first time the nomenclature, description of geologic units, and a graphic presentation on one chart (Plate 1) of the classification of rocks in Kansas.

The discussion printed in Zeller (1968) pertaining to the Jurassic classification is reproduced here:

JURASSIC SYSTEM

By Howard G. O'Connor

Deposits judged to be Jurassic in age (Fig. 9) occur in the subsurface in northwestern Kansas and crop out in a small area in southern Morton County. They consist primarily of varicolored shales and red sandstones and attain a maximum thickness of about 350 feet. In the subsurface they pinch out eastward along an irregular line extending from Morton County to Smith County and, in general, thicken toward the west. The Jurassic beds in southwestern Kansas, formerly classified as Triassic, Dockum (?) Group, have been restudied and are now designated as undifferentiated Jurassic (E. D. Gutentag, personal communication with H. G. O'Connor, 1966, 1967; see also Voegeli and Hershey, 1965).

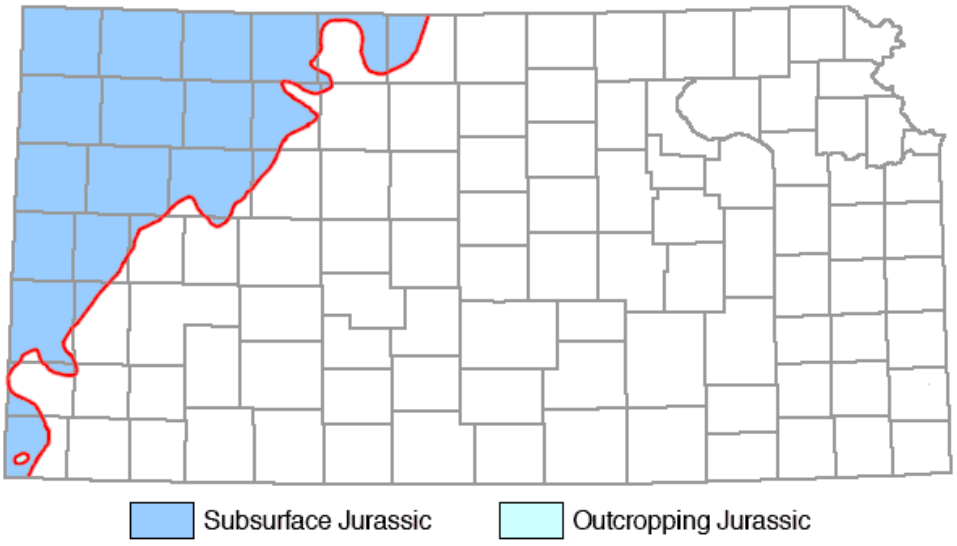

Figure 9—Distribution of Jurassic rocks in Kansas (modified from Moore et al., 1951).

Upper Jurassic Series

In Morton County undifferentiated beds of red siltstone and buff, green, and white sandstone that are believed to be equivalent in part to the Entrada Sandstone of Colorado underlie the Morrison Formation and overlie the Permian Big Basin Formation. The maximum exposed thickness is about 40 feet, but in the subsurface of Stanton and Hamilton counties, the thickness is about 250 feet (Gutentag, *ibid.*).

MORRISON FORMATION

The upper Morrison beds are chiefly green sandy shale containing limestone lenses. The lower shale beds contain pink chert, anhydrite, and gypsum. Where noted in wells, the Morrison Formation ranges in thickness from 100 to 350 feet (Merriam, 1963).

Five memoranda related to the reference "E. D. Gutentag, personal communication with H. G. O'Connor, 1966, 1967" are included herein as Appendix I. This correspondence explains the decision to classify the exposures at Point of Rocks as Jurassic and provides details concerning the personal communication between E. D. Gutentag and H. G. O'Connor in 1966 and 1967. Gutentag was with the U.S. Geological Survey and O'Connor was chairman of the Committee on Stratigraphic Nomenclature at the KGS. Chronologically, the memos are summarized as follows:

- 15 March 1966—Memo from Gutentag to O'Connor redesignating the rocks called Triassic (?) to "undifferentiated Jurassic."

- 29 September 1967—Memo from Gutentag to O'Connor outlining his arguments for designating the rocks "undifferentiated Jurassic" based on reinterpretation of test hole 8 (McLaughlin, 1942; Gutentag recognized the Day Creek Dolomite, the lower part of the Big Basin Formation, and the Permian-Jurassic contact in the test), subsurface correlations, and surface correlations by similar lithology.
- 20 October 1967—Memo from O'Connor to the KGS Committee on Stratigraphic Nomenclature File. Gutentag's changes were accepted by the committee for publication in Zeller (1968) because "Gutentag's knowledge and recommendation of the Mesozoic in Southwest Kansas is probably the best we have." It was noted in the memo that a publication with Gutentag's suggested changes that could be cited in Zeller (1968) would be preferable.
- 13 November 1967—Memo from O'Connor to Gutentag asking for a citable reference changing the Triassic (?) to undifferentiated Jurassic. Gutentag apparently had agreed to prepare a publication to explain the redesignation.
- 16 November 1967—Memo from Gutentag to O'Connor specifying authorship and a title for the requested paper but stating that the paper would not be finished before Zeller (1968) was published. The proposed paper was never published.

References

McLaughlin, T. G., 1942, Geology and ground-water resources of Morton County, Kansas: Kansas Geological Survey, Bulletin 40, 126 p.

Merriam, D. F., 1963, The geologic history of Kansas: Kansas Geological Survey, Bulletin 162, 317 p.

Moore, R. C., Frye, J. C., Jewett, J. M., Lee, W., and O'Connor, H. G., 1951, The Kansas rock column: Kansas Geological Survey, Bulletin 89, 132 p.

Voegeli, P. T., and Hershey, L. A., 1965, Geology and ground-water resources of Prowers county, Colorado: U.S. Geological Survey, Water-Supply Paper 1772, 97 p.

Zeller, D. E., ed., 1968, The stratigraphic succession in Kansas: Kansas Geological Survey, Bulletin 189, 81 p., 1 plate. http://www.kgs.ku.edu/Publications/Bulletins/189/index.html

APPENDIX 1

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : Mr. H. G. O'Connor

DATE: March 15, 1966

FROM : E. D. Gutentag

SUBJECT: Proposed changes to Kansas Rock Column

Enclosed is a copy of proposed changes to p. 21 and 29 of the present Kansas Rock Column. I don't know if this will fill the bill for the chages. However, we did get clearance from Thad McLaughlin to redesignate the Triassic units as Undifferentiated Jurassic.

Dave and I hope to have a small paper completed within a year to illustrate the designation.

Copy To: Phil Hulls
June 20, 66

Need to add to text:

1. Statement that Triassic(?) is being deleted, not present in Kansas as stated in previous summaries and other papers.

2. Statement citing source for change. -- ie Gutentage and Dave Myer if paper being prepared is far enough along -- otherwise personal communication.

The Kansas Rock Column

MESOZIC ROCKS

Deposits of Mesozoic age, comprising part of the geologic section of Kansas, belong mostly to the Cretaceous System. These rocks cover many thousand square miles in the western part of the State. Older Mesozoic rocks, probably represent the Jurassic System, are identified in well borings but are absent or are recognized very locally in surface exposures.

p. 29

JURASSIC SYSTEM

Deposits judged to be Jurassic age occur in the subsurface throughout the western one-fifth of Kansas and crop out in a small area in southern Morton County. They consist primarily of varicolored shales and tan to red sandstones and attain a maximum thickness of more than 325 feet. In the subsurface they pinch out eastward along an irregular line extending from Stevens County to Norton County and in general thicken toward the west. The Jurassic Morrison Formation is judged to comprise most of this interval in northwestern Kansas, whereas sandstones assigned to the Undifferentiated Jurassic are predominant in southwestern Kansas.

Morrison Formation.--Shales correlated with the Morrison Formation of the Jurassic System have been penetrated by drilling in northwestern Kansas. The shales are predominantly green in color and are characterized by pink jasper-like chert and pink gypsum. Where noted in wells, these shales range in thickness from 100 to 275 feet.

Undifferentiated Jurassic

Continental deposits of middle Mesozoic age, identified on the basis of vertebrate, intervertebrate, and plant remains, are widespread in western Oklahoma, northeastern New Mexico, and in southeastern Colorado. Certain outcrops in the panhandle of Oklahoma and southwestern Kansas, which possess similar lithology, are judged to be equivalent ot the Jurassic rocks farther west. Inasmuch as comparable rocks in New Mexico are Jurassic in age, this designation is employed in southwestern Kansas. These units are probably equivalent to the Entrada Sandstone, middle unit of Jurassic age and Morrison Formation as used in Prowers County, Colorado (Voegeli and Hershey 1965). Red siltstone, buff, green, and white sandstone are exposed in Morton County. Maximum exposed thickness is about 40 feet but in the subsurface of Stanton and Hamilton Counties thicknesses of 250 feet are found.

Reference: Voegeli, P. T. and Hershey, L. A., 1965, Geology and groundwater resources of Prowers County, Colorado: U.S.Geological Survey Water-Supply Paper 1772, p. 1-97.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : H. C. O'Connor DATE: September 29, 1967

FROM : E. D. Gutentag

SUBJECT: Sandstone outcrop in Morton County, Kansas

In your discussion of the Dockum Group and the Undifferentiated Jurassic (from Bull. 189) the same sandstone outcrop in Morton County is mentioned for both formations.

As we view the problem the sandstone is of Jurassic Age for the following: 1) The gypsum and red shale described in the Triassic (?) redbeds (McLaughlin, Bull. 40 p. 70) at Point of Rocks (test hole 8) is Permian in age. The gypsum is the Day Creek and the overlying red shales are the Big Basin Formation. Enclosed is a log of this test hole with the correlations we are using throughout the area. Also enclosed is a log of well 34-43-21cdd, located upstream from the outcrop, which exhibits similar lithology to that of the U.S.G.S. test hole. In test hole 8 the sandstone consists of 19 feet of tan to buff fine-grained sandstone. The sandstone in well 34-43-21cdd consists of 17 feet of buff fine to medium grained sandstone. The sandstone section is thin in the Cimarron valley because of erosion. Well 34-43-8dcaa is located on the upland surface west and slightly north of the outcrop. The beds are continuous with those in the valley and the Jurassic consists of 110 feet of mainly sandstone overlain with the Ogallala Fm. The kick of the Day Creek is a marker bed througout southwestern Kansas.

2) Subsurface data from gamma-ray logs and E-logs of oil and gas tests tie in with Merriam's cross-section (Oil and Gas Invest. 14, pl. 3). With additional data the Day Creek and Big Basin Formation as well as the Jurassic have been correlated across to the sandstone outcrop area in Morton County. Two Gamma-ray logs are enclosed which correlate in part with Log 7 on the Merriam cross-section. The only problem in the correlation of logs appears to be the selection of the Jurassic-Cretaceous contact. Regional continuity of the Jurassic is proven and the beds tie in with the cross-section from northern Kansas. The outcrop of so called Triassic correlates with the subsurface Jurassic througout this area.

Logs of wells 23-42-11dbbd and 23-39-14dbc in Hamilton and Kearny counties show the trend to a shale-siltstone interbedded sandstone facies of the Jurassic.

3) We discussed this problem with Thad McLaughlin and a field trip was arranged with the people in Kansas, Oklahoma and Colorado to check out the Mesozoic stratigraphy. Thad was unable to attend the trip and he sent J.H.Irwin (Oklahoma Dist.) who is experienced with the Triassic-Jurassic to lead the trip.

We viewed the outcrops in New Mexico, Oklahoma, and Morton County. Irwin considered the Point of Rocks section stratigraphically lower in the section than the Morrison Fm. exposed near Guymon, Oklahoma. The Point of Rocks section is probably Entrada and Summerville equivalent and in lieu of extensive research could be called Undifferentiated Jurassic.

In summary all data, surface correlation by similar lithology, and subsurface correlation indicate that a Jurassic Age for the sandstone outcrop is warranted.

E. D. Gutentag

The University of Kansas

STATE GEOLOGICAL SURVEY

LAWRENCE, KANSAS
66044

Phone (913) 864-3101

FRANK C. FOLEY
State Geologist and Director

WILLIAM W. HAMBLETON
Assoc. State Geologist and Assoc. Director

MEMO TO: Committee on Stratigraphic Nomenclature File

FROM: H.G. O'Connor

DATE: October 20, 1967

SUBJECT: Mesozoic Nomenclature Changes

Edwin D. Gutentag was asked in the Spring of 1966 to comment on the descriptions and classification of Triassic and Jurassic rocks as described in Kansas Geological Survey Bull. 89 and suggest any improvements or changes needed in the revision being prepared (for Bull. 189).

Two pieces of correspondence (dated Mar. 16, 1966 and Sept. 29, 1967) expressed his thoughts concerning needed changes. Gutentag's principal suggestion for change includes redesignating the rocks called "Triassic (?)" in Bull. 89 to "undifferentated Jurrasic."

These recommendations were considered by the CSN (Foley, Zeller, Goebel, and O'Connor) on Oct. 11 in the R.C. Moore Conference Room with agreement that Gutentag's knowledge and recommendations of the Mesozoic in Southwest Kansas is probably the best we have. Dr. Foley asked that Dan Merriam also express his views before any final decision to drop Triassic (?) is adopted.

Merriam read the correspondence and had no objections to Gutentag's suggested changes other than to say this made our new state map wrong and that it would be preferable to have had Gutentag publish the suggested change so we could cite a publication for the change.

There being no objection to the suggested changes Dr. Foley requested the action of the CSN be written into its minutes and the recommended changes be adopted and included in Bull. 189 with changes credited to E.D. Gutentag.

Cpy for O'Connor

E. D. Gutentag, Garden City, Kansas November 13, 1967

H. G. O'Connor, Lawrence, Kansas

Title of Triassic - Jurassic redesignation paper in preparation

Would you give me a statement including author (s), title, etc for the paper you (or you and Dave) are preparing to indicate the redesignation of Triassic (?) rocks to undifferentiated Jurassic. I would like the statement to be in bibliographic form so that it could be included in the Bull. 189 references.

If you want to publish this in our Kansas report of studies series it's possible it could be cited as "in press" if you get the paper in to Doris Zeller by the end of December. Citation of a paper "in press" would be preferable to a citation of "personal communication."

Howard G. O'Connor

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : H. G. O'Connor DATE: Nov. 16, 1967

FROM : E. D. Gutentag

SUBJECT: Paper on Triassic - Jurassic redesignation

Because of prior commitments we will not be able to get a paper to Doris Zeller by the end of December.

We were planning to work on this paper on our own so that we can devote our regular time to working two reports for the map series. These reports are late so they have top priority.

We do have the following title for the paper:

> Gutentag, E. D. and Lobmeyer, D. H., in preparation, Correlation of Pre-Cretaceous Mesozoic Rocks in Southwestern Kansas.

In Jamuary we will have a meeting with members of the Oklahoma WRD who are working on a similar problem of correlation of Pre-Cretaceous rocks.

E. D. Gutentag

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