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Annals of the Carnegie Museum.

[Pittsburgh] :Published by authority of the Board of Trustees of the Carnegie Institute, 1901-

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Article/Chapter Title: Geographic designation of the members of the Chadron Formation in South Dakota

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ART. 11. GEOGRAPHIC DESIGNATION OF THE MEMBERS OF THE CHADRON FORMATION IN SOUTH DAKOTA

By JOHN CLARK
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In 1937, I recognized three members of the Chadron formation of South Dakota* which were locally identifiable by their lithology. At the time, it seemed inadvisable to give these members geographic names, because they were recognizable only locally. The designations A, B and C and 1, 2 and 3 had already been used for purely faunal subdivisions known to be invalid, so I used the names Lower Member, Middle Member, and Upper Member. Work on lower Oligocene sediments in other localities has necessitated occasional references to these members and confusion has arisen as to whether, for instance, the expression "older Chadronian" means "coeval with the Lower Member of Clark 1937" or simply "older part of the early Oligocene." Personally, I do not approve of geographic names for thin, local members of formations, but the overwhelming majority of vertebrate paleontologists favor geographic names in this case. I, therefore, wish, at this time, to designate a standard section for the Chadron formation in South Dakota with geographic names for its members.

The standard section for the Chadron formation in the Big Badlands is the south fork of Indian Creek, Pennington County, from Sec. 34, T.3S., R.12E. to Sec. 10, T.4S., R.12E. The member formerly designated as the Lower Member shall be called the Ahearn member, from the name of a ranch formerly at the mouth of the south fork of Indian Creek. The member formerly known as the Middle Member shall be called the Crazy Johnson member. The member formerly known as the Upper Member shall be called the Peanut Peak member.

These last two names are the alternative local names given to the prominent butte in the southern part of Sec. 10, T.4S., R.12E., which is called both "Crazy Johnson Butte" and "Peanut Peak", referring to attempts by a man named Johnson to raise peanuts on top of it. The standard section for these two members is the north face of this butte, illustrated in Plate XXI, upper figure, of the Annals of the Carnegie Museum, v. 25, art. 21, referred to above.

It is obvious that more widely used geographic names would be preferable to these. However, the three members are all fossiliferous and are most characteristically developed at this locality, and no other geographic names are available here. It seems advisable, therefore, to let geologic practicability override euphony and lexicographic elegance in this case.

In the original definition of the three members, the Ahearn (Lower) member was described as characteristically including red sediments. It was assumed that all of these reds were inherited, either from a lateritic soil on the uplands or from the Spearfish and Opeche formations of the Black Hills.

*J. Clark. The stratigraphy and paleontology of the Chadron formation in the Big Badlands of South Dakota. Annals of the Carnegie Museum, 1937, v. 25, art. 21, p. 261-350.



Careful restudy has confirmed the presence of inherited reds in clay pebbles and small laminae interbedded with greenish sediments. However, small hematite concretions also occur, with ramifying extensions which could not have undergone transportation. Also, in some cases a red-stained zone of hematite concentration surrounds bone inclosed in even-grained, otherwise green sandstone. It is evident, therefore, that both inherited and epigenetic reds occur within the Ahearn member. The diagenetic nature of the red-orange color in the Peanut Peak and Crazy Johnson members has been further confirmed by recent field studies; it is apparent that three different types of red beds are represented in the Chadron of South Dakota.

In the original paper, bentonitic material was not reported for the western-derived Chadron sediments (p. 284). It was first detected by Ray Alf, now of Webb College, California, who wrote an unpublished paper on the subject. I have since confirmed Mr. Alf's observation. All three members contain ash, which differs from the ash of the overlying Brule in being completely bentonitic, while the Brule ash consists partly of fresh shards.

Additional information and interpretation will be presented in a forthcoming paper on the faunas of the three members.