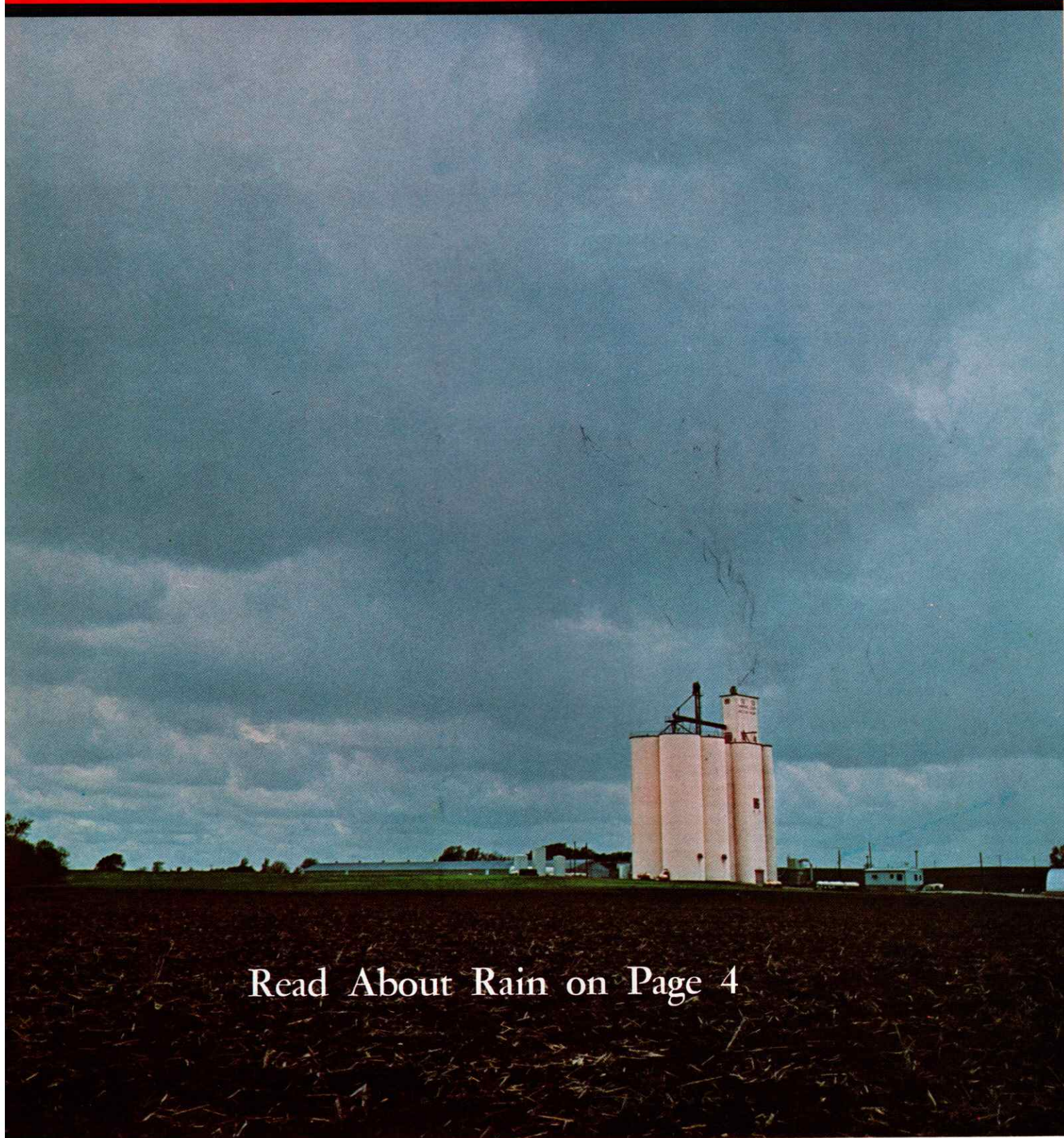


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# Collecting Nebraska's Colorful Agates

By Roger K. Pabian

The inexperienced gemstone collector may sometimes think of Nebraska as being a place Mother Nature forgot. Mother Nature, however, may be enjoying a little chuckle at the many gem collectors who drive right through Nebraska on their way to more exotic gem fields.

Nebraska has, in truth, much to offer the prospective gem collector, and many of Nebraska's rural residents have found gem collecting to be an excellent means of recreation. There are 21 gem and mineral clubs in Nebraska, many in the small, rural communities. Members include numerous farmers and ranchers who have become keenly aware of the interesting rocks on their properties.

Agate is the most common gemstone found in Nebraska, having been reported in 91 of 93 counties. Current collections represent all but Hayes and Frontier.

In 1967, Nebraska's centennial year, the Nebraska Legislature designated Blue Agate as the State gemstone. This material occurs in place in both Dawes and Sioux Counties. It is found in rocks that geologists classify as the Chadron Formation of Oligocene (Tertiary) age.

These rocks are about 30 million years old and are confined chiefly to the Panhandle of Nebraska. They consist mainly of sandstones, siltstones, and claystones; but in some places, these coarse rock types are punctuated with nodules of bluish, greasy-appearing material that the gem collector recognizes immediately as agate.

Agate is fairly hard (7 on a scale of 10), which is of great assistance to the prospector. Wind, rain, and snow erode the softer rocks enclos-

ing the agates, so that the prairie north of Crawford or Chadron is covered with residual agate nodules. This rock is often called chalcedony, a term designating colors of low intensity in agate, such as gray, light blue, or light yellow. It commonly is translucent to transparent.

Hard rocks are cut with a diamond saw, a metal blade impregnated with diamond dust and operated in a bath of mineral oil coolant to prevent the metal from melting. A slice or two from the heel of some agate nodules from the northwest panhandle may reveal a bland, grayish interior or a deep blue. Sometimes brilliant red or yellow interiors are encountered. These agates rival the finest material available from northern Mexico, where the choicest agates in the world are reputed to be found.

Blue Agate is unique in that it is formed in place right in Nebraska. Another type of agate found in the northwest Panhandle is called the "Fairburn" or Fortification Agate—the former name being for Fairburn, South Dakota, from which

the first agates of this type were collected. These agates were formed in rocks of Pennsylvanian Age (about 300 million years ago) in Wyoming and South Dakota. The Oligocene deposits of Nebraska contain the gravels of ancient, sluggish streams that originated in these states. Gravels deposited by these streams contain Fairburn Agates.

Because they are rather rare compared to Blue Agates, a day's collecting may yield only one or two specimens. Yet their beautiful colors and striking patterns are so exquisite that a single specimen may be worth several days collecting time to the avid agate fancier. Fairburn Agates can be found in the gravels covering much of the prairie about 20 miles north of Crawford.

In addition to Fairburn Agates, the Oligocene gravels north of Crawford contain a rock called Prairie Agate. The 1967 Nebraska Legislature selected Prairie Agate to be the state rock. However, Prairie Agates are not agates by any stretch of the imagination. Though they may be colorfully

Right, Fairburn Agate and "Blue" Chalcedony, Chadron Formation, Crawford area. Below, moss agates from Platte River gravels.



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layered, they do not possess any of the striking features of agate. To the geologist, these stones would be properly called chert. It is chemically the same as agate ( $\text{SiO}_2$ , silicon dioxide) but agate has a crystalline microstructure whereas chert does not.

Not all good agate is found in the northwest Panhandle. Some excellent specimens of moss agate, banded agate, and agatized wood have been found in Deuel County, near Chappell, and in Keith County, near Ogallala. This material may also be found on gravel bars in the channel of the present day Platte River. The Platte River has eroded into deposits of ancient rivers originating in the west, reworking these deposits in the process. The agates are found in both the ancient deposits and in the ter-

aces and gravel bars of the Platte River. The source of such gravel was the Front Range of Colorado and other deposits in Wyoming, Colorado, and western Nebraska.

Much of the agatized wood may have originated in Cretaceous time (about 100 million years ago) in forests that flourished in Colorado. Wood becomes agatized when porous areas are infiltrated with waters that are saturated with  $\text{SiO}_2$ . The silica is deposited in the wood as agate. Some agatized wood is very colorful. The grain or other interesting structures of the wood may be preserved and areas of deep red, orange, yellow, white, or black may often be intermingled with transparent areas to produce very striking color combinations, patterns, or contrasts. Although rounds (full limb sec-

tions) of Nebraska woods are not as common as they are in the Petrified Forest of Arizona, Nebraska's petrified woods are every bit as colorful.

Agate of one type or another can be found along just about every major drainageway of Nebraska, fine specimens having been collected in the valleys of the Republican, Loup, Calamus, Elkhorn, and Niobrara Rivers.

A third source of Nebraska's agates was the Canadian Shield, about 550 miles to the north. What may well be the oldest agate in the world (Precambrian age, about one billion years ago) formed in lava flows in what is now part of the north woods. These agates were transported here by glaciers during the Ice Age, of Pleistocene time (one-half million to a million years ago). Collectors commonly call these agates Lake Superior or Lakers, the name being derived from the Lake Superior Till, a glacial deposit in Minnesota, rather than from the water body of the same name.

Lake Superior Agates can be found in the eastern part of Nebraska and many fine specimens have been retrieved from road cuts, fields, and gravel bars in streams from Crofton to Falls City and as far west as Columbus. An excavation near 28th and Dodge Street in downtown Omaha has even yielded a Lake Superior Agate. Most Lake Superior Agates are highly colored and have striking patterns. Although generally an inch or less in diameter, specimens as heavy as 4 pounds have been found.

As a resource, Nebraska's agates are always valuable for the recreational outlet they provide collectors. However, fine pieces of jewelry made from Nebraska agates also bring great pleasure to the people who own and wear them. It is doubtful that any Nebraska agates occur in quantities that could be called commercial. Their chief value may well lie in the fact that an agate or piece of petrified wood often becomes the switch that turns on the inquiring young mind. □



Above, Lake Superior Agates from southeastern Nebraska. Below, petrified woods from Platte River gravels in Deuel County.

