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Conservation of Geologic Features in Iowa

C. S. GWYNNE¹

Abstract. It is suggested that attention be given to the following geologic features as possible subjects for recognition or preservation or protection: glacial erratics unique for size, shape, or composition; type sections or localities in the bedrock; falls; springs; fossil or geode collecting areas; areas of natural outcrops of all bedrock formations of the state.

Geological features obviously are everywhere — not only in Iowa, but all over the face of the globe. The questions arise: Which are those in Iowa that are unique in one way or another, and in danger of being destroyed or badly marred? Which should be considered for recognition or for preservation by state or by private ownership?

Let us look briefly at the geology of the state. This may be considered in three broad categories: the bedrock, the mantle or regolith, and the topography. The bedrock, except for a small area in the northwestern corner of the state, is entirely sedimentary. Above the bedrock is a blanket of soil and subsoil, the mantle, mantle rock or regolith, up to 600 feet thick in some places, averaging perhaps 200 feet. This is mostly glacial drift. In places, there are loess and alluvium. In some localities, there is even a residual subsoil, formed by the weathering of the bedrock right at the place where it is found.

As regards topography, the glacial drift, as first deposited, had a characteristic topography. In the area of younger drift, this is rather well preserved, at least over most of the drift plain. In the area of older drift, running water combined with weathering has destroyed these original topographic features and produced features of its own: valleys, cliffs, bluffs, terraces, floodplains, oxbow lake basins, and so on. Post-glacial running water is responsible for the development of similar features in the area of younger drift. The wind, also, has been responsible for the development of topographic features in a few places.

Some of these features of the bedrock, mantle, and topography are in a sense incapable of destruction. The bedrock is always going to be with us, however much we may blast into it and burrow into it with quarries. The preservation of areas of natural outcrop of bedrock, however, may be a desideratum, and of course there are many such in state parks, particularly in the northeast corner of the state. It might be well, however, to consider the extension of state, or even county, lands into areas of good outcrop of formations not now represented in the parks. Several of these come to mind. The Fort Dodge gypsum

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is one. Then there are excellent outcrops of the Shell Rock and Lime Creek formations along the Winnebago River in Cerro Gordo and Floyd counties. How well is the thick Pennsylvanian section represented in preserved areas? Not very well, if the channel sandstones of Wildcat Den, Ledges, and Dolliver are left out. So I would conclude that it would be well to check the geologic column with state parks to see if areas can be suggested for conservation that would include formations not now represented.

It might be well to include worked-out quarries, shale pits, and strip coal mines, which are valuable, to geologists, at least, for their exposures of bedrock not so easily available in natural outcrops. Beautiful glaciated surfaces are often uncovered in quarry operations. Their usual fate is to be destroyed in the course of quarry operations. It may not be exactly a matter of conservation, but it would be highly educational to have places where stripped-off glaciated surfaces are available.

There is also the matter, in connection with consideration of the bedrock, of the recognition, at least, of areas of the type sections of the geologic column. Many of the geologic formations of the state are named from Iowa localities where they were first studied by early geologists. If these type sections can be pin-pointed, consideration might be given to recognizing them in some way, perhaps preserving some of the best known.

There are many famous fossil-collecting localities in the state. The same thing might be said of geode collecting. Of course, if collecting continues in such areas, the supply of desirable items diminishes, so there is no conservation. It would hardly be desirable, however, to set areas aside and then ban collecting. It might be better to arrange for areas where the future collectors might collect, and depend upon weathering and erosion to bring further items to light.

Caves are present in the limestone formations of the eastern part of the state. A few of these are commercialized. One prominent spelunker is said to have stated that there were over 100 caves in Iowa. However that may be, if there are any of any size, some might well be given protection before they are robbed of their stalactites and stalagmites.

The glacial drift covers most of the state. There would be no object, obviously, in trying to set aside or conserve a locality showing a good section in the drift. Reason? Time would take its toll, and because of its incoherent nature, the material would rather soon slump down, be covered with vegetation, and so on. Let us leave it to the streams of the state in the years to come to undercut the valley sides and occasionally provide us with fresh outcrops of the glacial drift. They are bound to be

relatively fleeting in any case. Or we may depend upon quarry operators and road builders to help in this regard.

Some of the glacial erratics of the drift are another matter, the large granitic boulders of the Iowan serving as an example. These are unique because of their very size. The Boulder Church in Waterloo, built in 1891 to house the congregation of the First Presbyterian Church and now used by the Salvation Army, was constructed from the broken rock of a single gigantic granite boulder found on a nearby farm. The boulder was 30 feet long, 20 feet wide, and 27 feet high, and weighed over 2,500 tons.

The usual fate of these gigantic boulders has been to be destroyed in the course of agricultural operations, but there are a few still around — one in the park in Nora Springs, and another on a county road west of Cedar Falls. Another outstanding specimen is Pilot Rock located about 3 miles south of Cherokee (SE $\frac{1}{4}$ Sec. 15, T9N, R40W). No doubt there are others. In any case, it would be well at least to survey the situation with regard to these.

There is another feature of the erratics worth considering, and that is the uniqueness of some of them. The large one at the southeast corner of the Science Building on the Iowa State University campus is an example of this. This boulder is not only striking in appearance, but is truly extraordinary in the number of geological features exhibited. Boulders having attention-arresting features often end up in city parks or farm yards and this, too, is all to the good, for such boulders are often unique geologically in one way or another. I recall a large block of pre-Cambrian conglomerate on a street corner in the business section of Mason City. More attention might well be given to guarding such treasures. In this connection, we are fortunate in having so many fine buildings in our state parks constructed of glacial erratics.

The "walls" of our northern Iowa lakes are glacial erratics. Fortunately some of these walls in state parks have been preserved. It would be well if all such walls could be preserved, just as a matter of protection of the lake shores, if for no other reason.

As far as loess, aeolian sand, alluvium, and residual mantle rock are concerned, we are well off. There are plenty of these materials, and nature will take care of keeping them exposed in places.

Turning now to topographic features, the broader ones like ground moraine, swells and swales, terminal moraine, flood plains, and so on, are going to be with us more or less undisturbed, except that agriculture or housing developments will

extend over them. Some of the floodplains and terraces will be covered by reservoir waters. Fortunately, we have in Pilot Knob State Park a high point on an end moraine, from which an extended view may be had of the unmodified drift plain of the vicinity. Valleys, large and small, will continue to be everywhere and to grow. Some valleys, however, are unique — particularly for their bedrock — as is the case in many of the state parks where the bedrock outcrops. There probably are more valleys that might well be given protection because of their fine bedrock outcrops. This is true particularly in the Ames area.

Cliffs, a feature of valleys cut in the bedrock, are numerous in northeastern Iowa and in the parks of that area. There is no need to be concerned about them. Maquoketa Caves State Park has a fine natural bridge. A natural bridge of stone is such a unique feature that, if there are others, their preservation might be considered.

There are falls in Iowa, but I recall none in any of the state parks that amounts to much. What falls there are in the state are similar in character to Niagara; that is, they are places where the streams flow over a bed of resistant rock overlying an easily eroded bed. The falls at Cedar Falls, Iowa Falls, and other places have been so masked by power developments that they are unrecognizable as natural geological features. A recent article in the *Iowa Conservationist** has called attention to the existence of some fine falls over the bluffs along the Mississippi River near Clayton, probably better than anything in our state parks. At least they are spectacular when frozen. Presumably, these falls are unknown to most people. One or two good falls, particularly where the flow volume is fairly stable, might be worth considering as sites for preservation rather than of power development.

Then there is the matter of springs. Sievers, Twin, and Dunnings Springs at Decorah, and Big Spring, located a few miles northwest of Elkader, are outstanding. Some in White Pine Hollow Forest Preserve Area have a good flow. There must be others and the acquisition of a few more in addition to those already owned by state or counties would seem in order. Springs are an education in themselves in the matter of the source and movement of subsurface water.

And that brings us to one big geologic feature, widespread, the water. It is to be hoped that conservation measures will help to keep our streams flowing and our supplies of subsurface water replenished.

* Frozen beauty in Iowa's winter wonderland: M. K. Johnson, *Iowa Conservationist*,