NPS Form 10-900
(January 1992)
Wisconsin Word Processing Format (Approved 1/92)

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United States Department of Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900A). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Point of Rocks
other names/site number

2. Location

street & number	US Highway 12 approximately 0.85 miles north of Ski Hi Road and 0.25 miles south of Wisconsin Highway 159						N/A	**not for publication**	
city or town	Town of Baraboo						X	**vicinity**	
state	Wisconsin	**code**	WI	**county**	Sauk	**code**	111	**zip code**	53913

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets _ does not meet the National Register criteria. I recommend that this property be considered significant X nationally _ statewide _ locally. (_ See continuation sheet for additional comments.)

Signature of certifying official/Title — Date 4/22/10

State Historic Preservation Officer - Wisconsin

State or Federal agency and bureau

In my opinion, the property _ meets _ does not meet the National Register criteria.
(_ See continuation sheet for additional comments.)

Signature of commenting official/Title — Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:
✓ entered in the National Register.
___ See continuation sheet.
__ determined eligible for the National Register.
___ See continuation sheet.
__ determined not eligible for the National Register.
___ See continuation sheet.
__ removed from the National Register.
__ other, (explain:)

for Erika K Martin Seibert — Signature of the Keeper
6/11/10 — Date of Action

5. Classification

Ownership of Property
(check as many boxes as as apply)
x private
public-local
x public-State
public-Federal

Category of Property
(Check only one box)
building(s)
district
structure
x site
object

Number of Resources within Property
(Do not include previously listed resources in the count)

contributing	noncontributing	
		buildings
I		sites
		structures
		objects
I	0	total

Name of related multiple property listing:
(Enter "N/A" if property not part of a multiple property listing.
N/A

Number of contributing resources is previously listed in the National Register
0

6. Function or Use

Historic Functions
(Enter categories from instructions)
LANDSCAPE/ natural feature

Current Functions
(Enter categories from instructions)
LANDSCAPE/ natural feature

7. Description

Architectural Classification
(Enter categories from instructions)
N/A

Materials
(Enter categories from instructions)
Foundation N/A
walls N/A
roof N/A
other N/A

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for the National Register listing.)

X A Property is associated with events that have made a significant contribution to the broad patterns of our history.

_ B Property is associated with the lives of persons significant in our past.

_ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

_ D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

_ A owned by a religious institution or used for religious purposes.

_ B removed from its original location.

_ C a birthplace or grave.

_ D a cemetery.

_ E a reconstructed building, object, or structure.

_ F a commemorative property.

_ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Education
Science

Period of Significance

1874-1960

Significant Dates

N/A

Significant Person
(Complete if Criterion B is marked)

N/A

Cultural Affiliation

N/A

Architect/Builder

N/A

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographic References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous Documentation on File (National Park Service):
- _ preliminary determination of individual listing (36 CFR 67) has been requested
- _ previously listed in the National Register
- _ previously determined eligible by the National Register
- _ designated a National Historic landmark
- _ recorded by Historic American Buildings Survey #___
- _ recorded by Historic American Engineering Record #

Primary location of additional data:
- X State Historic Preservation Office
- _ Other State Agency
- _ Federal Agency
- _ Local government
- _ University
- X Other

Name of repository:
University of Wisconsin – Madison
Department of Geological Sciences

10. Geographical Data

Acreage of Property 1 acre

UTM References (Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	16	2/7/5/3/6/0	4/8/1/2/3/6/0
2	16	2/7/5/3/2/0	4/8/1/2/4/5/4
3	16	2/7/5/3/6/4	4/8/1/2/4/8/0
4	16	2/7/5/4/0/4	4/8/1/2/3/7/5

☐ See Continuation Sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

name/title	Jennifer R. Harvey (H) and Robert H. Dott, Jr. (D)				
organization	(Harvey) Great Lakes Archaeological Research Center (Dott) University of Wisconsin-Madison, Geological Sciences			**date**	May 2009
street & number	(Harvey) 1408 N. 5th Street (Dott) 1215 West Dayton Street			**telephone**	(H) 414.481.2093 (D) 608.262.1856
city or town	(Harvey) Milwaukee (Dott) Madison	**state**	WI WI	**zip code**	53212 53706

Point of Rocks	Sauk County	Wisconsin
Name of Property	County and State	

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs Representative black and white photographs of the property.

Additional Items (Check with the SHPO or FPO for any additional items)

Property Owner

Complete this item at the request of SHPO or FPO.)

name/title	Frank Busalacci, Secretary				
organization	Wisconsin Department of Transportation			**date**	May 2009
street & number	4802 Sheboygan Avenue, PO Box 7999			**telephone**	608.266.1114
city or town	Madison	**state**	WI	**zip code**	53707-7999

name/title	Kuhnau Property, LLC				
organization				**date**	May 2009
street & number	707 Augusta Drive			**telephone**	
city or town	Waunakee	**state**	WI	**zip code**	53597

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects, (1024-0018), Washington, DC 20503.

Point of Rocks is an outcropping of well-exposed Baraboo Quartzite located on the east side of USH 12 approximately 0.25 miles south of STH 159 and southwest of the City of Baraboo in Sauk County, Wisconsin. The highway is two lanes wide with wide gravel shoulders and makes a sharp curve at the location of the rock formation. This section of Highway 12 is predominantly rural with some scattered buildings, fields and tree cover. The top and sides of the outcropping itself are surrounded by tree growth. The exposed Baraboo Quartzite at the Point of Rocks is part of the Baraboo Ranges, exhumed monadnocks of massive pink, maroon or purple colored metamorphosed quartz sandstone.[1] This rock unit is about 4,000 feet thick, rests stratigraphically on exposed acidic igneous rocks, and was deposited approximately 1.7 billion years ago during the Precambrian era.[2] At that time, rivers with poorly defined channels that changed rapidly and frequently as they deposited coarse sediments within the lower part of the quartzite. The upper portion of Baraboo Quartzite contains stratifications characteristic of sediments deposited by marine processes.[3] Wave ripples with sharp straight crests are widespread and features formed by reversing tidal currents are present in places. These features, along with the overlying marine black mudrock (now slate), dolomite, and banded iron formations, indicate that the sea gradually flooded the southern margin of embryonic North America during the late Precambrian era.[4]

The Baraboo Quartzite and associated Precambrian rocks form an elongate ring of hills known as the Baraboo Range in Columbia and Sauk Counties, Wisconsin. These hills were part of an ancient mountain chain, which may have risen 2000 to 3000 feet above the surrounding plain. A single large down fold, or syncline, underlies the eastern Baraboo Hills, with the two eroded limbs of this fold forming the "north" and "south" Baraboo Ranges. During folding, the rocks were also metamorphosed with the sandstones converted to quartzite and mudstone to slate.[5] The north range, or limb of the syncline, is nearly vertical whereas the south limb dips to the north at about 25 degrees.

Point of Rocks occurs along the southern limb of the Baraboo Range and contains several important geological features. In the pink quartzite on the south-facing cliff beside USH 12, stratification features reveal the processes of deposition of the original sand by shallow marine currents and waves with a subtle influence of tides. In the road cut itself, several layers of metamorphosed mudstone (slate) are

[1] R.H. Dott, Jr. and J.W. Attig, *Roadside Geology of Wisconsin* (Montana: Mountain Press Publishing Company, 2004), 191.
[2] I.W.D. Dalziel and R.H. Dott, Jr., "Geology of the Baraboo District." *Wisconsin Geological and Natural History Survey Information Circular No. 14* (Madison, Wisconsin: Geological and Natural History Survey, 1970), 3; L.G. Medaris, B.S. Singer, R.H. Dott, Jr., and C.M. Johnson, "Detrital Zircon Ages from Early Proterozoic Quartzites, Wisconsin, Support Rapid Weathering and Deposition of Mature Quartz Arenites: A Discussion." *Journal of Geology,* Volume 113 (2005): 233-234.
[3] Dott, Jr. and Attig, *Roadside Geology of Wisconsin*, 194.
[4] Ibid., 194.
[5] Ibid., 192.

exposed which play a critical role in interpreting the deposition and later metamorphism of Baraboo sediments; these layers are rarely exposed elsewhere. Structures in the road cut record the very different deformational behavior of weak metamorphosed mudstone and strong quartzite. They also show the interplay between flow and folding of rock at depth and faulting and fracture at shallower levels. On the crest of the hill above the road cut, there is a well-exposed layer of intricately deformed and metamorphosed mudstone sandwiched between typical, coarser, red quartzite layers. Details of the geometries of the crenulations and cleavages like those exhibited in the metamorphosed mudstone at Point of Rocks provide clues about the local stresses experienced by the Baraboo Quartzite as the large down-folded structure beneath the hills was formed, probably about 1,630 million years ago. The small-scale structures at Point of Rocks are particularly valuable for instructing students in the complex behavior of different rock types during structural deformation.[6] They also provide a rare and valuable window into Precambrian history in Wisconsin, which can be linked to ancient mountain belts elsewhere in North America and the world.

Integrity

About 1980 the Wisconsin Department of Transportation cut back ten feet of the surface of the outcropping facing the highway to create a wider shoulder and to soften the sharp curve at this location. However, the most important elements that have served as the teaching tools at this location were spared. Given the size of the outcropping, the removal of a portion of the surface at one location has had a minimal impact on the overall integrity of the site.

[6] R. H. Dott, Jr., *Geological Significance of the 'Point of Rocks' Roadcut on U.S. Highway 12 in the Baraboo Hills* (University of Wisconsin-Madison: Unpublished Manuscript, 2007), 1-2.

Statement of Significance

Point of Rocks is eligible for the National Register of Historic Places under Criterion A because pioneering geologists in the late nineteenth and early twentieth centuries used rock outcroppings in the Baraboo District to make observations regarding geological processes that led to the development of significant theories regarding metamorphism, and Precambrian and structural geology. Together with Van Hise Rock and two or three other key localities, Point of Rocks played a key role in the interpretation of the major structural features of the metamorphosed Precambrian Rocks of the entire Baraboo District. Thus, Point of Rocks is associated with events that have made significant contributions to the broad patterns of our history and, like Van Hise Rock, which already has National Historic Landmark status, it meets Criterion A.

The pioneering geologists included Roland Irving, Charles R. Van Hise, Charles K. Leith, and Warren J. Mead; they all made significant early contributions to science in the fields of metamorphism, Precambrian rocks, and structural geology. As a result of their contributions to the field of geology, all of whom were affiliated with the Geology Department at the University of Wisconsin-Madison, their Department became nationally and internationally renowned in the early twentieth century as the "Wisconsin School of Precambrian Geology." Their headquarters, Science Hall on the University of Wisconsin campus, together with Van Hise Rock is featured in the National Historic Landmarks study theme for geology.[7] Because Point of Rocks is equivalent in importance to these properties, it is also nominated at the national level of significance. The period of significance begins in 1874. This date marks Roland Irving's study of the Baraboo District as part of the geological survey of the state. The period of significance ends with the end of the historic period in 1960; however, the formation continues to be used for educational purposes to the present day.

Nineteenth and Early Twentieth Century Geology in America and Wisconsin

In the early part of the nineteenth century, American geology was largely a descriptive discipline based on a science of observation and deduction. Practical interest in exploiting natural resources, especially coal, iron, lead, and copper, led to the establishment of numerous state funded geological surveys and, towards the end of the nineteenth century, the federally appropriated United States Geological Survey.[8] These economic interests played a significant role in the development of geology through the appropriation of state and federal funds for geological research and surveys, allowing it to evolve into a science based on inductive and synthetic reasoning. In the early twentieth century, it moved beyond a descriptive science to applying quantitative principles of physics and chemistry to hypothesis testing

[7] Butowsky, H.A. *National Historic Landmarks Geology Theme Study* (1990) 45, 81-82.
[8] I.W.D. Dalziel and R.H. Dott, Jr., *Geology of the Baraboo District. Wisconsin Geological and Natural History Survey Information Circular No. 14* (Madison: Geological and Natural History Survey, 1970), 3.

and the formation of theories.[9] Van Hise, Leith, and Meade were pioneers of this revolution in geology.

Nowhere is this change more evident than in Wisconsin where the importance of lead mining (circa 1820) and the discoveries of copper and iron (circa 1830 to 1840) allowed geological research to assume a prominent role, especially following statehood in 1848.[10] Geologists working for the state and federally funded geological surveys conducted research throughout the state, including the Baraboo District of central Wisconsin. These surveys not only furthered the knowledge of the geological characteristics of the state, but also provided extensive data for more intensive academic research, much of which was conducted at the University of Wisconsin-Madison. Through their work for the state and federally funded surveys, as well as their research conducted for the University of Wisconsin-Madison, Roland Irving, his protégé, Charles Richard Van Hise, Charles K. Leith, and Warren J. Mead would develop fundamental principles regarding structural and Precambrian geology, effectively laying the groundwork for modern geology.[11] The geological features exposed in rock outcroppings within the Baraboo District, such as those at Point of Rocks, Van Hise Rock, and in northern Wisconsin played a pivotal role in their research.

Van Hise Rock at Abelman Gorge in the northwest part of the Baraboo Hills achieved National Landmark status in 1999 because of its historic and educational importance. Standing beside Wisconsin Highway 136, it is both conspicuous and accessible with a Wisconsin historical interpretive sign and a small parking area. Van Hise himself and subsequent generations of teachers have used the Rock to demonstrate the principles developed by the Wisconsin School for inferring the structural geology of the Baraboo District. Being on the north limb of the Baraboo syncline, it is complemented by Point of Rocks accessible on the southern limb. Therefore, Point of Rocks deserves similar recognition to that of Van Hise Rock.

Geological Surveys in Wisconsin and Mapping of the Baraboo District

The rock outcroppings in the Baraboo District had been known to geologists since the early nineteenth century. These rocks were observed during the original survey of the territory, sponsored by the United

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[9] W.M. Jordan, "Application as Stimulus in Geology: Some Examples from the Early Years of the Geological Society of America." *Geologists and Ideas: A History of North American Geology, Geological Society of America Centennial Special,* Volume 1 (1985): 443.
[10] G.P. Merrill, *The First One Hundred Years of American Geology* (New Haven: Yale University Press, 1924), 127.
[11] R.H. Dott, Jr. "Wisconsin Roots of the Modern Evolution in Structural Geology," *Geological Society of America Bulletin* 6 no. 6 (2001): 1001.

States Department of Treasury, in 1839 and 1847-1850.[12] Led by David D. Owen, the most accessible regions of Wisconsin, Minnesota, Iowa, northern Illinois, and a portion of Nebraska, were explored and findings published in a series of reports. In 1853, the Wisconsin State Legislature created a State Geological Survey for Wisconsin.[13] Although the initial investigations focused on the lead region of southwest Wisconsin, subsequent surveys investigated other portions of the state, including the Baraboo District. In the second annual report, James G. Percival specifically discussed the quartzite forming the north and south Baraboo ranges, suggesting that they were part of the same formation, and noted that the rocks had been metamorphosed.[14] In 1862, James Hall correctly assigned the quartzite in the Baraboo district to the Precambrian, correlating it with the Huronian of Ontario.[15] Funds for statewide geological surveys were not appropriated during the period from 1862 until 1870, at which time an act provided for the survey of the lead district. In 1873, legislation was passed funding a complete geological survey of the state to be completed by 1877. Subsequent provisions extended the survey, and funds, until March 1879.[16]

The statewide survey commissioned in 1873, under the direction of state geologist Increase A. Lapham, resulted in the most extensive study of the Baraboo District and marks the initial involvement of Roland D. Irving. Irving had been appointed to the Chair of Geology at the University of Wisconsin in 1870 and also served as Assistant Geologist for the Wisconsin Geological Survey from 1873 to 1879. In 1873, Irving examined the iron and copper bearing regions of northern Wisconsin and was the first to recognize the Lake Superior syncline.[17] In 1874, Irving started a study of the crystalline rocks of east-central Wisconsin, from Dane County north to Wausau and west to Black River Falls, encompassing the Baraboo District. This region was to furnish Irving with material for study for the remainder of his life.[18] In 1875, under O.W. Wright, and from 1876 to 1879, under T.C. Chamberlin as State Geologist, Irving continued his studies in central and northern Wisconsin, including work in the

[12] S.W. Bailey, *The History of Geology and Geophysics at the University of Wisconsin-Madison 1848-1980* (Madison: University of Wisconsin, 1981), 9.
[13] E. Daniels, *First Annual Report of the Geological Survey of the State of Wisconsin* (Madison: David Atwood, Printer, 1854), 1-83.
[14] J.G. Percival, *Annual Report of the Geological Survey of the State of Wisconsin* (Madison: Calkins and Proudfit, Printers, 1856), 101-103.
[15] J. Hall, *Annual Report of the Geological Survey of the State of Wisconsin* (Madison: David Atwood, Printer, 1862), 11-12.
[16] E.F. Bean, "State Geological Surveys of Wisconsin," *Transactions of the Wisconsin Academy of Sciences, Arts, and Letters* 30 (1937): 210-211.
[17] R.H. Dott, Jr. "The Remarkable Legacy of the Wisconsin School of Precambrian Geology" *Geoscience Wisconsin* 18 (2001):28-29.
[18] M.M. Vance, *Charles Richard Van Hise Scientist Progressive* (Madison: State Historical Society of Wisconsin, 1960), 24.

Baraboo District.[19]

In 1880, soon after the Wisconsin state survey was completed, the United States Geological Survey (USGS) recruited Irving, along with Chamberlin, as agents for the Tenth National Census, which was to include the gathering of statistical data on mineral resources under the direction of the USGS. The USGS was a newly established federal organization, created in 1879, that was directed to classify public lands and examine the geological structures and natural/mineral resources of the national domain. One of the initial directives of the USGS was the preparation of a comprehensive map of the geologic formations of the nation with a special emphasis on the needs of the mining industry.[20] In 1881, Irving proposed to the USGS Director, J.W. Powell, that an integrated survey of the Lake Superior metalliferous deposits, which would include petrographic studies, was needed. In 1882, the USGS adopted Irving's suggestion and established a Lake Superior or Precambrian Division to investigate the iron bearing districts, with Irving in charge of the new office located in Science Hall at the University of Wisconsin-Madison. Irving continued also to head the Department of Mineralogy and Geology at the University of Wisconsin.[21] Irving employed Charles Richard Van Hise, his former student protégé and then current faculty member, as one of his assistants.

As the newly appointed head of the Division of Lake Superior Geology, Irving planned to divide the Lake Superior region into several distinct iron-bearing districts, study each district, and prepare a report on its geological characteristics.[22] From 1883 to 1887, the field work focused on the iron ranges in northern Wisconsin, Michigan, and Ontario.[23] Irving was writing his first report, on the Penokee-Gogebic district, when he unexpectedly died in 1888 at the age of 41. Irving's student Van Hise, who had worked part time for the Survey and also instructed classes, was named to succeed his mentor as chief of the Lake Superior Division. For the next fifteen years, Van Hise continued his studies of the Lake Superior region, with results that were to take him to the forefront of his profession.[24]

Before Irving's death, both he and Van Hise studied the rock outcrops in the Baraboo District under the auspices of the USGS. Roland Irving was the first to recognize the unconformable relationship between the quartzite and Cambrian sediments.[25] Irving also made the first structural observations, recording the general attitude of the cleavage in the phyllitic lenses within the quartzite in the South

[19] Bailey, 16; Vance, 24; R.D.Irving, "Geology of Central Wisconsin." *Geology of Wisconsin* Volume 2 (1877):504-519; 579-597.
[20] S.W. McGrath, *Charles Kenneth Leith, Scientific Advisor* (Madison: University of Wisconsin Press, 1971), 23.
[21] Dott, Jr., "The Remarkable Legacy of the Wisconsin School," 29.
[22] Ibid, 25.
[23] Vance, 34.
[24] Vance, 37.
[25] Dalziel and Dott, Jr., 4.

Range.[26] He published the first cross section through the Baraboo Hills, but his interpretation of the overall structure between the North and South Ranges was incorrect in that he did not recognize the synclinal fold between the two ranges. Van Hise later showed the importance of intense compression and shearing in the quartzite visible both in outcrops and under the microscope.[27] The first really comprehensive account of the Baraboo Quartzite and the structural geometry of the Baraboo syncline was by Samuel Weidman, a product of the "Wisconsin School." Prompted by the discovery of iron ore in 1900, he correctly recorded the structural geometry of the quartzite based upon observations of dip and strike of stratification and slaty cleavage.[28] His was one of the first demonstrations of the value of the geometric relationship between cleavage and stratification for inferring larger structures from individual outcrops. Andrew Leith later described the lithology of the overlying Precambrian units after extensive drill records became available.[29] On the basis of the accumulating data from Baraboo and the Lake Superior iron ranges, Van Hise was able to develop theories about the original composition of deformed and metamorphosed rocks and the forces of deformation, effecting a major advancement in geological thinking and founding the basic tenets of structural and metamorphic geology.[30] Van Hise and his successors used especially Point of Rocks and Van Hise Rock to demonstrate these tenets to students and to colleagues; his successors have continued to do so ever since.

As the complex Precambrian rocks of the Lake Superior region are so obscured by glacial deposits and vegetation, Van Hise, and his colleagues at the University of Wisconsin-Madison, learned how to use small-scale features visible in scattered outcrops, such as cleavage, in order to infer the large-scale structures, which were generally not visible, but which they knew must hold the key to an overall understanding of a region. For their work regarding Precambrian geology, based on studies of the Baraboo District and the Lake Superior region by Van Hise, C.K. Leith, and Warren J. Mead, the University of Wisconsin-Madison's department of geology came to be recognized as the "Wisconsin School of Precambrian Geology."[31] The applications in structural geology were taught routinely at Wisconsin by the turn of the century and were made available to a wide audience through Leith's

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[26] Ibid, 5.
[27] C.R. Van Hise, "Some Dynamic Phenomena Shown by the Baraboo Quartzite Ranges of Central Wisconsin," Journal of Geology 1 (1893): 347-355.
[28] S. Weidman, "The Baraboo Iron-Bearing District of Wisconsin," *Wisconsin Geological and Natural History Survey Bulletin* 13 (1904), 1-190.
[29] A. Leith, "The Precambrian of the Lake Superior Region, the Baraboo District, and Other Isolated Areas in the Upper Mississippi Valley," in *Guidebook Ninth Annual Field Conference*, edited by Kansas Geological Society, 320-332 (Wichita, Kansas: McCormick-Armstrong Company, 1935).
[30] C.R. Van Hise, 1893, 347-355; C.R. Hise and C.K. Leith, "The Geology of the Lake Superior Region," *United States Geological Survey Monograph* 52 (1911), 359-364.
[31] Dalziel and Dott, Jr., 4.

textbook of structural geology in 1913, the first such book ever. Van Hise, C.K. Leith, and Warren J. Mead largely concerned themselves with "rock cleavage" and correlation of the succession at Baraboo with Precambrian stratigraphy in the Lake Superior region to the north.[32] Mead brought special expertise in fundamental mechanics and its applications to geological phenomena.

Contributions of the Wisconsin School of Precambrian Geology to the Field of Geology

Charles R. Van Hise, an assistant and student of Irving, began to work for the Survey in the late nineteenth century. His first assignment was to study, identify, and classify the mineral components of specimens collected by Irving in northern Wisconsin. To accomplish this task, Van Hise employed an innovative technique, micropetrology, which was only just beginning to be used in the United States in the 1870s. Van Hise was one of the first American geologists to utilize this new technique, which involved the study of rock specimens by means of a microscope that employed polarized light. He coupled the technique with field observations to project the geology of one area to another, less well known area by determining the structural relationships among the different rock strata. Ultimately, he could then reconstruct the geological history of the areas that could explain these relationships. Van Hise and Irving were among the first geologists in the Western Hemisphere to sense the importance of this new type of analysis of complexly deformed rocks. Irving and Van Hise became the first American geologists to extend their applications of micropetrology to significant formulations of geological principles.

As a result of work completed for the United States Geological Survey, Van Hise became thoroughly familiar with the complex Precambrian geology of the entire Lake Superior region and other regions of the country with exposed Precambrian rocks.[33] Van Hise published *Principles of North American Pre-Cambrian Geology* in 1896, the first comprehensive treatment of these important rocks, which include the Baraboo District.[34] In *Principles of North American Pre-Cambrian Geology* Van Hise summarized the structural principles that he and his associates had been applying for years to the exposed portions of the Lake Superior formations. His extensive application and observations enabled him to modify, delimit, and extend then accepted principles of structural geology, and he is accordingly recognized as one of the founders of modern structural geology.[35]

Van Hise's studies of the deformation and metamorphism that the old rocks displayed culminated in *A Treatise on Metamorphism* (1904), his single most famous work, and a synthesis of all of his group's

[32] Dalziel and Dott., Jr., 5.
[33] Dott, Jr., "The Remarkable Legacy of the Wisconsin School of Precambrian Geology," 30.
[34] C.R. Van Hise, "Principles of North American Pre-Cambrian Geology" *Sixteenth Annual Report of the United States Geological Survey Part I* (1894-1895), 571-885.
[35] Vance, 48.

Lake Superior work, *Geology of the Lake Superior Region.*[36] Through his own research, as well as his training in engineering and metallurgy, Van Hise came to appreciate more than most contemporaries that if geology was to advance from mere classification to the formulation of principles, its practitioners must become well grounded in basic mechanics and chemistry.[37]

Early pioneering studies of structural geology developed the concept that solid rock strata can bend and flow.[38] Van Hise contributed to this concept by identifying and describing a "zone of fracture" and "zone of flowage." Large or small faults appear when rocks near the earth's surface are stressed and subsequently break (i.e. fail by brittle fracture). Rocks so deeply buried that conditions of heat and pressure exceed their ultimate strength are in the zone of plasticity and flowage. Under such circumstances the strata would fold or flow and not allow any fractures to form. Van Hise's concept of the influence of depth on the behavior of rocks under stress, and the corollary that original depth can be deduced from present structures, are essential elements of modern geology's working principles.[39]

In 1903, Van Hise became president of the University of Wisconsin. He promoted his protégé, Charles Kenneth Leith, to direct the Precambrian studies, and, in 1905, named him chair the Department of Geology. Also in 1905, owing to the growing demand for expert consultants by the mining industry, Leith changed his federal appointment to a per diem basis so that he could begin a long and lucrative consulting career. It was the Leith-Mead partnership, building upon the foundation pioneered by Irving and Van Hise, that originally put the Wisconsin's Department of Geology on the map.[40] Leith's textbooks, *Structural Geology* (1913, 1923) and Leith and Mead's *Metamorphic Geology* (1915) publicized the pioneering concepts of Van Hise and widely disseminated the wealth of insights gained from the Precambrian studies in the Lake Superior region during the preceding three decades.[41] In recognition of the stature of Wisconsin's pioneering geologists, the National Academy of Sciences inducted Van Hise to Fellowship in 1902, Chamberlin in 1903, Leith in 1920, and Mead in 1939.[42]

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[36] C.R. Van Hise, "A Treatise on Metamorphism," *United States Geological Survey Monograph 47* (1904) 1-1286; Van Hise and Leath, *Geology of the Lake Superior Region*, 359-364.
[37] Dott, Jr., "The Remarkable Legacy of the Wisconsin School of Precambrian Geology," 31.
[38] Vance, 48.
[39] Vance, 48-49.
[40] Dott, Jr., "The Remarkable Legacy of the Wisconsin School of Precambrian Geology," 31-34.
[41] Ibid., 34.
[42] Ibid.

Point of Rocks as an Educational Resource

The Point of Rocks outcrop in the Baraboo District is part of the southernmost extensive exposures of Precambrian Rock in Wisconsin and has been studied for more than a century by geologists.[43] The University of Wisconsin systems' faculty has used the Point of Rocks outcrop as well as Van Hise Rock to demonstrate important structural and metamorphic properties of rocks to their many students and colleagues. The outcrop is regularly visited by other universities as well, and is a specific point of interest in professional geological field guidebooks.[44] Recognizing the importance of Point of Rocks, the Wisconsin Department of Transportation provided several years ago an extra wide highway shoulder to accommodate vehicles for geological field trips. A realignment of U.S. Highway 12 now in the final planning stages will provide a dead end turnoff and parking space for even safer access to the site. An interpretive sign is planned as well.

Geologists from around the world have been drawn to the Baraboo district, including the Point of Rocks, by the work of the "Wisconsin School" of structural geologists. Features contained within the Point of Rocks outcropping allowed geologists in the late nineteenth and early twentieth centuries to develop principles that revolutionized the field of structural geology. The features are still present in the outcrops and allow modern geologists to observe for themselves the "data set" that led to the formation of important theories that revolutionized the field of geology. These features represent several episodes in the geologic history of a small area. At Point of Rocks, ripple marks on the layers of quartzite record the deposition of sand by ocean waves and currents and the tilting and fracturing of the strata record uplift and mountain building.[45] There has been just enough erosion in the Baraboo area to expose the bedrock and glacial deposits extensively, but not so much that their mutual relationships could only be imagined. In summary, the Point of Rocks outcrop is an exceptional teaching and research laboratory because classic features relating to structural, sedimentary, and metamorphic geology are well exposed and clearly displayed in an easily accessible area.

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[43] L. Clayton and J.W. Attig, *Geology of Sauk County, Wisconsin* (Madison, Wisconsin: University of Wisconsin Extension Geological and Natural History Survey, 1990, 5.

[44] For examples see Dalziel and Dott, Jr., Geology of the Baraboo District; A. Leith, The Precambrian of the Lake Superior Region, the Baraboo District, and Other Isolated Areas in the Upper Mississippi Valley; Dott, Jr., R.H. and Medaris, "Baraboo Revisited," *Outcrop* (2002): 28-31.

[45] Dott, Jr., and Medaris, *Baraboo Revisited*, 28-31.

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Verbal Boundary Description

Point of Rocks is a natural rock outcropping located east of USH 12 approximately 0.85 miles north of Ski Hi Road and 0.25 miles south of Wisconsin Highway 159. The exposed rock outcrop is in the NW SE SW NW and the SW NE SW NW of Section 15, Township 11 North, Range 6 East, Sauk County, Wisconsin.

Boundary Justification

The general area is an irregular polygon (roughly rectangular) whose long side is 147 meters long and runs southeast to northwest, whose short south side is 30 meters and is approximately 960 meters north of the intersection between USH 12 and Lehman Road. The northernmost point is approximately 1,075 meters north of USH 12 and Lehman Road.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Point of Rocks
Town of Baraboo, Sauk County, Wisconsin
Photographer: Jennifer Harvey
Date: May 28, 2007
Negatives at the Wisconsin Historical Society

Photo 1/5
Overview of Point of Rocks
View to the Northeast

Photo 2/5
Overview of Point of Rocks
View to the East

Photo 3/5
Cross bedding and crenulations in the southwest rock face
View to the Northeast

Photo 4/5
Ripple mark features
View to the Southeast

Photo 5/5
Structural features at top of outcropping
View to the Northwest

FIGURE 1:
POINT OF ROCKS
TOWN OF BARABOO, SAUK COUNTY., WI