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Lake Superior American lake series - Ft. library.

[Niedecker, Lorine]

[s.l.]: [s.n.], [s.d.]

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Depuys ^{down} dice for fish

& Golden Eagle's ^{fly in} Lake
fish away from speys

Lake Superior American Lake series - Ft. library

From Duluth to Grand Marais - the twinline in profusion - its vines under the evergreens - the favorite flower of Linnaeus. Another flower of the north, clintonia borealis - in bloom it may escape notice - its 3-belled flower of pale yellow but in midsummer and early fall has 3 or more large berries of midnight blue cannot be overlooked. Also white bunchberry flowers with later on shining red berries.

Flowers /
Fl

North shore - near Two Island River the party was caught in a nor'easter - "The wind continues. We are pretty well locked up - the lake before us in a slight foam - a little mad -"

Pigeon River - a black slate found here and in many places a sort of white earth which was used for filling crevices between logs of houses.

black R
slate

Nippigon Lake - Niggigon Falls here.

Falls

Thunder Bay - Kakabika Falls on the Kaministikwia R., the Niagara of the L. S. region. 119 ft. high.

R = 7
Falls

Late in the season, Evans, missionary, writing of 1838 - "We are barricaded with our canoe and evergreen tops and upon the whole tolerably comfortable. It has snowed all night & there is about 8 in. ... the roar of the lake, Soaring eagle howling wind & ... crackling fire and Indian language with many accompaniments tell me I am far from home."

Radisson along in the 1650's described Sault de Ste. Marie and its fisheries, the Pictured Rocks, and Chequamegon Bay where he and Des Groseilliers built the 1st known dwelling of white men on the lake. The winter of 1659-1660 Radisson and G. etc. was spent on a little inland lake, probably Lac Court Oreilles in Sawyer Co., Wis. to which a trail led long after these men were dead and gone. Later to Pigeon R. (north as now on the international boundary. As late as the Am. Rev. the river bore Des Groseilliers' name. Even today a river on the north shore carries a trans. of his name, the Gooseberry R. Radisson's delight was summed up: "We were Cesars being nobody to contradict us."

Pigeon R
Gooseberry R.
Mr. S.

The Great Lakes - Hatcher Ft. library

(a coral reef, with its concentric circles of growth clearly marked was uncovered in a quarry at Thornton, Ill.)

Soo - Cambrian sandstone. If the edge of the hard sandstone were not upturned, there would be no falls.

Soo - sandstone R

Pictured Rocks - 25 mi. of Cambrian sandstone red, gray and white facing the lake, with a thousand shapes. Stratified and hardened through the ages. Gets its many colors from the soluble mineral oxides which the waves and the rains have dissolved and used to tint the formations of the escarpment. Beating of storms and assault of waves make strange hollows big enough for ships to pass thru.

Sandstone R

Rivers plunging over the hard limestone run along Green Bay shores.

Green Bay
limestone R

Brulé, scout. Author: "Brulé got on handsomely with the Indians. He dressed in their clothes, ate their vile mess, and thrived on it." Along about 1610 one among the 200 Indians who paddled their canoes in orderly formation down the great river (Ottawa) to meet Champlain at the rapids at Montreal. Brulé gave him the first accurate information

(over)

Brulé

on rivers, lakes etc... First white man to see Lake Superior. He went over to the British thereby betraying Champlain. Brulé's Huron friends with whom he lived many years, murdered him.

Radisson had no fingernails - pulled off by Mohawks when they bound him to a stake for slow killing. Chouart, an engagee became a fur trader in his own right - married one of the Radisson girls and formed the partnership with Pierre Esprit Radisson. They wanted to see the tribes of the west; perhaps they might glimpse the China Sea; certainly they would find new sources of fur. They set forth in June, 1658. If Joliet had had 3 more days he'd have reached the Miss. Just 15 yrs. before the journey of Marquette and Joliet, Radisson and Chouart dropped paddles into Miss. Went to Soo. Allouez reached the Soo. - Three missions were established before Marquette came to the Soo. He had been 2 days on the straits when Nicolet came to St. Ignace. Nicolet and Marquette went over to Miss. R. down to mouth of the Arkansas.

reddish rock at Duluth as far as I can find pre-Cambrian and Cambrian sandstone on n. shore and even at Schreiber.

N. Shore
Sandstone
Schreiber
R

late in the season, Evans, missionary, writing of 1838 - "We are... caded with our canoe and evergreen tops and upon the whole tolerably comfortable. It has snowed all night & there is about 3 in. the rear of the lake, soaring eagle howling wind & ... crackling fire and Indian language with many accompaniments tell me I am far from home."

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Green Bay
Sandstone
R

State 35 -

Old mining or lumber centers. Dense forests of cedar, birch and poplar. Pines, beeches, blueberry plains.

Negaunee - first discovery of iron ore in the Lake Superior region. a 12 ft. pyramid of iron ore blocks erected in 1904 as monument to discovery. which took place in 1844 by a group of explorers from Jackson, coming here to mine copper, silver and gold.

Palmer - a charming little water fall

Escanaba River State Game Refuge - 2 miles or so from Palmer.

Princeton yielding heavy blueberry crops and The Princeton Mine. Gwinn, a small town for mining employees on east branch of Escanaba R. Rock - The early settlers cut maple forests for the charcoal kilns.

Gladstone - Industrial with deep water harbor on L. Michigan. Hardwood flooring, veneer and plywood

Escanaba (Ind. Land of the Red Buck) 14,000 pop in 1941, iron ore shipping and paper and hardwood and commercial fishing. In 1936 Escanaba furnished 100,000 sq. ft. of bird's eye maple for the Cunard line's S. S. Queen Mary. In April the annual Smelt Fishing Jamboree. Smelt fishermen, clad in hip boots and carrying dipnets march thru the streets in an opening torchlight parade. The river banks during the dipping are lighted by torches and bonfires.

Ford River on Green Bay was an important lumber mfg. place. Now the docks are rotting and the bay channels are filled with sand.

Fox now a resort.

Cedar River

Menominee Last week in July sailboat races (Men. R.) Their smelt celebration in April a huge thing. In 1934 2 fishermen lifted (pullys etc.) 4.200 lbs of smelt in less than 5 hrs. At night during these festivities fires are lit by auto tires gathered by the theatres of the Twin Cities (Marinette is a twin) at 'Fire matinees' for children, the price of admission to the show is one old tire. Marker at West End Park, 3 blocks w. of Interstate Bridge - War between Menominee and Chippewa.

Manistique (Ind. vermilion) mfg. and resort - Manistique R. Started with lumbering car ferry between Green Bay and Manistique.

Thompson US 2 clear cold water - springs spouting way into the air. In Big Spring no frogs or any animal life can live. Sand if brought up to the air from the bottom, turns black.

Kipling and Rudyard both named for Kipling by Gen'l Mgr. of Baltimore and Ohio R. R. - railroads selling stock and securities to investors in British Isles.

Rudyard - so many mosquitoes here in early days.

Kipling - once a site of charcoal iron furnace and chemical plant. Until timber was exhausted. The kilns, rounded beehives of stone, and the idle docks the sign now of Kipling's old time prosperity.

Kipling himself acknowledged the naming of the towns with a photograph of himself and a poem on the back:

'Wise is the child who knows his sire,'
The ancient proverb ran,

over

But wiser far the man who knows
How, where and when his offspring grows,
For who the mischief would suppose
I've sons in Michigan?

Yet I am saved from midnight ills,
That warp the soul of man,
They do not make me walk the floor,
Nor hammer at the doctor's door;
They deal in wheat and iron ore,
My sons in Michigan.

O, tourist in the Pullman car
(BynCook's or Raymond's plan),
Forgive a parent's partial view;
But maybe you have children too -
So let me introduce to you
My sons in Michigan.

Industrial with deep water harbor on a Michigan. Hard-
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S

Sault Ste. Marie (folder)
 rapids where Lake Superior pitched downward 21 ft. to the level of L. Huron. A mile and a half wide, an early missionary said. Whitefish. Saulteurs were expert in ~~XXXXX~~ netting the fish. Beside the rapids came to be the Capitol city of the Chippewas - Ojibway nation - on St. Mary's River.
 Etienne Brulé, first European to visit the city, 1622, scout and interpreter for Champlain, the Fr. founder of Quebec - went on (Brulé) as far as the copper country. In 1667 a Fr. missionary came to the Soo. 1668 joined by Fr. Marquette who founded the present city of Sault Ste. Marie and he gave it its name altho the Sault part of the name had already been given, meaning falls - Marquette's name for it was Sainte Marie du Sault.

Etienne Brulé
 sent by Champlain to find
 N. Outlet located in 1618
 W. W. James

Ship watching here and ship listening. Whistles are a code. Bishop Baraga Museum. Locks. Locks raise boats approx. 19 ft. to level of L. Superior. Rapids the original flume thru which the higher waters of L. Superior cascaded to the lower levels of the other lakes. St. Mary's forms international boundary between U. S. and Canada. St. Marie is the blessed virgin.

Henry Clay described the Soo as 'the ^{permanent} remotest settlement in the U.S., if not in the moon'. Oldest settlement in Michigan and 3rd oldest surviving community in the US. Was French till 1762 when English took possession. Am. army built Fort Brady in 1823 and ended French and English reign in the Soo.

Points of Interest: Brady Park on the waterfront. John Jacob Astor - Gov. Cass. The Schoolcraft House open by permission from Union Carbide Co., E. Portage Ave. and Bardeau St. - Indian Agency, built 1826-27 by Schoolcraft. Wrote here some of the books that later served as a basis for Lonfellow's Song of Hiawatha. Original colonial design obliterated by remodelling. Indian Reservation about 5 miles east of the Soo.

Twin cities, one in Canada, other in US (Michigan) Steel and iron mfg and pulp

In 1797 a bateau canal and lock was built, forerunner of today's. In 1855 state of Mich. financed by a land grant 2 Congress built a canal & lock at the Soo.

The Canadian Sault Ste. Marie has metal steel works. Sugar-Island between the two Soo cities has on it many Indians.

Arrival of Gov. Lewis Cass in 1820.

The Old Johnston Home (Schoolcraft's father-in-law) Original colonial design obliterated long ago.

Sault Ste. Marie, Michigan

Winter - Laying - choker jamboree.
 chokes because spear goes into back of head & closes off front's air.
 By end of 1912 cent - it was 10,000 pop. (over)

Marguette's mission fort of Brigham Ave -

bronze tablet on a granite boulder.

Brady Park Drive & Water St - 12 acres

facing waterfront gives clear view of St.

Marys River Sault Ste. Marie, Ontario

& the Canadian Soo locks. Here on the spot

landed Brulé, Melet, Joliet & other

voyageurs, fur traders & missionaries.

17 Brulé for came in 1618!

Vertical text on the right side of the page, possibly a page number or reference.

Indian Reservation about 5 miles east of the Soo. Original colonial design obliterated by remodeling. The books that later served as a basis for Lonsdale's Song of the Indian Agency, built 1828-27 by Schoolcraft. Wrote here some of Astor - Gov. Cass. The Schoolcraft House open by permission Points of Interest: Brady Park on the waterfront. John Jacob and ended French and English reign in the Soo. when English took possession. Am. army built Fort Brady in 1823 and 3rd oldest surviving community in the US. Was French till 1762 U.S., if not in the moon'. Oldest settlement in Michigan and Henry Clay described the Soo as 'the remotest settlement in the between U.S. and Canada. St. Marie is the blessed virgin.

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Epoufette - (Fr. place of rest) Fishing remains chief activity

Brevort - lumbering and fishing

St. Ignace - 70% are of Fr. descent. 2nd oldest settlement in Michigan. To the south, with the State ferries steaming across the bottle-necked straits of Mackinac separating the two ports (had just mentioned Mackinac Island to the east) is Mackinaw City, in the upper tip of the Lower Peninsula of Michigan. Freight docks. Fish-box factory. The shore side of a 4-mile street has fishing tugs, ferry boats and speedboats.

Altho Nicolet came here in 1634, town wasn't founded till 1671 when Fr. Marquette built a missionary chapel. In 1679 La Salle's Griffon on its way to Green Bay for furs, put in at St.

M
2
Mackinaw Country
Ignace and on the return journey disappeared without a trace, somewhere near the Straits. By that time Fort de Buade had already been established by Fr. military authorities to protect Marquette's mission. Cadillac the last in control. Name of Fort soon changed to Michilimackinac of the Indians. (Indian word, Michilimackinac means Cadillac left for Detroit and the place was practically abandoned. Except for the missionaries. The last priest, feeling there was no work to be done in such a dreary outpost, burned the chapel in 1706 to prevent its desecration. From that time on activity centered at Madinaw City and later at Mackinac Island.

Fishing at first - whitefish and trout. Fishermen still here in 1834 when the Jesuits were again attracted to St. Ignace. Railroad ferry service across the straits 1881. And at that time also iron smelting furnaces and rise of lumber industry. Now fishing and tour^{ist} business.

St. Ignacius Church, Spring and Church Sts. built in 1904 red brick of modified Gothic design with a two-stage tower and a steeple. Organized in 1837, church is known for the Painting of St. Ignatius, for whom the city was named. Artist unknown.

Indian Village - open to tourists - has 5 tepees and 4 wannigans representing Indian council houses, rectangular in shape, made of woven birch and cedar bark, without windows of floors; roofs held down by stones. Indians (Chippewa) live in the huts thruout the year. (mixed with Ottawa)

Marquette Park - Marquette's second grave. M. died in 1675 near Ludington when he was buried by his Indian companions. Honoring his wish 'to return to his little chapel in the Straits' Indian friends disinterred his remains and in 1677 ~~reburied~~ reburied them underneath the floor of the log chapel at St. Ignace. After the mission was burned in 1706, the location of his grave was unknown until 1877 when it was accidentally discovered. A marble statue was erected over the site and a few of the bones were sent to Marquette College in Milwaukee, Wis.

The Ruins of Fort de Buade - on a hill on Fort St. back of Marquette Park - 2½ centuries old. Ancient earthworks still visible. Stockade itself is gone. The northeast redoubt and much of the earthen parapet are still distinguishable. A federal approp. was made in 1938 to restore the fort.

Points of interest in environs of St. Ignace - Castle Rock vantage point 3 mi. from St. Ig. Fort Algonquin, Indian relics.

Mackinaw City - here was one site of Fort Michilimackinac, a name applied, without discrimination to forts successively built at At. Ignace et... Br. took it over from the Fr. in 1761

8

M Mackinac country

7

Background

Jean Nicolet sent out by Champlain to find a northwest passage to the Orient went thru Straits of Mackinac in 1634.

Fort of Michilimackinac at St. Ignace - in existence in 1679 when La Salle visited St. Ignace in the Griffon. Important trading center. Even then the English were inciting the Indians to fight against the French.

Across from St. Ignace ^{east} across the by - is Mackinac Island. To the South ferries steaming across the bottle-necked Straits of Mackinac. Mackinaw City on the upper top of Lower Peninsula. St. Ignace became Michilimackinac. Nearby Castle Rock, vantage point. Michilimackinac is Chippewa for big turtle. More than one site for Michilimackinac - St. Ignace (1681) by French, Mackinaw City and Mackinac Island. The British took it over in 1761 on present site of Mackinaw City. Indian massacre here (Pontiac Conspiracy) and in 1780-81 British moved the fort to Mackinac Island which in 1787 became the focal point of the Northwest Territory.

Fort Michili - state Park contains reconstructed stockade of the fort near northern edge of the village. Contains a small zoo of native animals. *might be Mackinaw City*

Long Lake notable for small-mouth black-bass fishing.

Margarette

Mackinac Island (1940's) no automobile permitted on the island. Boat trips. Up thrust hills from blue waters unforgettable sight. Carriages horse-drawn. The top soil not conducive to farming. A host of natural springs gushing from the limestone compensates for absence of lake or rivers. Michili - means the great turtle. The Indians believed it had risen thru supernatural causes from the Straits. Time and usage shortened the name to Mackinac. A refuge for tribes fleeing before the conquering Iroquois. Fr. Allouez described the Straits etc. in 1670. Mr. Marquette founded a mission at St. Ignace in 1671, visited Mackinac as did Robert Cavalier Sieur de la Salle who passed here in 1679 in his ill-fated Griffon, the first commercial sailing vessel on the Great Lakes. Entire upper lakes region formerly known as Michilimackinac, now known as Mackinac country.

Continual warfare - French sided with the Huron and Ottawa against Iroquois. In 1701 the commandant, Cadillac, moved the garrison to Detroit, and the settlement and mission at St. Ignace were abandoned. French ruled till French and Indian War 1756-63. Victorious British, transferred their garrison from Old Mackinaw on the mainland to the more strategic Mackinac Island in 1781. Kenneth Roberts in his novel Northwest Passage speaks of Mackinac of Michilimackinac (through the mouth of the governor) - 'It's the bottleneck of the Great Lakes. There isn't a mosquito anywhere near ... Every pelt that comes from the northwest and every package of goods that goes there, has to pass thru Michilimackinac.'

At end of Am. Rev. Mackinac was ceded to Am. by the terms of the Treaty of Paris, 1783, but English refused to evacuate the post - not till Jay Treaty 1796, then they moved to St. Joseph's Island in upper Lake Huron.

War of 1812 British on St. Joseph's Island amassed a force of 1000 soldiers, Indians and trappers. They took Mackinac - the

Mackinac country

inhabitants had not yet even heard of the declaration of war. The Americans strove to recapture the island in 1814, not successful. Tried twice more but failed. But when news of the signing of the Treaty of Ghent, 1814, reached the English, they withdrew from the island and the Americans once more occupied the fort that they had been unable to capture by force. John Jacob Astor centered the activities of the Am. Fur Co. (chartered in 1808) at Mackinac Island in 1817. Peak of the industry came in 1822. When fur trade declined southern planters built here but Civil War ~~XXX~~ wrecked their fortunes and they disappeared. Now tourist. Ferry service started in 1881.

In 1895 the island was declared a state park. A carriage driver: 'Most of these graves are of doctors; the climate of Mackinac is so healthy, they all starved for lack of patients.'

Dousman's distillery here. Dr. Beaumont at Fort Mackinac experimented on gastric juices.

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Handwritten signature

Michigan - and Wis. formed from the first N.A. continent called Laurentia. "Traces of the granitic core of Laurentia" remain in southern Canada & the northwest in Wis.

Successive creations + destructions -

Formation of Michigan Peninsula was result of intense volcanic activity, of sedimentation in basin-shaped seas, of uplift + subsequent erosion. Volcanic disturbances agitating the ancient land-mass - palpitant movements rather than violent eruptions did crazy things to rocks - lava flowed between etc. to form mineral-bearing rocks.

Archaean rock from ancient continent found in Upper Peninsula, composed of schists, granites, and gneisses, cut by dykes of lava, are believed to have been formed when convulsively moved rock masses reared above the sea of the newly formed planet. Many knobs of Archaean rock, some rounded by glacial action, rise west of Marquette. Archaean areas form part of the highlands of the Felsch, Gogebic, Marquette, Benoni, and Crystal Falls. (~~at~~ C. Falls on Parot River)

The first sedimentary rock laid upon the Archaean surface was of sandstone, shales + limestones - now appearing as quartzite, slate + marble - and the iron formation. Erosion wore the rocks and iron bearing beds were brought near the surface where oxygenated + carbonated water converted them into ore now worked in Iron, Gogebic, Baraga, Marquette + Dickinson Counties.

For hundreds of thousands of years, immense flows of lava covered the site of L. Sagar & the region immediately surrounding.

Copper was concentrated in the porous lava & the interbedded conglomerate.

Michigan basin alternately invaded & deserted by epicontinental seas. At times parts were arid land or shallow seas in which salt & gypsum were formed.

For long distances, as between Grand Marais & Marquette, Cambrian rocks has been undercut by waves & broken down leaving columns, grottoes, rocky headlands & bare vertical cliffs 50 to 80 ft high. The generally varied color of the rocks along shore east of Marquette for 15 to 20 mi. has caused the section to be named Painted Rocks (Grand Marais, Mich., not Minnesota).

Ontario

Toronto, cap. of Ontario
Ottawa, cap. of Canada

equal to 14 American states or as big as two: Texas and California together. No. 1 in agriculture in Canada and the leading mineral and fur production. Over 3/4 Canada's rubber products.

At entrance to L. Superior is a cracked and forgotten cairn - discovery of the lake by Etienne Brule, (1622?) later eaten by cannibals (Huron Indians). By mid 17th century by French Jesuit missionary - explorers or by 'coureurs de bois'. War of 1812 Canada came out well - a national identity.

St. Lawrence and Ottawa Rivers in Eastern Ontario. International Rapids on St. Lawrence, huge dam - electricity for both NY state and Ontario. Royal Military College at Kingston, city of 60,000. Actually for a brief period in Dicken's day the, the cap. of Canada before Ottawa was thought of. 1000 islands near Kingston (like Italian lakes) in eastern Canada. On the Ottawa R. see the fiery fall colors of the maples, 'the blood of the Mohawks and Tuscaroras'. Ottawa - 350,000 pop. Southwest Ontario is farming, warm. "Sometimes called the 'banana belt', its mild climate makes it the main tobacco-growing area in Canada.

International Nickel has a mine north of Toronto. North shore of L. Huron uranium mines - more than anywhere else in the world.

Twins - Fort William on the lake and Port Arthur, grain shipping and storage. Storage houses in Thunder Bay.

Champlain 1600 - French North America 1663-1760.
Britain closes in - 1689-1760. British North America 1760-75.

Ontario has 680 miles of shore line on salt water Hudson Bay and James Bay and 2,362 miles on fresh water Great Lakes.

Ontario is 10% of the Dominion

Deppigon River

Schoolcraft - born in the east, father a glass manufacturer. Learned French from a tutor and taught himself Hebrew and German and Indian languages.

Longfellow followed Schoolcraft's writings for a basis to Hiawatha - By the shores of Giche Gumee, by the shining big sea water Discovered or rediscovered the source of the Miss. - Lake Itaska (took syllables from the latin veritas caput meaning true source.

Married a daughter of Johnston, wealthy. She was educated in Europe and she was the daughter of an Indian woman.

In 1847 the government commissioned him to write six volumes on "History and Statistical Information Respecting the History, Condition and Prospects of the United States Indian Tribes". At \$30.000 a volume!

Temperance. Believed Indians should not have the name of evil, of savages.

Itaska

1820

Schoolcraft's account, mainly.

1820 Lewis Cass led a 38 man expedition along north shore of L. Superior and into wilderness of Minnesota and Wis. All Northwest Territory then. Named Red Cedar Lake L. Cassina, since known as Cass. Schoolcraft a member of this trip - ~~question as to whether he was, date does not always check out.~~

1832

or re-discovered by 1832

Schoolcraft discovered source of Mississippi - renamed Lake Le Biche or Elk Lake Itaska (a made-up name by S. from the latin veritas caput meaning "true source". Also a myth about a maiden, Itaska, whose tears for her lost lover formed the eternal springs which welled up from the Miss. R. A state park established in 1891 by Minnesota - at L. Itaska.

Winnibigoshish - a lake 10 mi. broad which the Miss. near its source, hits.

S: "The lake [Superior] which is called Igomi, Chigomi and Gitchigomi by the Indians, is remarkable for its extent, its depth, and the purity of its waters. It lies in a basin of trap rocks, with alternations of the granite and sand stone series." Waters free from impregnations from calcareous rocks of which none is here. "As it is the largest and the purest of the series of lakes it is also the highest in position;" Its banks are diversified with mural precipices, with extensive deposits of marine sand, and with beds of mixed detritus. Its immediate margin is loaded with primitive boulders and pebble-stones, alternating with shores of yellow and of iron sand. Several bold mountains of primitive construction stand near the central parts of its south shores, which are in striking contrast with the ruinlike, walled masses, of horizontal structure, which characterize other parts. Among the detritus of its shores are still occasionally found masses of native copper, which are now referred to the trap formation." (over)

rocks

rocks

rocks sand

detritus sand

"as the season shifts"

"the hunting grounds of Yellow Head's band Lac Travers ... for ... the winter hunt. And from this point they ascend southerly, which carries them still farther into "the red deer and stag and hind country of (the absolute head) of the Mississippi, Itaska Lake."

Furs and skins exchanged for goods brought in canoes from Michilimackinac.

S: "no ardent spirits shall be hereafter introduced, under any pretence, into the Indian country."

rock

"a boulder of gneiss rock, water-worn - a rude altar" "The soil, at this point, appeared to be rather rich, bearing a growth of elm, soft maple and white ash."

an east branch of the river (Schoolcraft River) a lake - Plantagenette (The Rest in the Path) found Water fowl frequently shot

The duck and mallard, wood-duck and sawbill. "The Indian in the bow of the foreward canoe fired at and killed a deer. We all landed to look at the animal.

gave over to the mosquito

L.S.
1 mile on shore - detritus

Lake Superior - at the International Border - Grand Portage.

In the shipping of furs on L. Superior the average canoe carried more than 5 tons of furs and supplies, and was manned by 8 voyageurs. Boats used on the interior lakes and rivers carried 1 or 2 tons and were manned by 6.

from other sources:

The iron ore from which steel is fabricated - $\frac{1}{3}$ of earth's supply lies in U.S. & of that, 80% is concentrated in the L.S. region.

Toward Rainy R. from the north shore of L.S.: very wild - crows circle over the water to dive for their dinner and eagles swoop down to rob them of their catch. "Recesses in the woods - moose, bear, porcupine, deer, partridges, heron, thrush, timber wolves & beaver." Pierre Gaultier and Sieur de la Vérendrye came thru here in early 18th century looking for the Sea of the West. Scene much the same now.

The more the highways the less wild animals, the more signboards.

rock / One in the party picked up a piece of zoned agate.

Canoes so light that each one with its apparatus was carried by one man. Scrub oak and pines. Descending rapids, dangerous. "Sleep soon overshadowed the whole party" with his downy pinions. Among the plants that border the river, the wild rose, which is so conspicuous on all the streams northwest of L. Superior, is very often seen here. A war chief - The peace pipe he smoked with his heart. "A blaze on the pinus resinosa, if made upon a matured tree. Too dark to fire guns to ascertain the position of the principal village.

All northern Indians live very much alike. "a life of want and vicissitude." "There is a perpetual change between activity and inanity, in the mind, which is a striking peculiarity of the savage state."

With the fur trade came their acquaintance with iron, gunpowder and woollens.

"All that related to a system of dances, sacrifices, and ceremonies, which stood in the place of religion, still occupies that position.. Missionaries have been slow. "it should not excite surprise, that the people themselves are, to so great a degree, mentally the same in 1832 that they were on the arrival of the French in the St. Lawrence in 1532 (1534)

white fish served by the chief to his guests

"Among the numbers of Indians who arrived here, during the day, were a party of nine Rainy Lake Indians, under the leadership of ... The Hole in the Sky." They resided at Springing-bow-string Lake.

The chief "had heard the Americans say, peace, peace! But he thought that advice resembled a rushing wind. It was strong and went soon. It did not abide long enough to choke up the road." But the Sioux had attacked and killed a number of his Indians. He said he believed it had been intended by the Creator that his people should be at war with the Sioux. "I have sent my pipe and invitations to my friends around..." He complained of the exclusion of ardent spirits" - whiskey. A fine gun, worth ten guineas was sold to a chief at one of the northern posts, for 120 lbs. of beaver, say \$480. Indians were vaccinated at this early time.

The length of a pause, say half a mile - men carrying loads rested at a pause. How far is it? - answer might be: three pauses.

"lakes of a pondy character, redolent with nymphae odorata, thru which we successfully passed"

The four sources of the primary rivers of the Mississippi within a circle of perhaps 70 miles. ¹Itasca L., its primary; ²Ossowa, ³The Long Water being the source of the De Corbeau, or Crow-wing River, ⁴and Shiba L. and river, source of Leech Lake.

companion and pipelighter - "a very tall, gaunt, and savage-looking warrior, who appeared to be made up, body and mind, of sensualities. And although he appeared to be quiet and passive, and uttered not a single expression that implied passion or vindication, I could not divest my mind of the recollection that I was in company with the murderer of Gov. Semple."

"the naked solitudes of Red River"

"to read the riot act"

trees

their canoe 32 ft. in length. Little Vermillion L. - birch and aspen with pines in the distance. Tamarack is a frequent tree on the shores, and the pond lily, flag and Indian reed, appear in the stream."

"a portage of four pauses"

Scalp L., Fish-Line L., Ottertail L. Leaf River. "its outlet of a spreading, sandy, shelly character. moderate sized lake - our maps afforded neither Indian nor French name - made use of Mr. Johnston's landing to fire at a deer, to name the lake after him. Sibley Lake also called the "Lake which the River passes through one End of" the working crew set up a tent with its furniture in no time at all - "he who would travel fast over an intricate interior route and be well served on the way, should not fail to prepare himself with a canoe allège and a crew of voyageurs. They will not only go when they are bid to go but they will go uncomplainingly. And after submitting to severe labor, both of the night and day, on land and water, they are not only ready for further efforts, but will make them under the enlivening influence of a song."

The eye is perpetually searching for something new ... novelty; an immediate passion... The 'lightning splintered' pine which raises its dead arms, amid the living foliage, is suited to call forth a remark.' The waterfowl with a tuft, or the shell with a deep cicatrice or a pearly interior, interrupts the silence.

On the third day of our voyage down this river (Miss.?) ... an Indian canoe ascended the channel before us. A simultaneous yell of recognition, both from it and from our men, shewed the accuracy, with which each could identify, on a first glance, and at a distance, the approach of friends, for it proved to be a Chippewa with his family. Our flag-staff was instantly placed in its socket, in the stern of the canoe, and the distance between us and them, made to appear less, under the influence of un chanson du voyageur."

ag. country

He presented a pipe That portion of the upper Miss. lying between the junction of the De Corbeau and St. Anthony's Falls, prairie and forest lands - a valuable ag. country. Wild hay might be cut in any quantity. "It is among the facts which mark the natural history of the region, that the buffalo, or more strictly speaking, the bison, which fed on these plains in 1820, has not appeared here since. The Virginia deer and the elk are, however still abundant. The absence of lime stone will probably prove the most formidable bar to its settlement." Fort Snelling is about 9 mi. below St. Anthony's Falls.

absence of limestone

Lake St. Croix - beautifully transparent, not much shade line to step onto. The moon came out before they encamped - "If 'Loch Katrine' (Scotland) presents a more attractive outline of sylvan coast, it must be beautiful indeed. We went up it, turning point after point, with the pleasure that novelty imparts, aided by the changing of our canoe men." "Nothing could present a greater contrast, to the noisy scene of horses and horsemen, war and bloodshed, which, we were then unconscious, was about being acted, so near to us. We allude to the pursuit and destruction of the Black Hawk's army" - at the Bad Ax.

coal-bearing

rock

"The great carboniferous limestone formation which fills the Miss. Valley, also reaches here, although there is now reason to believe

that it reaches but little farther north."

"drowned lands" - where trees stand permanently in the water.

the "Standing Cedars" a point called so, in the treaty of limits between the Sioux and Chippewa tribes."

rock { St. Croix Falls - greenstone - seem less falls than impracticable rapids. "The river tears its way through a vast bed of greenstone, whose black and square masses, stand on either side, and in the bed of the stream - common quartz, imperfectly chrysalized, is seen in the mass, and is the sole mineral apparent, ..." Saucers and Foxes very warlike all over.

quartz { "A Mr. Harris, who is still living at the age of about 84, informed me, that about the close of the American war, when he first came to this river (Snake River), rum was an article in highest request among the Indians. When they had purchased a keg of it, it was customary to pour it out into a large kettle and place it over a fire. A hand of tobacco was then put in. After being heated and stirred about for a time, the mixture was drunk."

35 mi. - took them the 30th of July from 11 A.M. to 8 at night and 31st until 8 A.M. to make this trip by canoe.

rock { At Yellow River, a naked eminence which the Indians call Place of the Hip Bone .

the corn was in tassel

"We slept on a kind of bog which the men call Tetes des femmes.
the travers

quartz - a hard mineral, transparent to opaque, found in brilliant, hexagonal crystals, usually prismatic, or in a massive form, & composed of silicon dioxide; one of the commonest mineral substances known.

quartzite - mineral. A compact form of sand stone made up of quartz, in which the individual grains have more or less lost their characters.

quartz

Minnesota, a History of the State - Blegen

word Minnesota means "land of sky-tinted water"

Two great Indian tribes here - Sioux or Dakota and Chippewa or Ojibway. There were at a much earlier time Mississippian Indians who influenced the Woodland types i.e. a change from elongated cone-shaped pottery to round, globule~~s~~ form that was typically Mississippian.

In the 1740's Chippewa drove the Sioux out of the Mille Lac area.

Nicollet, a gifted French mathematician and astronomer and author of a treatise on the mathematics of life insurance, appeared at Fort Snelling in 1836 and won friends - his modestly worn learning and his charm of manner.

"he was a private expedition" tho he carried letters of intro. from War Dep't (some financial aid from a St. Louis fur-trade magnate.)

Lake Itasca - he gave credit to Schoolcraft for discovery of the lake but he determined latitude, longitude and height above sea level. He was not unconscious of the spectacle he presented while trudging across a portage - "I carried my sextant on my back, in a leather case, thrown over me as a knapsack; then my barometer slung over my left shoulder; my cloak, thrown over the same shoulder, confined the barometer closely against the sextant; a portfolio under the arm; a basket in hand, which contained my thermometer, chronometer, pocket-compass, artificial horizon, tape-line, etc. etc. On the right side a spy - glass, powder-flask, and shot bag; and in my hand, a gun or an umbrella ... "

The burdened explorer, stumbling over rough paths and 'bogged in marshes', occasionally regretted the rashness that led him to make his journey.

Agassiz appeared in northern Minn. in the 1840's.

Schoolcraft at Fond du Lac, ^{St. Louis R.} Sandy Lake, then Cass Lake - 'the ultima Thule of previous discovery.' (Thule is the most northern land known or the farthest) Then passed L. Bemidji, turned south and came to 'Elk' (Lake Itasca). There 'cheering sight of a transparent body of water burst upon our view. It was Itasca Lake - the source of the Mississippi. In L. Itasca on northwest end of it is an island now known as Schoolcraft Island - here July 13, 1832. he raised the Am. flag. Eager to report this discovery he turned back to the Sault. Schoolcraft had taken part in the expedition of 1820 with Cass, Thompson, Pike and Beltrami.

Vaccination of Indians for small-pox by Dr. Houghton. In 2 mos. he had vaccinated 2070 Chippewa in the Superior and Upper Miss. areas.

Minnesota places to date

Bemidji - 156 mi. from Duluth. In 1894 homesteaders (settled late) found some quartzite pebbles on the lake shore and thinking them diamonds, purchased many acres in the vicinity. The little boom soon collapsed and in 1895 tamaracks still grew in the streets. Then came logging.

Cass Lake - 18.4 mi. from Bemidji. Was called by the Chippewa the place of red cedars because of the many cedars growing on an island in the adjacent lake of the same name. Renamed by Schoolcraft to commemorate Lewis Cass, 1820. Bishop Whipple founded a mission here in 1860 for the Chippewa. On his first visit to the village he asked a chief if he could safely leave his valise for a time in the village. The chief said "Oh, yes, there is no other white man in this part of the country."

The shores of Cass Lake are now included in Chippewa Nat'l Forest.

Little village of Leech Lake named for a huge leech that, according to legend, the Indians once beheld swimming in the water here. Leech Lake, 3rd largest in the state is 40 mi. across. Glacial effects - "The remains of an oak forest still existed in the white sand of the lake bottom till 1897, when the ice loosened the stumps and forced them to the shore."

Norway and white pine all thru here.

✓ rock

Mound Springs State Park has Blue Mound, visible a mile or so to the side of the highway, a massive bluff of quartzite about 3 mi. long. Stories relate that Indians used to drive herds of buffalo over it to their death below.

East of International Falls follow the beautiful southern shore of Rainy Lake - rocks rich in color and minerals. It is a watershed for Hudson Bay etc... West of International Falls area trapping of wolves, mink, ermine and muskrat still going on.

Laurel Mound No. 4 is 50 ft. in diameter, 4 1/2 ft. high - whole groups of Sioux buried here. Only a couple of rods from the Rainy R. Mound at least 500 years old. A

At the side of Williams on an improved road to Beltrami Island State Forest 6 mi. acres of pine hills and pine swamps. It harbors one of the Large Herds of Caribon in the U.S.

Le Sueur is named for Pierre Charles Le Sueur who at beginning of the 17th century explored the valley of the Minn. R. On the Main St. marked by a tablet is the Mayo Home, a residence of Dr. W. W. Mayo, father of Drs. Wm. and Charles Mayo of Rochester. Wm. was born in this house in 1861. The founder of the Mayo Clinic built this story and a half frame house in 1858 while he was still a country doctor. A Mexican village here - for migrant workers. At Le Sueur (on the Minn. R.) U.S. 169 crosses the Minn. R. to Traverse des Sioux State Park. Near the Ford the Treaty of Traverse des Sioux was signed in 1851. At that time it was a trading post and mission.

Traverse

Traverse des Sioux State Park about 62 mi. from Minneapolis or 8 mi. from Le Sueur.

St. Peter - founded in 1853 by Capt. W. B. Dodd who built the 1st section of a military road into Minn. He was killed at the battle of New Ulm.

Miss. steamboats plied the lower Minn. R.

quartz

Catlin visited the Red Pipe Quarry - "a perpendicular wall of close-grained, compact quartz, of 25 and 30 ft. in elevation... stratified in several distinct layers of light grey, and rose or flesh-colour quartz in any and all parts of which the Indians procure the red stone for their pipes, by digging through the soil and several slaty layers ... to the depth of 4 or 5 ft." He took a sample of the stone (defying the Indians in this) and sent it east. It got the name catlinite.

Renville, founder of Columbia Fur Co. on the shores of Lac qui Parle in Minn. R.) Renville built a large residence (a baronial hall with benches along the wall for voyageurs etc. R. at one time sent his son to tell the Chippewa to retreat to their own country. Asked why he didn't go himself, replied "I have sent my name. That is enough."

river - "You've got to eat it, sleep it, hate it, breathe it until you've got river in your shoe soles and in your pants pockets." - Richard Bissell.

The voyageurs sang the ^{river} sea songs of France. Every man of them cd. sing. Their paddles were often red and flashed in the sun. Two men cd. carry a bark canoe.

When the voyageurs' canoes gave way to the keelboats, there were still songs, but they were more apt to be American i.e. "Buffalo Gals" - a keelboat could be 40 ft. long.

One traveler said "The Minnesota River is a dirty little creek." Thoreau said it was "the river of Minnesota". He came at beginning of summer accompanied by young Horace Mann Jr. Not much by him on this except a letter dated 1861 to Mr. Sanborn: (Dear Sir is ^{how} he began it. Made trip on a steamer some 300 or more mi. up the Minn. (St. Peter's) R. to Redwood or the Lower Sioux Agency "in order to see the plains and the Sioux." "This is eminently the river of Minnesota, for she shares the Mississippi with Wisconsin". Very winding.

Traverse

Traverse des Sioux in general region of New Ulm, Mankato, La Sœur, St. Peter's. Dousman came there - to mouth of Minn. R. where Travers des Sioux Missionary houses stood - where Minn. R. enters Miss. - a ten day canoe trip from Prairie du Chien.

Thoreau's visit - Redwood a mere tiny village at that time. The Indians were paid and performed a dance but complained of their treatment by the whites.

Traverse

In 1851 Indians and whites came from all over mid-west to the meeting at the mouth of the Minn. Traverse des Sioux is where Leonard Calvert landed and he made treaty with Indians in 1634. Altogether at this meeting in 1851 8000 persons. Goodhue, editor of a paper at St. Paul: 'The bands pitched their white tepees and threw up their bark lodges 'like increasing waves ... one behind the other' .. After a band of Sissetons arrived, starving, they danced a begging dance (Sisseton Sioux) received presents of blankets, tobacco etc. and retired.' Now 'there were no more mock buffalo hunts with warriors disguised in skins as they created the impression of a thundering herd; no more sham battles; no more showing off by prairie Sioux pretending to be Comanches. The stars and stripes flew above the leafy bower sheltering the negotiations, and a man

from the Dep't of the Interior, raised a kite high above the trees to delight the children." Chief Sleepy Eyes came from his beloved Swan Lake. The Commissioner would not wait for the Buffalo-hungry Sisseton Sioux for the meeting to begin. Sleepy Eyes rose and said "Father, your coming and asking me for my country makes me sad; and your saying that I am not able to do anything with my country makes me still more sad. Those who are coming behind are my near relatives, and I expected to see them here. That is all I have to say, I am going to leave and that is the reason I spoke." Ramsey immediately ordered that the band receive no more rations so then Sleepy Eyes took his words back and signed the Treaty, protesting the amount of the purchase price. Under the treaty terms, Sleepy Eyes and 34 other chiefs, signed away approximately 30 million acres in Iowa and Minn. retaining only a 20 mile strip as a reservation along the upper Minn. R. Wasn't till 2 yrs. later that the Suland was abandoned by the tribes.

Swan L.

Traverse des Sioux - became a ghost town and settlers moved farther up stream. DAR have put a marker at the spot where the town was. Here in mid 80's lived for a time Edward Eggleston who was writing 'The Hoosier Schoolmaster' - he was a young minister in the first post-treaty rush of migration. To support himself he made soap on week days and sold it as he walked the river trails in search of converts. Met his wife here.

Traverse

Young C. G. Myrick wrote his family in Vermont just after he settled in La Sueur - "There has been a good deal said about the beauty and danger of a prairie on fire, but most of this is in the imagination... I have seen boys run more risk in running through a pile of burning shavings ... The flame shoots up more like a flash than a flame and when it passes it leaves no fire behind nothing but ashes." Described a fire that overtook a friend - "On he goes but faster rushes the fire and soon overtakes him, and passes by, simply scorching his whiskers and some hair from his horse. So much for the poetry of a prairie on fire."

Ginseng helped many a farmer keep his farm after grasshopper disaster. But man who bought it from the farmers misrepresented the price and they were much underpaid.

A Minnesota Valley home - Mrs. Martha Thorne: "The floor was just the ground. Over it we put a layer of wild hay and then staked a rag carpet over it. A puncheon shelf to put my trunk under, and the furniture placed, made a home that I was more than satisfied with ... My bab was born three weeks after we moved in. There was no doctor within a hundred miles. I got through, helped only by my sister-in-law. What do you women nowadays, with your hospitals and doctors, know of a time like this?"

When the Thornes first raised wheat, the whole family went to town to have it ground into flour. "We put the sacks in the bottom of the wagon, then our feather beds on top of them. The children were put on these. She spelled her husband driving and it took 40 hrs. to get to the mill. "The moonlight with the shadows of the clouds on the prairie, was magnificent. We never saw a human being." "When we got home we had a regular jibilation over that flour. Twenty of the neighbors came in to help eat it. They were crazy for the bread. I made three loaves of salt rising bread and they were enormous, but we never got a taste of them."

One woman recalled Indians coming from the reservation ^{Indians} always looking

first through the windows, then waked in without knocking). They squatted on the floor till dinner was over then motioned for the table to be pushed back to the wall. They then began to dance the begging dance. The house rocked. Tom-toms - dried skin drawn tightly over a hoop, beaten on with a stick. Asked for sweetened water and bread. this is all they asked for but they'd take all they could get.

Jacques marquette - "There is a calumet for peace, and one for war..."

Indian hunters: Breaking up, killing ghost and Runs Against Something When Crawling. and another started the men's Eggs War.

Traverse "Traverse, the home now of picnic-tables."

At the International Border - Grand Portage (see L. Superior back of a sheet in the Schoolcraft section) *now say here Pink*

Grand Marais (Superior Nat'l Forest). The village still has (1938) a fur trading post. Out from Grand Marais is the Gunflint Trail. Moose, deer, bear, porcupine etc... In this Grand Marais area is an arrow-shaped point of sharp, rose-colored rock ~~XXXX~~, Forest Lookout Tower (visitors permitted). *5 miles W. is Thompsons Beach*

J.M. Agate

The Manitou - "On the cold, wet rocks near the mouth of the Manitou grows a typically northern flower, the little white rock-saxifrage - blooms a month later here than on the hills farther south. Also growing among the damp, decaying leaves on the steep slopes facing the lake is the dainty little blue birdseye or wild primrose.

✓ rock rock

Little Marais, site of the old Crystal Bay corundum mine and plant of 1903. Corundum an exceedingly hard crystalline mineral once in great demand as an abrasive, now replaced by synthetic abrasives, such as carborundum. Harbor facilities not too good so plant gave up.

Moose Lake - wiped out by forest fire as was Sandstone. Here quarries opened - a stone varying from pink to dark red used in building thruout the Middle West.

Hinckley - the center of the raging forest fire of 1894 when more than 400 persons lost their lives. The hero of the disaster was Northern Pacific's engineer, Jim Root, who backed his train thru a wall of flames and on over the burning Grindstone Creek bridge all the way to Duluth. He saved 350 lives but his hands were burned fast to the throttle. At the side of Hinkley is Monument to the Fire Victims.

St. Croix R.

At Junction with State 23 - here a Chippewa mission was est. near the spot in 1838 and destroyed by the Sioux in 1841. Here lakes and thickets become more numerous. Wild plum and raspbe ries background for masses of lupine, thistle, goldenrod - otherwise a barren stretch of road. The power-line poles are oddly placed along this stretch and seem to lean on each other for support.

Red Wing - Mark Twain here spoke glowingly of the attractive view of streams, villages, Miss. R., quiet dreamlike scenes.

Leaf River - once a settlement of some consequence has almost disappeared. A copper knife evidently a relic of prehistoric times was found in Leaf R. in 1903.

Redwood Falls on a high bank of Redwood R. - now a center for granite shipping. Near site of the old steamboat landing.

see next page

Split-Rock Lighthouse - high cliff overlooking dangerous reefs. Its warning light is of great value to mariners for the magnetic attraction of the metallic rock formations diverts compas needles by several degrees. An iron stairway leads from top of the rock down to the lake shore.

3 pages on T.H.

Two Harbors - when Indians first saw it they named it spear by moonlight. Now Agate City (Agate Bay was already named by whites)

Knife Lake on State 65, identified as rendezvous of Radisson and Groseille and small bands of Chippewa, Huron and Ottawa Indians, following the Frenchmen's wintering along L. Superior (1654-60). A great feast was held, which many Sioux attended; the lake is said to have been so named because Radisson gave them the first steel knives many had ever seen.

Pinko

Pine City once the site of an Indian village. Cross Lake into Snake R. which runs thru the town. Along the river, from its lake source to the St. Croix are basaltic lava flows; several old shafts made by copper prospectors remain along the north bank.

Almelund (Swed. elm valley) Gold is being washed from the moraine here, about one dollar's worth to the ton.

Hastings - US 61 passes the limestone Mansion of Gen. Wm. Gates Le Duc (1823-1917) which is almost hidden by trees and now houses an antique shop. First house in the state to be built in the Victorian Gothic style. The New England and Greek Revival styles had prevailed until 1860: 15 rooms. Had a square rosewood piano. Cream-colored limestone exterior walls. Simple in a day when simplicity was not a virtue. Front door opening is a Gothic arch.

At Hastings is the junction with State 55. Right on this road 31 mi. to the junction with a marked road; R. here to ~~XXXX~~ Mininger 5.2 mi. the home of Ignatius Donnelly (1831-1901) politician, and author of the Great Cryptogram which attempted to prove that Lord Bacon was the author of Shakespeare's plays.

Nippigon R. - speckled trout

Quinn Canyon 500 ft wide, 500 ft. deep

Sibley Peninsula Lookout - entrance to Sibley Provincial Park

Port Arthur & Fort Wm. combined pop ^{over} of 1,000,000

Schreiber - midway stop between Soo & Duluth

Ile Royale - rocky - 35 miles from Port Arthur & Ft. Wm. - daily boat schedule. A copper range on the island. Miner. Museum sent men out to discover mining pits. 32 scattered lakes on island.

Deep spruce woods. Many of the plants are rarely found in Michigan. The saskatoon which resembles the juneberry - and ^{over}cranberry grows in rocky places.

In 1664 Boucher reported copper mine on Ile Royale. Now a nat'l park. 146,000 acres. Its deep harbors have light houses. Shacks of commercial fishermen line the shore.

Pigeon R. (wild pigeons of yesterday)
International bridge above churning waters

Silver Bay U.S. 61 World's first large-scale Commercial
Taconite Processing Site

Split Rock Lighthouse, highest lighthouse in U.S.
light can be seen 22 mi. away

T.H. ✓ Two Harbors beachcombing can result in finding
agates or Thompsonites. R.B. museum here

agate

Agate first found near a river in Sicily.
Varegated colors in stripes or clouds; boy's
marbles.

agate shop

Knife River

Duluth with Superior across St. Louis R.
constitute the Ferrous of the St. Lawrence
seaway; 3rd largest city of Minn.

Knife R
best way up
Antarctic
U.S.

Bayfield; Wis. 13

Gateway to Apostle Islands - discovered in
1659; ferry boat to Rustone Madeline
Island where there is a museum.

James Gray - Pine, Stream and Prairie 1945

"It would be useless for a body of water to be any bigger [than Lake Superior] simply to impress humankind."

city - a center of social life

osprey searching for fish

slews where cardinal flowers grow

notice what the skyline or towers etc. are at the cities

rock
 Iron ranges (iron from which steel is fabricated) - between L. Superior's two fingers that point westward thru Wis. and Minn. the ranges - Vermilion, the Messabe, and the Cuyuna in Minn; the Gogebic, across Wis. and into Mich., and the Menominee, which edges over the Michigan border into Wis. Loaded directly from the pits into cars. The red stream pours itself onto the dock boats to go to the blast furnaces. Open pit is like a man-made canyon - smaller but same kind of color, design and shape and created by man. The Hull-Rust Mahoming mine, open-pit, at Hibbing is largest in the world - 3 mi. long, about a mile across - 350 ft. below surface of the soil. Paint mining pit with its colors and they are unworthy of the splendor, not bright enough

rock!
 The rocks and pines - Elinor Wylie "the hard heart of a child"

Frank Mayer came in 1850 to observe and paint Indians. The squaws' feet despite the constant service demanded of them, remained for him as beautiful as those of the Venus de' Medici.

Paul Bunyan, a statue of him 18 ft. tall, of steel and concrete at Bemidji.

River
 The Minnesota River valley - formerly called St. Peter. - 1773 Peter Pond entered the river. Trapped the following winter and went to Prairie du Chien with furs. He counted there 130 canoes from Mackinac and some from New Orleans. For the season ending spring 1775 Pond recorded a profit of \$20,000.

Catlin - "We are two poor men, travelling to see the Sioux and to shake hands with them ..."

Red Pipe Quarry. southwestern Minn. A pipestone quarry - Indians used it for making their pipes - so sacred the quarry was neutral ground in the Indian wars.

The quarry had some religious meaning for the Indians. When they fought it was neutral ground.

Pipestone quarries still exist. Pipes made first of stone or clay, then later of catlinite from the quarries. Catlinite is mined red stone.

Pipestone is the seat of Pipestone Co. Library, Courthouse and the adjacent jail are constructed in part at least, of the beautiful red granite quarried here. Many articles carved by Indians from pipestone can be bought here.

ancient granitic foundation - barren bulges
- Jasper Peak near Soudan + Ely in northern
Minn.

One of the Vermilion Range deposited when lava
flowed thru Archæan rock; more than a million
yrs. later the earth bulged + threw up a mt. range
reaching 2 n.w. Minn. n.e. into Canada +
on into region of Quebec.

Knobs of granite + gneiss - Minn. Valley
in extreme n.e. part of the state - near Ortonville
+ Big Stone City; + near Lapanga L. in extreme
n.e. part of state. The great schists of St. Louis
+ Gasca Counties are lava flows changed by
the mountain-building processes

quartzite with its now famous pipestone or
catlinite deposit. The sea invaded - in
their sediments the Mesabi range formed -
lava broke thru - remains still plainly
visible along North Shore of L.S.

Iron is one of the most common elements
of the entire earth, + is found not only in rocks
but in most living things.

Many common minerals that appear
insoluble are in time dissolved.

The iron ranges in L.S. region are large
concentrated deposits of some of the richest iron ore
found anywhere on earth - geologic folds of rock
known as iron ranges.

Later geologic time, ^{in Minn.} the hills were away + fill
the sea. A great arm of Atlantic reached the
southern part of the State + the sediments formed
the Sandstone, limestone and shale strata on
river ledges - Taylors Falls + Iowa. And later
again when land animals were developing, the
arm of the Pacific came over but thwarted

by the Rockies the effort was of brief duration
& marked the end of the States' marine history.

Reddish soil was pushed up 2 Illinois &
pinkish from Labrador. ~~From Det R. +~~ ~~from~~ Valley

From n. of L.S. come ~~pinkish~~ ^{grey} - lavender drift
(~~is~~) but picked up next also from two ranges.

To these glaciers ~~bring~~ ^{bring} over its fertile pulverized
limestone that has made wheat raising lucrative

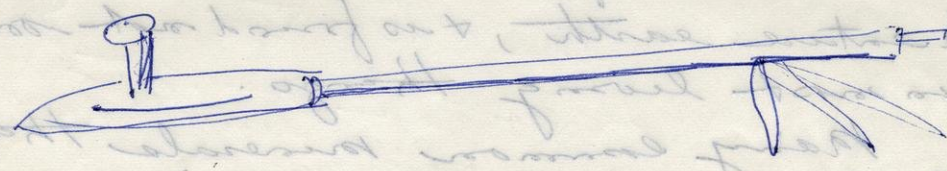
The retreating ice left the huge L. Agassiz - large
body of water, larger than the combined great
lakes. Lake Duluth sent its waters into the

ancient St. Croix

fauna flora - north -
wild roses, blackberries & New Jersey Tea
bunchberry, pink + white lady slippers - these
flourished 40 yrs ago on outskirts of Twin
lakes

Labrador Tea, several varieties of honey suckle

Thimbleberry. Prairie Phlox



French claim - the North American Continent

was relinquished in 1763

Minerals - inorganic compounds

hexagonal system - quartz, beryl, calcite, tourmaline and cinnabar.

Cube - galena, garnet, pyrite and halite

tetragonal - zircon, rutile, cassiterite

monoclinic - gypsum (blackish)

adamantine (brilliant) diamond

vitreous (glassy) quartz

metallic (like metal) galena

The metals are the core of our civilization — The progress as time went on

cobalt - chemically related to nickel and iron. Cobaltite, found in Cobalt, Ontario

Corundum - a primary aluminum mineral found in metamorphosed limestones and in schists. Hexagonal crystals are common. Occurs also as dark granules with magnetite - a form known as emery.

quartz - whitish, usually glassy - chemical silica - forms an imp't part of most igneous rocks. Some sandstones are almost 100 % quartz and so are such metamorphic rocks as quartzite. Quartz, when conditions permit, forms hexagonal crystals. Local name: Herkimer diamonds. Quartz changes under different temperatures i.e. silica combined with water is opal. *Sandstone under heat + pressure forms quartzite.*

Crystalline Quartz is amethyst i.e., there are others

Cryptocrystalline quartz is quartz with hidden or microscopic crystals - chalcedonies and flints, cherts and jaspers. Most of these are translucent or opaque. Some are prized as gems.

Chalcedony - colors from white to gray, blue, brown or black.

Carnelian (sard) a clear chalcedony - some shade of reddish brown. This is a cryptocrystalline quartz. As is jasper, flint, agate, chrysoprase, onyx, sardonyx, chert

jasper - an opaque quartz usually red, yellow or brown or a mixture of these colors. Sometimes banded. May grade into chert.

Flint - gray, brown or black quartz - breaks with conchoidal fracture into sharp edges so used by early man for making tools.

chrysoprase - translucent apple-green chalcedony - coloring due to nickel oxide.

agate - chalcedony, banded or irregular, variegated. Bands wavy or parallel, from differences in deposition. Petrified wood is usually agatized wood. Agate may be artificially colored.

sardonyx - a form of onyx with alternating bands of carnelian and white, that is, of red and white bands.

chert - (Illinois) impure form of flint, white, yellow, grey or brown.

Rock-forming minerals - these form the earth's crust. Some rocks have no definite minerals but most do. They furnish the minerals of our soil and the salt of the seas. Under rare circumstances they attain gem quality.

Tourmaline - a silicate of aluminum with boron and several other metals. It is occasionally abundant with mica and feldspars in granite rocks. It is mostly black - other colors forming gems. Note the triangular striated crystals.

Muscovite, the most common mica, is mined commercially in the Black Hills of South Dakota. The best and most perfect 'books' are from large deposits in India. Pale, almost colorless.

Mica found in metamorphic rocks as other minerals are altered by heat and pressure. The mica in mica schist and in gneiss is of this origin, as is the mica in some kinds of crystalline marble.

Labradorite - iridescent blue plagioclase feldspar. Feldspars are found in almost all igneous rocks. Widely used in making of ceramics. They ultimately decay to form kaolin or other clay minerals.

Amphiboles contain calcium, magnesium and iron.

Hornblende, dark green to black and glassy is found in basic igneous rocks and in such altered rocks as hornblende schist. Contains aluminum and is often of secondary origin.

Some rocks are composed of organic materials like coal.

Granite is the best known of the deeper igneous rocks. Formed mainly of potash feldspar (60%) and quartz (about 30%), usually with mica or hornblende. The intergrown mineral crystals are all about the same size - a characteristic of slow cooling. Fine granite has a salt and pepper pattern. Feldspar may redden it. Some granites may be metamorphic rocks.

Granite porphyry found in St. Cloud, Minn. And at Wausau, Wis.

Basalt - the common, dark heavy lava that is widespread the world over. About half feldspar, about half ferro-magnesium minerals. Basalt varies from a dark grey with a greenish tinge to almost black. In dry areas it's whitish-light green, in humid air the iron oxidizes, coloring the surface a rusty brown.

Sandstone is formed by action of wind, water and ice on older rock. Mainly grains of quartz cemented by silica, lime or iron oxide. Silica cement makes hard sandstone. Not so coarse it is called shale. Most sandstone formed in shallow seas and show signs of near-shore origin... often include fossil ripplemarks and shells of shallow-water animals.

Limestone - variable in color, texture and origin. Mainly of mineral calcite and react like calcite chemically. Most of marine origin - both plant and animal life contribute to their formation - corals, worms, crinoids, mollusks and certain protozoa, algae. *Sandstone under heat + pressure forms quartzite*
Limestone under heat + pressure forms marble

A unique and complex natural balance is known to involve the carbon-dioxide content of the air, the carbon-dioxide and lime dissolved in the sea, limestone formation, and climatic change. Limestone rocks are great reservoirs of carbon dioxide as well as of lime. Grand Canyon A rich source of fossils. Intimately connected with plant and animal life.

Limestones rich in clay are known as marls. They also grade into shales and into sandstones. ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~

Fossils are not common and yet certain layers of rock or strata are made almost entirely of shells, teeth, plant remains, and even of bone.

Agate preserved in wood - spectacular - result of action of hot, silica-bearing waters.

Marbles are recrystallized limestones, normally white, but often tinted by iron oxide, carbon or serpentine to attractive shades of yellow, brown, green or black. True marbles are result of metamorphism involving heat and pressure. Quartzite is metamorphosed sandstone.

gneiss - metamorphosed granite - a coarse-textured rock with minerals in parallel streaks or bands. Relatively rich in feldspar.

Soil is the best known, most complex rock. All life depends on it.

Shale is mainly clay hardened into rocks

Gems

Gem stones are minerals. That is, they are naturally occurring chemical elements or compounds which were formed thru inorganic process. Usually they are in a crystalline form. Thus gems are distinct from rocks which are mixtures of minerals.
Crystal structure - the innate shape of the mineral.

Cleavage - the pattern in which the crystal splits.

Most gems are hard - as hard or harder than silica, the very common mineral which is everywhere present in dust.

Crystal structure - the faces are not constant, vary with conditions, get lopsided etc... "Yet the angles between the faces remain constant and from these angles identification of the species is often possible!" "Mineralogists have assigned all crystals to 6 systems, according to the position of imaginary lines known as axes which intersect to form a theoretical framework or skeleton for the crystal."

An agate nodule may contain a center of easily discernible quartz crystals surrounded by chalcedony that is crystalline only to the eye of the microscope. A few like opal and obsidian are amorphous, no regular structure, like glass. They are a mineral jelly.

The color of a fine gem should be strong and clear, neither muddy, pale nor too dark. Color results from optical properties of a gem material that cause it to reflect or absorb certain wave lengths of the spectrum. Ruby passes or reflects red wave lengths more readily, then blue wave lengths. Result: a pigeon-blood red. One that reflects all colors is colorless; one that absorbs them all is black.

Minerals according to crystal structure and chemical nature. Some are elements, such as diamond (carbon); oxides such as corundum (aluminum oxide) etc. Most gems are silicate family i.e. calcium, iron or magnesium with silicon and oxygen.

Some gems are not silicates but carbonates - they fizz in hydrochloric acid.

Why Iowa and Montana and Minn. are places to find agates - sedimentary rocks - silent testimony to the fact that change is the first law of nature. Wind, water, heat, cold break down the solid mountains into clay, sand and gravel. These become consolidated into horizontal beds of shale, limestone and sandstone. Rich in fossils but not gems except for quartz, agates and jaspers eroded from older rocks.

Metamorphic rocks - have been changed by heat and pressure. Shale changes either to slate or schist, which contains mica; sandstone alters to quartzite or gneiss, limestone to marble, and granite to gneiss. Metamorphic rocks are layered like sedimentary, but layers are light and dark instead of being uniform as in sedimentary.

Sapphires come from formations found in Missouri R. near Helena.

Usual - granite rocks of Canada
lavas of L. Superior region
crystalline mountains in Black Hills and Ozarks

Agate - Patterns include iris, eyes, bands, fortification, moss, dot, flower and plume.

Carnelian - brown (sand) Sardonyx is sand or carnelian, striped with black or white. Usually found in desert areas.

Iowa
Montana

Thomsonite - composition is calcium, aluminum, silicate, Orbicular patterns in red, green, black. An orbicular dark green and pink mineral. Found near Grand Marais, Minn.

Sandstone - a variety of feldspar, Reddish spangled with inclusions. Found in igneous rocks.

Lapis lazuli - deep blue, mixture of lazurite with calcite, pyrite etc. It is metamorphic limestone.

Jasper is varicolored chrysoprase, a quartz stained green by a nickel mineral.

Quartz, of many colors yet really colorless. Found in cavities of many kinds of rocks.

Orbicular agate - (brownish-red) or eye agate, found at Mille Lacs, Minn. Known as Lake Superior agate.

Sodalite from Hastings Co., Ontario. deep blue mottled with flesh-colored pink and white inclusions.

Where to look in Minn.

Little Marais, Lake Co. in gravels at County Line Beach. ^{agate} Agate, gravels at Two Harbors. Agate, gravels at Gobseberry Falls State Park Beach.

Where to look in Mich.

Thomsonites, pink, green - on the Keweenaw, Pete's and Grotiot R. beaches.

Amethystine agate on Thomsonite Beach (Marquette Co.)

Canada → : moss agate at Thunder Bay and jasper at Kakabeka Falls.

Michigan →

Metamorphic rocks

Way Iowa and Montana and Minn. are places to find agates - the first metamorphic rocks - silent testimony to the fact that change is the first law of nature. Wind, water, heat, cold break down the solid mountains into clay, sand and gravel. These become consolidated into horizontal beds of shale, limestone and sandstone. Rich in fossils but not gems except for quartz, agates and jaspers eroded from older rocks. Metamorphic rocks - have been changed by heat and pressure. Shale changes either to slate or schist, which contains mica; sandstone alters to quartzite or gneiss, limestone to marble, and granite to gneiss. Metamorphic rocks are layered like sedimentary, but layers are light and dark instead of being uniform as in sedimentary. Sapphires come from formations found in Missouri R. near Helena. Usual - granite rocks of Canada - layers of L. Superior region - crystalline mountains in Black Hills and Ozarks. Agate - Patterns include iris, eyes, bands, fortification, moss, dot, flower and plume. Carnelian - brown (sand) Sardonix is sand or carnelian, striped with black or white, usually found in desert areas.

Archaen fire-born stones found at Rhinelander, Wausau and Chippewa Falls

Wind, rain, frost, sun and all corrosive chemistries slowly planed the heights. Then, with a downward movement of the earth's crust, the continent sank into the sea where surface waste had already been deposited. Finally the sunken continent began slowly to rise again. Molten rock. Pressure and heat metamorphosed sandstone into quartzite shale into slate, limestone into marble.

Purple-grey rocks seen in the present Baraboo Ranges are quartzite of these periods (Huronian stages). Huronian slate and marble are both revealed near Mellen. Some of the rock formations are rich in iron; good examples at Hurley.

The Lake S. syncline formed in the final movement when mountains were made. St. Croix Falls, Mellen and Superior afford good outcroppings of the Keeweenawan masses of lava, sandstone, and conglomerate. With the end of this Keeweenawan period more than half of the earth's estimated billion years of record had passed. Living things had developed slightly in complexity but without backbone or shell, still confined to water.

Now follows a period of land rest. The waters gradually crept over the land. With complete inundation came the deposition of sands, fine muds and clays that form the Cambrian series of rocks, examples at Madison, La Crosse, Eau Claire, Camp Douglas, Trempealeau and Lodi. Soft and porous, the Cambrian sandstones are the natural reservoirs that supply water to many Wis. cities. While the ancient sea lay in Wis. or parts of Wis., animal and plant life progressed. Shelled fauna, coral colonies. In southern and eastern parts of the state formations of Ordovician and Silurian times.

First of the Ordovician deposits is the lower Magnesian limestone, a heavy rock quarried near Madison and La Crosse and used for road bldg. and gen'l construction.

Second Ordovician deposit - St. Peter sandstone (at Viroqua) There is also Platteville limestone in Ordovician time. Lead and zinc spread thru it.

A thickness of 100 to 500 ft. of shale completes this age. Richmond Shale is near Fond du lac.

Clinton iron ore from Silurian period. Directly above the Clinton deposits is a series of limestone beds known as Niagara - composed, it's believed, of extensive coral reefs which were reduced to sedimentary muds by erosive water action. Appearing in a line of westward cliffs all the way from a point slightly north of Waukesha to the tip end of Door Co., the formation is known as the Niagara escarpment. Racine, Waukesha, Clinton, Sturgeon Bay and Green Bay lie on or near it.

Devonian period - shallow seas deposited limestone and shale - a small area along the Milwaukee shore of L. Michigan.

After the Devonian era all that is now Wis. rose above sea level and there it remained. Millions of years passed; thru erosion, old mountains again exposed, the Baraboo Ranges took their place as surface features.

Heistocene - ice period - one million or more yrs. ago - covered all but the south west quarter of Wis. Glaciers ground away hill tops and left depressions covered with the accumulations of their grindings. Sand, clay, gravel and even huge boulders.

Green Bay

✓ 1634 Nicolet for Champlain Indians and perhaps a few whites gave a feast in his honor - 120 beavers were the main course. For 200 years fur, principally beaver was the accepted currency.

Perot
 1671 Allouez est. mission near Green Bay.
 1884 Nicolas Perot (brilliant man) commandant of the region known as La Baye. By turn of century, diplomatic policy of Perot abandoned for military one - Fox Indian wars began - de Langlade built a fur trading post about 1745.

The Langlades, Grignons and Porliers (intermarriage with Langlades) (one family really) controlled the trade. By 1815 they were working for John Jacob Astor for Am. Fur Co.

1761 old Fort La Baye occupied by Br~~XXX~~itish.

Now iron and steel, paper, bldg. materials.

✓ Charming colonial house on Fox R, private 1008 S. Monroe St. built between 1837 and 1839.

✓ - Site of the Astor place - First Bank of Wis.

✓ Neville Museum attached to Kellogg Public Library - de Langlade's things, Indians etc.

✓ Courthouse Square Walnut St. between Jefferson and Adams St. extending to Doty St.

✓ *rock* At southeast corner of square facing Walnut and Jeff. Sts. is the Spirit of the North-West a 7 ft. statue of gray granite, sculptured by Bédore, a student of Lorado Taft. The three figures represent Nicolas Perot, Father Claude Allouez and a member of the Ojtagami Tribe - 3 types who developed the great N.W.

✓ Ft. Howard stockade and Parade Ground, foot of Dousman St. Bridge, marked by a white glagpole. Fort built in 1684.

✓ oldest house in Wis. - Roi-Porlier-Tank cottage slim French windows - simplicity. Windows were protected by heavy wooden shutters. In 18-50 Nils Otto Tank, a Norwegian bought the property, clapboarded it, plastered, painted the wide softwood floors black and added a wing on either side. From Holland (Tank's wife) came lovely pottery, linen, glass etc.

Stone lighthouse on Tail Point in the Bay (3 mi. from Green Bay)

Beyond Cooperstown (stage coach days) the road sweeps down to Rock Falls, a grove in a wooded valley. Rock Falls Creek breaks into little rapids as it plunges down the small gorges cut in the ancient bedrock, part of the Niagara Cuesta. Low limestone caves in this vicinity. One has been transformed into the Maribel Caves Inn, a bizarre castle-like structure built by a priest.

Doty and Schoolcraft and Cass - the Soo and Minnesota (Thwaites)
1820 expedition

Schoolcraft - Cass expedition to find sites for forts and report on topography of the country, examine where copper mines etc. and gypsum mines. Doty (21 yrs. old) who'd studied law was to become gov. of Wis. - was secretary of the exp. appointed by Cass, Gov. of Michigan Territory. Several important men in their fields accompanied as well as engagées and soldiers. They had canoes and often sailed.

✓ Doty: The land appears fertile and the farms comfortable."

Schoolcraft: "We had three canoes in our little squadron provided with masts and sails and a small U.S. pennant to each, so that the brigade, when in motion, and led as it usually was, by the chanting canoe-men, had a formidable and animated appearance."

White river - large white limestone rock. Surrounded with granite. The Town of White Rock, Huron Co., Mich. takes its name therefrom. A little farther on took a specimen of black mica.

Point au Barque Creek - now Port Austin, Huron Co., Mich. Rocks here chiefly sandstone, very soft. Farther on picked wintergreen berries, very large, size of a red cherry.

Mackinac Island. Limestone makes it up. 1½ mi. by ¼ mi. Hickory and Pine.

Reached the river au Sable, Thunder Bay.
The stone here is of a dark color.

Presque Isle

Swan River which empties into a bay of the same name. Fifteen mi. from Swan R. is Deep Bay (now known as Hammond's Bay into which a river of same name empties. This river is frequented by the Indians for hunting beaver.

Nearby Bois Blanc or White Wood Island is Mullet Lake.

Mackinaw Country. Doty: "The whole island of Mackinac appears to be a composite of broken limestone." The stone is whiter than any I ever saw. Organic remains are found in it. Many of the rocks are crusted over with calceous spar, particularly at Robinson's Folly.

Between Fort Holmes and the Town is Skull Rock. At the mouth of this cave and in it, human bones are still found. Between the Fort on the NE side of the Island is Sugar Loaf Rock. It is about 100 ft. high.

We left Mackinac accompanied by Lieut. Pierce in a 12-oar barge, 22 soldiers. The traverse to Goose Island is 12 mi. The wind has a sweep of 200 mi. on the lake so this passage is very dangerous.

Entered St. Mary's - two islands there - on one of them "the British have fortifications and a garrison. At night we heard their music playing."

Schoolcraft: St. Mary's R. a mile or ¾ mi. wide and the two separate villages on the Am. and Br. shores began to reveal themselves ... with the cataracts of the Sault Ste. Marie in the distance, and a beautiful forest of elms, oaks, and maples on either hand. We ascended with our flags flying, our little squadron being spread out in order, and the Canadian boatmen singing one of their enlivening songs. Long before reaching the place, who, as we put in towards the shore, fired a salute, and stood ready to greet us with their customary bosho." (bosho is a corruption of the French bon jour). They portaged at a rapid of 22 ft. 10 in. fall. "The rapid is run with an empty canoe in

less than 5 minutes." The rapid extends rather more than half way across the river which is about 3/4 mi. wide. "It affords a beautiful prospect when approached on the river below." At the foot of the rapid immense quantities of whitefish are taken and of a superior quality -

The inhabitants are Frenchmen chiefly, married to squaws by whom they have families. 8 or 10 houses here. (I take it he means Am. side) Schoolcraft says the village of St. Mary's consisted (British side) of 15 or 20 bldgs. of all sorts. "the principal bldgs and out-houses were those of Mr. John Johnson and the group formerly occupied by the Northwest Company."

The bed of the river at the Soo (Saut is what Doty calls it) is white, red and gray sandstone. No limestone seen.

"News was received yesterday of a peace having been concluded between the Sioux and Chippeway nations. It is hoped the information is correct."

mountain ash (the leaf of which resembles that of the wild locust-tree)

Grand Marais 21 miles from the Two hearted river. (Must mean Michigan)

✓ Agate - used as semi-precious gem

✓ Marais is swamp, marsh but sailors had their own language - to them it meant refuge

Pictured Rocks - 12 miles in extent "graywacke, or sand and pebbles cemented by lime; and the minerals and other matter between the strata have run out, and given the rocks various and very singular colours. A green like that running from copper is seen in several places. The appearance of iron is more frequent. These rocks are generally from 2 to 300 ft. high. They present the most appalling spectacle I ever witnessed. From the deep caverns underneath a roar like that of cannon is continually reverberated, occassioned by the waves rolling in. In passing along under them the sensations exceed those excited on viewing the Cataract of Niagara."

They named an arch the Doric Arch, bearing resemblance to that architecture.

✓ "The Chocolate river is 15 miles from the laughing fish river and three miles farther is the river of the dead, a little below Presque Isle. Iron ~~XX~~ pirites is found on this stream.

Nine miles or so farther on - "Large, confused masses of granite is interspered with hornblende", all peaks thrown up by some volcanic eruption, one would think. Garlic river. Farther on, a portage.

Portage Lake - "This morn I rose at 4, and walking on the shore of the lake found several fine specimens of cornelian and agate. (LN - I think he spelled it cornelian every time) Next morning to River Ontonagan - "having sailed 51 miles before breakfast!"

Had passed Graverod's River "This is a small stream, and is only particularly noticed from a Trader by the name of Graverod being murdered on it many years since. His son now resides at Mackinac, an int. in the Ind Dept."

(Quite often the list of trees reads Sugar maple, beech, birch, hemlock and spruce.)

rock Granite on top of the mountains based with red sandstone. So many pigeons at Point Chegeoiamegon that flying low they could be killed by the men with clubs and sticks thrown into the flocks as they passed.

On the St. Louis river a man had cows and it was a great treat in the wilderness to get this milk.

(LN swamps giving rise to big rivers!)

Breccia (bretch yuk) = cinders, ash + broken fragments 36

or simply fragments - of quartz, matons
or quartz breccia - or whatever?

Grand portage on river Brulé - "At the end of the second pause the bank of the river was a strata of breccia. It lay at an acute angle shelving towards the river."

✓ When they'd got everything across the portage "for all which we were blessing our stars over a piece of ham and a good dish of chocolate."

(pass is a portage)

Coteau R. ledges of slate. A lake near or in Fond du lac R. which it seems is now St. Louis R. the lake remarkable for its fine cornelians and agates. "we named this water 'cornelian Lake'".

✓ (LN: we name our thoughts, our paintings, but think: to name a lake etc.)

(Off north shore of LS) Sandy Lake - below the mouth of the Little Savannah - (they had been at Detroit) they find now lakes covered with wild rice. They've been going and still do, w: and n.w. Sandy Lake - a fur trader living there working for John Jacob Astor's company. Enjoyed a stay in that house. Doty: "Starvation has few honors which aren't at some season or other felt in a greater or less degree by the resident here. Even at this season these people are living on dried buffalo meat and Labrador tea! without bread or vegetables." The lake surrounded by sand and gravel in which I found great numbers of cornelians, agates and jaspers. The Miss. runs within 1/2 mi. from the lake.

Schoolcraft and a few others went to the sources of the Miss. but did not get quite that far, only to Red Cedar Lake, 350 mi. from Sandy Lake. Whole country low and marshy and covered with wild rice.

After that the whole party went to St. Peter's (Minn. R.), Camp Cold Water. 1 1/2 days spent hunting buffalo on the scrub oak prairies. Killed 4 buff., 1 elk and 1 deer. "The buffalo meat is rather inferior to that of the bear" Rapid succession of rapids now so could ~~not~~ make 150 mi a day by canoe. Wherever the banks were sandy and gravelly we found cornelians and agates in abundance. "On one of these Mr. Schoolcraft found a piece of agateised wood."

De Corbeau R (Crow) "A short distance above the falls of St. Anthony a river empties in, which Carver calls Rum R. The Indians say it is the residence of good and bad spirits. Carver not understanding them as to spirits thought they meant the ~~XXXXXXXX~~ liquor kinds and called the river: Rum. (LN: a corruption indeed of d'esprit)

Falls of St. Anthony - here white sandstone overlaid with secondary limestone appears for the 1st time since leaving L. Superior. The Falls are about 30 ft. Scenery grand and beautiful. At St. Peters R. (Minn. R.) last winter an inf'y detachment wintered and troops taken with scurvy - 40 out of 100 men died, then relief was discovered in strong decoctions of hemlock boughs. The troops subsisted on salted provisions, without any vegetables which is supposed to have caused their ill health. Later they moved to Camp Cold Water where excellent water gushing out of a limestone rock is excellent. Waters of St. Peter's at its mouth yellowish apparently filled with alluvial soil. It is a principal channel of communication with the Red River, rises near there.

David Thompson in Americana Ence. found Turtle L. to be source of Miss. Geologist (stone called Thompsonite named after him?)