January 2, 1981

Research & Regulations Branch
Bureau of Alcohol, Tobacco & Firearms
Department of Treasury
12th & Pennsylvania Ave., NW
Washington, DC 20226

Sirs:

Pursuant to 27 CFR Section 4.25a, we the undersigned hereby make application for a viticultural area appellation of origin for a portion of Leelanau County, Michigan.

1 The proposed name for the viticultural area is "Leelanau Peninsula ".

2 The boundaries of the area may be found with reference to four USGS maps, all of the 15 minute series, entitled: 1) "Empire Quadrangle, Michigan" , 2) "Maple City Quadrangle, Michigan" , 3) "Traverse City Quadrangle, Michigan" , 4) "Northport Quadrangle, Michigan". The proposed viticultural area consists of the contiguous mainland portion of Leelanau County, which may be more fully described as follows. The area circumscribed by a line drawn from the point of beginning at the intersection of the southern boundary line of Leelanau County and the western shore of Grand Traverse Bay; thence westerly along the southern boundary line of Leelanau County to a point on the eastern shore of Lake Michigan; thence along the shore of Lake Michigan in a generally northeasterly direction to the most northern point of land; thence generally southeasterly along the shore of Lake Michigan and Grand Traverse Bay to the point of beginning.

3 The name "Leelanau" has been used to describe this area for over one hundred years. "It was not until 1836 that the area comprising this county began to appear in written records... One of the names selected was LEELINAU, spelled with an "I" instead of an "A"...The name survived, however, with the adopted spelling using an "A" instead of an "I"...At first it was entered in the State records as Leelanaw because someone in Lansing read the handwritten "u" as a "w". This spelling appeared on all maps and records until it was officially changed in 1896."-- (Exhibit A) See further Exhibits B and C.

4 The Leelanau Peninsula has long been recognized as a unique climatic region; from 1866: "the triangle forming Leelanaw county is embraced by two large bodies of water, and enjoys a situation unlike that of any other portion of the northwestern States".--(Exhibit D) See further Exhibits C and E. The tempering effect of Lake Michigan on the area's weather has been extensively documented in modern scientific literature. See further Exhibits G and H.

5 Leelanau's combination of climate, soil, and topography (quite unlike that of areas away from the lakeshore) has proven ideal for fruit growing: "as a fruit-growing region, it is doubtful whether any other part of the United States will compete with this".--(Exhibit D) See further Exhibits C, E, F, J.

6 "Grapes thrive admirably throughout,"--(Exhibit D); and after Prohibition winegrapes have been grown in the area since at least 1965. See further Exhibit E. Within the proposed viticultural area there are today four bonded wineries, all of which have vineyards within the viticultural area. See further Exhibits C, F, G, H, I, J, K, L. A partial list of winegrape varieties grown within the area includes: Aurora, Marechal Foch, Cascade, Baco Noir, DeChaunac, Seyval Blanc, Vignoles, Chardonnay, Riesling, Pinot Noir, Pinot Gris.

7 Wines produced from grapes grown in the Leelanau Peninsula have distinctive character, distinguishable from other areas in Michigan and the United States. See further Exhibits E and I.

Respectfully,

Bernard Rink
Boskydel Vineyard

D. Bruce Simpson
Bruce Simpson
Good Harbor Vineyards

Nathan Stackhouse
Leelanau Wine Cellars

L. Mawby
Lawrence Mawby
L. Mawby Vineyards/Winery

Enclosures

LIST OF EXHIBITS

A Littell, E., 100 Years in Leelanau, The Print Shop, Leland Mi, 1965.

B Dickinson, J., The Story of Leelanau, Solle's Bookshop, Omena, Mi, 1951.

C Anon, The Traverse Region, Historical & Descriptive, HR Page & Co, 1884.

D Winchell, A., The Grand Traverse Region, Dr. Chase's Steam Printing House, 1866.

E Adams, L., The Wines of America, 2nd ed, McGraw-Hill, 1978.

F Wagner, P., A Winegrower's Guide, Alfred A. Knopf, 1965.

G Vandenbrink, C. et al, Growing Degree Days in Michigan, MSU Ag Exp Station, 1971.

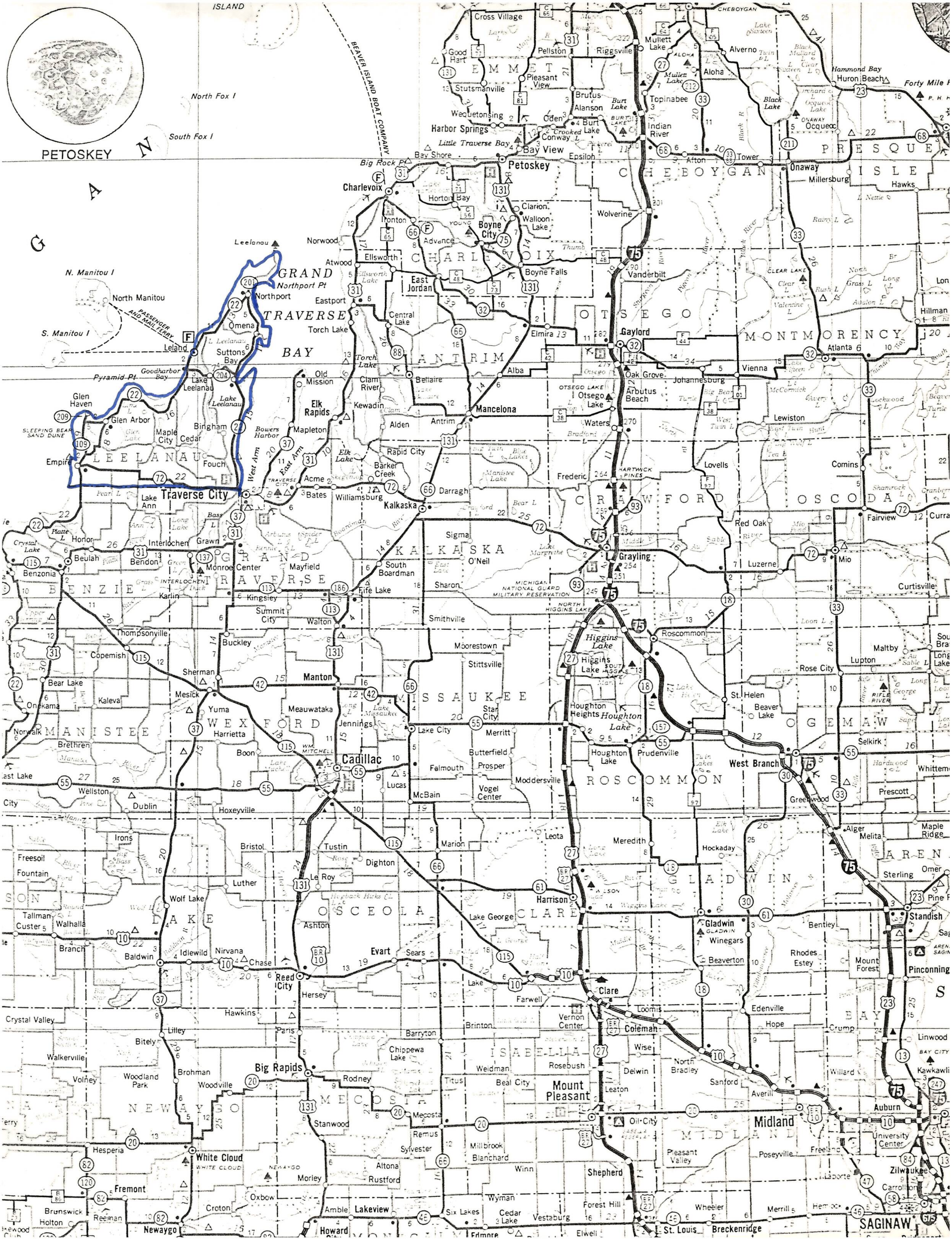
H Strommen, N., Climates of the States--Michigan, US Govt Printing Office, 1967.

I Rine, Carol; "A Toast to Midwest Wine Makers", Republic Scene, May, 1980.

J Anon, "Wine-Grape Plantings and Wineries Announced in Leelanau County", The Great Lakes Grape Growers News, July, 1975.

K Wine Tour Guide, The Association of American Vintners.

L Anon, "Good Harbor Vineyards to Open June 1", Great Lakes Fruit Growers News, November, 1980.


PETOSKEY
BEAVER ISLAND BOAT COMPANY
North Fox I
South Fox I
N. Manitou I
North Manitou
S. Manitou I
PASSENGER AND MAIL FERRY
SLEEPING BEAR SAND DUNE
GRAND TRAVERSE BAY
EMMET
CHEBOYGAN
PRESQUE ISLE
CHARLEVOIX
OTSEGO
MONTMORENCY
ANTRIM
LEELANAU
CRAWFORD
OSCODA
KALKASKA
GRAND TRAVERSE
BENZIE
MANISTEE
WEXFORD
MISSAUKEE
ROSCOMMON
OGEMAW
ARENAC
LAKE
OSCEOLA
CLARE
GLADWIN
BAY
NEWAYGO
MECOSTA
ISABELLA
MIDLAND
Cross Village
Good Hart
Pellston
Riggsville
Mullett Lake
Alverno
Harbor Springs
Little Traverse Bay
Bay View
Petoskey
Charlevoix
Boyne City
Boyne Falls
East Jordan
Indian River
Topinabee
Onaway
Vanderbilt
Gaylord
Elmira
Atlanta
Hillman
Northport
Omena
Leland
Suttons Bay
Lake Leelanau
Glen Haven
Glen Arbor
Empire
Maple City
Cedar
Bingham
Fouch
Traverse City
Elk Rapids
Kalkaska
Mancelona
Bellaire
Grayling
Frederic
Mio
Luzerne
Fairview
Interlochen
Beulah
Benzonia
Honor
Kingsley
Fife Lake
Manton
Cadillac
Lake City
Houghton Lake
Roscommon
West Branch
Higgins Lake
Prudenville
Lucas
McBain
Marion
Harrison
Gladwin
Standish
Pinconning
Reed City
Evart
Baldwin
Big Rapids
Clare
Farwell
Coleman
Mount Pleasant
Shepherd
Midland
Auburn
Saginaw
White Cloud
Fremont
Newaygo
Howard City
Lakeview
Edmore
St. Louis
Breckenridge
Zilwaukee
Freeland
Sanford
Hesperia
Onekama
Mesick
Sherman
Buckley
Copemish
Kaleva
Brethren
Wellston
Irons
Luther
Tustin
Le Roy
Ashton
Chase
Idlewild
Nirvana
Hersey
Paris
Rodney
Stanwood
Mecosta
Remus
Barryton
Rosebush
Weidman
Beaverton
Rhodes
Estey
Sterling
Omer
Alger
Prescott
Lupton
Rose City
St. Helen
Atlanta
Lewiston
Comins
Johannesburg
Vienna
Lovells
Waters
Alba
Central Lake
Ellsworth
Eastport
Atwood
Norwood
Torch Lake
Kewadin
Alden
Antrim
Rapid City
Acme
Williamsburg
Bates
Barker Creek
Sharon
South Boardman
Mayfield
Grawn
Karlin
Thompsonville
Bear Lake
Harrietta
Boon
Yuma
Merritt
Falmouth
Moddersville
Prosper
Butterfield
Meredith
Hockaday
Dighton
Wolf Lake
Walhalla
Custer
Branch
Fountain
Freesoil
Brohman
Woodville
Bitely
Lilley
Volney
Hawkins
Morley
Altona
Rustford
Sylvester
Millbrook
Blanchard
Winn
Vestaburg
Six Lakes
Cedar Lake
Forest Hill
Elwell
Wheeler
Merrill
Hemlock
Carrollton
Kawkawlin
Linwood
Crump
Edenville
Hope
Averill
North Bradley
Wise
Delwin
Leaton
Loomis
Vernon Center
Brinton
Lake George
Titus
Beal City
Oil City
Pleasant Valley
Poseyville
Laporte
University Center
Rhodes
Bentley
Winegars
Greenwood
Selkirk
Maltby
Curtisville
Red Oak
Sigma
O'Neil
Smithville
Moorestown
Stittsville
Star City
Walton
Summit City
Leota
Vogel Center
Crystal Valley
Walkerville
Woodland Park
Croton
Oxbow
Reeman
Brunswick
Holton
Rose City
Wolverine
Clarion
Walloon Lake
Horton Bay
Ironton
Advance
Bay Shore
Big Rock Pt
Epsilon
Afton
Tower
Millersburg
Aloha
Ocqueoc
Huron Beach
Hammond Bay
Oden
Conway
Alanson
Brutus
Burt Lake
Pleasant View
Stutsmanville
Wequetonsing
Gaylord
Otsego Lake
Arbutus Beach
Oak Grove
MICHIGAN NATIONAL GUARD MILITARY RESERVATION
NORTH HIGGINS LAKE
HARTWICK PINES
Houghton Heights
Beaver Lake
Dublin
Hoxeyville
Bristol
Sears
Lake
Orient
Tallman
Melita
Maple Ridge
Whittemore

L. Mawby Vineyards/Winery

Post Office
Box 237

Suttons Bay
Leelanau County
Michigan 49682

616
271-3522

21-Mar-81

Norman P. Blake
Research & Regulations Branch
BATF
Department of the Treasury
Washington, DC 20226

Dear Mr. Blake:

After our telephone conversation yesterday, I checked with the Leelanau County Planning Department and they informed me that the land area included in the proposed Leelanau Peninsula appellation measures 329.6 square miles.

Should you need any additional information in regard to this application, I am at your service.

Sincerely,

L. Mawby

Lawrence Mawby

EXHIBIT A

100 Years In Leelanau

by

EDMUND M. LITTELL

Printed by The Print Shop, Leland, Michigan

CHAPTER I

The Beginnings

As old as time, the heavily timbered wilderness that became Leelanau County is said to owe its name to the Indians who lived and moved about in all of upper Michigan. They made trails, many of which are today's highways. They marked their routes with trees which were bent as saplings and which in some places still survive. But otherwise they left no records, only legends, so very little is known about the length of their occupancy.

As for the white man, there is a definite possibility that French explorers moved through the waters in their canoes as early as 1622. They may have used the islands as their camping grounds as they explored, though there are no records of it. And during the century that followed, when the French and the British — and the Indians — fought for possession of the lands and waters of the north country, no mention is made of this county's land.

It was not until 1836 that the area comprising this county began to appear in written records. In the Treaty of Washington, signed that year, the Indians, for an agreed compensation, ceded their rights to the upper western half of the State. And four years later the area was laid out into 21 unorganized counties, all of which were given Indian names by Henry R. Schoolcraft, who was United States Commissioner to the Indians. One of the names selected was LEELINAU, spelled with an "I" instead of an "A", and he translated the word as meaning "delight of life." In one of his books, "Algic Researches," he has a story called "Leelinau, on Ojibway Tale," in which he tells the story of an Indian girl who lived on the south shore of Lake Superior. This tale is repeated in Longfellow's "Myth of Hiawatha," in which the heroine says: "From her baby Neenizu, my dear life, she was called Leelinau."

There is another opinion, however, to the effect that Leelanau does not appear to be an Indian name, there being no similarity in root between it and the Ottawa tongue. The assumption in this case is that the word is of French derivation, based upon the fact that the area is on the lee of the waters — "eau" or "au" (French) — of Lake Michigan. The name has survived, however, with the adopted spelling using an "A" instead of an "I." And at first it was entered in the State records as Leelanaw because someone in Lansing read the handwritten "u" as a "w." This spelling appeared on all maps and records until it was officially changed in 1896.

Meanwhile, Indians lived and moved on their trails in Leelanau County. There was a village of some 300 Ottawas on the hill north

EXHIBIT B

The Story Of Leelanau

by

Julia Terry Dickinson

Published, and for sale by:

1951

INTRODUCTION TO LEELANAU

Leelanau county geographically began ages ago when the late Wisconsin ice sheet in its northward retreat left a beautiful peninsula of rolling hills and sparkling lakes extending north into Lake Michigan at the northwest corner of the lower peninsula of Michigan.

Politically Leelanau county is a youngster barely 100 years old with many of the original homesteads still maintained by third and fourth generations of those families who arrived in the wild unspoiled country by boat, by ox-cart, by covered wagon, and on foot.

Leelanau, "Land of Delight," is just that to the 8400 people who live here year round and to the several thousand visitors who come for all or part of the summer. The islands of North and South Manitou attracted "resorters" as far back as the 1850s when people even then sought refuge from the cities of the Midwest during months of summer heat.

The Manitous were first of all wooding stations for steamboats or propellors as they were popularly called, that traveled up and down the Lake Michigan waterway on their way through the Great Lakes. A few of the remaining old time residents can still recall seeing as many as 80 schooners seeking refuge in the unexcelled harbor of South Manitou during lake storms.

Over on the west side of North Manitou where softly rolling hills descend gradually to the lake shore, Crescent, the now forgotten village, was the landing site for early visitors to the islands and to the mainland of Leelanau.

The two Fox islands, northeast of the Manitous attracted fewer people, although a lumber mill was maintained on South Fox for some years, and a coast guard light still casts its helpful beam over the waters in that area.

The mainland of Leelanau is generally triangular in shape with more than 100 miles of shoreline. Sand dunes and bluffs, and sand beaches mark the west coastline of the peninsula while bays and irregular peninsulas jutting into Grand Traverse Bay are trademarks of the east shoreline.

The interior lakes of Leelanau, for the most part, are bordered by hills making a gemlike setting for most inland bodies of water. Lake Leelanau and Glen Lake are the largest lakes and draw many visitors each year. Lime Lake, Cedar Lake, Little Traverse Lake, Bass Lake (two of them), Duck Lake, and many smaller bodies of water delight fishermen in all seasons.

Ice fishing in the winter time finds the lakes populated with villages of shanties, and good catches of pike, perch, bass, and trout come from the cold waters as long as the ice holds. Fishermen cast their flies in the clear streams of the county, while trolling and the humble drop line crowd the lakes in the summer.

Leelanau's location, a little off the beaten track of main railroads and main highways, helps keep it free of too much commercial

industry and development. Its residents are farmers, orchardists, cabin and hotel operators, commercial fishermen, and proprietors of several smaller industries which provide not great stores of wealth, but a quiet, comfortable and simple livelihood.

The people here are ambitious but not avaricious. The country with its natural beauty does not condone qualities of monetary greed. There is already free for the inner man, the great eternal beauty of clear lakes, wooded hills, quiet streams.

Most of Leelanau's residents and visitors want to keep it that way.

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ILLUSTRATIONS OF SCENERY

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OF SOME OF ITS

Prominent Men and Pioneers.

CHICAGO:
H. R. PAGE & CO.
1884.

MAP OF LEELANAW COUNTY MICHIGAN.

LEELANAW COUNTY.

CHAPTER XXXI.

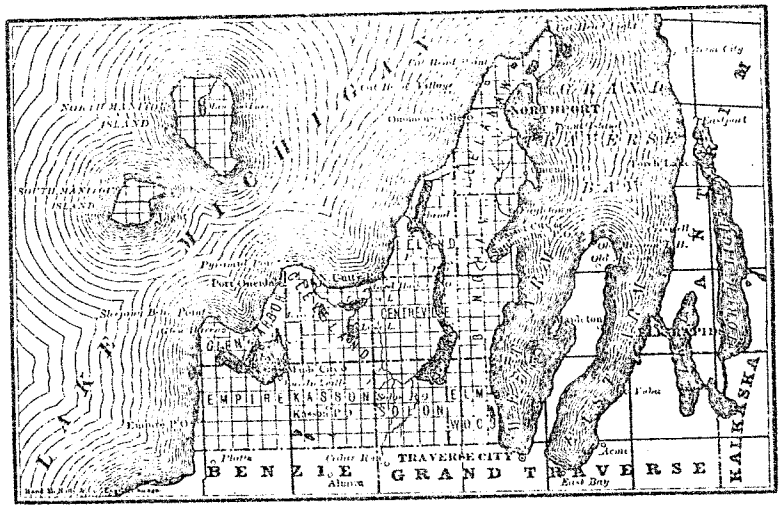
GEOGRAPHICAL LOCATION—DESCRIPTION OF PHYSICAL FEATURES—FIRST SETTLEMENT—BIOGRAPHY OF REV. GEORGE N. SMITH—FIRST SETTLEMENT AT NORTHPORT—FIRST FOURTH OF JULY CELEBRATION—REMINISCENCE BY JAMES J. MCLAUGHLIN.

Leelanaw County lies wholly between Grand Traverse Bay and Lake Michigan. It is bounded on the north and west by Lake Michigan, east by Grand Traverse Bay, and south by the counties of Grand Traverse and Benzie. The county is irregularly triangular in shape, its greatest width being twenty-two miles on the southern boundary. Its greatest length is about thirty-nine miles. It has a shore line of more than a hundred miles. There are several lakes within its territory, the more important of which are Glen Lake and Carp Lake. The latter is fifteen miles in length, measuring in a straight line, but considerably more than that if the crooks of the channel are followed. The outlet of this lake is Carp River. At its south end the lake is little more than three miles from Grand Traverse Bay, while its northern extremity approaches to within half a mile of Lake Michigan.

Glen Lake lies within a mile of Lake Michigan, with which it connects through Crystal Creek. This body of water covers about one-sixth of a township. It is over two hundred feet deep.

The surface of the country is high and rolling, and heavily timbered. The soil presents the usual varieties of the Traverse Region.

Speaking of the topography of Leelanaw County, Professor Winchell says: "Some parts of the county present hills of some what formidable magnitude. Most of the northern part of th triangle is decidedly rough. The ridge of land separating Ca Lake from Sutton's Bay attains an elevation of nearly 400 fe above the bay. The slopes, however, are passable for loaded wa ons. Carp Lake is a beautiful sheet of pure water, resting in th bosom of the hills, which, with their rounded forest-covered form furnish it a setting of surpassing loveliness. Except for a sho space on the east side, south of the narrows, the shores of th lake are occupied by dry and arable land. The region betwe Glen Arbor and Traverse City is substantially an undulating platea lying at an elevation of about 300 feet above the lake. Glen La is surrounded by hills, which attain an elevation of 250 to 400 fe North Unity is a bold bluff of clay and sand, formed by the wa ing of the lakeward-side of a prominent hill by the action of t



waves. Sleeping Bear Point is an enormous pile of gravel, and clay, which has been worn away on its exposed borders til lakeward face presents a precipitous slope rising from the wate an elevation of 500 feet, and forming with the horizon an ang fifty degrees. Back from the face of the bluff is an undul plateau of clay, pebbles and sand, covering an area of six or square miles, over which the only signs of vegetation are a tufts of brown, coarse grass with scattered clumps of dw and gnarly specimens of the balm of gilead,—a miniature d lying 380 feet above the lake. Across this waste of sand and the wind sweeps almost incessantly,—sometimes with relen fury— driving pebbles and sand into the shelter of the neighb

on the east by Grand Traverse Bay, on the west and north by Lake Michigan, and on the south by Manistee. It has eighty six miles of lake and forty miles of bay coast. There are five organized townships, viz: Leelanaw, Centerville, Glen Arbor, Crystal Lake and Benzonia. Leelanaw contains 720 whites and 319 Indians; Centerville 411 whites and 237 Indians; Glen Arbor 252 whites, no Indians; Crystal Lake 127 whites, no Indians. Total 1,603 whites 554 Indians; grand total, 2,157. As Benzonia was only organized last fall we have no means of knowing the number of inhabitants. It includes the Benzonia or Bailey colony, where it is in contemplation to build a college. Many of the best lands in the county are held by and reserved for the Indians, which has greatly retarded its settlement.

The village of Northport is in the township of Leelanaw. It is pleasantly situated on a safe and capacious harbor of the bay, about ten miles from its mouth, and is the largest village on the bay, containing four hundred inhabitants. The old Indian village of Wau-ka-zoo-ville and Northport are now one and the same, the Indians having sold out and abandoned it. It is an important wooding point for the propellers trading between Chicago and the lower lakes, and has two extensive wharves, five stores, three hotels, several saloons, one saw-mill and a number of mechanic shops.

The new Indian mission under the charge of Rev. Mr. Dougherty is also in this township. It is delightfully situated on a commanding eminence of the bay six miles south of Northport.

Centerville joins Leelanaw on the south and extends nearly to the head of the bay, and westerly from the bay to Lake Michigan. It embraces Carp Lake—some eighteen miles long, and from one to two miles wide—a beautiful sheet of water abounding in choice varieties of fish. The principal business point is Leland, at the confluence of Carp River with Lake Michigan. Messrs. Cordes & Theiss have an extensive wharf here for wooding propellers, and they have also a saw and grist-mill. John I. Miller has a beautiful farm in the immediate vicinity of Leland. There are some excellent farms on and in the immediate vicinity of the bay, among which are those of James, Robert and Thomas Lee, Messrs. Bates, Sutton and Cumberworth. Farther up the bay Mr. Norris has a tannery, a grist-mill, and an excellent water-power.

Glen Arbor lies north and west of Traverse City and is an excellent township of land. The settlement is mostly on the western side of the town in the vicinity of Lake Michigan. There are two villages, Glen Arbor and North Unity, the latter a German settlement. Glen Arbor is at the cone formed by Sleeping Bear Point and is a wooding point for propellers.

Rev. George N. Smith in a letter dated at Northport [illegible] 1862, gave the results of his experience in fruit growing, and expressed his firm belief that this region was unsurpassed for the purpose. He was situated on Section 3, Town 31 north, of Range 11 west, on the west shore of Grand Traverse Bay. He describes his soil as follows: "My soil is alluvial; granite and lime rock are abundant, but nothing in place—everything is drift, and in the drift almost all the varieties of northern rock are represented. The subsoil is clay; the surface soil sand and gravelly loam. I have been here nearly thirteen years, and commenced cultivating fruit the first season, adding something every year since. I have put out in orchard form about 150 apples of extreme varieties, a great number of peaches, pears, plums, cherries, etc. In general my trees have prospered well, most of them extraordinarily well."

OPENING OF THE STATE ROAD.

In the spring of 1862 the Northport and Newaygo state road was opened between Northport and Traverse City. Previous to this

ganized into a new township by the name of Centerville, and the first town meeting be held on the first Monday of April next at the house of Antoine Manseau, Jr., and Antoine Manseau, E. W. Caleff and L. D. Quackenbush be inspectors of election."

After this time the respective townships of Leelanaw, Glen Arbor and North Unity, or Centerville, were represented as follows:

	Leelanaw.	*Centerville.*	*Glen Arbor*
1857,	Otis L. White,	John I. Miller,	John E. Fisher.
1858,	Philo Beers,	John I. Miller,	John E. Fisher.
1859,	Philo Beers,	J. W. Timblin,	Henry Decker.
1860,	Philo Beers,	Robert Lee,	E. S. Bryant.
1861,	Philo Beers,	Robert Lee,	John E. Fisher.
1862,	Philo Beers,	John Porter,	John E. Fisher.

LEELANAW COUNTY ORGANIZED.

In the winter of 1862-'63 an act organizing the county of Leelanaw passed the legislature. The full text of said act we give below:

AN ACT

To organize the County of Leelanaw and define the County of Benzie:

SECTION 1. The People of the State of Michigan enact, That all that part of the county of Leelanaw which lies north of the south line of Township 28 north shall be organized, and the inhabitants thereof shall be entitled to all the rights, privileges and powers to which, by law, the inhabitants of other organized counties in this state are entitled.

SECTION 2. At the township meeting to be held in the several townships in said county on the first Monday in April next, there shall be an election of all the county officers to which, by law, the said county may be entitled, whose term of office shall expire on the first day of January, A. D. eighteen hundred and sixty-five, and when their successors shall have been elected and qualified.

SECTION 3. The board of county canvassers under the provisions of this act, shall meet on the second Tuesday succeeding the day of election, as herein appointed, in the village of Northport, in said county, at the house of Joseph Dame or at such other place as may be agreed upon and provided by such board, and organize by appointing one of their number chairman and another secretary, and shall thereupon proceed to discharge all the duties of a board of county canvassers as in other cases of the election of county officers as prescribed by the general law.

SECTION 4. The location of the county seat of said county shall be determined by the vote of the electors of said county at a special election which is hereby appointed to be held by the several townships of said county on the first Monday in June next. There shall be written on the ballots then polled by the qualified electors of said county, one of the following names of places, to-wit: Glen Arbor, Leelanaw or Northport, and that one which shall receive the greatest number of votes shall be the county seat of the county of Leelanaw.

SECTION 5. It shall be the duty of the several boards of township inspectors in each of the townships of the said county to conduct the elections authorized by the provisions of this act and to make returns thereof in accordance with the general provisions of law for conducting elections in this state, so far as the same may be applicable thereto.

SECTION 6. The board of county canvassers for the special election for locating the county seat shall consist of the persons appointed on the day of such special election by the several boards of township inspectors, and said board of county canvassers shall meet on the second Tuesday succeeding the day of said special election at the house of Otto Thies, in the village of Leland, and having appointed one of their number chairman, and the county clerk of said county acting as secretary, shall proceed to canvass the votes and determine the locatio
ance therewith, and it shall be the
to file a copy of the determination
of the county seat, signed and cert
by the chairman, with the secretary
clerks of the several townships in s

SECTION 7. All that part of
lies south of the south line o
be and remain the county of Ber
thereof shall be attached for civil
county of Grand Traverse.

SECTION 8. The secretary of
nish the township clerk of the tow
tified copy of this act, and it shall
the same notice of the elections t
of this act that is required by law
unorganized counties.

SECTION 9. That the said co
ganized shall be attached to the ten
of said circuit shall hold courts in
cases made and provided.

SECTION 10. All acts and part
visions of this act are hereby repe
therein may conflict with this act.

SECTION 11. This act shall tak

CHARLES S. I
SULLIVAN M. CUTCHEON, Speaker of
Approved Feb. 27, 1863.

COUNTY OFF

In March, 1863, mass conventic
house in the village of Leland, char
ing county officers. On the first
year, the following gentlemen were
of Leelanaw County: Judge of pro
Edward Friend; treasurer, John I.
hard Verfurth; prosecuting attorn
sioner, E. Cromwell Tuttle; survey
George N. Smith, George Ray.

Thus was the organization perf
county placed in running order.
Jan. 1, 1865. In November pre
elected as follows: Judge of probat
John Bryant; treasurer, William Gi
Fisher; prosecuting attorney and c
Cromwell Tuttle; surveyor, Kassan I
Powers, Harvey C. Sutton.

During the year 1864 a censu
found to contain some 2,400 inhabita

The county officers elected at th
are as follows:

1866.—Sheriff, Samuel Wilson;
clerk, Archibald Buttars; register, J
iam Gill; prosecuting attorney, Seth
L. D. Quackenbush.

1868.—Sheriff, Samuel Wilson
deputy clerk, Alfred John; register
William Gill; prosecuting attorney, S
John Dean.

1870.—Sheriff, Valentine Lee;
clerk, Stephen J. Hutchinson;
deputy register, Seth C. Moffatt; tr
cuting attorney, William H. Brya
Dean.

tined in that state in the prac-
a he came to Grand Traverse
ed medicine till 1882, when he
th his practice he keeps bath
cated vapor and shower baths.
male attendants. Married in
ld, Vt. They have four children.
is of lumber, Cadillac. Bought
established a business in 1876,
proportions. They run two mills
of 100,000 feet of lumber per
slabs and edgings for the man-
y also run a large planing-mill
They are building a railroad,
h 160,000,000 feet of pine tim-
Canada in 1823, moved to Lock-
1840, and learned the trade of
s in New York and Canada till
County, Mich., and engaged in
it to Canada, and soon after to
lumber business till 1876, when
1845 to Mary A. Snider, of Can-
lington W. is a member of the
er Lumber Company; one son is
er who resides with her parents.
nufacturers, Cadillac. The bus-
Their work has been to a great
gradually working up a genuine
Denmark. Came to the United
of age and for ten years worked
usiness. In 1880 he, in company
and commenced business. After
Beerman sold his interest to Geo.
ne, Kent County, Mich., Nov. 15,
n. At the age of thirteen went
ls, and at the age of eighteen en-
, at Ann Arbor. Two years at
iversity of Wooster, O., gave him
of 1881, in company with three
ited States Monthly, at Chicago,
its interests, visiting nearly every
382, he purchased a one-half in-
nuary, 1884, has taken charge of
twenty-five men in the manufact-
, handles, etc.
, Wexford County, was born in
1845. At the age of eleven he
ettling in Barry County, where he
arned the trade of carpenter and
followed it there until 1872. He
e First Michigan Cavalry, serving
t the close of the war the regi-
epartment for service against the
plains to Salt Lake City. Mus-
Leavenworth, Kas. He came to
owed his former occupation until
since. Has been deputy sheriff
and deputy U. S. marshal for the
ut ten years. Was city marshal
other offices. Was elected sheriff
1876, to Ella Long, daughter of
e, and has one son. Mr. Cooke is
with J. L. Bennett, the firm of Bennett & Cooke, formed in March, 1884, being located at No. 110 N. Mitchell Street.

BYRON BALLOU was born near Cleveland, O., Dec. 3, 1827. His father, Philander Ballou, and family emigrated to Ypsilanti, Mich., in 1830, and were three weeks making the journey with an ox team, themselves and three other families pounding corn in a stump with the Indians the first year. At this place his father died in 1836. Left home and went to Kalamazoo in 1839 to live with his aunt, a Mrs. Nathaniel Foster, and learned the carpenter and joiner trade with his uncle Foster, who moved to Otsego, in Allegan County, in 1843, where Byron lived with his uncle and finished his trade. Soon after, at the age of twenty-three, he married Hannah Eldred, his present wife. After jobbing at his trade about twelve years, and accumulating something, himself and brother, L. D. Ballou, went into merchandising in the year 1856 and finally was largely in business and owned a large amount of property; a four run flouring-mill, a tannery, store, shoe shop, etc., but in the fluctuations of times came out about $10,000 worse than nothing. Lived at Otsego about thirty-five years and sold out and paid all on his debts but $400, and refused the repeated advice of neighbors and friends to go into bankruptcy, but promised to pay the balance as soon as he could earn it, and has paid those debts and interest since, although some of them had been outlawed two and three times. Moved to Cadillac in 1871 and engaged for the first seven years in the hardware business with John M. Cloud, and was in business under the name of Cloud & Ballou. The city was then quite new and no roads. Mr. B. has done a share of building up the city and country, and as a merchant and business man, has contributed his full share to help build up and improve the country and to assist others. Mr. Ballou is a radical Republican in politics, and for several years was chairman of the Republican county committee. He is a man of strong convictions upon all subjects that engage public attention. He has once been elected mayor of Cadillac, but resigned at the end of three months. Mr. Ballou and wife have three daughters and two sons.

CHAPTER LIV.

CONCLUSION—CLIMATE, SOIL, ETC.—THE GRAND RAPIDS & INDIANA RAILROAD—ORIGIN OF THE GRAND TRAVERSE REGION.

It is only a short time since the soil and climate of the Traverse Region began to be understood, and even now erroneous opinions regarding them prevail in some quarters. Hon. J. G. Ramsdell, of Traverse City, has written voluminously upon these subjects, and we quote herewith a few extracts from what he says:

"Lake Michigan, 1,000 feet deep, with an average width of sixty-five miles, and containing an area of 23,150 square miles, lies along our entire west and northwest border, forming a vast thermal regulator which tempers down the rigors of our winters to such a surprising degree that our thermometrical records are regarded as fabulous by those unacquainted with this favorable feature of our geographical position.

"The amount of heat which a gallon of water will absorb and then give off again when surrounded by a lower temperature, is immense. Take a gallon of water, heat it to the boiling point, put it into a common jug and place it at your feet under the robe in your sleigh, and it will keep them comfortably warm for a whole day's journey, with the thermometer at zero. Such is precisely the effect of Lake Michigan—less in degree, but infinitely greater in amount.

"Warmed up by the summer's heat of sun and wind, as the air over the water falls below it in temperature, the water yields up a

portion of its heat, in constantly ascending vapor, which the return trade winds, already described, bring directly to our shores, softening our climate nearly passing credulity. In this particular the great lake almost seems endowed with consciousness; the colder the weather the greater its efforts to temper the air. Go out in a still, clear morning, when the thermometer is at zero, and look out upon the lake; you will see a dense column of steam rising from its surface, as though all the fires of Pluto were seething at its bottom. This steam is wafted over us, and meeting with the colder upper air, is condensed and falls in snow-flakes, so clean and pure and white, that nature can furnish no object with which to compare it.

"This evaporation is going on constantly during the winter season, giving us a great depth of snow, particularly in the northern portion of this region. The atmosphere cools down to the freezing point before the soil and precipitates a mantle of snow upon the ground while it is yet unfrozen. As the atmosphere grows colder the fall of the snow increases and the ground is entirely protected from frost throughout the winter; so that the tenderest tubors, like the gladiolus and the dahlia, may be left in the ground, with no other protection, with perfect safety.

"The same causes that soften our winters, acting inversely, temper also the heat of our summers. These return trade winds, like the snow-bound traveler in the hermit's cell, 'blow hot and cold with the same breath,' yet the summer temperature is sufficiently high to grow and ripen to the most luscious perfection every variety of garden and orchard fruit known to the latitude of St. Louis and Cincinnati.

"Along this whole shore, for at least ten miles inland, and around Traverse Bay for a distance varying from three to five miles, damaging frosts, either spring or fall, are unknown.

"Every one has observed that ordinary frosts vary greatly in their severity, low places, level lands and basins or depressions suffering more injury than side hills, knolls and ridges. On a clear still night heat radiates from the surface of the earth into space. As this radiation goes on, the surface grows colder and colder, if level, the air remains stationary and falls in temperature with the surface of the earth. At first the moisture of the earth is condensed and forms dew, at 32° Fahrenheit it is crystallized into hoar frost, if it sinks still lower the sap of tender plants is frozen, expands, and bursts or injures the cells and kills the plant. Cold air is heavier than warm air, and the colder it grows the heavier it gets. On side hills, knolls and ridges, as radiation cools the surface, the air becomes heavier and runs down the hill to the valley or plain below, and the warm air takes its place; this in its turn grows dense and passes down, forming a current of air down the hill, leaving none of it at rest long enough to reach the freezing point. If the valley is enclosed so as to form a basin, the cold air 'draining' into it may fill it up so that the frost will reach up the side hills to the level of the dam which encloses it. But where the drainage reaches a body of water, heat escaping from the water reheats the air, causing it to rise again and flow back to take the place of that which is flowing down the hills. In the coldest nights of winter the difference between hillsides and enclosed basins is surprising. In one case Messrs. Avery and Marshall, of Old Mission, found a difference of 22° in less than one hundred feet elevation, and Messrs. Parmelee and Brinkman 11° in fourteen feet. Where the valley or hillside opens without obstruction to the bay or lakes the difference is not so great. I find on my farm, which descends rapidly toward Grand Traverse Bay, a difference on such nights of from four to six degrees per each hundred feet, and in one instance, February 9, 1865, the coldest night ever known in this region, it varied ten degrees to the hundred feet. When we consider how close the margin is between absolute exemption and total destruction of the tender varieties of fruit trees by freezing, we shall see how important this matter of atmospheric drainage is. With -12° the peach is comparatively safe, at -15° the tree is in danger, and at -22° is almost certain destruction. A hundred feet elevation, with open drainage to water, may determine the difference between a crop of peaches and a dead orchard. And in an enclosed valley or basin twenty feet may do the same. If my reasoning and conclusions are correct, it is easy to determine the extent of this territory best adapted to the general cultivation of fruit. Upon all the hillsides with free atmospheric drainage to Lake Michigan—Crystal Lake, Glen Lake, Carp Lake, Grand Traverse Bay, Elk Lake, Round Lake and Torch Lake—peach orchards may be planted with as much safety from winter killing as at any place north of the latitude of Cincinnati. Upon the terrace around Grand Traverse Bay and the lower inland lakes, where the orchards of this country were first planted, the winter of 1875 demonstrated that it is unsafe to plant peaches, plums, cherries or pears. And upon the level plateaus mentioned nothing but the hardiest trees should be planted. But grapes may be cultivated with success upon every hillside in the whole region where the elevation above the nearest level is sufficient to protect them from late spring and early fall frosts; for if pruned and laid down in the fall as they should be, the deep snow of our winters will cover and securely protect them from winter killing.

"The extraordinary adaptation of this climate to the raising and perfecting of the fruits of more southern latitudes, rests not upon vague theories or hypothetical deductions, but has been proved by observation and demonstrated by experiment, to rest upon a law of nature as perpetual, as certain and as unvarying as that which governs the revolutions of the globe.

"It will be seen from the foregoing that Lake Michigan is the great thermal regulator that softens the rigor of our winters and tempers the heat of our summers."

THE GRAND RAPIDS & INDIANA RAILROAD.

Congress, by various acts, gave to the state of Michigan, in the years 1856 and 1864, certain alternate sections of the public lands, to be devoted to the building of railroads. To the Grand Rapids & Indiana Railroad Company a grant was made by the state, of 1,160,382, 62-100 acres of the above lands, which were to be used in constructing a first-class road from Fort Wayne, in the state of Indiana, to some point on Traverse Bay, in the state of Michigan, a distance of 333 miles.

In the fall of 1856 a preliminary survey was ordered, mainly by private enterprise, from this city northward. William P. Innes was the engineer engaged. In June previous Congress had made an appropriation of lands to the state of Michigan to aid in the construction of certain railroads, of which one was to be a line from Grand Rapids to Grand Traverse. Mr. Innes had gone as far as Newaygo north, when the Grand Rapids & Northern Railroad Company was organized in this city, with the following officers: President, John Ball; vice-president, William H. Withey; treasurer, Daniel Ball; secretary, Peter R. L. Pierce. Directors, William A. Richmond, John Ball, Daniel Ball, John M. Fox, Wilder D. Foster, Charles Shepard, William H. Withey, Frank B. Gilbert, F. W. Worden, Albert H. Hovey, George Coggeshall, George C. Evans, A. B. Watson. Commissioners, Solomon L. Withey, John W. Pierce, A. Platt, David Burnett, Boardman Noble.

Looking over the list of names the reader will recognize the fact that more than half of the gentlemen to whom they belong have passed from earth. The capital stock subscribed was $170,000. In January, 1857, Engineer Innes made a report in whic'

EXHIBIT D

THE GRAND TRAVERSE REGION.

A REPORT

ON THE

GEOLOGICAL AND INDUSTRIAL RESOURCES

OF THE COUNTIES OF

ANTRIM, GRAND TRAVERSE, BENZIE AND LEELANAW

IN THE

LOWER PENINSULA OF MICHIGAN.

By ALEXANDER WINCHELL, A. M.,

Prof. of Geology, Zoology and Botany in the University of Michigan, and late State Geologist; Member of the Geological Society of France; Corresponding Member of the Geological Society of Glasgow; Member of the American Philosophical Society; Corresponding Member Boston Society of Natural History, &c.

ANN ARBOR:
DR. CHASE'S STEAM PRINTING HOUSE.
1866.

only is the whole extent of shore line of lake Michigan and the bay accessible for vessels of large draft, but to augment this shore line to a still greater extent, the bay is parted longitudinally for the distance of seventeen miles, and nearly the entire coast of the lake and bay is diversified by alternate "points" and indentations, which materially increase the means of access to the land. The whole extent of coast line bordering on lake Michigan is not less than seventy-five miles, of which fifty lie within Leelanaw county. Grand Traverse bay presents a coast line of 113 miles, of which 41 lie within Leelanaw county, 50 in Grand Traverse, and 23 in Antrim county.

The shore line of navigable water afforded by the various inland lakes is as follows: In Leelanaw county Carp lake affords about 36 miles and Glen lake about 14. In Benzie county Crystal lake affords about 20 miles and Frankfort harbor about 5 miles. In Antrim county and extending into Grand Traverse, Elk lake affords about 23 miles, Round lake 7 miles, Torch lake 36 miles, Clam and Grass lakes 17 miles. Omitting mention of the considerable lakes in the western part of Grand Traverse county we thus have in this region 158 miles of shore line bordering on the navigable inland lakes, and 189 miles bordering on the bay and lake Michigan. This gives a total of 347 miles of shore line bordering on navigable waters in the region under consideration, and distributed as follows:

In Leelanaw county	141 miles
In Benzie county	50 "
In Grand Traverse county	63 "
In Antrim county	93 "
Total	347 "

IV. TOPOGRAPHY.

The mean elevation of the Grand Traverse region above lake Michigan may be estimated at 230 feet, or 808 feet above the level of the sea. The mean elevation of the lower Peninsula of Michigan is estimated by Higgins to be 160 feet above lake Michigan or 738 feet above the sea level.

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northwestern State, caused no damage whatever in the Grand Traverse region.

Another characteristic of the winter of this region is its comparative uniformity of temperature. The mercury neither rises as high nor sinks as low as in other regions along the same parallel of latitude.

Other comparisons are no less surprising than those which have just been made. Autumnal frosts are postponed to a remarkably late period. Unlike other regions, frost seldom appears till the mercury actually reaches 32°. The first killing frosts ordinarily occur throughout the region, between the middle and end of October. Sometimes they are delayed till late in November. They occur at Traverse City and southward from there somewhat earlier than at Northport, Glen Arbor and Frankfort. The first killing frost this year at Traverse City was a slight one, October 13th, but it did not reach Northport. Tomatoes and other tender vegetables were still growing thriftily at Northport and Pine River, and even at the head of Little Traverse bay, when I visited those places, Oct. 27th and 28th. On the night of the 28th, however, the thermometer sank to the freezing point, and injured vegetation generally throughout the region. On the 5th of November, it froze again. At the same time the mercury sank to 24° at Ann Arbor, and to zero at Bangor, in Maine. Nevertheless, when I left the region on the 8th of November, the leaves of apple and peach trees were still perfectly green, while those of the forest were partially changed and beginning to fall. On reaching the southern part of the State, vegetation presented already the appearance of mid-winter.

Autumnal frosts occur only after days of very threatening severity. I observed that when, during the day, the thermometer rises as high as 40°, it is seldom crowded down to the freezing point the following night. At Ann Arbor we often get frost after the thermometer has been at 60° during the previous day.

Snow falls in November or December, before the ground has been materially frozen, and lies without thawing till the following April. It accumulates to the depth of two or three

feet, and sometimes, in certain localities, to a greater depth. Its disappearance is postponed till abouth the 10th of April, when the danger of severe frost is generally passed. The ground consequently escapes freezing throughout the entire winter, so that root crops may be left out without damage. Potatoes are thus, frequently, wintered in the ground without digging. It always happens that the few remaining in the soil after the crop has been gathered, vegetate in the following spring, and produce a spontaneous crop. Thus they propagate themselves from year to year, so that the Irish potato has become a naturalized weed, growing in corn fields and wheat fields, and sometimes in uncultivated fields, and by the road side. I saw potatoes growing in places where I was informed no seed had been planted for ten years.

The same preservative effects of snow are witnessed in other crops, and in the bulbs, tubers and roots of ornamental plants. The Dahlia blooms till the last of October, and after this the tubers may be left in the soil till the following spring, when, not long after the disappearance of the snow, they send up fresh shoots. Delicate green-house roses stand out with the same impunity as in Alabama and Louisiana. Mrs. Judge Fowler, of Mapleton, on the Peninsula, informed me that she had in her garden forty varieties of delicate roses, which stand out every winter.

Wheat, of course, is never in danger of winter-killing in a region thus exempt from extremes of cold, and thus clothed during the entire winter with a thick mantle of snow.

The presence of snow till the middle of April preserves vegetation from the stimulating influence of occasional warm days, and the buds of fruit trees consequently remain dormant till the danger of severe frost is passed. When the snow finally disappears, the soil is in a condition to receive immediately the genial influence of sunshine and atmospheric action. The disagreeable period of mud caused by the slow escape of frost from the soil is unknown. The breaking up of the ice in the bay exposes the entire region to the equalizing influence of large bodies of water, and the region is thus nearly as exempt from the destructive effects of late vernal frosts, as from those

of late autumnal ones. No damaging f
occur later than the middle of May, which is
of latest frosts in northern and middle Ohio.

The mean temperatures of the four winter
Traverse, for five years, are as follows:

December.....
January.....
February.....
March .....

The following are the means of four month
at Northport:

January.....
February.....
March .....
April .....

The temperature of summer is as remarkal
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portunity to examine any record of thermo
tions made during the summer, but the sum
mitted to be exempt from extremes and sudd
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tomatoes, tobacco and the like.

The facts which I have disclosed above to
climate of the Grand Traverse region are
excite surprise; but I think no one can que
A moment's reflection, moreover, will reveal
peculiarities of the climate of this portion of the
Traverse region, like the peninsula of Florid
British islands, is subjected to the equalizing i
bodies of water. Lake Michigan borders t
slope of the State. In the region under consi
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two arms thirty-four miles into the interio
triangle forming Leelanaw county is embra
bodies of water, and enjoys a situation unlik
portion of the northwestern States. Our col
proceed from the southwest or west. Pass
water of Lake Michigan sixty miles in widt
of which never sinks below 32°, it is impo

of late autumnal ones. No damaging frost is liable to occur later than the middle of May, which is about the period of latest frosts in northern and middle Ohio.

The mean temperatures of the four winter months at Grand Traverse, for five years, are as follows:

December	25°.2
January	23°.2
February	23°.0
March	29°.0

The following are the means of four months of the year 1860 at Northport:

January	22°.48
February	22°.91
March	33°.91
April	40°.33

The temperature of summer is as remarkable for its moderation and uniformity as that of winter. I have not had the opportunity to examine any record of thermometrical observations made during the summer, but the summer climate is admitted to be exempt from extremes and sudden changes. Yet the mean temperature is sufficiently high to mature peaches, tomatoes, tobacco and the like.

The facts which I have disclosed above touching the winter climate of the Grand Traverse region are well calculated to excite surprise; but I think no one can question the figures. A moment's reflection, moreover, will reveal the reason for the peculiarities of the climate of this portion of the State. The Grand Traverse region, like the peninsula of Florida, Sweden and the British islands, is subjected to the equalizing influences of large bodies of water. Lake Michigan borders the whole western slope of the State. In the region under consideration the body of water is greatly augmented by the bay which reaches its two arms thirty-four miles into the interior. Moreover, the triangle forming Leelanaw county is embraced by two large bodies of water, and enjoys a situation unlike that of any other portion of the northwestern States. Our cold winds generally proceed from the southwest or west. Passing over the open water of Lake Michigan sixty miles in width, the temperature of which never sinks below 32°, it is impossible to avoid ab-

stracting a considerable amount of heat, so that when these cold westerly winds strike the Michigan shores of the lake, the severity of the winter gales is materially mitigated. Moreover, the severest and most destructive winter gales proceed from the southwest, and the trend of the lake is such that these winds, on striking the Grand Traverse shore have traveled over more water than southwest winds striking the Michigan shore in Ottawa, Van Buren and St. Joseph counties.

But the thermometer on some occasions sinks to a *minimum* with an easterly or even a southeasterly wind—as in February, 1857, when it sank twenty-four degrees below zero at Ann Arbor with an easterly wind and a cloudy sky. Before such winds the eastern shore of lake Michigan in St. Joseph county and northward experiences no protection from the proximity of a large body of water. In the Grand Traverse region, on the contrary, the diameter of the peninsula is so much diminished that easterly winds retain the softening influence exerted by the waters of lake Huron. Moreover, the whole of Leelanaw county enjoys nearly as complete protection from easterly as from westerly winds. It is almost impossible for a gale from any direction to bring into Leelanaw county a temperature of eighteen or twenty degrees below zero, the point at which the limbs of peach trees are liable to be killed.

No observations on the other elements of climate have been brought under my observation. It is obvious, however, that a region so environed by water must possess an atmosphere of sufficient humidity to offer a guarantee against habitual drouths. I am informed that no severe drouth has ever been experienced before the summer of 1864, when the whole northwest was parched to an unprecedented extent.

VII. SALUBRITY.

A region possessing such a climate, and such physical features as have been described above, can scarcely offer any other than favorable sanitary conditions. Accordingly, I was everywhere assured by the inhabitants of the region that diseases are almost unknown. I heard of a few cases of typhoid fever in the neighborhood of Glen Arbor, and a few cases of dysen-

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tery about Leland and in Antrim county. I
foreign to the country. No ague was ever
genous to the region. On the contrary, mar
suffering from malarious influence have been
by a residence in the region. The uniformi
ture and the purity of the air and water are
pulmonary diseases; and I learned of som
tions that had been cured by a few months

VIII. TIMBER AND NATIVE

Passing from a survey of the physical fea
Traverse region, I proceed to offer a brief a
ral history. Generally speaking the regio
magnificent growth of hardwood timber.
this statement are few and unimportant.
abundant species is the sugar maple (*Acer s*
distributed generally throughout the regio
the bay. It bears, however, a larger ratio
on the west side. Mingled with this are
sylvatica), white or American elm (*Ulmu*
hemlock (*Abies Canadensis*). The beech, as
is more abundant on the more coherent soils
the bay and in Grand Traverse county. Th
generally scattered through the forest o
Traverse and Benzie counties, forming on a
fifteenth, or less, of the forest growth.
quently in Antrim county. In certain situ
is most retentive we encounter patches
with the black ash (*Fraxinus sambucifoli*
vitæ, or western "white cedar" (*Thuja*
joint possession with the balsam fir (*Abies*
moist and wet lands, and the tamarack
sometimes crowds itself into the compan
zens of the occasional swamps. The whit
bus) is very partially distributed. Some
individuals of which attain a diameter of
be seen in the south part of Leelanaw co
Cedar run, where some wasteful settlers a

6. HAY.—Timothy hay proves a successful crop. Mr. Bates, of Traverse City, has 33 acres seeded, which he calculates will pay him the interest on $3,000. If it brings only one ton to the acre, he will receive a profit of $9 per ton, or $307 on the whole, which is ten per cent. on $3,070, or about $93 per acre. Rial Johnson, four miles south of Elk Rapids, has one of the oldest farms in the country, and raises superior Timothy hay. Mr. E. Pulcifer, south of Elk Rapids, got 19 loads of red clover hay from three acres planted to an orchard. He keeps nine cows, and makes butter and cheese for the market. He proposes to enlarge his dairy. I saw first rate Timothy hay in the fine, capacious barns of William Monroe, in Grand Traverse county.

7. OTHER CROPS.—Turnips grow with the utmost luxuriance, as I have observed on the west side of Carp lake, at various places about Traverse City, and along the road thence to Glen Arbor. Mr. Sprague, near Leg lake, in Leelanaw county, directed my attention to a fine field of turnips, and assured me that he once raised a flat turnip which weighed 17 pounds (!) Carrots grow well. Mr. Stewart, on the Peninsula, showed me a bed of carrots which were from two to three inches in diameter, the seed of which was planted July 1st. He showed me parsnips of a still larger size. I saw fine carrots back of Glen Arbor. Tomatoes ripen well. I met with them at various points. Mrs. Joseph Batey raised three tomatoes in the south part of Traverse township, which weighed 40 ounces each. Mrs. Dixon informed me that tomatoes do not mature well at Pine river. I saw an excellent crop of white beans at Rial Johnson's; and also large, plump marrowfat peas.

XIII. FRUITS.

As a fruit-growing region, it is doubtful whether any other part of the United States will compete with this. Apple trees were planted on the first settlement of the county, and have always grown well and borne luxuriantly. The characteristics of the trees and fruit are healthfulness, luxuriance and large size. Rev. Mr. Smith, of Northport, has a young orchard in which I saw various familiar varieties in a greater degree of

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perfection than in any other part of the country. The average size of the Rhode Island Greenings was eleven inches in circumference—weighing eleven ounces. Seedling apple trees were loaded with fine winter fruit. Fine young orchards are coming into bearing on all parts of the Peninsula, and throughout the country south and southeast of Elk Rapids. Mr. Hannah, at Traverse City, has planted an orchard of about forty acres containing 1,000 trees. At New Mission, I witnessed the most beautiful exhibition of apples that ever met my eyes. An orchard on the seminary grounds, about 14 years old, was completely loaded with large, fair, richly-colored fruit of old and new varieties. It was a marvel of luxuriance and beauty. I saw whole trees borne down with apples from four to four and a half inches in diameter, and weighing from 14 to 18 ounces. These trees were planted and reared by Rev. Peter Dougherty, the intelligent and useful superintendent of the mission. I saw young apple trees flourishing luxuriantly in the neighborhood of Glen Arbor, and in nearly all other parts of the region.

It was formerly supposed that the climate was unsuited to peaches, but different persons having from time to time planted a few peach stones, it was ultimately proven that the peach flourishes in perfection. At Leland, I saw trees laden with ripe fruit in September. At New Mission, the peaches which I saw were as great a marvel as the apples. Some measured eight and nine inches in circumference. The seedling fruit was so abundant that no attempt was made to gather it. Thomas Tyre, on the Peninsula, brought to market this year 75 to 100 bushels of peaches. Rial Johnson, on Elk lake, raised 200 bushels from a small orchard, the seeds of which were planted ten years ago. Rev. Mr. Smith, of Northport, succeeds with peaches. Mr. Fisher treated me with peaches raised at Glen Arbor. I saw thrifty trees growing on the farms back of Glen lake. Mr. Almon Young, on the south side of Round lake, raised superb peaches; also Mr. Amos Wood, two miles from Elk Rapids. Mr. Wood's trees have been bearing regularly for six or seven years. Mr. E. Pulcifer, near Whitewater creek, raised 20 bushels of peaches. I

was informed that peach trees come into bea
from the seed. I heard of only one instanc
winter-killing of peach trees, and that was
miles south of Traverse City and 20 miles fro
Nectarines are raised by Judge Fowler, at
Peninsula, and probably at other places. Ph
fusely, and are exempt from all insect ravage
shoot of this year's growth five feet long on a
Fisher's yard at Glen Arbor. Mr. L. R. Smit
raised one stem of Early Orleans variety whic
averaging four inches in circumference. H
Washington plum. Rial Johnson raised five

The different varieties of cherries thrive equ
flourishing trees on Mr. Smith's place, at N
Glen Arbor. Mr. Wm. J. Bland, at Elk Rap
reau cherry tree that has borne regularly f
saw thrifty trees on the place of E. Pulcifer.

Pears thrive wherever they have been teste
soil at Northport is probably peculiarly adapt
they flourish very finely. They do about equ
Mission. I saw good trees also at Glen A
Whitewater region. Mr. Smith also succeeds

Grapes thrive admirably throughout the
wherever I saw them they were retarded in
lack of pruning, by excessive crops, and by t
I saw grapes bearing well at Leland. At New
Isabella and Catawba grapes ripened on neg
situation badly exposed to the sun. Mr. Sm
literally borne down with their burden of ripe
in the latter part of October. L. A. Thayer,
of Torch lake, raised superb Concord grapes.
been bearing four years. Isabellas ripen earl
Judge Fowler, at Mapleton, has matured Isa
four or five years past.

This region is the native home of the red
raspberry, and the blackberry. Currants a
Raspberries bear with the utmost luxuriance, e
tivated or uncultivated state. I saw ripe raspl

7.

was informed that peach trees come into bearing in four years from the seed. I heard of only one instance of complaint of winter-killing of peach trees, and that was at Monroe's, 12 miles south of Traverse City and 20 miles from lake Michigan. Nectarines are raised by Judge Fowler, at Mapleton, on the Peninsula, and probably at other places. Plums produce profusely, and are exempt from all insect ravages. I measured a shoot of this year's growth five feet long on a plum tree in Mr. Fisher's yard at Glen Arbor. Mr. L. R. Smith, at Elk Rapids, raised one stem of Early Orleans variety which bore 22 plums, averaging four inches in circumference. He also raises the Washington plum. Rial Johnson raised five bushels of plums.

The different varieties of cherries thrive equally well. I saw flourishing trees on Mr. Smith's place, at Northport; also at Glen Arbor. Mr. Wm. J. Bland, at Elk Rapids, has a Bigarreau cherry tree that has borne regularly for four years. I saw thrifty trees on the place of E. Pulcifer.

Pears thrive wherever they have been tested. Mr. Smith's soil at Northport is probably peculiarly adapted to pears, and they flourish very finely. They do about equally well at New Mission. I saw good trees also at Glen Arbor, and in the Whitewater region. Mr. Smith also succeeds with quinces.

Grapes thrive admirably throughout the region—though wherever I saw them they were retarded in development by lack of pruning, by excessive crops, and by too much shade. I saw grapes bearing well at Leland. At New Mission, I saw Isabella and Catawba grapes ripened on neglected vines in a situation badly exposed to the sun. Mr. Smith's vines were literally borne down with their burden of ripe and unripe fruit in the latter part of October. L. A. Thayer, on the east side of Torch lake, raised superb Concord grapes. His vines have been bearing four years. Isabellas ripen early in September. Judge Fowler, at Mapleton, has matured Isabella grapes for four or five years past.

This region is the native home of the red currant, the red raspberry, and the blackberry. Currants are unsurpassed. Raspberries bear with the utmost luxuriance, either in the cultivated or uncultivated state. I saw ripe raspberries in Octo-

8.

ber, on the Peninsula, growing on canes of the present year's production. The same canes bore green fruit and flowers. This phenomenon is of frequent occurrence. Mr. Tilley, of Leland, informed me that he had, on the last of October, ripe black-cap raspberries growing in his garden, on this year's canes. Strawberries flourish as well as in any part of the world. Mr. Hannah, of Traverse City, informed me that he raised this year 25 bushels from a piece of ground 50 by 75 feet. Mr. Stewart, on the Peninsula, assured me that he could pick strawberries in his fields every day from the first week in June till the approach of snow.

Few situations suitable for cranberries exist, but Mr. Fisher informed me that a marsh along Crystal creek produces them at the rate of 300 bushels to the acre, and he proposes to avail himself of this source of revenue.

The secret of the wonderful adaptation of this region to the production of fruit, is found in the characteristics of the soil and climate heretofore described. It is likely the sandy plains to the south of the East and West Arms of the bay will be found well adapted to the raising of peaches. The region best protected from danger of winter-killing and late spring frosts, lies between the bay and the lake, in Leelanaw county; and yet actual results demonstrate that the peach flourishes, hitherto without drawback, several miles east and south of the bay.

The recent discovery of the admirable adaptation of this region to the purpose of fruit growing, has caused very general attention to be directed to the subject. Almost every farmer is enlarging his plantations. When at Traverse City, on the 8th of November, I witnessed the arrival of 32 cases of fruit trees from the nursery of T. D. Ramsdell, of Adrian. Mr. Mace Tisdale, who had made contracts for this large supply, informed me that he was introducing $4,100 worth of fruit trees this fall.

XIV. THE INDUSTRIES OF THE PEOPLE.

The leading occupation of the inhabitants of this region must necessarily be the cultivation of the soil. Evidently,

however, in a country so densely wooded, th
urges itself upon the attention of the new se
clearing. As pioneers generally desire to
as possible the avails of their labor, the cho
"cord wood" has unavoidably engaged a la
tion; and the shipment of cord wood to Chi
ply to propellers running on the lakes, have
tant branch of business. In November
chopping a cord of propeller wood was $1
shipping wood $1.50. The difference is caus
care requisite in the preparation of a cord w
market regulations in Chicago. Propeller
on the dock at $3.00 to $4.00 a cord. Shipp
beach was selling for $3.00 a cord; on th
Freights to Chicago were exorbitantly high
things was evidently exceptional and tempor
existing charges for freight, the price in C
margin for profit to the shipper.

Thousands of cords of beech and maple w
to effect a clearing, are simply chopped an
ground. It is obvious that two or three pota
would save an enormous waste of ashes, and
ble convenience for the pioneer. I am not
manufacture of potashes is carried on at th
any part of the region. It was suggested t
prepared to buy ashes or "black salts," and
change such commodities as farmers gener
succeed in doing a profitable business. He sh
kettles for sale to farmers residing at distan
justify the transportation of the ashes. The
be used in the manufacture of "black salts"
thus materially reducing the bulk of the arti
ported to the ashery. It is estimated that eve
from 350 to 500 bushels of ashes.

Another use to which the forest may be i
verted is the manufacture of maple sugar. Th
dustry is mostly left to the unskillful and unti
of the Indians. It is estimated that one man c

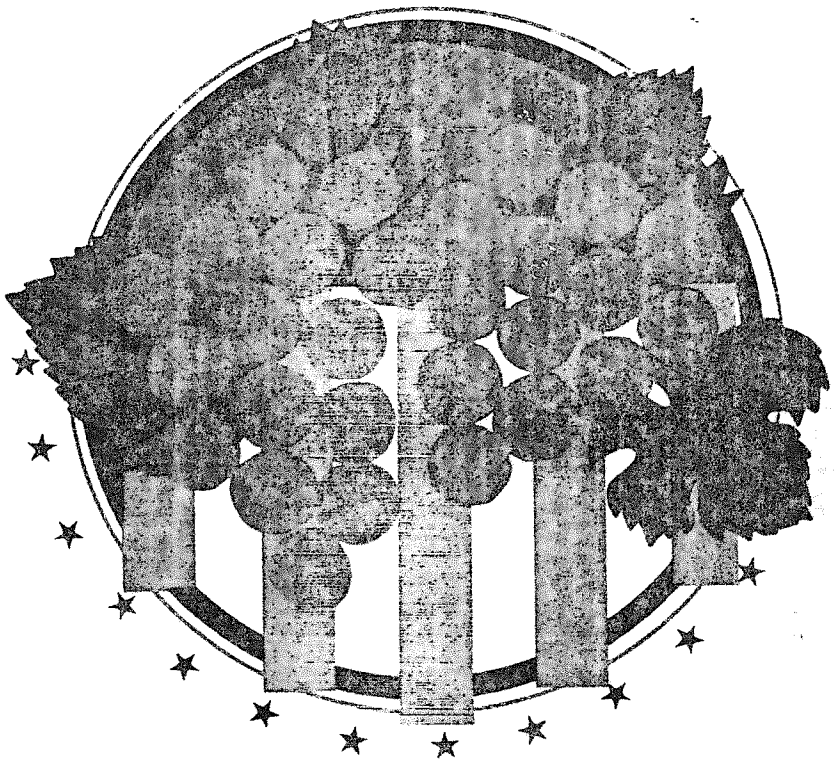
SECOND EDITION, REVISED

EXHIBIT E

THE Wines OF AMERICA

The fascinating story of North American wines and winemakers from the 16th Century to the present—a complete guide for connoisseurs, hobbyists, and amateurs

LEON D. ADAMS



11

Wines of Michigan

ALTHOUGH Michigan ranks fourth among the states in grape growing and fifth in wine production, few of our connoisseur writers ever write anything about Michigan wines. Yet I have tasted many Michigan wines and found them all clean and sound, and more than a few lately that I have rated as excellent. The fruit belt of Michigan is as capable, climatically speaking, of producing fine wines as most of the other viticultural districts east of the Rockies, including even the justly famous Finger Lakes region of New York. But until very lately, the Michigan wineries never tried to produce anything fine, for reasons only their history and their peculiar state law can explain. Now, however, with newly planted Old World wine grape varieties, with new modern wineries and modernization of some of the old, they are trying, and the image of their wines has begun to change.

The best way to know Michigan wines is to visit the wineries, which numbered a dozen at last count, with at least three more planned. They are hospitable, offering tasting and tours from spring through fall daily including Sunday afternoons. There is a three-day grape and wine festival at the fairgrounds near Paw Paw in the latter half of September, when you can sniff the grape fragrance as you approach the town. Some of the individual wineries also hold festivals of their own.

• 2 •

Michigan's western counties, behind the towering sand dunes on the Lake Michigan shore, are one of the great fruit-producing sections of the earth. The deep lake waters, which rarely freeze over, yield warmth for the vineyards and orchards in winter, and cool winds from the lake in spring

1.

usually retard the buds from opening until danger of killing frosts has passed. This beneficent climatic influence enables fruit to grow all the way from the Indiana border north to Grand Traverse Bay, a stretch of some two hundred miles.

In four southwestern counties—Van Buren, Berrien, Cass, and Allegan—more than 15,000 acres are planted to grapes, mostly picked by the new mechanical harvesting machines since 1968. All but a few hundred acres here are Concords, because four fifths of the state's grape crop is used for juice and jelly or is sold fresh for table use. The other fifth goes into wine.

At the far northern end of the fruit belt, the lake-bordered peninsula that is Leelanau County and the Old Mission Peninsula to the east have climates that are less hospitable to Concords and more hospitable to wine grapes. Until now cherries have been the principal fruit crop on these two peninsulas, which extend north of Traverse City, the sour cherry capital of America. Vineyards of French hybrid and Vinifera wine grapes have been newly planted among the cherry orchards, and the four newest Michigan wineries are here.

Michigan's new interest in winegrowing has also inspired some planting of vines on the eastern side of the state between Lakes Huron and Erie. A new winery there, however, makes mainly wines of fruits other than grapes. I even have heard reports of a vineyard being planned on Michigan's Upper Peninsula, which crosses the forty-sixth parallel, almost as far north as Germany's Rhineland and the Champagne district of France.

What has caused the recent increase in Michigan winegrowing is that wine consumption in the state has more than doubled in this decade. So many new vineyards have been planted that Horticulture Professor Gordon S. Howell of the state university has warned Michigan farmers about creating grape surpluses, of which this state has had its share in the past.

• 3 •

The wineries of Michigan are still young. There were no famous wineries with castlelike cellars in the state before Prohibition, such as those in Ohio, Missouri, and New York. But actually, the growing of fruit, including grapes, began in southern Michigan in the mid-nineteenth century. By 1880, when the national winegrowing census was taken, there were 2,266 acres of vineyards in the state, and Michigan wine production in that year was 62,361 gallons valued at $75,617. At

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that time more wine was mad
the Lake Erie shore, than o
Wagner, who grew up at
Prohibition there were many
man farmers in Monroe and

What started the massive v
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Juice Company, with its ne
York, began about 1900 to
states, the planting of Cor
Berrien Counties.

The original Michigan w
Prohibition in 1919, but the
year Welch established its ow
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Still another outlet opene
1920s: four new wineries sp
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Next came the Great De
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began operating in the Det
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Canada. Soon there was a su
because Michigan wines, ma
compete with those coming f

Michigan's grape-growing
One of the Canadian vintne
Maurice R. Twomey, propos
wine market for Michigan
lished the La Salle winery at
Michigan wine law, which l
table wines from outside th
only 4 cents, provided they
Michigan-grown grapes for
grower at least $100* a ton.
grapes is allowed to come f
principally in tank cars from

*Originally $55 a ton in 1937.

Valley in 1974. They built homes for their families there and began planting their first forty acres of hybrid and Vinifera vines. A year later they built a château-like winery into the adjoining hillside. While waiting for their vines to produce, they made their first wines of local blueberries and cherries, then brought Riesling and Gewürztraminer grapes from Washington State, and made some excellent table wines. Theirs is a family undertaking. Douglas, with degrees in biology and chemistry, is the winemaker. His wife Lynn, who teaches school, and his father and mother all help in the business. The 60,000-gallon winery is a model of completeness for its size, with a tasting room, a home-winemaking supply shop, and balconies from which visitors can watch how the wines are made. The first estate-bottled Fenn Valley De Chaunac was due in 1978. To reach Fenn Valley Vineyard, take the Fenn exit (M-89) east from I-196 for three miles, then turn right on 72nd Street one mile to 122nd Avenue.

• 9 •

From the Welschs' vineyard at Fennville it is 200 miles due north to Traverse City and six miles still farther on Highway 37 to the Château Grand Travers vineyard and winery. This is a third of the way along Old Mission Peninsula, the spectacular narrow finger of land that extends eighteen miles to the middle of Grand Traverse Bay.

To this spot chunky millionaire entrepreneur and ex-college gymnast Edward O'Keefe, of the Canadian brewing family, brought Geisenheim-trained viticulturist Bernd Philippi from Germany in 1975 to plant the chateau's fifty-acre vineyard of White Riesling and Chardonnay facing the western arm of the bay. The equipping of the 40,000-gallon winery was supervised by Karl Werner, the onetime winemaster of Schloss Vollrads in the Rheingau, who is now the winemaker consultant to the Callaway Vineyard and Winery in California. Until its vineyard comes into bearing, Château Grand Travers is making Montmorency Cherry and Morning Apple wines and is bottling wines from California for sale under its Old Mission label.

O'Keefe was only the first to plant vines and build his winery on the Old Mission Peninsula. Bernard Rink, the librarian of Northwest Michigan College at Traverse City, and Michigan State University emeritus chemistry professor Robert Herbst had pioneered the growing of French hybrid wine grapes on the Leelanau County peninsula for more than a decade, in Rink's case since 1965. Bernie Rink bonded his own 20,000-gallon

3.

Boskydel Vineyard winery on
and offered his first half doze
were a white Vignoles and a
winery, a cave in the hillside
miles north of Traverse City
Lake Leelanau is three miles

Rink is able to keep his full-
explains, "I have an indulge
him in the vineyard and win
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With Lake Michigan on the
the east, the Leelanau and
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says Bernie Rink, "the Leel
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As though to support Rink'
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The Leelanau wine rush
Mawby of Sutton's Bay beg
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Mawby Vineyards Winery in

Hearing of this excitement
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Stackhouse and Professor H
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Dr. Howell thinks the micr
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be especially adapted for fine
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enology from the University
Davis, agrees with Dr. Howe
will be grown here, too. "Mich
better than California's," says
weather in some respects is t

Boskydel Vineyard winery on his twenty-acre vineyard in 1976 and offered his first half dozen hybrid wines—the best of which were a white Vignoles and a red De Chaunac—for sale. Rink's winery, a cave in the hillside facing Lake Leelanau, is sixteen miles north of Traverse City on county road 641. The town of Lake Leelanau is three miles farther north.

Rink is able to keep his full-time job as a librarian because, he explains, "I have an indulgent wife and five sons," who help him in the vineyard and winery. Dr. Herbst grows wine as a hobby at his vineyard four miles to the west.

With Lake Michigan on the west and Grand Traverse Bay on the east, the Leelanau and Old Mission peninsulas have the climate-moderating lake influence on both their sides. "If we can find enough good microclimates for wine grapes here," says Bernie Rink, "the Leelanau Peninsula can become the Napa Valley of Michigan."

As though to support Rink's prediction, fruit grower Charles Kalchik in 1975 began planting sixty acres of French hybrids and Vinifera on his nearby Hilltop Farms. He also commissioned Nathan Stackhouse to establish the 30,000-gallon Leelanau Wine Cellars winery with the latest stainless-steel equipment at Omena, twenty-five miles north of Traverse City on Highway 22, with a tasting room five miles south of Traverse City on US 31 and M-37.

The Leelanau wine rush was on. Lawrence and Edward Mawby of Sutton's Bay began planting French hybrids near their cherry and apple orchards in 1975 and opened their own Mawby Vineyards Winery in 1977.

Hearing of this excitement, I paid a flying visit to Traverse City in the spring of 1977 and toured the vineyards with Stackhouse and Professor Howell, visiting the new wineries and tasting Rink's and Dr. Herbst's impressive young wines. Dr. Howell thinks the microclimates and deep, light, well-drained soils of this new northern Michigan grape district may be especially adapted for fine white wines. The "lake effect" is said to account for the district's cool spring, when vines bloom almost three weeks later than in southern Michigan, for its cool summers, long, cool autumns, and warmer winters than in the counties to the south and east. Nate Stackhouse, a graduate in enology from the University of California's wine school at Davis, agrees with Dr. Howell but believes the best red wines will be grown here, too. "Michigan's climate for winegrowing is better than California's," says Stackhouse, "because California weather in some respects is too good for grapes."

4.

EXHIBIT F

A Wine-Grower's Guide

REVISED EDITION

By Philip M. Wagner

An interesting and informative book for the amateur viticulturist on the cultivation and use of wine grapes

NEW YORK : ALFRED A. KNOPF

1965

egree of the soil's geologi-

erent types of soil — is, in
of plants in this respect.
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, but it may be subject to
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ıg the relation of soil types
Chapter IX.

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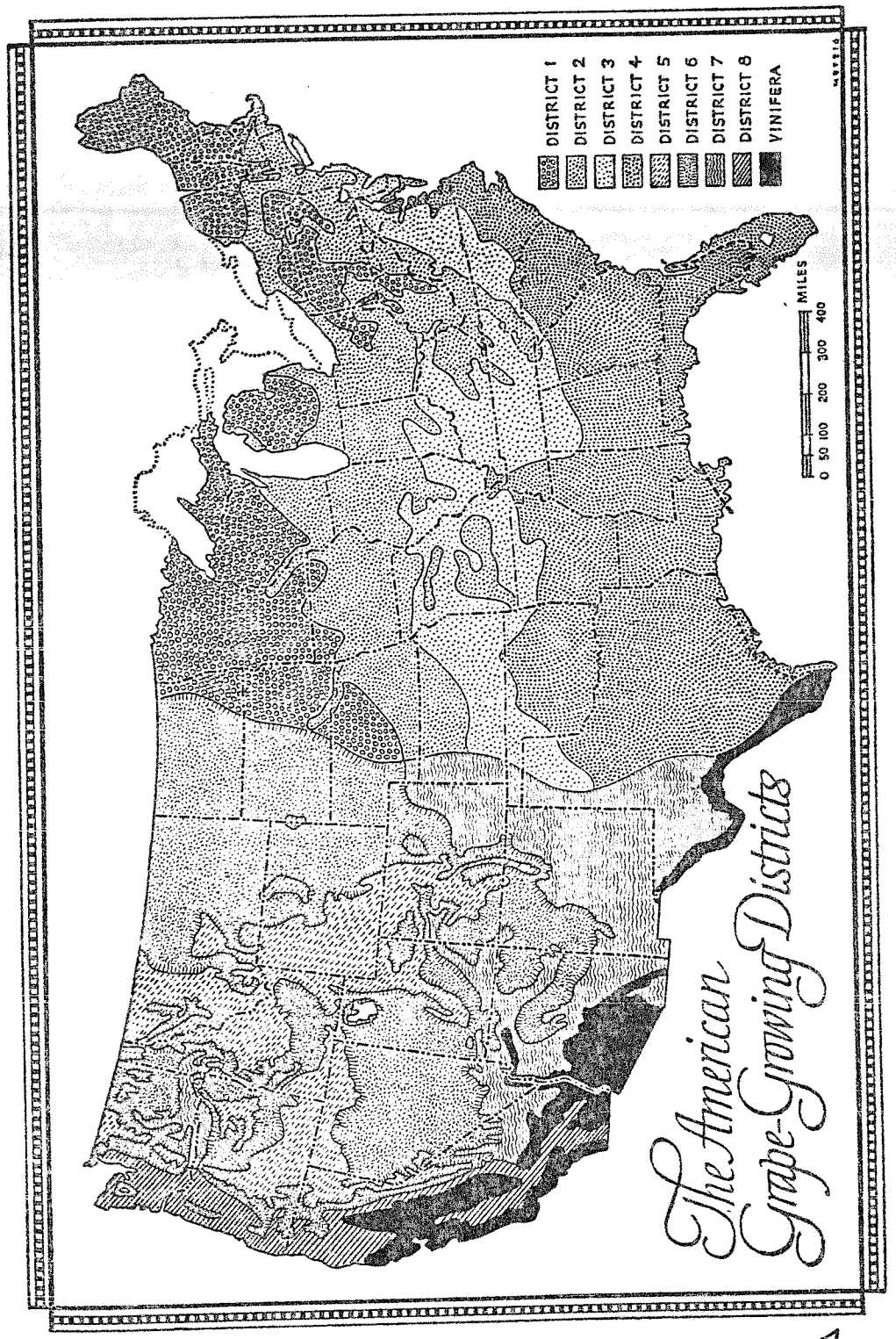

1.

shown on the accompanying map — must be highly tentative, and must be based on such broad grounds that it is subject to numerous exceptions and qualifications. All such broad regions or districts shade into each other, so that the boundaries should not be taken too literally. And they are subject to revision by experience. The outline of districts shown on the map [1] is only one of several such schemes that have been constructed in the past and is hardly to be taken as the last word. It cannot be emphasized too much that this scheme of districts [2] must not be taken literally, either as to its boundaries, the details of the accompanying descriptive notes, or the recommendations of varieties for planting. County agents can sometimes supplement these notes with limited advice on grapes in general, but are rarely trustworthy on specifically wine-grape questions. Weather stations can provide appropriate local qualifications and amendments.

District 1. We begin with a note on a district that is sharply limited in its grape-growing possibilities by two factors: shortness of growing season and low winter temperatures. It comprises upper New England, much of the northern half of the Appalachian mountain system, all of northern Michigan and much of southern Michigan, and a substantial chunk of the northern Great Plains area. The growing season ranges from 90 to 150 days, and winter temperatures run lower than in any other natural area of the United States. Rainfall is everywhere ample, ranging from 25 to 45 inches; and in most parts humidity is fairly high, requiring consistent disease-control measures. The grapes best adapted are hardy *riparia* hybrids, such as the grapes of the Alpha group,[3] and among the French hybrids only those with a

[1] This map is adapted from C. A. Magoon and Elmer Snyder: "Grapes for Different Regions." U.S.D.A. Farmers' Bulletin No. 1936, 1943. This same bulletin has likewise been drawn on for some of the facts contained in the notes on districts.

[2] These general districts will always be referred to, in Chapter XIII as well as this one, by arabic numerals — to assist in distinguishing them from the system of California regions, the latter being always referred to by roman numerals.

[3] Hardly worth bothering with, actually.

substantial portion of *riparia*, an
should be tried — such as Joffre, F
so, in the most intemperate parts
protection[1] may be necessary.

District 2. This district contair
grape-growing sections outside
though necessarily arbitrary, g
tion of its extent. In general it
more clement parts of New Er
lachians, large areas in the Nort
tension west of the Mississippi w
the northern edge of Missouri, p
and the Ozarks area. The areas v
extensively are the Chautauqu
southern shore of Lake Erie, t
central New York, the region
Lake Erie, the region along t
Michigan centering in Paw Paw
growing sections, and scatter
along the Missouri River well i
growing season from frost to
days on the average, and in al
there is ample rainfall. Most
average humidity so that prote
eases and insects is necessary;
bility in this regard. In the Cha
where the breezes never cease
superb health with relatively

A large assortment of grape
hybrids and the French hybri
within this region. For those
flavor there are Catawba, D
Elvira, Canada Muscat, Niaga
Buffalo, Steuben. Of the Fre
early and early-midseason
are worth trial on a broad s
wine Seibel Nos. 5279, 911

[1] See pp

2.

substantial portion of *riparia*, and possibly *rupestris*, blood should be tried—such as Joffre, Foch and Seibel 13053. Even so, in the most intemperate parts special measures for winter protection[1] may be necessary.

District 2. This district contains all of the principal present grape-growing sections outside of California. The map, though necessarily arbitrary, gives a pretty good indication of its extent. In general it may be said to include the more clement parts of New England, the southern Appalachians, large areas in the North Central States, and an extension west of the Mississippi which includes most of Iowa, the northern edge of Missouri, parts of Kansas and Nebraska, and the Ozarks area. The areas where grapes are grown most extensively are the Chautauqua Belt extending along the southern shore of Lake Erie, the Finger Lakes district of central New York, the region around the western end of Lake Erie, the region along the southeast shore of Lake Michigan centering in Paw Paw, Michigan, the Ozark grape-growing sections, and scattered grape-growing districts along the Missouri River well into Nebraska. The length of growing season from frost to frost runs from 150 to 180 days on the average, and in all but the most western parts there is ample rainfall. Most of the region has fairly high average humidity so that protection against the fungus diseases and insects is necessary; but there is great local variability in this regard. In the Chautauqua region, for example, where the breezes never cease to blow, the vines grow in superb health with relatively little need for spraying.

A large assortment of grape varieties, both the American hybrids and the French hybrids, find conditions congenial within this region. For those who enjoy the "American" flavor there are Catawba, Delaware, Brocton, Dunkirk, Elvira, Canada Muscat, Niagara, Diamond, Iona, Dutchess, Buffalo, Steuben. Of the French hybrids those grouped as early and early-midseason have proved themselves and are worth trial on a broad scale. These include for white wine Seibel Nos. 5279, 9110, 10868, and 13047, Seyve-

[1] See pp. 119–21.

3.

EXHIBIT 9.

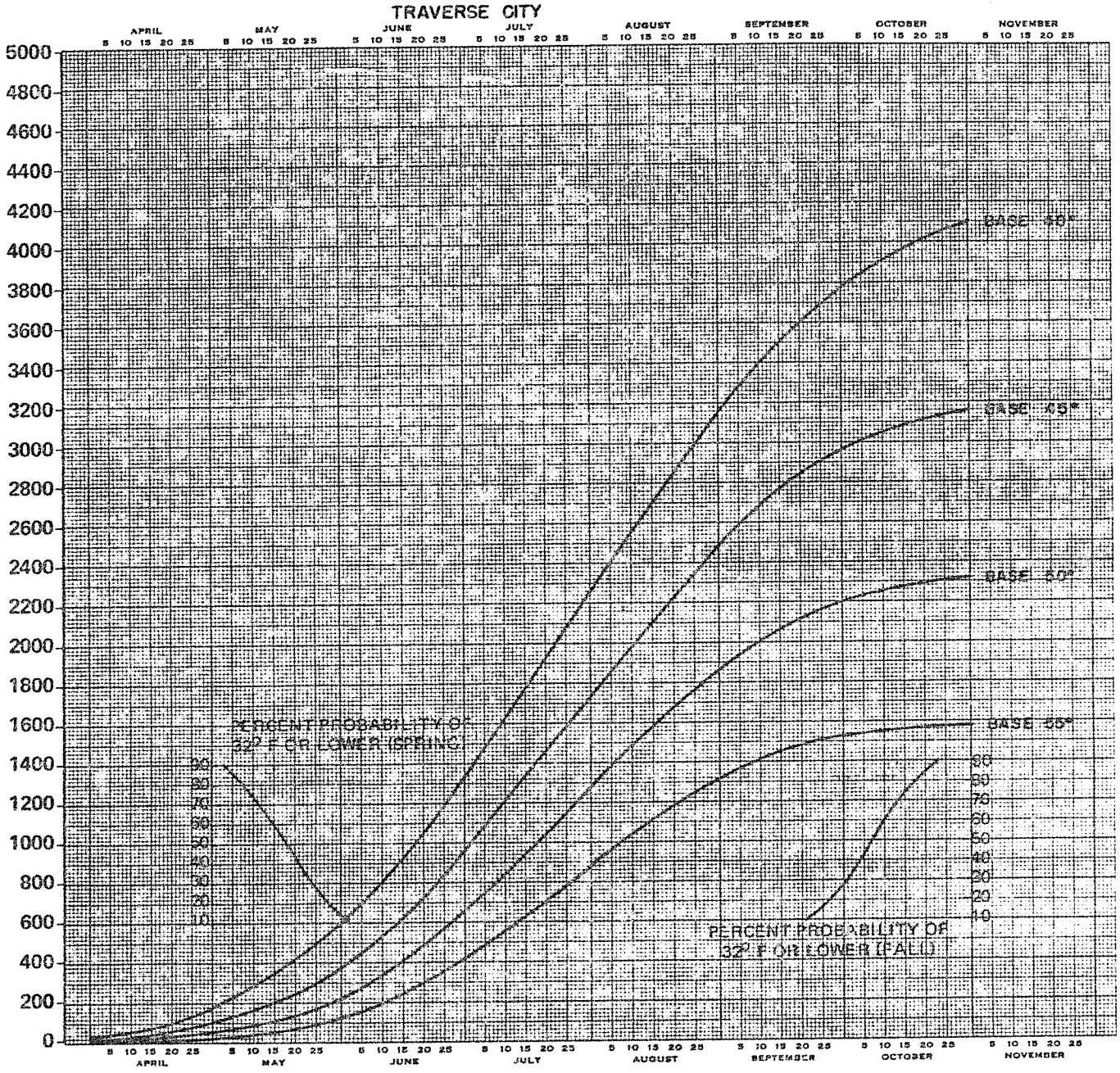

Fig. 40. Average seasonal growing-degree-day accumulation and freeze probabilities for Traverse City.

Table 40. Average monthly and seasonal growing-degree-days for Traverse City.
(S = Standard deviation of mean.)

Average Growing-Degree-Days by Months

For Month	Base 40° Mean	S	Base 45° Mean	S	Base 50° Mean	S	Base 55° Mean	S
March	28	47	13	28	6	14	2	6
April	150	76	85	57	44	37	20	21
May	413	92	277	84	168	70	91	52
June	732	79	583	78	436	77	296	75
July	933	82	778	82	623	82	468	82
Aug.	897	94	742	94	587	94	433	94
Sept.	621	79	474	78	333	74	211	68
Oct.	327	90	204	76	111	56	51	38

Seasonal Accumulation by Months

Thru Month	Base 40° Mean	S	Base 45° Mean	S	Base 50° Mean	S	Base 55° Mean	S
March	28	47	13	28	6	14	2	6
April	178	96	99	68	50	43	22	24
May	591	124	376	99	218	74	113	51
June	1323	154	959	138	653	120	410	98
July	2256	197	1736	183	1276	167	877	148
Aug.	3153	238	2478	227	1863	213	1310	198
Sept.	3774	278	2952	267	2196	253	1521	234
Oct.	4101	292	3156	279	2306	262	1572	241

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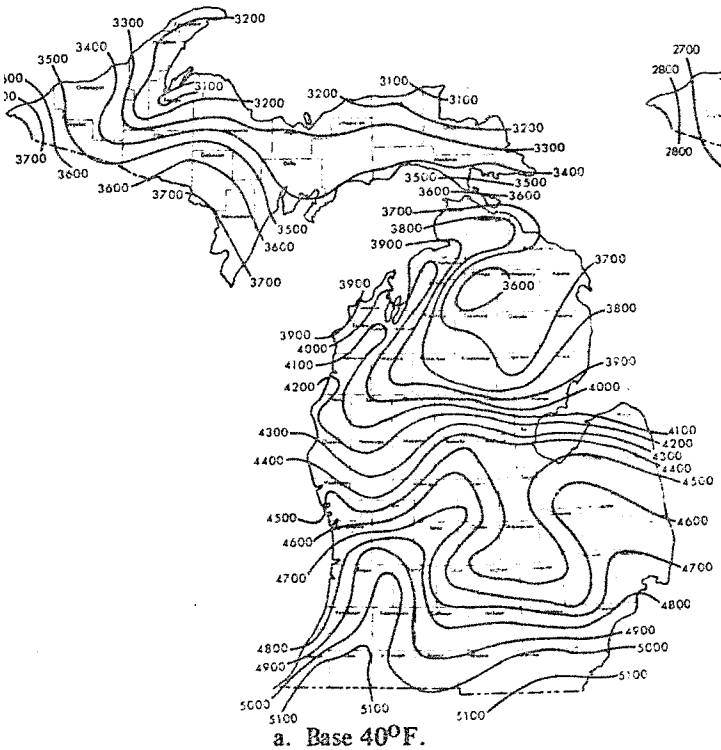
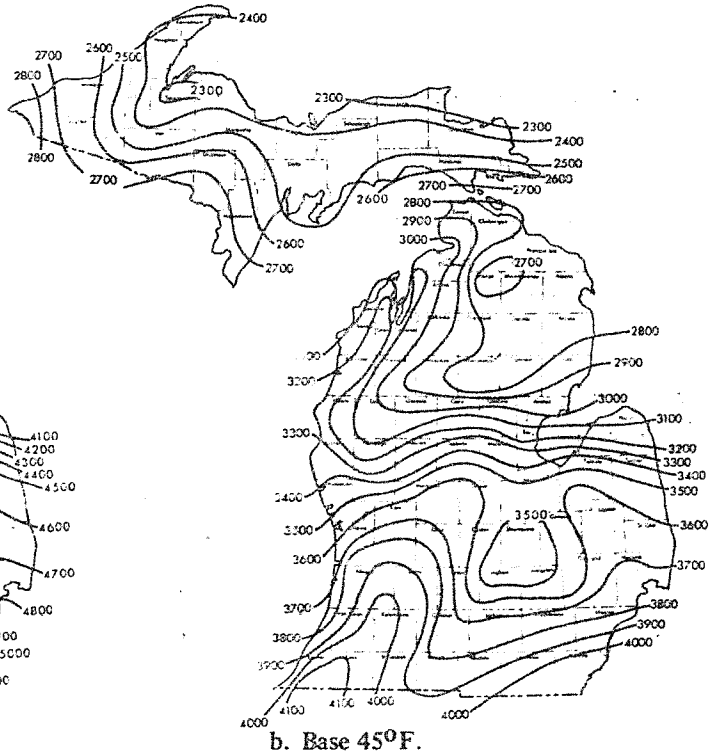
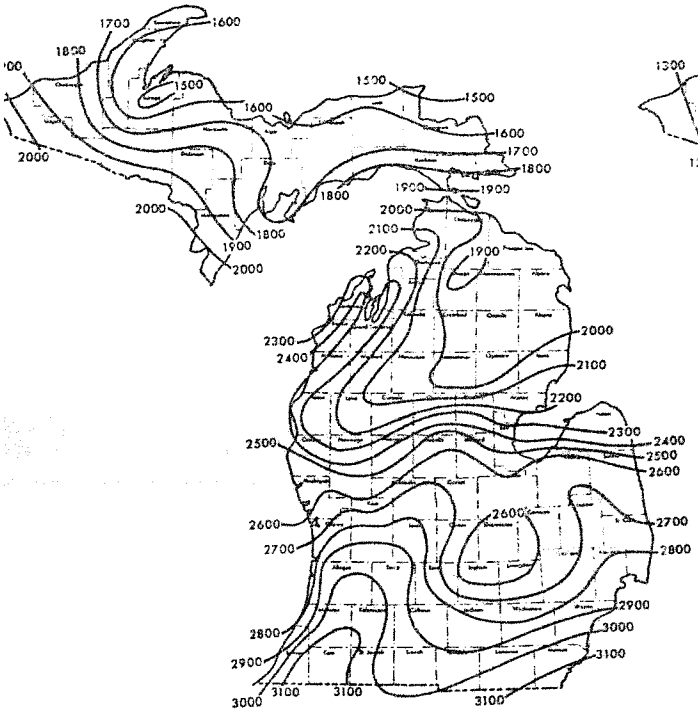


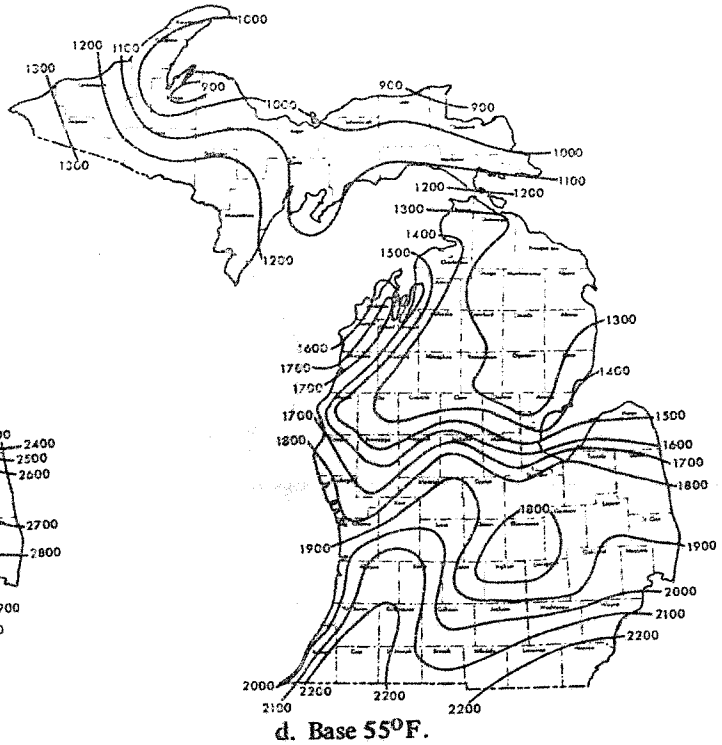
a. Base 40°F.



b. Base 45°F.



c. Base 50°F.



d. Base 55°F.

Fig. 43. Average cumulative growing-degree-days (March 1 - October 31).

EXHIBIT H

U. S. DEPARTMENT OF COMMERCE
ALEXANDER B. TROWBRIDGE, Secretary
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
ENVIRONMENTAL DATA SERVICE

CLIMATOGRAPHY OF THE UNITED STATES NO. 60 – 20

CLIMATES OF THE STATES

MICHIGAN

WASHINGTON, D. C.

MAY 1959
(Revised and Reprinted August 1967)

Climate of Michigan

Norton D. Strommen, ESSA State Climatologist

Michigan is located in the heart of the Great Lakes region and is composed of two large peninsulas. Many smaller peninsulas jut from these two peninsulas into the world's largest bodies of fresh water to give most of Michigan a quasi-marine type climate in spite of its midcontinent location.

The Upper Peninsula is long and narrow, lying primarily between 45° and 47° north latitude. It averages only 75 miles in width and extends from Northern Wisconsin eastward over 300 miles into Northern Lake Huron. Lake Superior lies to the north while the northern portion of Lake Michigan forms the boundary to the southeast. Isle Royale, separated from the mainland, is located in Lake Superior about 50 miles northwest of the tip of the Keweenaw Peninsula. Isle Royale, about 10 miles wide and 25 miles long is a popular National Park during the summer months.

The Lower Peninsula, shaped like a mitten and occupying about 70 percent of Michigan's total land area, extends northward nearly 300 miles from the Indiana and Ohio border or about 42° north latitude to the eastern end of the Upper Peninsula. The recently completed Mackinaw Bridge which spans the Straits of Mackinac now joins the two large peninsulas together where Lake Michigan flows into Lake Huron. Lake Michigan extends the entire length of the Lower Peninsula on the west while Lakes Huron, St. Clair and Erie form the eastern boundary. The total coastline for the state exceeds 3100 miles.

In addition, Michigan has over 11,000 smaller lakes with a total surface area of over 1,000 square miles. These lakes are scattered throughout 81 of the 83 counties while more than 36,000 miles of streams wind their way across the state.

While latitude, by determining the amount of solar insolation, is the major climatic control, the Great Lakes and variations in elevation play an important role in the amelioration of Michigan's climate. Because of its mid-latitude location, prevailing winds are from a westerly direction. During the summer months winds are predominantly from the southwest when the semi-permanent Bermuda High Pressure Center is located over the southeastern United States. During the winter months the prevailing winds are west to northwest, but change quite fre-

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quently for short periods as migrating cyclones and anticyclones move through the area. One exception occurs in the eastern portion of the Upper Peninsula where easterly winds prevail during the late fall and early winter months. This is the result of early winter anticyclones moving eastward across Canada and major storm tracks beginning to push southward.

TOPOGRAPHY.---The eastern half of the Upper Peninsula varies from level to gently rolling hills with elevation generally between 600 and 1000 feet above sea level. The gently rolling hills located along the Lake Superior shoreline contain the famous Pictured Rocks and Tahquamenon Fall areas. The western tablelands rise to elevations generally between 1400 and 1600 feet with Porcupine Mountain, the state's highest point, 2023 feet, located in Ontonagan County overlooking Lake Superior. The rugged hills extend northeastward from Ontonagan County through the center of the Keweenaw Peninsula and play an important role in the larger precipitation amounts received in this area. The Lower Peninsula features range from quite level terrain in the Southeast to gently rolling hills in the southwest with elevations generally between 800 and 1000 feet. A series of sand dunes along the Lake Michigan shoreline rise to heights of nearly 400 feet above the lake level. These are the result of the prevailing westerly winds which blow across the lake. Tablelands cover the northern part of the Lower Peninsula and reach a maximum elevation of 1700 feet in Osecola County near Cadillac. In the northwestern section of the Lower Peninsula a number of finger-like peninsulas extend into Grand Traverse Bay and Lake Michigan.

LAKE INFLUENCE.---The lake effect imparts many interesting departures to Michigan's climate which one would not ordinarily expect to find at a midcontinental location. Because of the lake waters' slow response to temperature changes and the dominating westerly winds, the arrival of both summer and winter are retarded. In the spring, the cooler temperatures slow the development of vegetation until the danger of frost is past. In the fall, the warmer lake waters temper the first outbreaks of cold air allowing additional time for crops to mature or reach a stage which is free from damage by frost. This lake effect is best seen by comparing stations at similiar latitudes in Wisconsin and Michigan. In July we find Madison, Wisconsin's mean temperature is 71.2°, while Lansing has a mean of 71.1° and Muskegon's mean is 69.9° F. In January, this trend is reversed with Madison's mean temperature 17.5°, while Lansing has a mean of 24.3° and Muskegon's mean is 26.0° F.

With the first cold air outbreaks in the fall, Michigan experiences a considerable increase in cloudiness. When cold air passes over the warmer lake water, a shallow layer of unstable, moisture-ladden air developes in the lower levels of the atmosphere. This air, when forced to rise, produces the increased cloudiness and frequent snow flurry activity observed in the fall and early winter months. A comparison of percent of possible sunshine in December shows Lansing receiving 27 percent while Madison, Wisconsin receives 42 percent. This difference decreases slowly as the lake waters cool, but does not completely disappear until the latter part of February.

Precipitation frequencies also show large variation from one side of the lake to the other. In January, Milwaukee, Wisconsin experiences measurable precipitation about 20 percent of the time or, on an average, once every five days. While Muskegon, with 45 percent, can expect, on an average, measureable precipitation every other day. In June this trend is reversed with Milwaukee's frequency of measurable precipitation almost 25 percent and Muskegon's frequency down to less than 15 percent. This difference in precipitation frequencies decreases inland from the lakes.

On warm summer days when prevailing winds are generally light, the lake's shore area frequently develops a localized wind pattern which may extend inland for only a few miles. This is frequently referred to as the 'lake breeze'. It developes when the much warmer air over the land masses begins to rise, allowing the cooler air over the lakes to move inland. At night this pattern may be reversed creating what is known as a 'land breeze'. A wind of this type may also be observed, but on a much smaller scale along the shores of the larger inland lakes.

GROWING SEASON.---The length of Michigan's growing season or freeze-free period does not decrease in the normal manner from south to north. Instead, isolines for the length of the growing season follow closely the contours of the lake shores. The shortest average growing season, about 60 days, occurs in the interior section of the Western Upper Peninsula. The growing season increases to between 140 and 160 days, as one goes towards the lake shores. A similar pattern exists in the Lower Peninsula where the growing season in the northern tablelands averages only 70 days, but increases rapidly to 140 days near the Lakes. Michigan's maximum average growing season, 170 days, is found in the southwest and southeastern corners of the state.

PRECIPITATION. --- Michigan averages about 31 inches of precipitation per year. About 55-60 percent of the annual total is recorded during the normal growing season. Summer precipitation falls primarily in the form of showers or thunderstorms, while a more steady type of precipitation of lighter intensity dominates the winter months. The annual number of thunderstorms observed decreases from about 40 in the south to around 25 in the Upper Peninsula area with nearly 50 percent of these recorded during the summer months, June through August. The maximum five-minute rainfall total of 0.86 of an inch was recorded at Detroit on August 17, 1926. The greatest monthly total, 16.24 inches, occurred

at Battle Creek in June of 1883. Battle Creek also failed to record any precipitation in February 1877. A number of other stations in southern and central Michigan have recorded no rainfall for a month, but these records were established during the late summer or early fall months. The frequency of floods is quite low in Michigan with the greatest likelihood occurring in late winter or early spring when sudden warming and rain may be combined with snowmelt. Mild meteorological drought conditions are not uncommon in Michigan, but meteorological droughts reaching severe conditions are infrequent and generally of short duration. The normally even distribution of precipitation and higher humidities observed in Michigan are helpful in reducing the high demands for moisture, as experienced in other areas of the Upper Midwest.

SNOWFALL.---Michigan receives some of the heaviest snowfall totals east of the Rockies except for isolated points in the New England States. The maximum average annual snowfall amounts of over 170 inches, are located along the escarpment which rises abruptly to an elevation of over 1400 feet above Lake Superior, at the western end of the Upper Peninsula. Another area with amounts exceeding 120 inches is centered in the western section of the tableland region of the Lower Peninsula. The prevailing westerlies, passing over the Great Lakes, become moisture ladden in the lower levels and when forced upward by the land masses, drop much of their excessive moisture in the form of snow squalls in these areas. The record seasonal snowfall total of 276.5 inches occurred at Calumet during the winter of 1949-1950. A single storm from January 15-20, 1950 accounted for 46.1 inches of this total. The 24-hour snowfall record of 27 inches was established on October 23, 1929, at Ishpeming and equaled at Dunbar on March 29, 1947.

TEMPERATURES.---The coldest temperature recorded in Michigan was -51° at Vanderbilt on February 9, 1934. The highest, 112°, occurred July 13, 1936 at Mio. Temperatures below -40° have been recorded in most interior sections of the State, but seldom have readings of -20° been observed in the immediate vicinity of the Great Lakes. This modification in temperature extremes by the lakes enables Michigan to produce successfully a variety of crops more ideally suited to the climate of the southern United States.

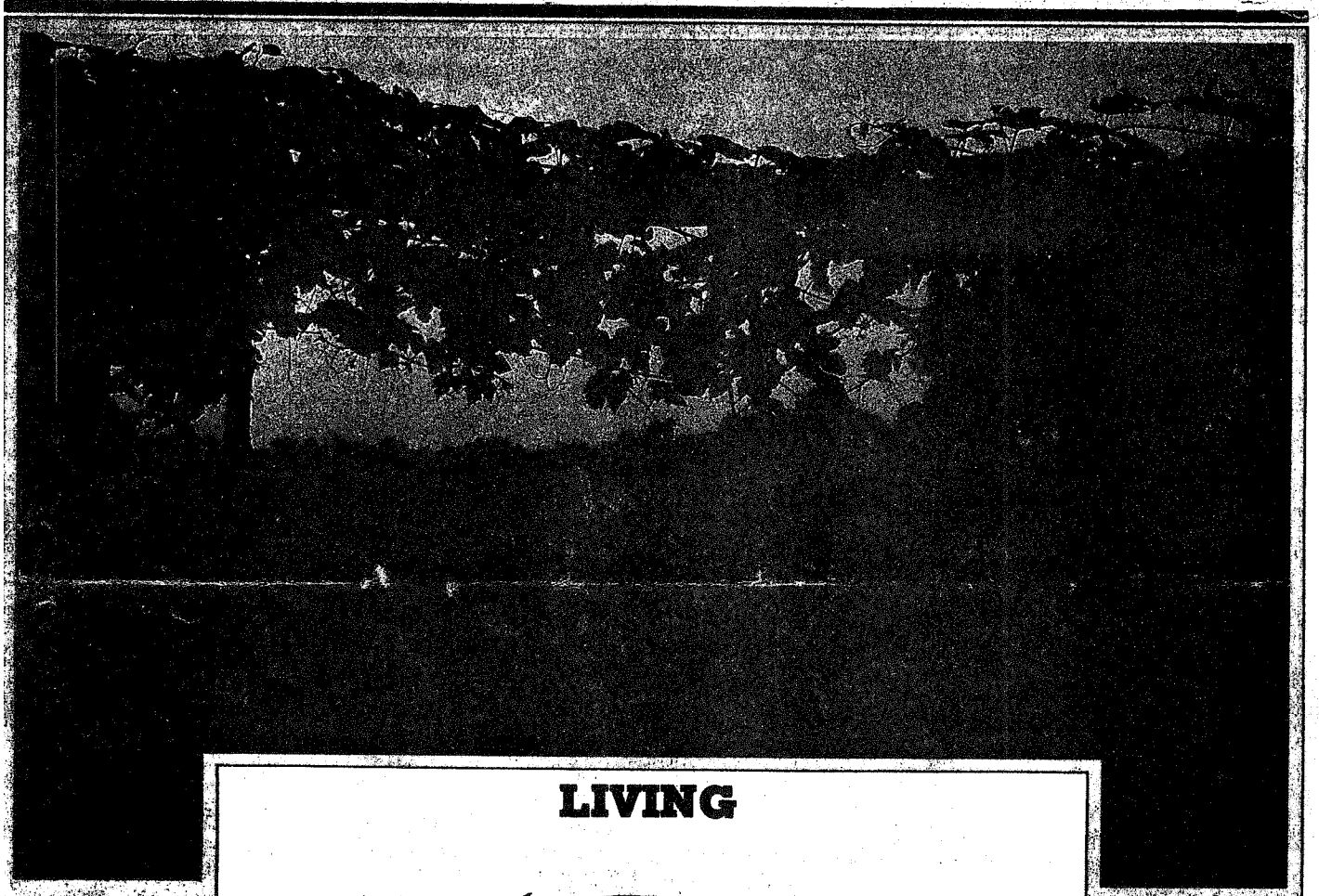
STORMS AND TORNADOES.---Damaging or dangerous storms do not occur as frequently in Michigan as in the states to the south and west. Recorded tornado occurrences in Michigan have averaged four per year for the period 1916-1965 with an average of about nine per year during the last decade. The increase in the last decade is attributed primarily to better reporting services and networks. About 90 percent of these tornadoes occurred in the southern one-half of the Lower Peninsula. In recent times, a most destructive series of tornadoes were observed on Palm Sunday, April 11, 1965, causing over $51,000,000 in damages to southern Michigan. Damaging wind storms and blizzards are not as frequent but do cause considerable damage from time to time. Hail is most frequently observed in the spring months, but the total damage caused by hail is small. A higher frequency of hail is noted in the fall months over the northwestern section of the Lower Peninsula. This is attributed mainly to the strong lake influence in this region.

WATER SUPPLY AND AGRICULTURE.---Michigan is particularly fortunate in its supply of both surface and ground water. Surface water supplies are constantly replenished by a mean annual rainfall averaging about 31 inches, well-distributed throughout the year and with little annual variation. Because of moderately high humidities, evaporation rates are quite low so that less water is lost in this manner. Heavy industrial demands are made upon the water supply of Michigan, but few industries have had to go any great distance to find adequate supplies. Aside from the availability of the lake water, industry can normally meet its water requirement needs from depths running from 25 to 400 feet, with the majority of wells from 50 to 200 feet deep. There is, of course, also an abundance of water to meet the needs of cities and individuals. Because of its climate, soils and marketing conditions, a large variation in agricultural practices and many varieties of crops are found in Michigan. Primary crops in Michigan with respect to agriculture are hay and pasture, corn, wheat, field beans, oats, truck crops, potatoes, sour cherries, apples, sugar beets and peaches. Hay and tillable pasture occupy about 28 percent of the total tillable land and are grown generally throughout the State, as are oats. Corn production is concentrated in the southern half of the Lower Peninsula, and field bean growing is concentrated in the Saginaw Valley and "Thumb" areas. Tuscola, Sanilac, Saginaw, Huron and Bay are the leading sugar beet counties in the State.

The fruit belt of Michigan is located in the southwestern and western border areas of the Lower Peninsula, along the shores of Lake Michigan where, because of the prevailing westerly winds, the tempering influence of the lake water is strongest. Peaches are concentrated in five southwest and western counties, while apple orchards extend north to the Grand Traverse area. This latter area is noted for its production of sour cherries. Cherry growing is best adapted to areas having relatively short, cool growing seasons free from extremely low winter temperatures and free from frosts at blossom time. A number of fingerlike peninsulas extend into Grand Traverse Bay with further amelioration of the climate, and cherry growing is heavily concentrated on these peninsulas.

RECREATION.---Because of the Great Lakes' influence on Michigan's climate the changing topographic features, and thousands of miles of lake shore, we find a robust year-around

EXHIBIT I



LIVING

A Toast to Midwest Wine Makers

By Carol Pine

Midwest wines are improving rapidly—and vintners in Michigan, Wisconsin and Minnesota are battling to command national attention

For many years, most of the country thought Midwestern wines weren't drinkable—unless you had an iron stomach," says Ruth Church, veteran wine critic for the *Chicago Tribune*. "Now, even Californians are discovering Midwestern wines with surprise, and even delight." Wines such as Seyval Blanc, Vidal Blanc and, among the reds, Baco Noir, Foch and Chelois are some of the names to look for. "These are wines with a future," Church says.

This prediction may come as a surprise to some traditional horticulturalists. For years, they preached that the only grapes that could survive Midwestern winters were the hardy but humble American varieties such as the Concord and Niagara. They advised leaving the noble European vines—the Reislings, Cabernet Sauvignons and Chardonnays, for instance—to the North Coast of California, or the fertile hillsides of Germany and France.

But a band of pioneering vintners in the upper Midwest was not content with accepting these limitations. This group is committed to making premium wines, and they are experimenting widely with high-quality European viniferas. Many of these wine makers are new to agriculture, but they are quick to learn and they support each other. Word of their successes and failures travels quickly, even when vineyards are several hundred miles apart.

Now the wine distributors are beginning to pay new attention to the Midwest, says critic Ruth Church. "In the past, small vintners just didn't produce enough volume to matter in the minds of the distributors. But recently, I've noticed some competition for the fine wines from small wineries, despite the limited quantity available," she notes. "American wine drinkers like to try new labels."

Len Olson of Tabor Hill Vineyards in Berrien County, Michigan is one of the leaders of the new wine makers. For his efforts in developing premium wines in the Midwest, Olson recently won the Gold Vine award (the industry's Oscar, as he calls it) from the Knights of the Vine, a national fraternity of wine-lovers. Three years ago, Olson, a former steel salesman from South Chicago, hauled 500 cases of Michigan wine to Washington, D.C. in a truck in an effort to spread the Midwest wine gospel. This fall, he intends to "go national" by distributing six of his best wines in the Twin Cities, Milwaukee, Chicago, St. Louis, Springfield, Indianapolis, Fort Wayne, Detroit, Cleveland, Cincinnati, New York and Washington. If Olson's plan succeeds, he will be setting a distribution precedent for the region.

Many Midwest vintners still sell most of their stock at their own wineries. Up until recently, even the largest producer of Midwestern wines, Warner Vineyards in Paw Paw, Michigan, which sells about 150,000 cases annually, had done little serious marketing nationwide.

"Until 10 years ago, we did a pretty good job of not telling people we were making premium wine," says Warner's Rick Palasinski. Even now, Warner's wines are available mainly in Michigan, Indiana and New York; a few cases are shipped to Wisconsin, Ohio and South Carolina. "Trouble is," says Palasinski, "we're competing with the imports and the big guys like Gallo. And only recently has the reputation of Midwestern wines begun to change for the better."

Midwestern wines have carried something of a sticky reputation from years past, when they were considered to be syrupy creations fit mainly for dressing up ice cream or basting a bird. Some so-called wine producers put together big batches of sugar, water and fruit extracts with such fanciful names as Nature Boy and Bahama Mama.

For today's serious wine makers, operating a winery in the Upper Midwest can be a lonely business. There are fewer than two dozen commercial vintners in Minnesota, Michigan and Wisconsin. There are none in the Dakotas.

A handful of vintners—including Jim Warner of Warner and Dave Braganini of St. Julian Wine Company, both in Paw Paw—have generations of capital and equipment behind them. But most of the more experimental producers ventured into the business only a decade or so ago. Many rely on other employment to help make ends meet until their wine ventures mature. Along with Len Olson of Tabor Hill, this group of optimists includes David Bailly, Minneapolis attorney and owner of Alexis Bailly Winery in Hastings, Minnesota; Bob Wollersheim, University of Wisconsin engineering school instructor and owner of Wollersheim Winery near Prairie du Sac; Bill Welsch, Mokena, Illinois building supplies retailer and owner of Fenn Valley Vineyards in Fennville, Michigan.

Many of the vintners have been frustrated by state laws that—unlike California's more favorable legislative code—seem to offer no tax breaks or investment

WINERY TOURS

Visitors to a Midwest winery will see a variety of wood casks, towering stainless steel storage tanks, mechanized grape pressers, centrifugal sediment separators, split-second bottlers and, of course, tasting rooms.

All of the vintners listed below welcome visitors:

MICHIGAN

Boskydel Vineyard—Free tasting room open year round, seven days, from 1 to 6 p.m. Regular tours May through September; tours can be scheduled on request during other months. Near Traverse City. Rt. 1, Box 522, Lake Leelanau, MI. (616) 256-7272.

Bronte Champagne and Wines, Inc.—Free tours and tastings year-round. Monday through Saturday, from 10 a.m. to 4 p.m.; Sunday from noon to 4 p.m. Located outside Hartford in Keeler, County Rd. 687, off I-94, MI. (616) 621-3419.

Chateau Grand Travers, Ltd.—Tours from May 1 to December 31, Monday through Saturday, 10 a.m. to 6 p.m., Sunday, noon to 5 p.m. 12239 Center Rd., Traverse City, MI. (616) 223-7355.

Fenn Valley Vineyards and Wine Cellar—Tours and tastings all year, Monday through Saturday, 10 a.m. to 5 p.m.; Sunday, 1 to 5 p.m. 6130 122nd Ave., Fennville, MI. (616) 561-2396.

Frontenac Vineyards—Free year round tours and tasting. Monday through Saturday, 9:30 a.m. to 4 p.m.; Sunday, 12:30 to 4 p.m. P.O. Box 215, Paw Paw, MI. (616) 657-5531.

Lakeside Vineyard, Inc.—Tours from April to December, Monday through Saturday, 10 a.m. to 5 p.m., Sunday, noon to 5 p.m. 13581 Red Arrow Hwy., Harbert, MI. (616) 469-0700.

Leelanau Wine Cellars—No tours, strictly wine sampling in the tasting room. Monday through Saturday, 10 a.m. to 6 p.m., Sunday, noon to 6 p.m. April 1 through January 1. 726 U.S. Hwy. 31 South, Traverse City, MI. (616) 946-1653.

L. Mawby Vineyards—No formal tours scheduled, but visitors can arrange one by calling Larry Mawby at (616) 271-3522. Or, write L. Mawby Vineyards, 4519 Elm Valley Rd., Suttons Bay, MI.

St. Julian Winery—Tours and tastings weekdays all year, 9:30 a.m. to 4 p.m.; Sundays, noon to 4 p.m. 716 S. Kalamazoo St. Paw Paw, MI. (616) 657-5568.

Tabor Hill Vineyards and Winecellar—Tours and tastings daily, noon to 5:30 p.m. all year. Rt. 2, Box 720, Buchanan, Berrien County, MI. (616) 422-1161.

Warner Vineyards—Tours and tastings March to August, Monday through Saturday, 10 to 4 p.m.; Sundays, 1 to 4 p.m. Off-season: Saturdays, 10 a.m. to 4 p.m.; Sundays, noon to 4 p.m., or by appointment for out-of-town visitors. 706 Kalamazoo St., Paw Paw, MI. (616) 657-3165.

MINNESOTA

Alexis Bailly Winery—Free tours and tastings, May 1 to October 31, Tuesday through Saturday, 10 to 5 p.m. 18200 Kirby, Hastings, MN. (612) 437-1413.

WISCONSIN

Fruit of the Woods Wine Cellar, Inc.—Tours daily, May through late November, tastings all year, daily including Sundays, 9 a.m. to 5 p.m. Last complete tour at 4:30 p.m. 1113 Wall St., Eagle River, WI. (715) 479-4800.

Stone Mill Winery, Inc.—Tours and tastings all year except major holidays. Monday through Saturday, 10 a.m. to 5 p.m.; Sunday, noon to 5 p.m. $1 per adult; age 18 and under free. Near Milwaukee, in Cedarburg, off Hwy. I-43 N. WI. (414) 377-8020.

Von Stiehl Wine Co.—Free tours and tastings May through October (June through September in Baraboo); seven days, from 9 a.m. to 5 p.m. Two locations: 115 Navarino St., Algoma, WI, near Green Bay; and 331 Lynn St., Baraboo, WI, near Madison. For tour information call: (414) 645-2574.

Wollersheim Winery—Tours and tastings, all year except major holidays, daily, 10 a.m. to 5 p.m. $1 per person, children 11 and under free. Hwy. 188, Prairie du Sac, WI. (608) 643-6515.

incentives to serious commercial wine makers willing to risk their capital and their sweat to develop a new industry. Many of them have wrestled with Midwestern bankers who were reluctant to commit funds to operations that might need 10 to

In Michigan, where the snow cover was greater, all Len Olson could do was wait and dream.

12 years to mature before showing any substantial profit.

All of the growers battle the weather.

The Midwest grape-growing season is short—at best from late May to early November. Multiple weeks of hot, dry weather, such as the drought of 1976, can wither the year's crop. In the spring, an unseasonable freeze can easily rupture a vine and paralyze young buds. An early frost in September may weaken the vine for next year's harvest.

David Bailly has borrowed techniques from Soviet farmers to cope with winter temperatures that drop as low as −30 degrees. Bailly trains the trunks of his grapevines to grow laterally along the ground before they climb the first trellis; after the harvest, he blankets his vines under heavy mounds of dirt to protect them from the approaching winter.

This past January, at Wollersheim Winery in Wisconsin, proprietor Bob Wollersheim was out on the hillsides clearing away weeds in order to get a head start on the traditionally short spring season. In Michigan, where the snow cover was greater, all Len Olson could do was wait and dream.

In fact, southwest Michigan vintners such as Olson have the best growing conditions in the upper Midwest. In roughly a 35-mile swath along the eastern shore of Lake Michigan, the weather is tempered by prevailing north to northwest winds passing over the lake. Temperatures at Tabor Hill Vineyards, which is about 90 miles northeast of Chicago, are 10 to 15 degrees warmer than in the Windy City. Above-average snowfall also insulates Olson's vines from dropping temperatures. Summer breezes off Lake Michigan usually rule out scorching days. Olson's neighbors forego the traditional sturdy Midwestern crops such as corn and soybeans to grow grapes, peaches, strawberries, apples and other fruit.

Many Midwest vintners must buy grapes from local growers because they own limited parcels of land themselves. That purchase is not casual, says Charles Catherman, wine maker for St. Julian, the second largest Midwestern producer.

"We pick 'micro climates' that will offer the best harvest," he says. "Southwest Michigan is a good fruit belt, but within that area there are prime micro climates. There's a ridge just west of Paw Paw half a mile wide by three miles. It's hilly—grapes do better on hills because cold air settles into lowlands—the soil drainage is good and the land has clear southern exposure. That's a micro climate. We pick growers on this basis: we look at a guy's land and decide which grape variety will grow best there. We mutually agree—it has to be a variety St. Julian needs and a variety the grower can make money on. We put nothing in writing. Instead, we have handshake agreements with about 50 people."

Midwest grape growers may be farmers of conventional crops, but they are more often early retirees from unrelated professions. Many are former attorneys, doctors and businessmen who grew up on farms. Some work 10-acre plots on weekends. Others have invested in a thousand or more acres to grow Concords for Welch Foods (makers of juices and jellies) along with hybrids for fine wine makers.

Growing grapes is no get-rich-quick scheme, says Catherman, but it can provide a good retirement income.

"Let's say a guy wants to plant 10 acres of hybrids to sell to us. Vines cost about 50 cents apiece and one acre might take 850 vines—that's $425 per acre. In addition, the grower can count on spending about $650 to $1,000 per acre annually for herbicide, fungicide, fertilizer, pruning and general maintenance. On a small spread, he can trim these costs by handling most of the field work himself. But then you have to add land taxes on top of that.

"During the first year," Catherman continues, "the vines will establish the root system. That winter, the grower prunes each vine to one or two buds so that the vine will produce fruit the second year. He'll spend the second year training his vines to follow wires and stakes. In the third year, he may get one-half ton or one ton per acre. By the fourth year, he can

Growing grapes is no get-rich-quick scheme, but it can provide good income.

expect about four tons. By the fifth year, he can usually do well."

An average yield per acre is five to six tons, says Len Olson. At a cost of $500 a ton, the gross is about $2,500 to $3,000 per acre.

"Look at that land," Olson said recently, scanning his windshield during the drive

up to Tabor Hill. "It's doin' nothing. The best grape land in Michigan is owned by guys who just aren't aware of what we're trying to do. That land could easily be converted into a vineyard. Those hills—those rolling hills—are perfect. Look at it this way. Americans drink 2½ gallons of wine a year now. Experts say that consumption will rise to 8½ gallons per person by 1984. There aren't enough

"Times are changing— even Californians give us respect."

'THE FOOL ON THE HILL'

Bob and JoAnn Wollersheim
WOLLERSHEIM WINERY
Prairie du Sac, Wisconsin

"The fool on the hill" is the nickname that some of the local farmers in the Wisconsin River valley gave to Bob Wollersheim. In a region known for dairy farms and bumper crops of corn, Wollersheim devotes his 80-acre spread to growing French hybrid grapes and making premium wines.

About eight years ago, Wollersheim and his wife, JoAnn, became smitten with a crumbling, century-old winery outside Prairie du Sac. "I was a graduate student then at the University of Wisconsin in Madison, up to my ears in student loans—and fascinated with wine making," recalls the 40-year-old Wollersheim. "The winery was straight out of a storybook—a little piece of history that had remained virtually unchanged for 100 years." A future teaching electrical engineering courses began to seem pale by comparison.

The Wollersheims decided to invest all the money they had—and a lot they didn't have—to become the owners of the ramshackle 15-room house and the decaying limestone winery. The original vineyard had been planted in the 1840s by Agoston Haraszthy, a Hungarian nobleman. Haraszthy couldn't tolerate the fierce Wisconsin winters, however, and shortly left for California, where he established that state's wine industry.

Bob Wollersheim, the son of German immigrants and a native of Fond du Lac, wasn't put off by Wisconsin weather. What's more, he had learned to make wine from watching his Grandma Maggie—Margaret Wollersheim, who lived in nearby Johnsburg. Her wine was produced from wild grapes that she crushed in a kettle, squeezed through a cloth jelly bag, fortified with sugar and left to ferment in a crock.

Following Grandma Maggie's example, Wollersheim made his first batch of wine about 20 years ago. He poured the brew into old Chianti bottles and stored them in his closet. "A few years ago, I cleaned out the closet, and that wine tasted pretty good," Wollersheim recalls with a smile. "I started reading everything I could about wine. I exhausted all the libraries."

The old Haraszthy spread seemed a logical place to begin making wines. With only his family to help, Wollersheim brought the winery back to full operation in about three years. He split rails for fences, laid brick and scoured the countryside for inexpensive but usable equipment—a 50-cent sink, 120-year-old wine barrels that had been made in Ohio by Confederate prisoners of war, a junk motor, a corking machine that looks as old as the Wisconsin hills.

All the Wollersheims pitch in. Bob's 72-year-old father now can bottle and cork about 100 cases of wine a day. Steve Wollersheim, 13, mows grass, works the flat land with a tractor and prunes grape vines. Julie, 14, and Eva, 11, lead tours and pull weeds. JoAnn Wollersheim is in charge of bookkeeping and retail sales.

Unless, of course, there's a crisis. During the drought of 1976, for example, the entire family carried countless pails of water to their three-year-old vines to save the withering crop.

The Wollersheims began planting in 1973 with about 10,000 vines. They harvested their first major crop in 1978 from five hardy hybrids: Millot, DeChaunac, Foch, Aurora and Seyval Blanc. More recently, Wollersheim has begun experimenting with Pinot Chardonnay and Johannisberg Riesling.

Total Wollersheim production is still small—about 75,000 bottles a year. But prices are going up. ($3.50 for an average bottling, $6.50 for a special). And so, too, is the quality.

Indeed, after his first crops, Wollersheim didn't have to wait long for recognition. The awards began rolling in: at the 1975 International Wine and Spirits competition in Surrey, England, Wollersheim's 1973 Baco Noir and Chelois red table wines each won gold medals against competitors from 22 other nations. His red wines have also captured medals in American competitions. "Times are changing," Wollersheim acknowledges with a quiet pride. "Even Californians give us respect . . . when they get to know us."

vineyards planted in the U.S. to meet that demand. It's not a pipe dream when I talk about turning 20,000 acres of southwest Michigan into vineyards. It should happen. Mark my words, it's going to happen. We can make wine here that's just as good as wine produced in France, Germany and the Napa Valley (California). We're in our infancy, that's all."

Len Olson, an admitted dreamer, believes the traditional yield of about 300 gallons per acre worldwide can be boosted to 1,600 gallons by employing techniques developed by Helmut Becker of Geisenheim, Germany. "Becker has already increased gallonage to 800 per acre by picking only the strongest and most productive vines for propagation," says Olson. "We plan to take advantage of his knowledge to boost output here in the Midwest."

Olson stops his car abruptly on Hollywood Road and zeroes in on a field of naked, black vines: "Imagine those Concord vines bearing premium Chardonnay, Riesling, Pinot Noir and Cabernet Sauvignon grapes. I believe we can make that conversion with grafting. It'll be a first in the Midwest when I try it this year. Essentially, we'll attach buds from these four premium varietals to the strongest Concord root stock we can find. We're bringing in a California horticulturist to handle the grafting on about 20 acres. If all goes well, the vines grafted this spring will produce between 8,000 and 14,000 gallons of premium wine. By June, 1981, we'll know if the experiment worked."

If the grafting is successful, existing Midwestern growers will earn far more on a premium grape yield than on Concords, Olson says.

Olson has been an innovator before. He set the young Midwest wine business on its ear in 1963 when he pioneered in planting viniferas—pure European grape vines from European stock. Whether those less hearty viniferas can survive multiple Midwest winters on a large scale is still a matter of debate.

In the coming decade, however, Midwest vintners believe that wine-lovers around the nation will sit up and take notice of their products.

"When our founder came here in 1921, all he had to work with was Concord and Niagara grapes," says Charles Catherman of St. Julian. "We couldn't handle the grapes California did . . . or so we thought. Since then, we've been playing catch-up football. It's taken time to adapt delicate European varieties to the Midwest, but we've worked hard, we've experimented and we hope to develop vines strong enough to handle our climate and produce quality grapes. Starting in 1975, our wines have begun to reflect the eight to ten years of hard work that vintners put in. And now we're beginning to turn the corner."

STARTING A WINERY ON A GRAND SCALE

Bill and Ruth Welsch
FENN VALLEY VINEYARDS
Fennville, Michigan

Many people thought we were pretty brash—if not stupid—to build a winery big enough to handle 100,000 gallons," says 54-year-old Bill Welsch. "We built a lot of sophistication into our facility; for that reason, we'll have to grow bigger to make it work."

In 1979, Fenn Valley produced about 40,000 gallons (or 200,000 bottles) selling for $3 to $6 a bottle. The winery is operating in the red, but Bill Welsch's Big Buck Building Center, located in Mokena, Illinois, generates the profits that permitted him to start a winery on an abandoned 250-acre peach farm. "You don't start a winery with pocket change," says Welsch.

He claims that originally he was simply looking for a tax shelter. Yet Welsch knows that there are safer investments around. "I wanted some connection with the land," he says. I had fooled around with wine making at home. But when I embarked upon this venture in 1973, I was truly inept."

Inexperienced perhaps, but Welsch was careful about picking his land. For two years he and his family traveled in search of vineyard property. Finally, the Welsches settled on Fenn Valley, which is located not far from Kalamazoo.

"The farm we chose was known as a good peach producer," says Welsch. "The soil is fundamentally sound, and we are just 140 miles from Chicago."

Today, Bill and Ruth Welsch, their daughters, and their son and his wife, all live at Fenn Valley and help produce the wines.

Fenn Valley produces wines from a group of hybrids, including Seyval Blanc, Aurora, Foch, Chelois, and Baco Noir. The winery has been winning medals in competitions since 1977, including a gold at the 1978 Small Wineries Marketing Conference in Washington, D.C.

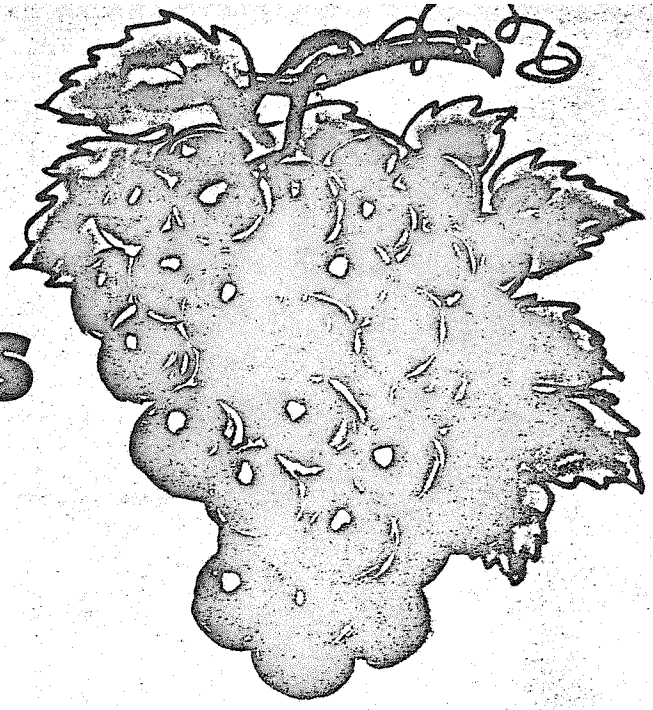
The Welsches recently opened a retail outlet in Mokena, which they hope will improve their balance sheet. "Ultimately, the winery has to make out or it will bleed us dry," says Welsch. "But for now, we have Big Buck to lean on."

EXHIBIT J

The Great Lakes Grape Growers News

A Semi-Annual Supplement to
The Great Lakes Fruit Growers News
(Published February and July)

July • 1975 • Volume 4 • Number 2



Wine-Grape Plantings and Wineries Announced in Leelanau County

From the evidence in so far grapes are off to a significant start in the horticultural economy of Northern Michigan's Leelanau County. This includes new plantings of both French hybrid and vinifera varieties as well as announcement of plans for the construction of two wineries.

Most of this activity is by a newly-formed wine-grape operation called Leelanau Vineyards and Winecellars, Ltd. This new enterprise got underway in the spring with 10 acres of French hybrids planted just west of Suttons Bay and a small test planting of vinifera south of Northport ajacent to the site selected for a winery overlooking Grand Traverse Bay.

Whether it's a new introduction to Leelanau County's grape industry or one of several individuals with much smaller experimental plantings, standing somewhere in the background is Bernie Rink whose 10 years of experience with the new grape varieties is the longest and most intensive of anyone in the area. what wines can best be made from them and to provide cuttings for a nursery. "We're trying everything to learn all we can!" he exclaimed.

He estimates his costs at between $2,000 and $3,000 to bring each acre of French hybrids to maturity, and this cost includes consideration of the labor of his five sons ranging up to 18 years of age. "They are doing most all of the work in the vineyard," Mr. Rink commented.

Some of his comments about growing French hybrids cover winter damage, cultural practices, pruning and the use of sod. For example, Mr. Rink believes that the risk of winter damage is tied in with site or slope orientation. A straight southern slope is not suitable because of the adverse way the sun reflects off from it during the winter months while snow is on the ground.

"There is a great intensiveness required in the care of French hybrids," Mr. Rink cautions. "You can't be timid damage.

To avoid washouts, sod is used on the slopes by Mr. Rink. Although he isn't sure yet, it is in these areas where the sod competes with the grape plant that additional nitrogen may be required. He believes that soil sampling and leaf analysis are important in making these determinations.

Mr. Rink and his wife, Sue, and their five sons have lived at their present location for 18 years. The family came to the Traverse City area in 1955 when Mr. Rink was a demonstration librarian for the Michigan State Library. He spends his working hours at the Northwestern Michigan College in Traverse City where he has been on the faculty since 1957 and presently is head librarian.

ies is the longest and most intensive of anyone in the area.

The decade-long successes of Mr. Rink in growing French hybrid grapes in Leelanau County can largely be attributed to his extensive knowledge of the fruit, the hardiness of the French hybrid varieties as well as the "micro-climate" of his specific location.

By "micro-climate" he means an ideal climate for his grapes, and that includes direction of slope, air drainage and the nearness to a warm body of water. "These conditions are not necessarily true just a short distance away," he emphasizes.

In contrast, another Leelanau County vineyardist with several acres of grapes is a retired Michigan State University chemistry professor, Dr. Robert Herbst, who grows French hybrids just south of the Village of Leland on Lake Michigan. Dr. Herbst successfully grows many of the same varieties as Mr. Rink. The only difference is that the Herbst grapes ripen about two weeks later than those do in the Rink vineyard.

Both locations are described by Mr. Rink as "micro-climates," only with warmer water from inland Lake Leelanau having a more favorable effect on the Rink plantings than colder Lake Michigan has on the retired professor's fruit.

Mr. Rink now has about 12 acres of French hybrids planted on a southwesterly slope facing toward Lake Leelanau. In all he has about 30 varieties under cultivation, however, of these seven include plants 10 years old. These varieties are S. V. 5247, Cascade, Foch, S. 1000, Aurora, Baco Noir and Chelois.

Future plans, he said, call for planting about eight acres more and construction of a 32,000 square foot building into the slope just east of the plants for a winery. The facility will consist of four rooms and take for wine only the production off the Rink vineyard.

Reasons why Mr. Rink has planted such a multitude of varieties is to be able to evaluate

ness required in the care of French hybrids," Mr. Rink cautions. "You can't be timid in pruning or cluster thinning or the grape plants will overbear, the wood won't harden sufficiently for winter and cane maturity is sacrificed."

Some of Mr. Rink's shoots are spread out for the length of the entire vine with every other one eliminated. The advantage of this system, which is recommended by Michigan State University, is that it takes advantage of the entire trellis.

He has never fertilized his grape plants although he anticipates the need to do so next year. Again he cautions that nitrogen might well result in too lush a growth that could enhance the chance of winter

Bernie Rink is shown in a two-year-old planting of the French hybrid variety Ravat 51. Further behind him on the incline which slopes into Lake Leelanau are vineyards with French hybrids three and four years old and 10 years old. Mr. Rink, who presently has 12 acres of French hybrids under cultivation, has announced plans to build a small winery.

EXHIBIT L

Good Harbor Vineyards To Open June 1

Although the cherry industry will undoubtedly remain unchallenged as Northwestern Michigan's major horticultural crop, the grape-wine industry is showing more signs of coming to life with promise of becoming an integral part of the area's agricultural economy.

The most recent example of this is occuring on M-22 three miles south of Leland where Good Harbor Vineyards, which takes its name from nearby Lake Michigan's Good Harbor Bay, is scheduled for opening on June 1, 1981.

Careful planning went into launching Leelanau County's newest of four wineries by John Simpson and his sons, Bruce and Chris, after they made the decision to develop a vineyard and winery four years ago.

Bruce Simpson, who will be Good Harbor's Winemaker and Vineyard Manager, is a 1977 graduate of Michigan State University with a degree in horticulture and business administration. Following his graduation from MSU, he studied grape growing and winemaking for one year at the University of California - Davis.

Chris Simpson, [illegible] MSU graduate with his degree in horticulture and business administration, is secretary-treasurer of Harbor Hill Fruit Farm, Inc., the parent corporation of both Good Harbor Vineyards and the Manitou Farm Market. John Simpson is president of the parent corporation. Mildred (Mrs. John) Simpson and Bruce Simpson are both vice presidents.

The Manitou Farm Market, which sells fruits and vegetables grown on the farm, is located almost directly in front of the new winery. *"In one sense the winery will be an extension of the farm market which is operated with the philosophy of giving the public the best possible produce from Leelanau County,"* said Bruce Simpson.

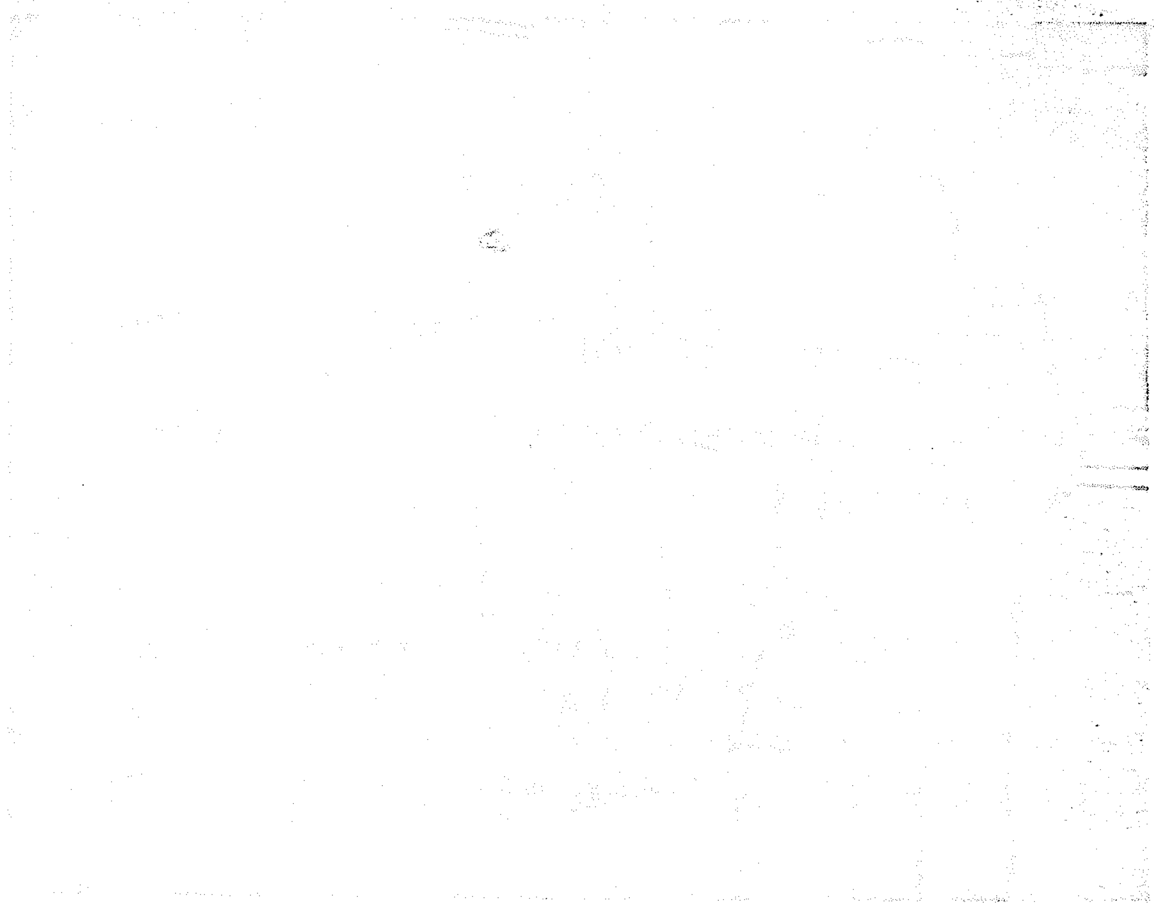
The products to be offered will be mostly table and fruit wines made in a manner that they are light, fruity and ready to drink without the need for extensive aging. They will be sold under the *"Good Harbor Vineyards"* label.

Grapes to be made into wine by Bruce Simpson will come initially from seven acres of French Hybrid plantings set out in 1978 on the hill just behind the winery. Three varieties for white wines in the planting are Seyval Blanc, Aurore and Vignoles while red wines will come from Marechal Foch, DeChaunac and Chancellor.

Mr. Simpson said that plans call for planting 12 more acres of French Hybrids, mostly white varieties, in the spring of 1981 followed by eight acres in 1982 and 12 acres in 1983. The present goal is to have about 40 acres of bearing grapes, he added.

[illegible]

The three wineries now in operation in Leelanau County are Boskydel Vineyard at Lake Leelanau, L. Mawby Vineyards at [illegible]



[illegible] Bruce Simpson, Winemaker and Vineyard Manager. [illegible] gallon stainless [illegible] wine can be [illegible]

[illegible]

EXHIBIT K

Wine Tour Guide has been produced by The Association of American Vintners for its members. Additional copies are available by sending name & address and 25¢ in coin to The Association of American Vintners, Box 84, Watkins Glen, NY 14891.

Wine Tour Guide

to more than

225

AMERICAN WINERIES

East, Midwest, South, Southwest

Lake Michigan Area

Continued from preceding page

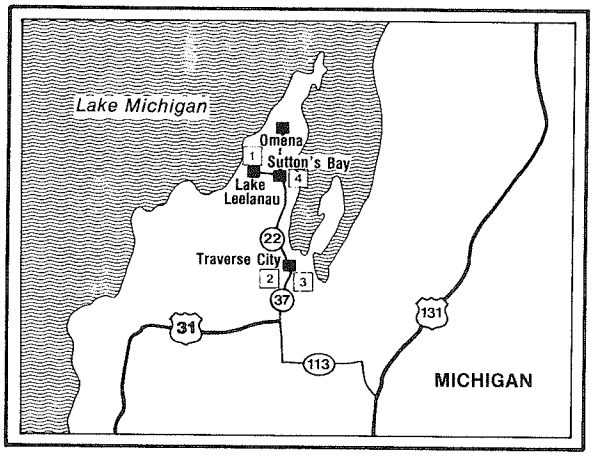
3. **Fenn Valley Vineyards,** 6130 122nd Ave, Fennville 49408; (616) 561-2396. Tour mgr Mary Beneditti or William Welsch. Tours incl W,V,T,RS,GS, movie; rest serves snacks; gps, buses by appt; picnic facil. Spclty: Eur tbl & fruit wines. M—S 10—5; Su 1—5 all year. Exit I—196 at 34E, go 3 mi to 62nd St, 1 mi S to winery.
4. **Frontenac Vineyards,** Box 215, 3418 W Michigan Ave, Paw Paw 49079; (616) 657-5531
5. **Lakeside Vineyard,** 13581 Red Arrow Hwy, Harbert, MI 49115; (616) 469-0700.
6. **Rauner & Sons** 314 Dixieway N (US 31), South Bend, IN 46637; (219) 277-4078.
7. **St. Julian Wine Co,** 716 Kalamazoo St, Paw Paw 49079; (616) 657-5568.
8. **Tabor Hill Champagne Cellar,** 10243 Red Arrow Hwy, Bridgman 49106; (616) 465-6566. Tour mgr Martin Friedburg. Tours incl W,T,RS,GS, slide show; gps, buses by appt 100 max. Spclty: Eur tbl & spkg wines. Write for spcl events. M—Su 10—6 Apr—Oct; M—Su 10—5 Nov—Mar. I—94 at exit 16.
9. **Tabor Hill Vineyards,** RD 2, Box 720, Mt Tabor Rd, Buchanan 49107; (616) 422-1161. Tour mgr Martin Friedburg. Tours incl W,V,T,RS,GS; picnic facil; gps, buses by appt 100 max. Spclty: Eur tbl wines. Hand-carved wine casks. Write for events. M—Su 10—6 Apr—Oct; M—Su noon—5:30 Nov—Mar. I—94 exit 16 (Bridgman), turn R at light, follow signs 7 mi to winery.
10. **Vendramino Vineyards,** RD 1, Box 257, Paw Paw 49079; (616) 657-5890.

Continued on next page

Continued from preceding page

11. **Warner Vineyards,** 706 S Kalamazoo St, Paw Paw 49079; (616) 657-3165. Tour mgr Richard Palasinski. Tours incl W,T,RS,GS, movie; appt for 20 or more; rest serves lunches, seats 40. Spclty: tbl, dsrt & spkg wines. Michigan's oldest winery. Wine festival 2nd wknd Sep. M—Su 10—4 May—Dec; noon—4 Jan—Apr. I—94 exit 60, 2 blks N.

Traverse Area



1. **Boskydel Vineyard,** RD 1, Box 522, Lake Leelanau 49653; (616) 256-7272. Tour mgr Bernard Rink. Tours incl W,T,RS: gps by appt. Spclty: Eur tbl wines. Daily 1—6. From Lake Leelanau S on CR 641 3-1/2 mi.
2. **Ch. Grand Traverse,** 12239 Center Road, Traverse City 49684; (616) 223-7355.
3. **Leelanau Wine Cellars,** 726 N Memorial Hwy, Traverse City 49684; (616) 946-1653. Retail mgr Theresa Nesvacil. Tours incl T,RS; buses welcome. Spclty: Eur tbl & spkg wines, fruit wines. M—S 10—6, Su 12—6 Apr—Dec; M—S 10—5, Su 12—5 Jan—Mar. From Traverse City 5 mi S on US 31.
4. **L. Mawby Vineyards,** Box 237, Suttons Bay 49682; (616) 271-3522. Tour mgr L. Mawby. Tour incl W,V by appt only. Spclty: tbl wines.

MINNESOTA (no map)

1. **Alexis Bailly Vineyards,** 18200 Kirby Ave, Hastings 55033; (612) 437-1413.
2. **Lake Sylvia Vineyard,** RD 1, Box 149, South Haven, 55382; (612) 236-7743.