

Map locates deepest part of Lake Erie off Long Point, Canada. The western end of the lake to a point just east of the islands has a maximum depth of 30 feet. The middle of the lake averages 78 feet in depth.



Shore erosion along Ceylon (just west of Ruggles Beach) shown in this 1947 picture. Many places along Lake Erie's shore would show similar scenes of devastation caused in periods of high water.

The Lake That Tosses and Tilts

CHARLES DICKENS, a better novelist than sailor, arrived in Cleveland by steamer from Sandusky during his American tour in 1842. He was mighty glad to get off the boat.

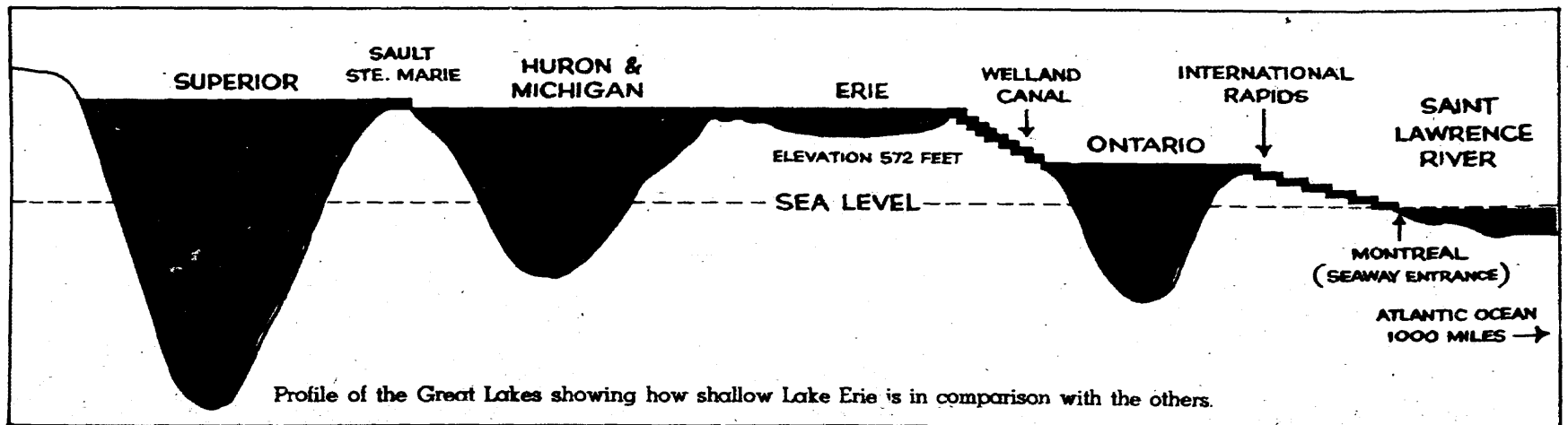
"It's all very fine talking about Lake Erie," he said on his arrival, "but it won't do for persons who are liable to seasickness. It is almost as bad in that respect as the Atlantic. The waves are very short and horribly constant!"

Dickens was probably not the first traveler, and certainly not the last, to complain about Lake Erie's choppy behavior. It is notorious in that respect. It is the most turbulent of all the Great Lakes, and for a reason. It is the shallowest.

Lake Erie covers 9,960 square miles. It is 241 miles long and 60 miles across at its widest. Its average depth is 58 feet. It is much shallower than that over its western end, a circumstance which keeps ship captains careful to stay in the prescribed channels. Its deepest spot is 210 feet. This is a small area off Long Point.

Compare this to the deepest soundings in the other lakes: Huron, 800; Superior, 1,300; Michigan, 850, and little Lake Ontario, 900.

Shallow water is more easily and quickly whipped up by the wind. Besides being extremely shallow for such a large body of water, Lake Erie's geographic position contributes to its rough character. The long



axis is sufficiently east and west so that the westerly winds get a clean sweep across 241 miles of water.

Several days of strong westerly winds will push the water out of the western end of the lake and pile it up at the Buffalo end. On Nov. 21, 1900, and again on Jan. 2, 1942, the water level in Buffalo harbor was more than 13 feet higher than the level at Toledo. In effect the lake was tilted. Those were extreme instances but a difference in levels up to eight feet is not at all uncommon.

The piling up of water at Buffalo is known as a "wind tide." Theoretically, there are true lunar tides on the Great Lakes but they are too insignificant to be measured.

There is another phenomenon that often through ignorance is called a "tidal wave." This is the seiche (pronounced say-sh), and occurs on all the Great Lakes and on other large inland bodies of water. A seiche powerful enough to create a so-called tidal wave occurs only once in about 10 years. While this phenomenon is not completely understood even in this age of science, it is believed to be caused by a difference in barometric pressures over different areas of the lake.

The seiche acts with great suddenness. Instances are recorded about the water along a particular section of shore abruptly draining away for no apparent reason, and much to the consternation of onlookers. A few hours later a huge wave may rush across calm waters on the unsuspecting opposite shore.

A SEICHE is probably the explanation of the baffling experience of James Sloan, a pioneer ship captain. While he was at anchor in Point Albino, a few miles west of Buffalo on the north shore, the water mysteriously receded so fast that he did not have time to move from the shallows. Within minutes his vessel was stranded on the bottom, and Capt. Sloan had the experience of walking all around his ship on the bed of the lake.

A seiche may have been involved in the peculiar goings-on in Buffalo harbor in 1844, although at the time the blame was put on a sudden shift in the wind. At any rate, all the water left the harbor and numerous

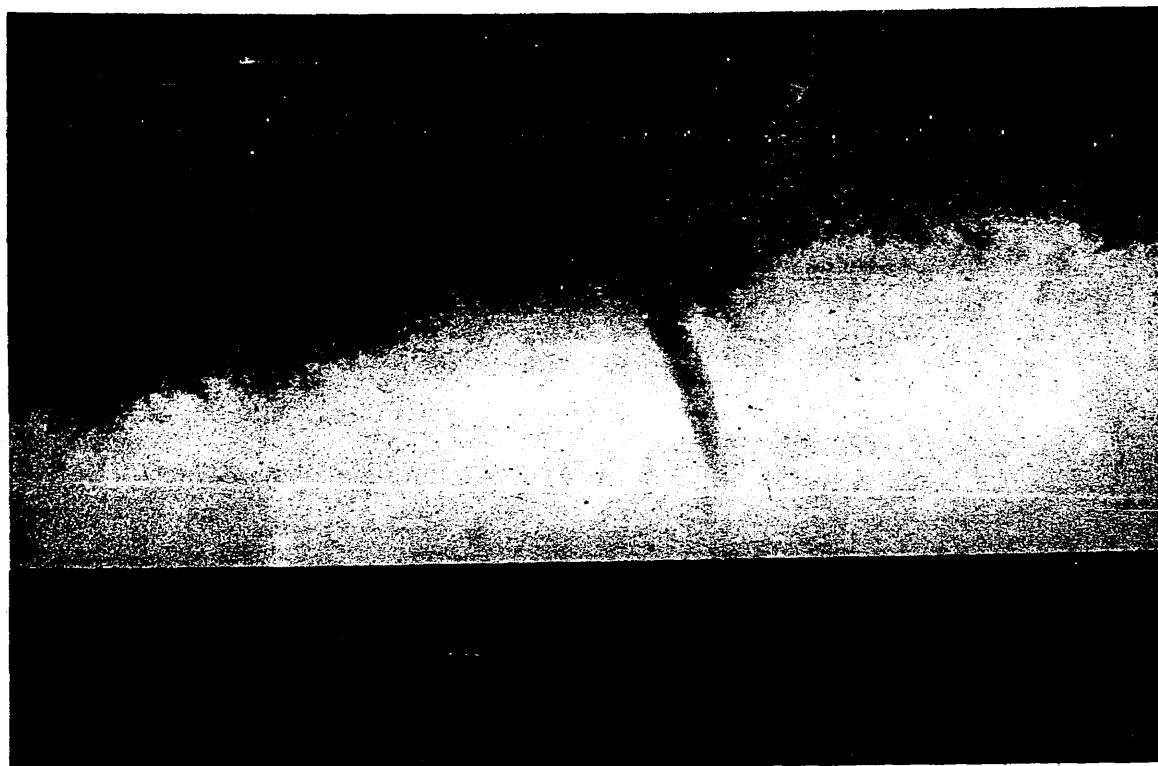
The bottom of Lake Erie is a broad, flat monotonous plain, unbroken by ridges or valleys. It is mostly mud, with the exception of four areas of sand and gravel located north of Lorain-Vermilion, Cleveland, Fairport and Conneaut.

Lake Erie was named after the tribe of Indians who inhabited the region, the Eries.

Ice sometimes stays in Buffalo harbor until the middle of May.

Sandusky Bay averages only nine feet in depth.

Is it really impossible to see across Lake Erie from Cleveland? On a hot summer day about 50 years ago, Clevelanders plainly saw the town of Rondeau, Ontario. The sight was made possible by a mirage.



A waterspout over the lake off Lorain. It had started to disappear by the time Mrs. Richard Sly of Lorain got her camera to take this picture.

ships settled into the mud. At the same time Toledo, at the other end of the lake, was experiencing a flood.

Suddenly the wind shifted and the high water at the Toledo end of the lake rushed back in a monster wave (they called it "tidal wave") which crashed into Buffalo harbor and did great damage to waterfront streets. When the waters receded the 600-ton steamer Columbus was dry-docked in the middle of a street.

Cleveland and other ports along the middle shore are not visited by such sudden and extreme changes in water level brought on by the wind or seiches, or both working in concert.

The lake level is constantly changing. The average seasonal difference is 1.22 feet, the water usually being lowest in February and highest in May.

Then there are long range variations in level. If this should be a summer of heavy rain in the Great Lakes watershed, then Lake Erie would be higher next year. If this should be an unusually dry summer the lake will be low next year. The rise and fall of the lake level lags one and sometimes two years after the wet or dry season that brought the change. The greatest range in Lake Erie water level is 5.27 feet, the difference between low water in 1936 and high water in 1952.

HIGH water is a mixed blessing and evil, and vice versa. High water enables ships to carry greater cargoes. It reduces the need for costly dredging. These blessings are offset by faster shore erosion. Many a shore resident has had to move his house back as the lake literally started lapping at his doorstep. Beaches, lawns, highways have all

fallen victim to the relentless pounding of the waves.

We may as well add one more item to what seems already a rather formidable record of violence. When conflicting winds meet over the lake—as they often do—a waterspout is sometimes born in the turmoil. One of these looks like the funnel of a tornado, as might be expected since both are twisters. After a waterspout has collapsed in moving off the lake onto land, residents along the shore sometimes have found small fish flopping on their lawns.

Seiches, wind tides, waterspouts—all these make Lake Erie sound more treacherous than it really is. Remember, these excesses of violence are rare. Persons who live beside the lake for the most part think there is no other place worth living. Day after day is it benign and beautiful. It is usually like the explorer, La Salle, found it about three centuries ago—"a magnificent vista of blue water and gentle winds."

To Dig a Lake— First get a glacier

CLEVELANDERS who drive along Terrace Road in East Cleveland, far out of sight of the water, never give it a thought but what they are driving on is the beach line of long gone Lake Whittlesey.

Before man came around to mess up the landscape, glaciers were doing it. The tool was a bulldozing ice sheet perhaps a mile high. When it melted, in all northern Ohio the bare earth was revealed with not a tree nor a bush nor a blade of grass.

The beach of Lake Whittlesey is so high

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Glacier CONTINUED

and well defined, particularly in the eastern part of the state, that it is estimated that the waves lapped here for perhaps 2,000 years. To the gigantic beavers and the sloshing mastodons of the period, the lake and its adjacent bogs probably seemed permanent, just as we today regard Lake Erie as permanent.

You can see the beach of old Lake Whittlesey on the West Side where it is known as Center Ridge Road west of Rocky River, and as Schaaf Road near the Cuyahoga Valley.

Euclid Avenue, the busy artery of commerce, is in part on the beach line of old Lake Warren, another of modern Erie's predecessors.

U.S. 20 from Elyria to Westlake is a shore of Lake Whittlesey, as is Route 61 east of Norwalk and Route 84 from Elyria to Ashtabula. Lake Whittlesey (named for a Cleveland geologist) was about 200 feet higher than present Lake Erie and a good deal colder. It was higher because the glacier, not too far to the north, dammed up all the rivers out of the pocket, and it was colder also because of the glacier.

IT IS the theory of geologists that before any of the four ice ages re-arranged the topography, the Great Lakes amounted to a river system. When the ice came groaning down from the north, perhaps a mile high, perhaps two miles high, it pushed most of Canada's top soil down here and it scoured out the river bottoms.

That made a place for water to collect in a few thousand years when the glacier began to melt. How long ago? Maybe 20,000 years. Maybe 10,000 years. Nature is delightfully indefinite.

The water did its digging after the ice had retreated north from this shore but still loomed high in the distance, damming all the old outlets of the river system. For a while the lake, in a phase known for purposes of convenience as Lake Maumee, flowed westward.

It stood high over what later was to be Toledo and rushed its way down to the Mississippi.

At various periods as the ice alternately retreated and advanced, Erie's waters flowed east down a river lower than Niagara, dropping the level drastically, then west again, later east down the Hudson and finally over the land that by its impetuous urging became the Niagara gorge.

The last sheet of ice that came down over Canada but not as far as Cleveland dragged with it millions of



Up goes the red triangle storm warning flag, so frequently flown on Lake Erie. Anton Pescha of Coast Guard Auxiliary, and Gabriel H. Brown of power squadron hoist.

tons of rocks and earth, as is usual with glaciers. This chinked up the old gorge of Niagara and forced the water to form the present gorge. The whirlpool shows where the new gorge meets the old, the rubble in the old gorge yielding more easily to the rushing water than the bedrock of the new gorge.

As the pressure of the ice was lifted from off the land after so many thousands of years, the hemisphere actually raised, "as when you take a pile of books off a mattress," as one geologist put it.

This rising of the northeastern part of the continent, which may still be going on, the ice having left only recently as geology reckons time, raised the level of Lake Erie by hoisting its outlet higher. Thus some previous Lakes Erie were lower than the present one, and their beach lines are not defined.

All this is set forth in words and maps in the Cleveland Natural Science Museum (until recently the Museum of Natural History).

TAKE a look sometime at the land at it heads downhill toward its rendezvous with the present lake. In many places you can pick out the old shore lines, softened by time and by the hand of man. They are relics of the days when Lake Erie really threw its weight around.

Take a good look at the present lake, to, while you're at it. Geologists estimate that in perhaps 25,000 years Niagara Falls will have cut its way back to Lake Erie.

It will be just like pulling the plug out of a bathtub.

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