

OCEANOGRAPHY

Beautiful, But Dangerous

Towering white mountains are deceitful in appearance, with vast bulk hidden under water. International Ice Patrol now maintaining continuous watch on their location.

By ANN EWING

► TOWERING WHITE mountains, many as big as ten Empire State Buildings, are again a menace to North Atlantic shipping.

These floating icy islands are Greenland's largest export. The U. S. Coast Guard's International Ice Patrol, supported by the main shipping nations of the world, spots the icebergs, tracks the big ones as they wander southward with the ocean currents. All shipping is warned when icebergs get dangerously close to much-used lanes.

Twice daily radio broadcasts announce the latest iceberg information. The great white masses are detected by patrol ships, by planes and by war-developed radar and loran. Radar and loran, however, are supplemental to actual visual patrol, either by plane or ship. Shipping lines and ship captains have learned that the best way to avoid trouble with icebergs is to stay out of their way, so courses are shifted southward whenever necessary.

Icebergs are the mighty tips of glaciers—sizable hunks of snow so hard packed the pressure has changed them to ice. They break off from the ice sheets that cover much of the land areas in the far north and far south. Such an ice sheet is formed when temperatures are so low that one layer of snow does not melt before the next snowfall.

Ice Cap Mile Thick

As the ice sheet gets thicker and thicker, its edges begin to creep, at little more than geologic speed, toward sea level, pushed on by the weight of many years' snows. Greenland, except for a small coastal fringe, is covered with a high, thick ice cap that produces nearly all the bergs seen in the North Atlantic. Shaped like a shield, this ice cap is estimated to be nearly a mile thick in places.

The ice mantle moves down the slope of the land toward the sea, taking the line of least resistance. Near the coast the valleys are filled by these rivers of ice which have their fronts projecting through the fjords out into deep water.

The ice noses out into the water until buoyancy lifts it up, and then the front of the glacier breaks off at a weak spot.

With a great roar and a splash, the glacier fragment plunges into the sea, an ice mountain ready to start its long journey southward. Ocean currents influence the

where and how fast of an iceberg's travels. The influence of the wind is usually small compared to that of the currents, of which there are three main ones:

The East Greenland current is an overflow from the polar basin, going southwesterly along the east coast of Greenland to the land's tip, then around and northward along the west coast of Greenland until it reaches about 65 or 70 degrees north latitude. There it shoots off branches westward to the Labrador current.

The Labrador current has its source in Arctic regions, where it is known as the polar drift. Upon passing through Davis Strait, the current assumes stream flow and becomes known as the Labrador current. Its major stream flows southeasterly, reaching and completely flooding the northern part of the Newfoundland Banks where it branches, one definite stream continuing southward down the east side of the Grand Banks. This is the part of the Labrador current that brings the bergs southward to menace steamship tracks.

When the Gulf Stream, the third main current, leaves the coast of the United States, it gradually shifts direction until near the Banks its flow is eastward. Just east of the Grand Banks, it breaks sharply and flows in a northerly direction again.

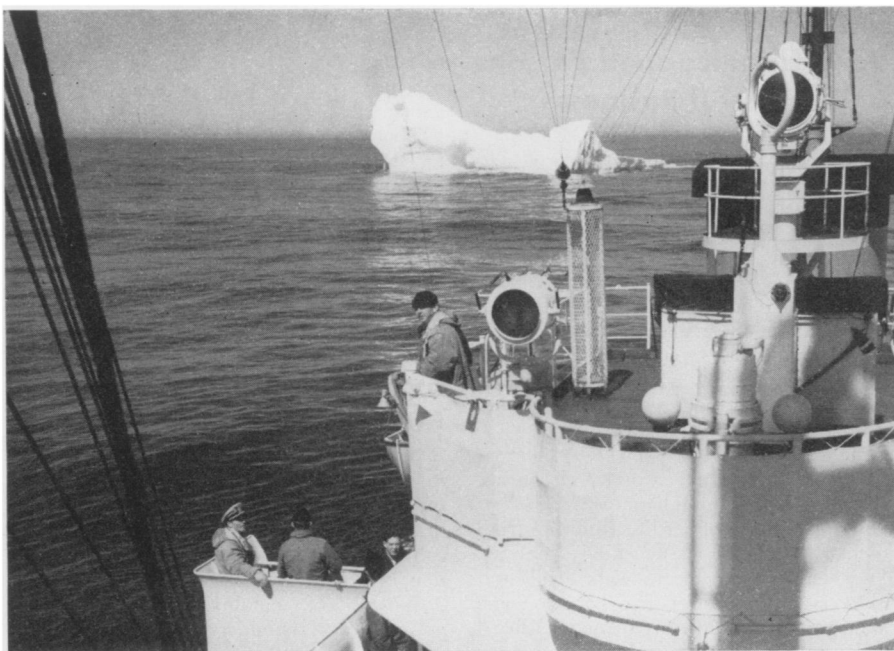
Called Cold Wall

The cold wall is the name given to the boundary between the Gulf Stream and the Labrador current. Off the Grand Banks this wall is nearly perpendicular in position and extends downward sometimes as deep as 1,500 feet.

It is not unusual at this place for sailors to be able to go swimming in the warm Gulf Stream, while within sight of their ship, possibly as close as one-half mile away, floats an iceberg. This region, where Arctic and tropical waters meet, exhibits the greatest hydrographic contrasts to be found anywhere in the world.

From the day the bergs appear off Newfoundland, they are tagged and tracked by the International Ice Patrol. Already they have traveled some 1,800 miles.

Icebergs calved from the west Greenland glaciers one summer usually spend their first winter in the vicinity of Melville Bay, their second winter in the neighborhood of Cape Dier and reach the Grand Banks during the following spring and summer. Most



FLOATING ICE MOUNTAIN—A U. S. Coast Guard vessel on ice patrol notes the location of this huge hunk of ice. Transatlantic shipping routes are shifted southward when the menacing masses approach close to the usually used lanes.

of them have disintegrated before they reach the Grand Banks, and some have come by longer and others by shorter travel periods.

Icebergs Calve Growlers

But when they come close to the Grand Banks area, they are marked wanderers. Estimated positions of bergs are radioed twice daily. The only sure sign of an iceberg, however, is to see it. On a very clear day, large bergs can usually be seen from an eye height of 70 feet at a distance of 18 miles. But in a light fog or drizzling rain, the berg is visible only one to three miles away.

Icebergs in the warm water of the Gulf Stream give off cracking sounds as they melt. When a growler is calved, or a quantity of ice sloughed off from the side of a berg, it gives off a thunderous roar as it falls into the water. A growler is a low-lying piece of glacier ice not so large as a berg.

The bergs are deceitful in appearance. The amount to be seen above the water is small compared to the vast bulk that lies hidden beneath the surface. Yet large icebergs are frequently a city block long and half as high just above the water!

Floating ice displaces its own weight in water, so that close to 85% of a berg's bulk is hidden under the ocean's waves. And this is one of the deadliest of the iceberg's dangers, because jagged edges of ice pro-

trude far out under water from the visible mass.

There are nearly 100 tidewater glaciers along the west coast of Greenland. Most of the bergs that threaten North Atlantic shipping lanes, however, come from 20 glaciers, with such names as Humboldt, King Oscar, Umiamako and Little and Great Karajak.

An estimated 7,500 sizable icebergs break off from the West Greenland glacier every year. Of these, an average of only 428 reach the Grand Banks, though the number varies from year to year. It has been known to go as high as 1,350 sighted south of the 48th parallel in 1929. On the other hand, in 1931, not a single white specter was spotted below that line, and there have been many years, including 1951, when less than ten bergs were found that far south.

The bergs drift leisurely, and their speed varies, averaging about 10 miles per day, although some have been clocked at 30 to 40 miles a day for six days.

Forty years ago, the liner TITANIC, on her maiden voyage, ripped her starboard flank on the protruding underwater edge of an iceberg, and 1,517 of her passengers lost their lives. The need for protection of transatlantic shipping during the iceberg season, brought to worldwide attention by this tragic sinking, resulted in formation of the International Ice Observation and Ice Patrol Services.

Science News Letter, April 12, 1952

PSYCHOLOGY

Toothache Nerves Tested

➤ A GROUP of 45 University of Rochester students gave themselves temporary but painful toothaches to help Dr. Paul Swartz of Hobart College, Geneva, N. Y., learn more about pain and other sensations in teeth.

Toothache was produced in these young men and women by applying electric current to the amalgam filling in a tooth. This is what a dentist does when he wants to find out whether a tooth nerve is dead or not.

In this case, the student himself gradually increased the current applied until he could feel it. What he felt at first was not pain but another sensation surprising to Dr. Swartz because the only sense organs in the tooth are believed to be those of pain.

The point at which pain was felt differed for different individuals but averaged about 100 microamperes. Then the students were instructed to go on pushing up the current until they could stand it no longer. Surprisingly, some went on until they had gotten the current up to 1,500 microamperes. At this point they were stopped to prevent any possible damage to the tooth.

Results did not reveal that either men or women can stand toothache better than

the other sex. After reaching the upper limit of pain tolerance, the students were then asked to set the current down until the pain experienced was just half what it was at the maximum. It was found that this half-way point in intensity of pain exactly corresponded to the half-way mark in application of current.

In spite of their willingness to endure pain for science, the students nevertheless did miss their appointments occasionally just as do those going to a dentist.

Dr. Swartz reported his study to the Eastern Psychological Association meeting in Atlantic City.

Science News Letter, April 12, 1952

METEOROLOGY

Weather Pattern Reverses Over Nation for April

➤ A REVERSAL of the weather pattern during the period until the end of the month, with the western half of the nation scheduled for warmer than usual weather and the eastern seaboard states for colder than normal, was foreseen by long-range forecasters at the U. S. Weather Bureau.

Science News Letter, April 12, 1952

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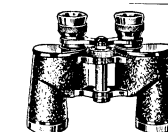
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