

GEOLOGY

Icebergs Still Menace Ships

Treacherous masses of glacier ice enter the foggy Grand Banks area off Newfoundland. The International Ice Patrol maintains a season-long surveillance of these icebergs.

By RICHARD LITELL

MASSIVE ICEBERGS calved from Arctic glaciers begin to move southward in early spring into the world's busiest shipping lane off Newfoundland's Grand Banks.

This year, as always before, they remain a natural hazard that man, with all his ingenuity, cannot completely control.

In an average year, about 400 bergs drift below the 48th parallel and into the steamer lanes. Occasionally only a few appear but, sometimes they will come in swarms of over 1,000. Last year (1959) was a comparatively heavy season with 693.

Present indications point to a rather light season this year, although it is impossible to predict exactly what each season will bring.

The average iceberg that reaches or passes Newfoundland has a volume of 5,000,000 cubic feet and weighs 150,000 tons. The same iceberg in its Arctic birthplace, however, was ten times as big with a volume of 50,000,000 cubic feet and a weight of 1,500,000 tons.

Thus the icebergs that drift below the 48th parallel and constitute a danger to shipping are bergs in the twilight of life—two to three years old. Though treacherous and able to inflict mortal wounds in the hardest of ships, these bergs' days are numbered. The warm waters of the Gulf Stream usually melt them down in a week to ten days.

Iceberg Life Cycle

The start of this life cycle—from bergs ten times the size of the Empire State Building to harmless ice cubes—takes place in the glacier capped barrens of the Arctic. They are born where glaciers meet the sea.

A few originate in Spitzbergen or other Arctic islands, but by far the majority of the 20,000 icebergs born each year come from the west coast of Greenland. A frozen blanket of ice over a mile deep and more than 1,000,000 square miles in area, covers Greenland. There are about 100 tidewater glaciers along its west coast, but only about 20 of these combine to make icebergs Greenland's largest export.

Glaciers give birth to bergs in either of two ways. Where there is a sharp drop from the shore to the sea floor, water eats away at the base of the advancing glacier until the overhang breaks off and falls into the sea with a roar.

The bergs may also be calved, or floated off, where the sea floor slopes gradually from the shore and the advancing glacier pushes down into the sea. When deep water is reached, the buoyancy of the ice lifts the foot of the glacier and snaps it off.

Once born, these huge mountains of ice begin a roundabout, 1,800-mile two- to three-year journey to the Grand Banks area, a trip that few of them are able to complete. Their travels, at the rate of about 10 miles per day, are largely dictated by winds and currents, with the latter playing by far the bigger role.

The icebergs are swept northward by the West Greenland Current, then westward across Baffin Bay, and then southward along the Labrador coast by the Labrador Current.

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

Of the 20,000 bergs that set out, thousands are grounded in Greenland bays or are trapped by Arctic islands. Many others pile up on the northern Newfoundland shore. Those that make it to the Grand Banks are greatly reduced in size, yet still hazardous.

Icebergs, 85% of their bulk being hidden underwater, would be dangerous anywhere they are encountered. They are especially dangerous around the Grand Banks where Arctic and tropical waters meet to exhibit

the greatest hydrographical contrasts to be found anywhere in the world.

The area's frequent thick fog makes navigation through iceberg infested waters extremely precarious, and hampers aerial tracking. To make matters worse, radar detection, never completely effective for spotting icebergs because sea water is a better reflector of radar waves than ice, is especially impractical here. The existence of many layers of air with sharply varying temperatures causes radar waves to be bent upward.

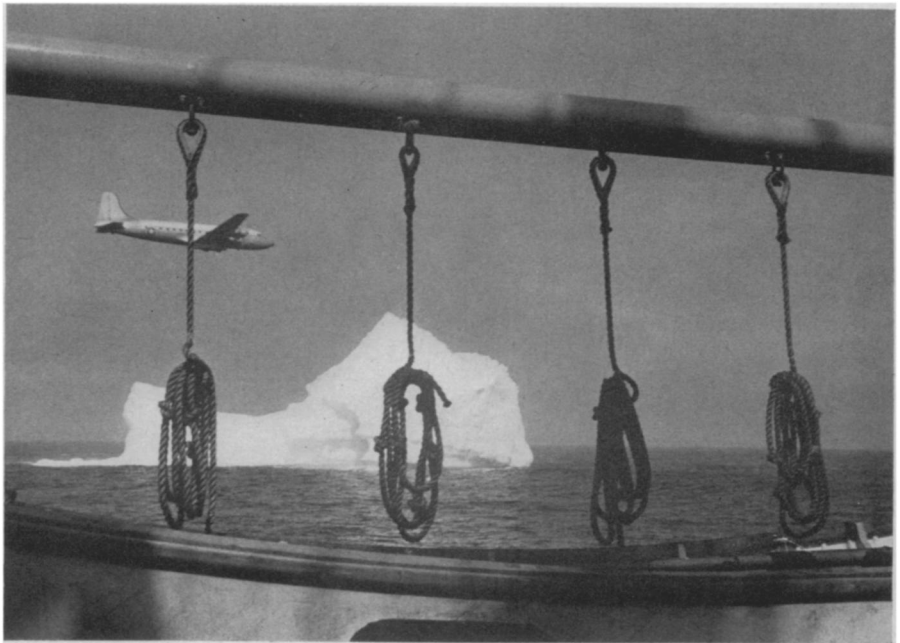
When the difficulty arising from the prevalence of fog is added to the concentration of merchant ship and fishing vessel traffic in the Grand Banks area, the importance of being ever alert to the exact location of icebergs is easier understood.

Not only is the Grand Banks area the world's heaviest seaborne traffic lane, it is also probably the world's busiest fishing area.

One has only to recall the Titanic disaster in April 1912, in which that proud "unsinkable" ship together with 1,513 of her passengers and crew were lost after ramming an iceberg's invisible underwater shelf, to know what terrible damage an iceberg can do.

This tragic sinking spurred the creation of the International Ice Patrol in 1914. The Patrol, run by the U. S. Coast Guard and maintained throughout the ice season from February through August, covers a region of the Grand Banks about the size of the State of Pennsylvania.

Sixteen nations contribute toward its up-



DANGEROUS ICE—Seen through the boat falls of the U. S. Coast Guard Cutter *Androscooggin*, a Coast Guard R5D ice reconnaissance plane flies over a Grand Banks iceberg off Newfoundland.

keep—Belgium, Canada, Denmark, France, Greece, Italy, Netherlands, Norway, Sweden, the United Kingdom, the United States, Spain, West Germany, Liberia, Panama and Japan.

It is to the Ice Patrol's credit that no fatalities as a result of iceberg collisions have occurred in its area of responsibility since its inception.

Besides the regular work of locating icebergs and warning passing vessels of the danger limits, the Patrol employs the latest oceanographic techniques for the prediction of iceberg drift and deterioration.

The Patrol has three planes based at Argentia, Newfoundland, for aerial observation. Known as R5D's, these are actually specially configured DC-4's with observation platforms.

In addition to the planes, the Patrol has one oceanographic ship that is always on duty, and two cutters that are now on standby for use when poor visibility makes flying impossible or during periods of heavy iceberg saturation.

The Patrol collects ice, weather and sea temperature reports from shipping and aircraft traversing the Ice Patrol area, evaluates all ice information in the light of meteorologic and oceanographic conditions, and radios the ice situation twice daily to all shipping in the Grand Banks area.

Since 1914, except for intervals in World Wars I and II, the Patrol has been continuously maintained by the Coast Guard, and an average of 397 bergs have been observed to pass below the 48th parallel each year.

The heaviest season was in 1929 when there were 1,315. The lightest season was in 1958 when none was reported during the season but one after the season. The next year, 1959, was again a heavy year with 693.

This year, according to Lt. Cmdr. Robertson P. Dinsmore, the Patrol's ice information officer at Woods Hole, Mass., the extremely light field ice conditions off Labrador would seem to point to a rather light season.

Field ice, small chunks of frozen sea water, and icebergs have different origins. Yet their respective abundance is related because field ice tends to keep the ocean calm so that the iceberg's biggest enemy—heavy waves—cannot erode them.

Iceberg destruction has also been attempted by the Patrol. It never tries to melt a berg, however, but merely break it up so that it may melt quicker in the water. Cmdr. Dinsmore says it would take the heat given off by 2,000,000 gallons of burning gasoline to melt an average size berg, even at an unattainable 100% efficiency.

In the past, destruction techniques such as gunfire, land mines, torpedoes and plain thermite bombs have proved unsuccessful.

This year, the Patrol hopes to devise a thermite-containing armor-piercing bomb as well as an effective way of hitting a berg with such a bomb. Boarding a floating iceberg that has reached the Grand Banks area is very hazardous because the berg turns over several times a day.

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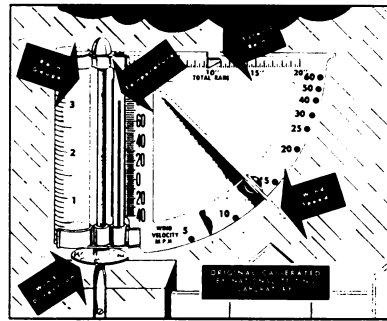
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