

Antarctica and the remnants of the multinational base at Deception Island, which was abruptly closed when the island volcano erupted in 1967. The *Hudson* also steamed into a great natural harbour which was literally steaming itself, the water hot enough to blister the paint on the ship's dory, the beach covered with warm ashes and pocked with mysterious cone-shaped depressions.

Much of the work the scientists were involved in would take years to complete, but along the way they were able to draw at least some tentative conclusions: baleen whales (the largest) as well as dolphins (the smallest) do converse in ultrasonic waves, though by mischance they were unable to record them; the sea is not ever likely to be converted to a vast farm to feed the world; the sea, on the other hand, does not seem to be losing its ability to produce oxygen, a disaster feared by some.

The most exciting and challenging phase of the long voyage came when the ship swung east at the top of its oblong track and sent its special one and five-eighths inch hull (twice the

thickness of an ordinary one) smashing full speed into the Arctic ice pack at Point Barrow. After two hours of relatively easy going, the *Hudson* stopped dead. It charged again, the bow rose up on the ice, and slowly the ice groaned and split under the weight of the ship. The *Hudson* emerged forty-two hours later, on August 25th, near Herschel Island in the Beaufort Sea. Bernie Pelletier, of the Geological Survey of Canada, was the chief scientist during this phase of the voyage and the interest was in oil and ice. How was Canada to get the first past the second? The conclusion reached in one exciting week was that it was going to be much more difficult than anyone had imagined.

Jim Shearer was waiting at Herschel and the first thing he said was, "Wait until you see what I've got." Shearer had been working aboard the smaller ship, the *Richardson*, charting the basin of the sea with side-scan sonar. Side-scan sonar does more than register the depth of the bottom directly beneath the ship; it gives a three-dimensional picture of what the whole bottom is like. Shearer had some startling pictures and he laid them out on the chart house table: the bottom of the Beaufort Sea was criss-crossed with deep gashes. The ice pack which covered the sea most of the year was so thick and subject to such enormous pressures that "keels" of ice formed extending down to the bottom. As the pack shifted, the keels gouged deep valleys in the sediment of the continental shelf, some twenty to thirty feet deep. The gashes were of appalling significance. The oil reserves were in the shelf, twenty, thirty, sixty miles from shore. The assumption had been that once tapped, the oil could be brought to shore by pipeline, as it is from all other offshore fields. It was soon apparent to Pelletier that there could be no pipelines in the Beaufort Sea.

Any pipeline laid on or beneath the ocean floor could be sliced by the first passing keel—the

