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# HMICCS SACKVILLE 1941-1985

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# CHAPTER 5

## OCEANOGRAPHIC SERVICE

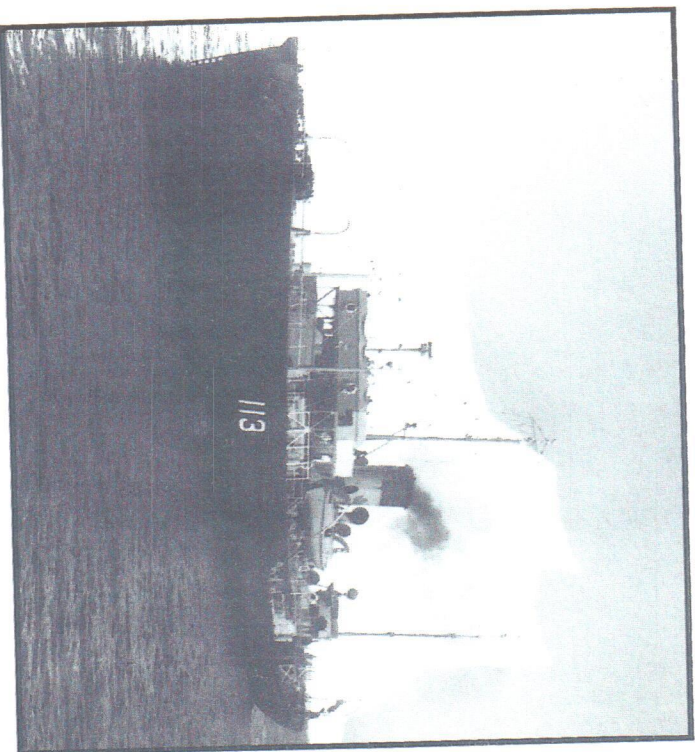
For a full thirty years, from that cold December day in 1952 when she was finally called out of reserve until a drizzly day in the same month in 1982, *Sackville* served the interests of science. Her usefulness and efficiency in that role is perhaps best measured by the simple fact that, of all the Second World War vintage ships which operated as research vessels, and of all those which might have been converted for the purpose, *Sackville* lasted longest. With some modest improvements she also managed to survive quite significant changes in the sophistication of modern oceanography. Although by the 1970s she was eclipsed by modern, purpose-built oceanographic vessels, *Sackville* retained her usefulness to the navy until she was over forty years old. Few ships have served Canada better.

*Sackville's* career as a research vessel divides nicely into three distinct phases. In the first ten years her work was balanced between civilian and military purposes, working for the Joint Committee on Oceanography. From the early 1960s to the mid-1970s she concentrated primarily on biological and geological work under the direction of the new Bedford Institute of Oceanography. In 1975 she went back almost exclusively to naval work, supporting modern research into underwater acoustics by the Defence Research Establishment, Atlantic.

### Cold War Research

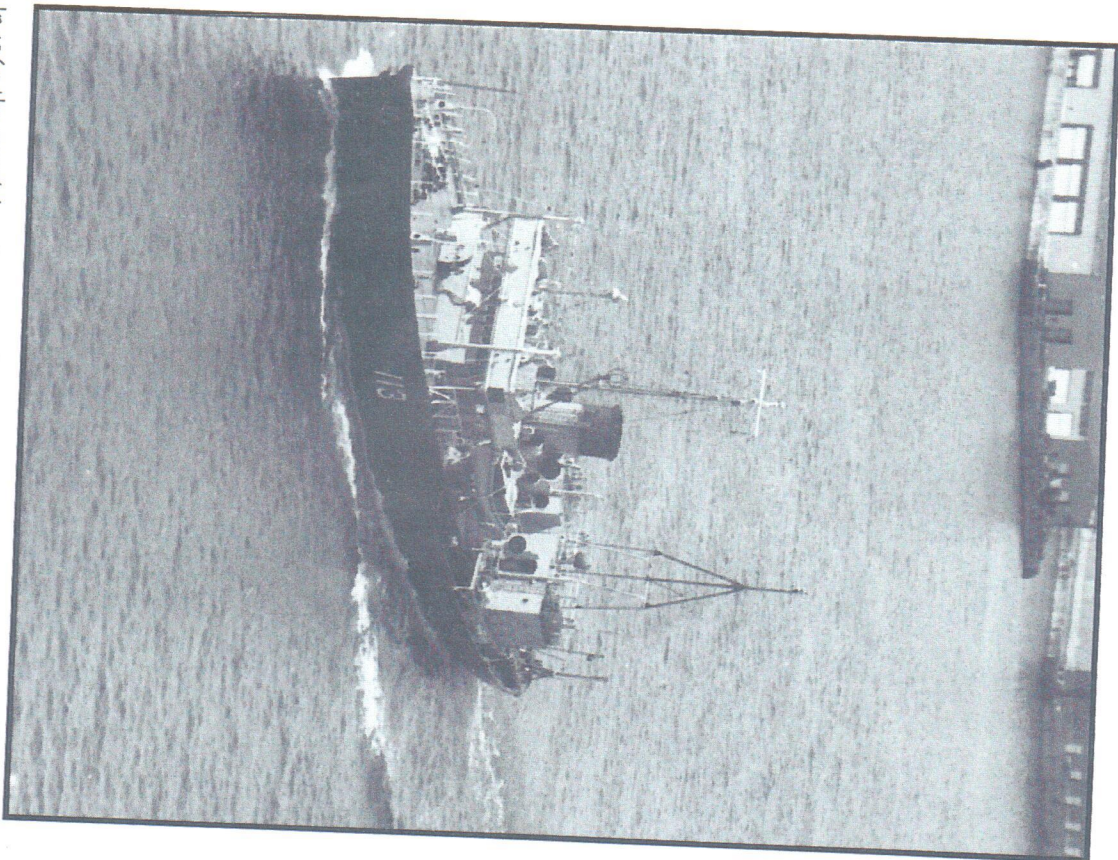
The process began in August 1953 when, as the Canadian Navy Auxiliary Vessel (CNAV) *Sackville*, with a civilian crew transferred from *Whitchwood*, she steamed to St. Andrews, New

Brunswick, to load scientists and equipment from the Atlantic Oceanographic Group. The AOG had been responsible for the navy's initial forays into oceanography late in the war, including basic bathythermographic (changes in water temperature with



Cruising northern waters in the late 1950s, *Sackville* now sports her familiar post-war hull number; a new mizzen mast designed to carry radio antennas, not a sail; a power workboat abreast the funnel; and her radar has been relocated to a pole mast atop the bridge. (DND PMR 87-58)





In 1964 the new laboratory, seen here across the end of the engineroom casing, was added: the first significant alteration of Sackville's corvette profile. (DND DNS 29606)

increases in depth) and bottom surveys. During the 1950s AOG provided overall direction for oceanography in Canadian waters, continuing its own work in the nature of the water mass and the seabed. This was the RCN's contribution to the Joint Committee on Oceanography. Other agencies shared in the work and results. Naval Research Establishment (NRE) at Halifax conducted experiments in low frequency sound propagation and worked on a new bottom sound location system. The Fisheries Research Board participated in the general scientific research as well, and so too did geologists from the Department of Mines and Technical Surveys who took a lead in the basic research on ocean currents, bottom samples and seismic surveys.

All of this work was co-ordinated by the Oceanographer in Charge of the AOG. Thus Sackville's movements in the 1950s show her a frequent visitor to St. Andrews, where she returned briefly to off-load in November 1953 after her first survey of the Gulf of St. Lawrence. In early 1954 she followed a regular shuttle between Halifax and St. Andrews conducting a winter survey of water conditions along the Scotia Shelf and the Bay of Fundy. As the weather warmed she moved to Sydney for a spring survey of the Gulf and estuary of the St. Lawrence River. The summer found her operating south of the IISN's highly secret research facility at Shelburne Nova Scotia, doing "trials for NRE." These almost certainly were connected with calibrating the Shelburne array of the expanding underwater Sound Surveillance System. SOSUS was – and remains – a sophisticated system of underwater listening devices able to record the passage of vessels. The Shelburne station was passed to Canadian control in 1959. Once

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During the oceanographic work in the fall, *Sackville* was the first to work on the Halifax and Cabot Strait and propagation system in the field geology. Technical work on oceanographic

*Sackville* completed her highly classified work in September 1954 it was back into the Gulf for more survey work in the fall, followed by another brief stint as a tug in December. A refit at Lunenburg in early 1955 was needed, including a complete retubing of her boiler. Most of June appears to have been spent in St. Andrews getting ready for the year's work, all of which concentrated in the Gulf and Cabot Strait. *Sackville* sailed from St. Andrews in early July for Quebec City and then, following a brief return to the AOG base, she spent the month of August around the Magdalen Islands. Work in the Cabot Strait followed in September and by 1 October she was alongside at St. John's – the first time in over a decade. As before, *Sackville* ended the year towing, this time a scow to Quebec City, before returning to Halifax on 13 December.

The next year, 1956, was a hectic one as well. Oceanographic work off the Atlantic coast of Nova Scotia began on 11 January with another winter survey of the Scotia Shelf and Fundy areas. *Sackville* shuttled back and forth from Halifax to St. Andrews until late May. Then she steamed into the Gulf en route for Montreal for a brief layover. This much was simple science. But on 6 June she picked up an oceanographer from the station at Shelburne and made a passage to the largest USN base in the Atlantic, Norfolk, Virginia, to embark "special equipment" probably associated with the SOSUS system. En route her scientists took hourly bathythermographic readings. She was back in Shelburne by the 17th and then made two trips to Boston to embark more equipment. By the end of July *Sackville* arrived back in St. Andrews in preparation for another survey of the Gulf and the Scotian Shelf under AOG direction. Much of the next few months was spent in the Cabot Strait, with brief visits to the US base at Argentina (where there was a major SOSUS facility), St. John's and eventually to Gaspé, Quebec. *Sackville* was alongside at Halifax on 23

November 1956 after a busy year. She was now due for a lengthy refit.

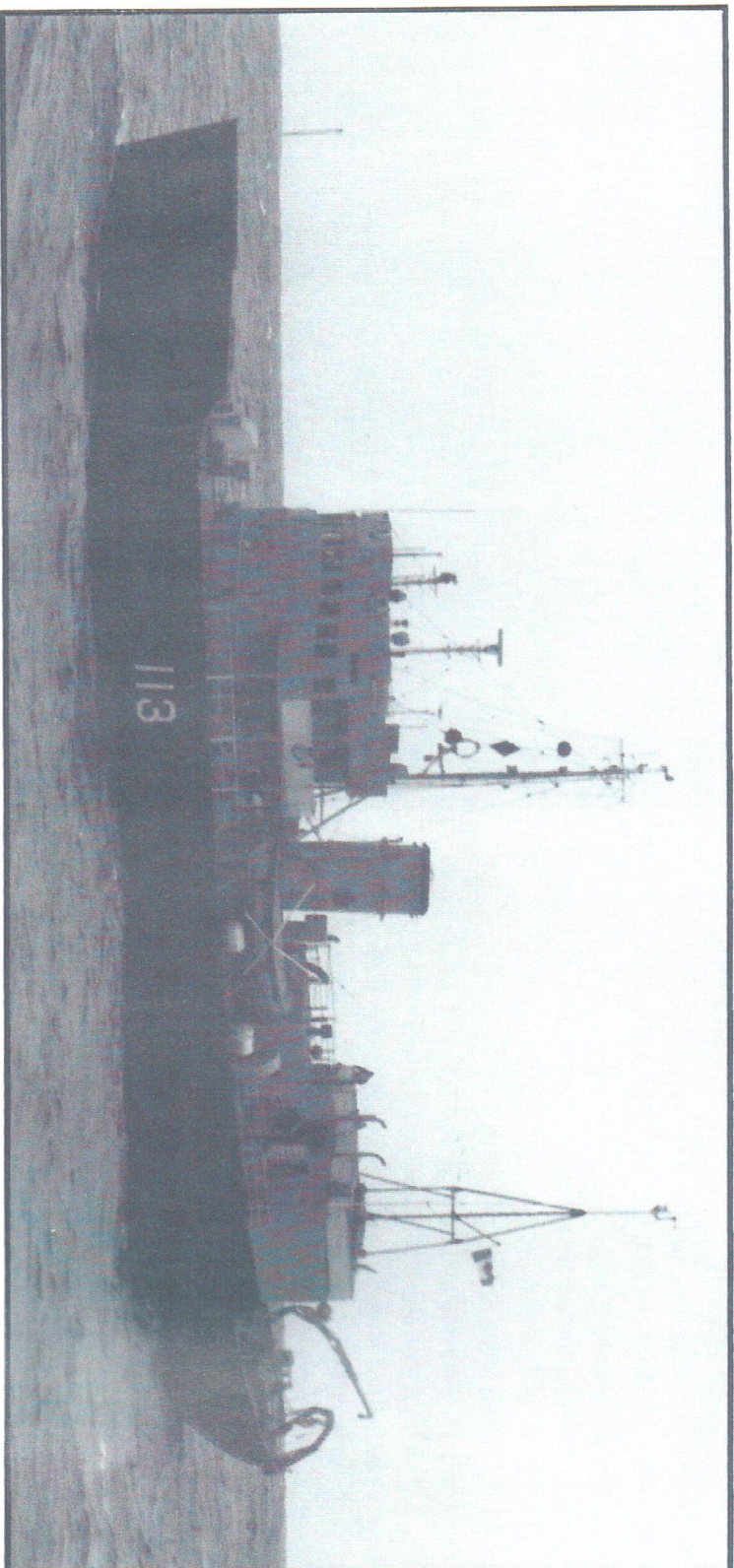
There seems little doubt that *Sackville* was earning her keep by 1956. Scientists found her "very near to ideal for oceanographic work ... good seakeeping, satisfactory endurance and well equipped." The new "cathodic protection" (an electro-magnetic system for inhibiting rust developed by Canadian scientists at NRE) installed in the early 1950s also meant that *Sackville* had at least fifteen years of hull life left. The problem in early 1957 was that her one remaining boiler was shot.

### Boiler Trouble and a Brush with Extinction

Refit and boiler problems kept *Sackville* inactive throughout all of 1957 and she might well have been discarded then. She was towed to Sydney in February and from there to Montreal for docking, and was back in Halifax by mid-June but her boiler troubles lingered. Scientists pressed for her to be converted to diesel engines so that these could be completely shut down when conducting very sensitive acoustic tests. *Sackville*, they argued, was needed "because of an anticipated requirement for increased effort in research into long-range detection techniques." This latter was almost certainly in response to the new and growing threat from submarines capable of firing missiles armed with nuclear warheads.

*Sackville*'s lone fire-tube boiler needed replacement in 1957, but there was none to be found. The rest of the left-over wartime fleet was fitted with more modern water-tube boilers that operated with pressurized boiler rooms. There were no replacements for *Sackville*'s antiquated fire-tube boiler available, even within the reserve fleet. Re-engining with diesels was an expensive proposition, estimated to cost \$1.068 million. This was much more than it had cost to build *Sackville* in the first place. In the





Above and right; *Sackville's* final post-war form was achieved in 1968, as demonstrated here a few years later: fully modern bridge, cabins all along the waist of the ship and her foc'sle raised. (DND DREA 3437-1)

end, the need for *Sackville* was so great that her boiler was repaired. Ironically, when *Sackville* returned to DND research in the late 1970s her antiquated steam engines were found to be quieter – while operating – than modern diesel engines, something which made her very useful for towing acoustic equipment. For the moment, however, the advent of the nuclear propelled and nuclear armed submarine saved *Sackville* from the wrecker.

The next few years brought a slight change in the ship's operational pattern, as *Sackville* steamed into the arctic and made a number of trips to Bermuda. The arctic trip in 1958, made in con-

junction with the research vessel *Verna* from Columbia University, was primarily intended (rather prophetically) to find new sources of fish should those on the Grand Banks fail. Voyages to Bermuda in 1958, 1959 and 1960 probably had something to do with mapping the boundary between the cold Labrador current off eastern Canada and the warm Gulf Stream waters that pass well offshore.

The time between these distant forays was easily filled by a busy research schedule in Canadian waters. *Sackville* was almost constantly on the move, conducting surveys, popping into St.



Andrews to land results and scientists, frequently visiting Halifax while in passing, and then back to sea. A short refit in Sydney in early 1960 was followed by surveys of the Laurentian Channel in June, Cape Sable and Bay of Fundy in July and Newfoundland and Nova Scotia waters in August. Then down to Bermuda again in late October, just in time for a hurricane, a brief stop in Halifax before going on to St. John's and then home to Halifax on 5 December.

After a long refit in Lunenburg much of 1961 was spent working for NRE on more acoustic trials southeast of Shelburne. That year *Sackville* also started her long association with the New Bedford Institute of Oceanography (BIO), opened in Dartmouth Nova Scotia, which began with trips into the Gulf and off the Labrador coast for biological studies.

During 1961 *Sackville* spent 101 days at sea, but 1962 was probably her busiest year ever as a research vessel. In that year she logged 21,000 nautical miles in seven major cruises that kept her at sea for a full 152 days. The first cruise took place in March south and east of Sable Island. This was the beginning of a Department of Mines and Technical Surveys (DM&TS) study of deep water circulation off the tail of the Grand Banks. *Sackville's* scientists took water samples in sixty-one locations. In May bottom sediments were surveyed in the estuary of the St. Lawrence River. *Sackville* roamed from south of Sable Island to well up the St. Lawrence River in June and early July, obtaining data on current movements. This was followed by further DM&TS work on deep circulation south and east of Sable Island.

Then from mid-August to the end of September scientists from the Institute of Oceanography at Dalhousie University conducted the first major Canadian geophysical survey on the east coast of Canada. The same institute booked *Sackville* for a deep ocean cruise to Bermuda in October – at the height of the Cuban Missile Crisis. En route they studied “deep sea cosmic material”

and plankton. The year ended with a twelve-day cruise to the Gulf to take water temperature readings as part of an ice forecasting project, and to sample marine organisms near the Magdalens.

### Supporting Civilian Oceanography

Without a doubt 1962 was an exceptionally busy year for *Sackville*, and marked a shift in her work to largely marine biology and geophysical surveys for the next thirteen years. Perhaps because of the changing nature of her work (or perhaps because of the changing nature of the scientists embarked) operations in 1961-1962 revealed some shortcomings. Whereas a few years earlier scientists had found *Sackville* perfectly acceptable for oceanographic work, at the end of 1962 there were complaints about her suitability and standard of upkeep. The navy, it appears, had largely given up spending money on her, concentrating its funds on ships like *New Liskeard* and *Fort Frances* which were operating in support of NRE research exclusively on defence research projects. But *Sackville* remained a naval responsibility and even the Director of the RCN's scientific services complained about her condition in December 1962. No other Atlantic-based ship “employed for research has had so little money spent on it” he wrote. And yet there was “no comparison between *Sackville's* sea time record and that of *New Liskeard* and *Fort Frances* put together.” If *Sackville* was a more capable ship, he concluded, “our 1963 program would have called for an additional 10 weeks of sea time” – a nice compliment to the ship, although *Sackville's* crew might not have liked the idea. It was necessary now “to equip her more fully for oceanographic research.”

While senior officials battled over *Sackville's* fate, 1963 proved a busy year, too. *Sackville* sailed on 16 January for the usual winter survey of the Scotia Shelf and did not tie up for the





season again until 29 November. During those months she plied the sea from the Gulf of Maine to St. John's and well up the St. Lawrence River: all familiar haunts. In the meantime the navy and scientists pondered what to do with her. Some thought she was now too small for the jobs required. The idea of replacement with a frigate was mooted, but given up when it was deemed too expensive to man and operate. In view of the heavy demand on auxiliary vessels for research time, and *Sackville's* excellent hull condition, it was finally decided to find the money needed to bring her up to acceptable standards.

On 19 January 1964 *Sackville* arrived in Lauzon Quebec, for a refit and the needed additions. The most obvious change was the construction of a large laboratory across the end of the engineroom casing. An oceanographer's hut was also built at the fore'sle break on the starboard side. To improve her stability at sea a "flume stabilizing" tank was installed and, later in the year, so too was a vertical axis thruster – another propeller mounted in the bow. These latter two additions were attempts to ensure that she could hold a position, as steady as possible, especially when handling equipment lowered deep into the sea (in excess of 2000 feet). Corvettes were notoriously unstable to begin with, but building a laboratory on the stern and – later – a modern two-deck bridge simply made the problem worse. As things turned out, all efforts to stabilize *Sackville* proved worthless. Within months the ship's Chief Engineer complained that the stabilizing tank was not much use, and the bow thruster produced so much drag that it was removed in 1967. For that reason *Sackville* was limited to inshore work on the physical properties of water masses and on bottom sampling.

*Sackville* was ready for sea again by May 1964, and she spent most of the year, apart from the trip to Lauzon to fit the bow thruster in September, steaming off the east coast. The next year she undertook five major cruises. Four of these occurred largely

in the Gulf: two on physical oceanography and two seismic surveys. *Sackville's* principle task during seismic surveys was to act as the "fringing" ship: lowering the charge into the sea and setting it off so that other ships and land-based stations could monitor the shock waves. Work was also done on physical oceanography for the Department of National Defence.

The improvements carried out in 1964, particularly the laboratory, were a great help but scientists continued to complain about *Sackville's* limitations as a research vessel. Her station keeping remained poor, limiting the ship to shallow water experiments, and her range of a maximum of fourteen days at sea was short. Fortunately for her, though, the pressure on available ships was simply too great to let her go. All five ships attached to the BIO – *Hudson*, *Baffin*, *Maxwell*, *Acadia*, and *Kapusksing* – were fully employed in 1965 and scientists were still short of time at sea. There was also a need for a ship to carry explosives, which *Sackville* was suited to do. Consequently, the Department of Mines and Technical Surveys, which operated the ships based at BIO, pushed in early 1966 to have *Sackville* modernized further. Although the ship itself was generally suitable, her standards of accommodation, messing and general habitability "remain that of the Second World War and are unacceptable by modern standards."

DM&TS now wanted a number of improvements made to see the ship through a further five or perhaps ten years. Accommodation needed to be modernized and expanded to house twelve scientists, washroom facilities brought up to date, a modern public address system installed, improvements in winches and equipment handling made, and safe storage for up to twenty tons of explosives provided. There were other needs as well, not least of which was a modern bridge.

Through 1967 the naval dockyard worked on preliminary drawings while the two government departments involved hag-



gled over who would pay. In the end it was decided that DND would continue to refit and operate the vessel for another five years, while the new Department of Energy, Mines and Resources paid for the proposed modifications.

Meanwhile *Sackville* soldiered on through 1966 and 1967, engaged in both civilian and some limited military research. Finally in 1968 she was taken in hand for her last major alterations. The naval style bridge, which had survived largely intact since the Galveston refit, was removed. In its place a modern two-deck fully enclosed bridge was built, altering *Sackville's* look dramatically. In addition, the main deck between the break in the fore and the laboratory aft was enclosed to add more accommodation. The ship that emerged from refit in 1968 was therefore a far cry from a corvette: only her hull lines revealed the truth.

A hectic schedule of research cruises commenced again in 1969, ranging from Newfoundland to Bermuda and throughout the Gulf of St. Lawrence. By all accounts *Sackville* was performing yeoman service, but that did not keep scientists from griping about minor if rather nagging limitations. In 1971, for example, they complained about the soot from *Sackville's* funnel, which contaminated their samples. The navy, it turns out, was saving a few pennies by fuelling *Sackville* with a cheap grade of fuel oil. A change in fuel solved the worst of that problem. A few modern winches and pieces of special equipment were added and *Sackville* soldiered on. Despite the soot problem she was always a very clean and tidy ship, lovingly cared for by her civilian crew. And so, with the growth in university-based oceanographic research programs in the early 1970s and the resultant shortage of sea time for ambitious researchers, *Sackville* remained a good platform for most inshore tasks.

The navy agreed. As it concluded in 1971, *Sackville* had her problems but she would still be useful "for some time to come"

and was worth spending a bit of money on. The questions throughout the early 1970s remained; whose money and how long would anyone continue to spend it on a thirty-year-old ship? The navy retained responsibility for the annual refit and operating costs, while the Department of Energy, Mines and Resources, through the Bedford Institute, assumed the additional costs associated with research equipment. But the lines of responsibility were never very clear, and they were blurred by tightening budgets and increased requirements. The navy's own research program, under NRE's successor Defence Research Establishment Atlantic (DREA), was in need of more ships itself by the early 1970s. Its war-built fleet of research vessels was either gone or on its last legs: *Whitethroat* was sold in 1967, *New Liskard* was scrapped in 1969 and *Fort Frances* was slated to go in 1974. *New Liskard's* replacement, the modern purpose-built oceanographic vessel *Quest*, was commissioned in August 1969. A similar ship designed to replace *Fort Frances* never got off the drawing board. By 1975 DREA would need a second ship to work alongside *Quest*.

### Back to Defence Work

Through the early 1970s DREA made occasional use of *Sackville*, and in 1973 five cruises were made for DREA by the Pacific-based research vessel *Kapuskasing*. But *Kapuskasing*, too, was slated for disposal unless she underwent an extensive refit. In late 1975 it came down to making a choice between *Kapuskasing* and *Sackville*, although neither ship could fulfill the longterm requirements of DREA. As it turned out, the old corvette won the battle for survival. Although less manoeuvrable at low speed than a twin-screw Algerine and a little noisier, *Sackville* was well suited for towing acoustic equipment and her deeper draft meant she was less likely to drift when trying to keep station. She remained notoriously uncomfortable in any



sea, but those who sailed in her felt completely safe. And, as always, she was well maintained. As one senior DREA scientist recalled, “*Sackville’s* longevity relates primarily to a succession of proud and diligent operators.” She was always “clean and bright”. Over the next six years extensive use was made of *Sackville* by DREA as a second ship in the research cruises conducted by *Quest*. *Sackville* completed fifty-two cruises in all. During 1976 *Sackville* steamed 11,540 nautical miles, spending 90 days at sea. Much of her time was devoted to underwater acoustic work, often acting as the firing ship, discharging patterns of explosives while *Quest* monitored the rate and range of transmission of the sound through different water masses. Nine cruises were planned for early 1977, but five of them had to be abandoned because of the need for a lengthy refit. This resulted in a “serious disruption in the scientific program” for 1977.

The refit had its purpose, however. *Sackville* was clear of the navy’s new syncrolift on 19 April, and within a month she was at sea with *Quest*. *Sackville* may have been old by now, but she was fit enough to steam with *Quest* for the Azores on 1 August. After calling at Ponta Delgada they pushed as far east as 14 degrees west – the farthest east *Sackville* had been since August 1944. The two ships covered over 5,000 nautical miles in one month, not bad for an elderly lady with one lung!

The pattern for the next few years was much the same. Her log often records *Sackville* “stopped and drifting” on a given spot of ocean, or largely stationary for days on end. Much of this work was associated with the launching and recovery of acoustic arrays and sound projectors, probably related to DREA’s development of new passive sonar systems to counter increasingly more sophisticated submarines. Not all of these cruises were defence-related, however. Throughout her final years as a research vessel *Sackville* continued to support work on marine

life, such as her 1979 and 1980 cruises to the Labrador Basin on sealing surveys.

Corvette watchers knew that *Sackville’s* days as an operational ship were numbered when the navy deferred her scheduled refit in January 1982. Without the needed work she could not steam for much longer than a year. *Sackville’s* last cruise came in the summer of 1982, when she and *Quest* conducted acoustic tests just north of Bermuda. Over a period of ten days *Sackville* steamed over 1,100 miles, but much of her time was spent with engines stopped and drifting while her acoustic projectors and arrays were deployed and their sound monitored. She returned to Halifax on 1 August 1982. When her engines rang off 1019 hours on that fresh summer morning her forty years of service to Canada came to an end.

### Decommissioning

On 16 December *Sackville* made her final sailpast. Vice Admiral J.A. Fulton, Commander, Maritime Command, took the salute, joined by a small group of dignitaries. Nostalgic and curious onlookers lined the waterfront, standing patiently in the fog and icy drizzle as *Sackville* steamed past. Her long decommissioning pennant – the standard 380 feet for a warship – trailed a full ship length astern as she slipped by. And, just as on that long-ago rainy day in May 1941 when she first hit the water, ships in the harbour sounded their foghorns and whistles.

Her passing marked not only the end of her own service, but the final end of that remarkable fleet that fought and won the Atlantic war. For nearly forty years *Sackville* had steamed on as the sole survivor of 123 corvettes in the wartime fleet. Through most of those years she served alongside other Second World War veterans, many like herself serving in support roles. Most of these ships were disposed of in the 1960s. The final die-hards disappeared from Canadian service in the 1970s, with the last to go –