HISTORICAL ARCHAEOLOGY AND THE BYRD LEGACY

The United States Antarctic Service Expedition, 1939–41

by NOEL D. BROADBENT and LISLE ROSE*

THE first official United States government expedition to Antarctica is probably the least known of Rear Admiral Richard E. Byrd's undertakings. The expedition was put together in 1939 as World War II raged in Europe, and it ended with a hasty evacuation on 22 March 1941. Less than a year later, the United States entered the war, and the men of the Antarctic, including Byrd himself, served in campaigns throughout the Pacific, North Africa, and Europe.

The two bases that had been established in 1940, one at the Bay of Whales, called West Base, and the other on Stonington Island in Marguerite Bay off the Antarctic Peninsula, East Base, were left standing for future use. West Base, or Little America III, became deeply buried and was finally lost as the ice shelf eroded into the sea. East Base, by contrast, was built on a rocky island and thereby has survived as the oldest permanent U.S. research station in Antarctica. In 1989, the Antarctic Treaty nations recognized the old station as a historic monument to scientific exploration.

This article presents an account of the reclaiming of East Base, its clean up, its archaeology, and a discussion of its value as a physical record of American presence and scientific endeavor in Antarctica. Archaeology is

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especially helpful for bringing to light the everyday aspects of expeditions. It shifts the spotlight from planners and leaders to all the men and women who made up the expeditions, their work and leisure, what they wore, ate, and did. Historical archaeology has a rich, and little realized, potential in Antarctica.

With growing tourism—well over one hundred cruises by tourist vessels per year—Antarctic historic sites are being subjected to increasing pressure. There is an urgent need for monitoring these locations and conducting field documentation, site clean up, artifact curation, and building maintenance. The East Base site can serve as a model for future efforts by the United States and other nations. It is fitting that preserving the record of the United States Antarctic Service (USAS) expedition under Admiral Byrd's command has become a starting point for new American responsibilities for cultural resource management in the southern continent. By presidential directive, the National Science Foundation (NSF) is responsible for overseeing United States activities in Antarctica. An executive agency of the United States government, the NSF is charged with maintaining U.S. strength in scientific research and education. The East Base project, under direction of NSF personnel, was carried out as a part of extensive environmental clean up operations in 1991–92. Preserved and interpreted as a historic site, East Base also serves as a monument to the legacy Richard Byrd left to polar exploration.

By the end of 1938, after two widely publicized expeditions, Richard Byrd was seriously considering another privately funded campaign to the Antarctic. *Alone*, his account of the awful five months he spent at Advance Base in 1934, had just been published and was rapidly becoming both a critical success and a best seller.[1] Emboldened by his steadily increasing stature as a national hero and sobered by his near-death experience on the ice four years before, Byrd had become a major, if increasingly ineffective, figure in the peace movement that swept over the United States and Europe following the Nazi seizure of power and Germany's subsequent rearmament and expansion. He continued the exhausting round of speeches on the national lecture circuit that he had begun years before after returning from his controversial North Polar flight with Floyd Bennett.[2] At the same time, Byrd's restless mind had conceived yet another spectacular project to justify a third expedition: he would fly from the United States to Australia via the Antarctic.[3]

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[1] Richard E. Byrd, *Alone* (New York, 1938).

[2] Richard A. Harrison, "Paladin and Pawn: Admiral Richard E. Byrd and the Quagmire of Peace Politics in the 1930s," *Peace and Change: A Journal of Peace Research* (1982): 29–48; Richard Evelyn Byrd, *Discovery: The Story of the Second Byrd Antarctic Expedition* (New York, 1935).

[3] Byrd to Harry R. Sheppard, 1 Apr. 1941, Records of the U.S. Antarctic Service, General File I, 1939–41, Record Group (hereafter cited as RG 126), National Archives at College Park, Md. (hereafter cited as NA-CP).

But the world was not about to let Byrd live out his dreams in splendid isolation or allow the Antarctic to live in peace. The year 1938 was one of horror. Japan advanced steadily into China, devastating the countryside and cities, pillaging and raping mercilessly. In Europe, Hitler seized power in Austria and drove into the Sudetenland as Britain, France, and their allies looked on helplessly. On 23 December a small notice appeared in the *New York Times*—Hitler was sending the "German Antarctic Expedition of 1938–39" southward. Led by a Captain Ritscher and sponsored by the "German exploration community," it used the seaplane tender *Schwabenland*, which had formerly been in the service of the German commercial airline, Lufthansa. The vessel had been used "for catapulting mailplanes during the series of North Atlantic trial flights last Fall" and would support two seaplanes for aerial mapping in the Antarctic.

As the Nazi expedition turned for home the following spring, Ritscher radioed reports of having explored by air and sea some 135,000 square miles of Antarctic territory lying directly south of the African continent along the Princess Marthe Coast.[4] As Ritscher and his men neared Hamburg in April 1939, Nazi bombast reached a fever pitch and sent other nations engaged in Antarctic exploration into crisis. Germany not only claimed more than 200,000 square miles of the Antarctic, thus staking out the first Nazi colony outside Europe, but it also wrested this colony from Norway, which already claimed the "Crown Princess Maerta Land" as its own on the basis of prior exploration. The *Hamburger Fremdenblatt*, "often the [German] Foreign Office's mouthpiece," grandly proclaimed that Nazi Germany no longer sent its explorers out into the world on purely "theoretical" excursions, "the practical, political, and economic fruits of which other nations then harvest without effort." The Nazi "empire stands behind the work of these men with the whole weight of political world power," ready to claim for "Great Germany" those areas of the earth not physically occupied by other countries or peoples. Ritscher's flyers had dropped "Reich flags on the south, east and west" of the territories overflown and "likewise raised the Great German colors on the most important coastal points."[5]

Norway, its two million people huddled only a few hundred miles across the North Sea from the Nazi threat, contented itself with only a mild "official protest" against the German claim, holding that the previous mapping and exploration efforts by Norwegian explorers "were more thorough than those followed by other countries." Knowing how thorough Hitler's explorers were, however, the Norwegians had no hope that they could alone stand up to Germany. Whatever might happen, one unnamed source was quoted as

[4] *New York Times*, 23 Dec. 1938, p. 39; ibid, 10 Mar. 1939.
[5] Ibid., 13 Apr. 1939, p. 11.

stating with mordant humor, at least there were no human populations in the Antarctic for Hitler's "protection."[6]

The Nazi claims galvanized Western Hemispheric nations with their own stakes in Antarctica. Argentina led the way in demanding diplomatic and political action. It averred that "Land ownership" in the Antarctic must be settled at the Congress of Arctic Explorers scheduled to meet at Bergen, Norway, in 1940, and the Buenos Aires government was already drawing up what it considered incontestable proofs based upon both exploration and occupancy. It was not enough, Argentinean officials declared bitterly, simply to assert the Monroe Doctrine to keep foreign interests out of those Antarctic regions that lay in the Western Hemisphere. The Americans had always invoked the doctrine when it was in their interest to do so, as in justifying seizure of the Hawaiian Islands, but Washington had refused to support Argentina when Britain seized the Malvinas in 1833 and renamed them the Falklands. Argentine spokesmen emphasized that their nation was the only one to colonize Antarctic territory permanently, having established and maintained a meteorological observation base at Laurie Island in the South Orkneys since 1904.[7]

All of these pressures and events were picked up by Franklin Roosevelt's sensitive political antennae, and he resolved to do something about them. Even as Hitler's flyers were busily photographing and mapping the Princess Marthe Coast and its hinterlands, the State Department informed the president that not only Richard Byrd but also Finn Ronne and Richard Black, both members of Byrd's most recent expedition southward, were planning expeditions of their own. Moreover, Lincoln Ellsworth, a polar explorer who nearly matched Byrd's record of activity, was already in the Antarctic with a small expedition. Roosevelt directed his diplomats to contact the War, Navy, Interior, and Treasury departments about the feasibility of establishing permanent bases in the Antarctic, after which Byrd and Ellsworth should be consulted for their views and "practical advice."[8] When the interagency conference reported favorably on the scheme, Roosevelt secretly dispatched two State Department officials, including Hugh Cumming of the European division, to Byrd's home in Boston with a note, in Byrd's words, "suggesting that the State Department converse with me concerning claims of territory in Antarctica." Byrd told the two diplomats "that I would gladly abandon any undertaking if the Government needed my services." Several weeks later, Roosevelt called Byrd to the White House for lunch and told the explorer that "he wanted two or three bases established in Antarctica." The president

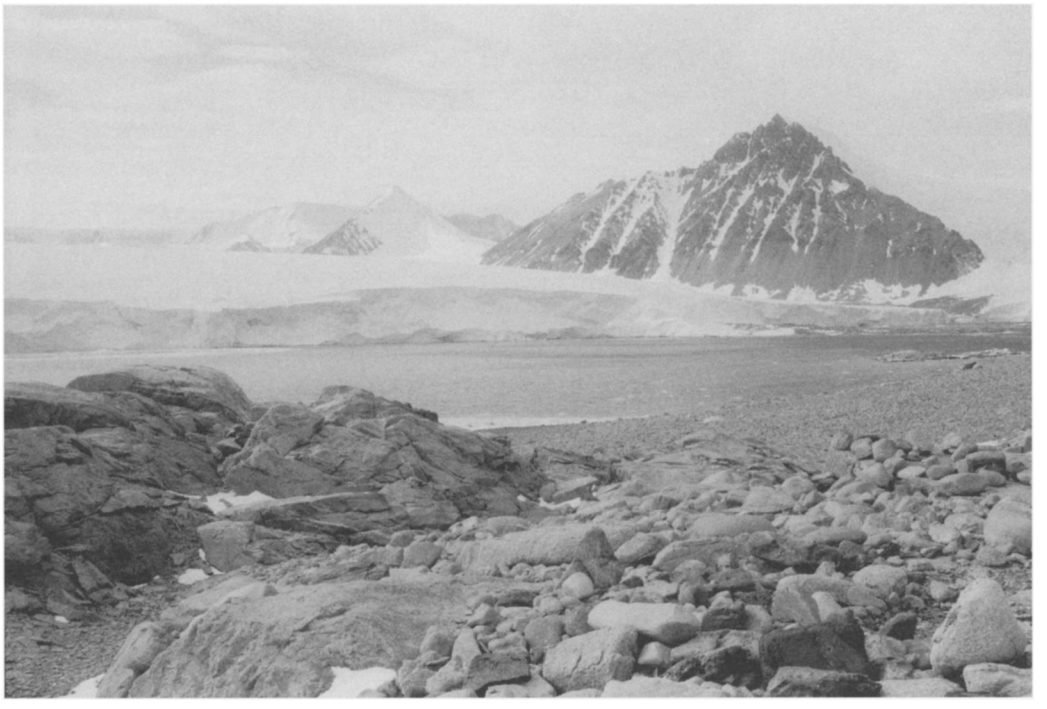
[6] Ibid.
[7] Ibid., 25 June 1939, p. 1; 27 June 1939, p. 7.
[8] Secretary of State Cordell Hull to Willis A. Robertson, 26 Mar. 1940, RG 126, NA-CP.

"gave various reasons for his interest in substantiating whatever claims this country had a right to make to the South Polar territory."[9]

Nazi claims adjacent to the Western Hemispheric portion of Antarctica were undoubtedly high on Roosevelt's list, but there was another consideration driving the president's actions. By the end of 1938, Richard Byrd posed a political predicament to his friend in the White House. Caught up in the idealism of the international peace movement, whose internal strains and divisions he scarcely understood, Byrd had unwittingly gotten in the middle of the increasingly bitter struggle between FDR and his secretary of state, Cordell Hull, over the best means of confronting Axis aggression in the world. Hull clung to the idea that economic appeasement of the aggressors would curb their appetites and bring peace back to the world. After Hitler's seizure of Austria and the Sudetenland, Roosevelt was prepared to consider a much more active policy based on international collective security. From the president's perspective, it was important to muffle Byrd's voice in the movement that opposed military action. FDR reasoned that the best way to accomplish this was to offer the explorer the leadership of a government mission to the place he could not resist: Antarctica.[10] Byrd was given four or five months to organize an expedition, a process that under the best of circumstances should have taken four times as long. He worked "day and night under the greatest possible strain to reach Antarctica before the winter night would set in."[11] He rallied his "boys," including Paul Siple, Alton Wade, Black, Ronne, and others, and set them to work. In fact, it proved impossible to get an expedition underway in the 1939 austral summer, but time was well spent developing the administrative organization required to support a permanent U.S. presence in the South Polar region.

On 7 July 1939 President Roosevelt formally designated Byrd commanding officer of the United States Antarctic Service. That same day, FDR created an interagency executive committee to direct the work of the USAS. The Departments of State, Treasury, Navy, and the Interior were to constitute the steering committee, and Roosevelt directed that the State representative be Hugh Cumming, whom the president had earlier secretly sent to Admiral Byrd to discuss the feasibility of a permanent U.S. presence in the Antarctic. The State Department had already informed the other American republics about the concerns and objectives of the United States in the Antarctic. On 8 August, Acting Secretary Sumner Welles sent a circular memorandum to all twenty-one nations noting that "In the past few months Germany has been actively concerned with the possible resources of the Antarctic, and has already sent one expedition to that region. Japanese interest has also been

[9] Byrd to Sheppard, 1 Apr. 1941.
[10] Harrison, "Paladin and Pawn," pp. 42–43.
[11] Byrd to Sheppard, 1 Apr. 1941.



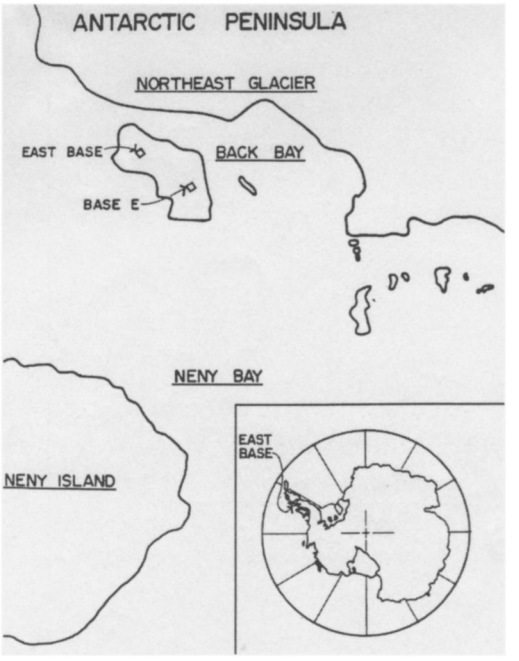
The 1992 photograph above offers a view of Back Bay and the Northeast Glacier as seen from Stonington Island (towards the west). (*Photograph Courtesy of Noel Broadbent*)

manifested." The United States, Welles strongly implied, had no choice but to respond in kind. Thus:

> On the recommendation of the President of the United States, the Congress has made funds available for an investigation and survey of the natural resources of the land and sea areas of the Antarctic regions. This investigation is to be conducted by an expedition of the United States Antarctic Service commanded by Rear Admiral Richard E. Byrd, U.S.N., Retired, which will be conveyed to the Antarctic Continent by the United States Coast Guard cutter *Northland*, the Department of the Interior *North Star*, and the barkentine *The Bear*.[12]

In his November directive to Byrd, Roosevelt stated that the "principal objective" of the expedition would be "the delineation of the (Antarctic) continental coast" between meridians 72 degrees and 148 degrees West and the consolidation of the geographical features of Heard Island and the James W. Ellsworth and Marie Byrd lands. The expedition would engage in essentially the same kind of aerial mapping work that Hitler's airmen had just completed along the Princess Marthe Coast in order to "consolidate these areas," and place Heard Island and the Ellsworth and Byrd lands under U.S. juris-

[12] *Foreign Relations of the United States, 1939* (5 vols.; Washington, D.C., 1956–57) 2:9–14.



Probably the least known of Byrd's Antarctic ventures was the first official U.S. government expedition to the southernmost continent. That effort established two sites in 1940, West Base, on the Ross Ice Shelf, and East Base, on Stonington Island. This map shows the latter site, along with the British Base E, surrounded by Back Bay and Neny Bay, parts of a larger body, Marguerite Bay, lying off the Antarctic Peninsula. (*National Park Service*)

diction, should that be deemed necessary. Indeed, Byrd was instructed to plan his flights in such a way as to "supplement previous flights which have been made [by Byrd and Lincoln Ellsworth] along the 75th, 101st, 116th, 134th, 150th and 152nd meridians of West Longitude." Byrd was told that "Members of the Service may take any appropriate steps, such as dropping written claims from airplanes, depositing writing in cairns, et cetera, which might assist in supporting sovereignty claims by the United States Government." He was admonished to keep "careful records" of the "circumstances surrounding each such act. No public announcement of such act shall, however, be made without specific authority in each case by the Secretary of State."[13] At long last, the United States government had entered the Antarctic picture—United States foreign policy and the heroic career of Richard E. Byrd would never be the same. By the time the president issued formal orders, the two expedition ships, SS *Bear of Oakland* (sold by Byrd to the navy for one dollar) and the Department of the Interior's *North Star* were already en route to Antarctica. Two bases were to be located to achieve maximum coverage of the coastlines and interior between the 72 degree and 142 degree meridians, from the lower Antarctic Peninsula to the Ross Ice Shelf. The vessels first established the site of West Base, at the Bay of Whales, on 12 January 1940.

Altogether, the expedition consisted of 59 men and 130 dogs. The planning of the USAS expedition was in the hands of R. A. J. English, Paul Siple,

[13] Ibid., 2:12–13.

Richard Black, F. A. Wade, and Finn Ronne.[14] Siple was in charge of supplies at the Boston Navy Yard and his name, stenciled on every supply box, can still be seen in the caches at East Base. The crew members were equipped with three aircraft, two light army tanks, and two light tractors. In addition, the private Research Foundation of the Armour Institute had donated the *Snow Cruiser*. After nearly breaking through a ramp during off-loading at West Base, the fifty-five-foot-long, multiwheeled mobile base complete with living quarters and scientific facilities was found to be almost unusable because of its excessive weight of 33.5 tons and underpowered engines. It was abandoned.

Admiral Byrd, commanding the *Bear* on an exploratory cruise from West Base that began on 19 January, entered Marguerite Bay on 5 March 1940. The site for East Base was chosen on 8 March after five days of searches by the *North Star*, which had come from Valparaiso, Chile, where it had earlier sailed to pick up supplies. Heavy pack ice made the original plan for a base on Charcot Island impossible. A small island in Marguerite Bay (68 degrees 28' 36"S, 67 degrees 17' 36"W) was selected instead and subsequently named after Stonington, Connecticut, the home of Nathaniel B. Palmer, the first American credited with sighting the Antarctic Peninsula in 1820.

A suitable location was chosen on the north end of the 2,500-foot-long, 1,000-foot-wide island connected to the peninsula by a glacial ramp. The ramp gave ready access to the peninsula for sledding teams and a summer airstrip on the Northeast Glacier. This ramp was a major advantage of Stonington Island as a base for exploration. It survived until 1975, but has subsequently melted away, and the island is now separated from the glacier by a 150-foot-wide stretch of water. The glacial front is a jagged and rapidly eroding seventy-five-foot-high wall of ice.

Both expedition ships departed Stonington Island for the United States on 21 March 1940. Paul Siple had already assumed command of West Base; Richard Black was the leader of East Base.[15] Byrd, in fact, remained on the *Bear* while East Base was being built, giving his commanders, Black and Finn Ronne, full responsibility for the establishment of the station. The admiral then returned to the United States and, although he kept in contact with the expedition by radio, did not himself return to Antarctica until after World War II.

The base whose construction Byrd delegated to Black and Ronne consisted of four main buildings: a science building with a three-story meteoro-

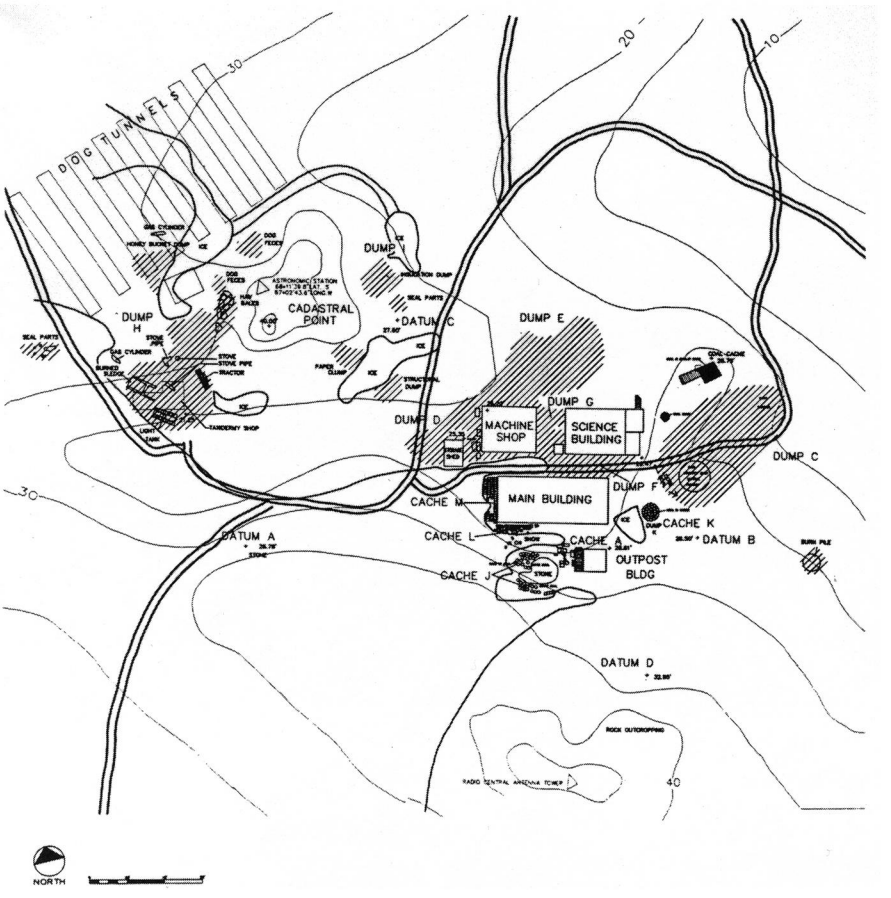
[14] R. A. J. English, "Preliminary Account of the United States Antarctic Expedition, 1939–1941," *Geographical Review* 31 (1941): 466–78.

[15] Richard B. Black, Narrative of East Base, U.S. Antarctic Expedition, 1939–1941, 27 Dec. 1960, Accession III-NNG-57, RG 126, NA-CP; R. B. Black, "Geographical Operations from East Base, United States Antarctic Service Expedition, 1939–1941," *Proceedings of the American Philosophical Society* 89 (1946): 4–12.

The photograph above shows the remains of Byrd's East Base and its surroundings in 1992. The disintegrating edge of Northeast Glacier lies in the background. As late as the 1970s, the glacier extended from Stonington Island to the peninsula and was a major reason for establishing the base there in 1940. (*Photograph Courtesy of Noel Broadbent*)

logical tower, a main building, a machine shop, and a storage shed. Cables helped anchor these buildings in place, and numerous turnbuckles and wires still litter the site. In addition, a twelve-by-twelve-foot outpost building was erected beside the main building for extra bunk space. Finn and Edith "Jackie" Ronne of the Ronne Antarctic Research Expedition (RARE) occupied this building in 1947–48. Jackie Ronne, together with Jenny Darlington, wife of the RARE chief pilot, Harry Darlington III, were the first women to winter-over in Antarctica.[16] A second hut was constructed near the airstrip marked out on the adjacent Northeast Glacier. Finally, a taxidermy shop was built using an aircraft wing crate. In all, East Base housed twenty-six men during the Antarctic winter of 1940. The buildings were clustered closely together and connected by canvas-covered walkways, enabling easy access from the bunkhouse to the science building, machine shop, and storage facilities.

[16] Edith Ronne, "Women in the Antarctic, or the Human Side of a Scientific Expedition," *Appalachia* 28 (1950): 1–15; Finn Ronne, *Antarctic Conquest: The Story of the Ronne Expedition 1946–1948* (New York, 1949).



In 1991 the National Park Service created this map of East Base on Stonington Island. In the following year, refuse areas, designated Dumps A to I, were cleaned up or marked with warning signs. All of the buildings remain standing today except for the machine shop. Though built using standard early twentieth-century technology, the structures proved remarkably sturdy and remained almost perfectly plumb, in spite of a half century of exposure to the Antarctic climate. (*National Park Service*)

The base buildings were constructed of standard prefabricated eight-by-ten foot panels with tongue and groove exteriors and plywood interiors. Rock wool insulation was packed into 3 1/2-inch-deep wall cavities. Battens held down canvas covers on the building exteriors. The construction was standard World War I technology, but a sixteen-inch false floor above the main floor—an idea developed by Paul Siple during the second Byrd expedition—created an insulating air pocket. Because of their sturdiness, the buildings have remained almost perfectly plumb, in spite of fifty years of exposure to the elements.[17]

[17] Catherine Holder Spude and Robert L. Spude, *East Base Historic Monument, Stonington Island/Antarctic Peninsula: Part I: A Guide for Management, Part II: Description of the Cultural Resources and Recommendation,* NPS D-187, National Park Service, United States Department of the Interior (Denver, 1993).

Along with prefabricated structures, two tracked vehicles were brought to East Base, and both still remain on the site. A light artillery T3E4 tractor served multiple purposes around the camp, including towing the aircraft. An A2M2 light tank, an unusual prototype vehicle, was powered by an air-cooled radial aircraft engine. The tank had an open top and no gun turret. Even with extensions added to its treads, it did not prove very useful. Both of the machines have been badly vandalized and stand where joy-riding visitors abandoned them, about 150 feet from the buildings.[18]

One of the USAS expedition's twin-engine Curtiss-Wright Condor biplanes operated from East Base. This aircraft was later used for the evacuation of the base's personnel along with some scientific records and personal belongings, seven puppies, and a giant petrel (seabird) that ended up in the Smithsonian National Zoological Park in Washington, D.C. The aircraft was subsequently abandoned "on the crest of the ice cap" near Mikkelsen Island, some one hundred miles to the northwest. The *Bear* transported East Base personnel back to the United States, arriving in Boston on 18 May 1941. Richard Black's unpublished narrative in the National Archives gives an account of the two evacuation flights off the Northeast Glacier, including a moving description of the dogs left behind, half of whom had to be shot, and half left alive in case the flights failed.[19]

Planned for two years, the USAS undertook only one season of exploration and research. Each of the lead scientists wrote brief reports of their accomplishments. Best known of the trail parties was the "Main Southern Sledge Journey," which lasted from 4 November 1940 to 28 January 1941. Finn Ronne and ornithologist Carl R. Eklund, supported by Lytton Mussleman, cadastral engineer J. Glenn Dyer, and Joseph D. Healy, traveled 1,097 nautical miles, took thirty-four astronomical fixes, and established twelve control stations, enabling the mapping of 320 major peaks and nunataks. Dyer, Healy, and Musselman separated from the party at 70 degrees latitude and helped fix the locations of an additional fifty-eight peaks and nunataks. One of the major discoveries of the Ronne and Eklund trek was that King George VI Sound separated Alexander I Land completely from the peninsula, thereby showing it to be an island. Although most surveying and collecting trips extended southward from East Base, several treks were undertaken eastward to the Eternity Range and the Weddell Coast as far as 72 degrees latitude. Twenty-seven flight operations, totaling 94.7 hours, were also carried out from East Base in support of the trail parties and for photographic mapping over the ground control points.[20]

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[18] Ibid.

[19] Black, Narrative of East Base.

[20] F. A. Wade, "An Introduction to the Symposium on Scientific Results of the United States Antarctic Service Expedition, 1939–1941," *Proceedings of the American Philosophical Society*, 89 (1945): 1–3; Inventories of East Base, United States Antarctic Service, RG 126, NA-CP; Charles E.

This 1991 photograph shows the main and outpost building at East Base from the southwest. Later that year, wind blew the roof off the outpost building. Broken skylights allowed tons of snow to enter the main building over the years. These buildings were repaired in 1992. (*Photograph Courtesy of Robert Spude*)

Scientific measurements and collections were made in the environs of East Base and on the sledging trips. These included biological, geological, glaciological, meteorological, and magnetic studies. Among the biological collections mentioned by Carl Eklund and assistant biologist Herwil W. Bryant were bird eggs and stomach contents from kelp gulls and south polar skuas. These scientists also collected the skeletons and skulls of Weddell seals. In addition, some 123 geological samples were listed by Paul H. Knowles, expedition geologist. Snow, ice, and glacial data were also recorded. Knowles calculated, for example, that the glacial front at East Base moved 0.22 feet per day. Finally, magnetic surveys reported by Dyer covered some 100,000 square miles of new territory. Although these reports are on file in the National Archives, many of the expedition's scientific findings were not published because of the hasty demobilization of personnel and restrictions in the original orders requiring that all writings and photographs be surrendered to the government.[21] Furthermore, aerial evacuation necessitated abandoning various collections.

Dewing and Laura E. Kelsay, comps., *Preliminary Inventory of the Records of the United States Antarctic Service* (Washington, D.C., 1955).

[21] Ibid.

This photograph shows the interior of the main building at East Base and indicates the debris-strewn and dilapidated state of the structure after its abandonment in the 1970s. Visible in the picture is the raised floor erected by the British Antarctic Survey (BAS). Note the missing horizontal trusses and the bolt holes apparent on the posts. The trusses were removed by the BAS to provide more headroom. (*Photograph Courtesy of Noel Broadbent*)

After the USAS departed East Base, the site was used by various subsequent expeditions. In 1946 members of the British Falklands Island Dependencies Survey (FIDS) occupied the base while they built their own facilities. Wooden boxes marked "FIDS" survive as evidence of their presence, together with English crockery stamped 1945, stakes and harnesses for dog teams, and later alterations to the buildings. British occupation of the island and use of the base generated some controversy when the Ronne Antarctic Research Expedition reclaimed East Base in 1947.[22] By then, crews from Chilean and Argentinean ships had seriously vandalized it, one crew wreaking major havoc just days before Ronne's arrival.[23] The RARE team occupied East Base from 8 March 1947 until 8 February 1948 and accomplished important air and land mapping of the Antarctic Peninsula in collaboration with the British.[24]

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[22] Ronne, *Antarctic Conquest*, pp. 55, 57.

[23] E. W. K. Walton, *Two Years in the Antarctic* (New York, 1955), p. 29; J. H. Lipps, "The United States 'East Base,' Antarctic Peninsula," *Antarctic Journal of the United States* 11 (1976): 215.

[24] Finn Ronne, *Antarctica, My Destiny: A Personal History by the Last of the Great Polar Explorers* (New York, 1979), p. 118.

The British FIDS and later British Antarctic Survey (BAS) used bases on Stonington Island from 1946 to 1975. The first British structure, Base E, was torn down and burned, but the second Base E building and a storage shed still stand and served as headquarters for the joint U.S. National Science Foundation and BAS clean up team in 1992. The buildings are maintained by BAS personnel as refuge huts and provide a comfortable shelter for tourist groups to the island.

The British used East Base until the 1970s. The USAS science building, also known as "the Hotel," was used as a storage and sledge repair facility. The main building, which had become three-quarters filled with snow and ice, was turned into a tent store and facility for butchering and storing seal carcasses. The Ronne hut housed a paint and general store and later held a generator on a concrete slab. The outer walls of these buildings were recovered with rubberoid tar paper numerous times as most of the original canvas coverings had been destroyed by wind. The machine shop had apparently collapsed and, for safety reasons, the British removed all but one wall; the other sheds had likewise fallen apart. None of these buildings had the Siple false-floor construction. The British undertook clean ups of trash around the buildings, and there is evidence of surface burning near the buildings and the nearby dumps. In the BAS Stonington Island Records, now kept at Rothera Station on Adelaide Island, there are several descriptions of the uses and clean ups of East Base:

> Good use has been made of the old American Science Building that is now used as a sledge workshop and it remains in reasonable condition. The former sleeping quarters are now used as a seal store and it is hoped that more ice can be removed from this hut and it can be used as a storage space. The small "Finn Ronne Hut" has proved a valuable storage area. . . . Also much rubbish around the American huts has been collected and dumped on the sea ice, but this is a never-ending job as the thaw reveals more and more trash.[25]

J. H. Lipps described the history and contemporary condition of East Base in several articles in the late 1970s.[26] Lipps argued for the preservation of the site and its recognition by the Antarctic Treaty nations as a historic monument. He made reference to a 1978 consideration of a resolution to this effect by the Polar Research Board of the National Academy of Sciences.[27] In 1989 Peter J. Anderson of the Byrd Polar Research Center at Ohio State University and Karen Tupek, daughter of Finn Ronne, proposed a historic preservation research project, encompassing East Base, Palmer Station, and sealing camps on the South Shetland Islands to be administered by the NSF

[25] General Reports, Stonington Island, 1946–58, 1963–75. British Antarctic Survey (Rothera Station).

[26] J. H. Lipps, "East Base, Stonington Island, Antarctic Peninsula," *Antarctic Journal of the United States* (1978): 231–32; Lipps, "The United States 'East Base,'" pp. 211–19.

[27] Lipps, "East Base, Stonington Island," p. 232.

Division of Polar Programs (DPP). Unfortunately, the proposal did not fit into any existing research program in the division at that time, and no resources were available through the Antarctic Operations Section.

The Antarctic Treaty nations formally recognized East Base in 1989 as a historic monument.[28] But the first impetus for conducting cultural resource management came with new congressional allocations in 1991 for the environmental clean up of U.S. Antarctic stations, primarily McMurdo Station on the Antarctic continent. Later, a court decision held that the U.S. National Environmental Protection Act (NEPA) applied to U.S. government activities in Antarctica.[29] Important to note in this context is that NEPA standards also contain provisions for the protection of cultural and historical resources. This is significant because environmentalists often equate clean up with the removal of all human traces from Antarctica.

With funds available in 1991, the clean up of East Base was considered to be an NSF responsibility directed towards the environmental management of U.S. stations. To help accomplish this goal, the National Park Service (NPS) was contacted and subsequently produced a management plan for East Base in accordance with national standards.[30] Noel Broadbent, co-author of the present article, an archaeologist and then a program director in the Division of Polar Programs, was given responsibility for overseeing the East Base effort together with Sam Higuchi, a DPP environmental engineer. Numerous meetings were held with NPS representatives and other interested parties, including Edith Ronne and Karen Tupek.

NSF and the NPS signed a cooperative agreement in January 1991, and in March of that year, NPS historian Robert L. Spude and historical archaeologist Catherine H. Blee departed for East Base, via Punta Arenas, Chile, on the chartered vessel *Erebus*, which served as a supply and transport vessel to the U.S. Palmer Station on Anvers Island. Following a stop at Palmer Station, the NPS experts, assisted by station personnel, spent four days documenting the buildings, supply caches, trash dumps, and artifacts on Stonington Island. On their return, they produced a detailed report and management plan that laid the groundwork for the preservation effort.[31] Published by the National Park Service in 1993, this report recommended four short-term actions: clean up and documentation of debris; documentation, disposal, or placement of warnings of hazardous materials; systematic sampling and collection of archaeological materials; and repair of doors, windows, and other openings.

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[28] "Antarctic Treaty Consultative Parties Gather in Paris for 15th Meeting," *Antarctic Journal of the United States* 25 (1990): 1–18.

[29] *EDF* v. *Massey*, 986 F2d. D.C. Circuit Court 1993.

[30] Spude and Spude, *East Base Historic Monument.*

[31] Ibid.

Longer-term objectives included the storage and curation of artifacts as well as ongoing monitoring of the site. The NPS recommended that following clean up and recovery of artifacts and hazardous materials, the middens should be covered with light gravel from the island. This covering would protect the cultural resources from further vandalism, provide a shallow cap for future archaeological investigation, and improve the appearance of the site so that visitors would better appreciate and respect the historic monument. Because Stonington Island is an attractive diversion for visitors, the NPS also recommended the preparation of interpretative devices such as a short pamphlet, signs, and a panel or wayside exhibit for the site. The NPS also made more specific recommendations about the camp buildings, the airplane engine, the vehicles, food, coal and miscellaneous caches, dumps, organic refuse, and the flag pole. This report thereby formed a detailed plan for follow-up actions at the site that were undertaken the following season.

A small team was assembled in the fall of 1991, consisting of historical archaeologist and hazardous waste expert Robert Weaver and Noel Broadbent. The group was joined by Michael Parfit and Robb Kendrick, who were to document the effort for *National Geographic Magazine*.[32] Two specialists from Antarctic Support Associates, a private contractor for the NSF/DPP, joined the team at Palmer Station: Mark Melcor, carpenter and radio operator, and Doug Hillborn, field assistant and cook. Two members of BAS, Ben Hodges and David Routledge, joined the team at Rothera Station on Adelaide Island. They were to carry out clean up at BAS Base E and assist the efforts at East Base. The team arrived at Stonington Island on 20 February 1992, and departed on 3 March, a total of twelve working days.

Heavy winds and snow at first prevented archaeological work, so initial efforts were put into repairing the buildings. The roof of the Ronne hut had blown off since the park service visit the year before, and the storage room at the east end of the main building had largely filled with snow. Work started by shoveling out this room, rebuilding the hut roof, and conducting general repairs.

The old bunkhouse presented a more serious problem. The British had built a false floor over the four feet of ice that had filled the main building. With little headroom left for storing seals, they also removed the beams across the ceiling, seriously weakening the structure. Rebuilding these horizontal trusses added considerably to the life of the building. A window was cut into the plywood wall separating the bunkhouse section from the storage room to give visitors a view of the interior. The door that opens into the storage room was rebuilt for entry through the step-up doorway showing the sixteen-inch cold trap. This storage room had once been divided into Issac "Ike"

[32] Michael Parfit and Robb Kendrick (photographer), "Reclaiming a Lost Antarctic Base," *National Geographic Magazine* 183 (1993): 110–26.

Schlossbach's room, RARE second-in-command, and the Darlingtons' room, "Jenny's Roost," in 1947–48. Finally, a window described in Jenny Darlington's book, *My Antarctic Honeymoon*, was replaced with plexiglas and a description from her book mounted on the wall.[33]

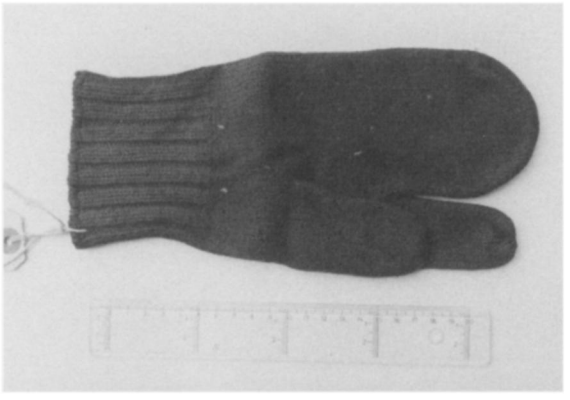
The roofs of the larger buildings had lost numerous boards, exposing their rock wool insulation. The south, and remaining, wall of the machine shop, was carefully dismantled, and its precut boards were used to replace missing segments of the roof panels of both the main and science buildings. These repairs are virtually indistinguishable from the originals. Broken skylight windows were replaced with plexiglas sheets. The Ronne hut door was also rebuilt and the hut secured as a storage facility for the artifacts collected on the site. The hut's single window was unboarded, allowing visitors a view of the room, which still has decorative red tape put up by Jackie Ronne in 1947–48.

Decoration in the Ronne hut notwithstanding, very few artifacts remained in the East Base buildings in 1992. As the snow melted, however, masses of objects appeared mixed with trash and wooden debris around the buildings and in surrounding dumps. All areas were systematically examined, and exposed artifacts of historic interest or in danger of further damage were collected. In the same way, hazardous materials were removed. Artifact recovery could only be accomplished when air temperatures melted the deposits and the thicker ice around the buildings had been chipped out. The contents of a medical box, which had been scattered near the entrance to the science building, presented particularly difficult conditions. Glass vials, syringes, and medicine bottles containing fluids and pills, together with bottles of photographic chemicals were found embedded in the ice and had to be handled as hazardous waste.

The artifacts consisted of a wide range of objects that reflected the daily tasks and concerns of expedition members. Among numerous items of discarded clothing were boots of all kinds, gloves, and mittens. Hand tools, turnbuckles, sled parts, dog harnesses, collars and chains, metal stakes, trail flags, crampons, ice axes, weather balloons, ring markers for birds, and containers for biological specimens suggest the amount of equipment required by exploring parties. Meanwhile numerous bandages, razors, magazines, books, playing cards, Monopoly cards, chess pieces, light bulbs, radio tubes, food cans, jars, bottles, plates, cups, cutlery, and many other domestic objects shed light on how the men and women of East Base passed both their working and leisure hours.

Of particular interest were sections of sixteen-millimeter film, which were found under the floorboards of the science building; metal bunk plates

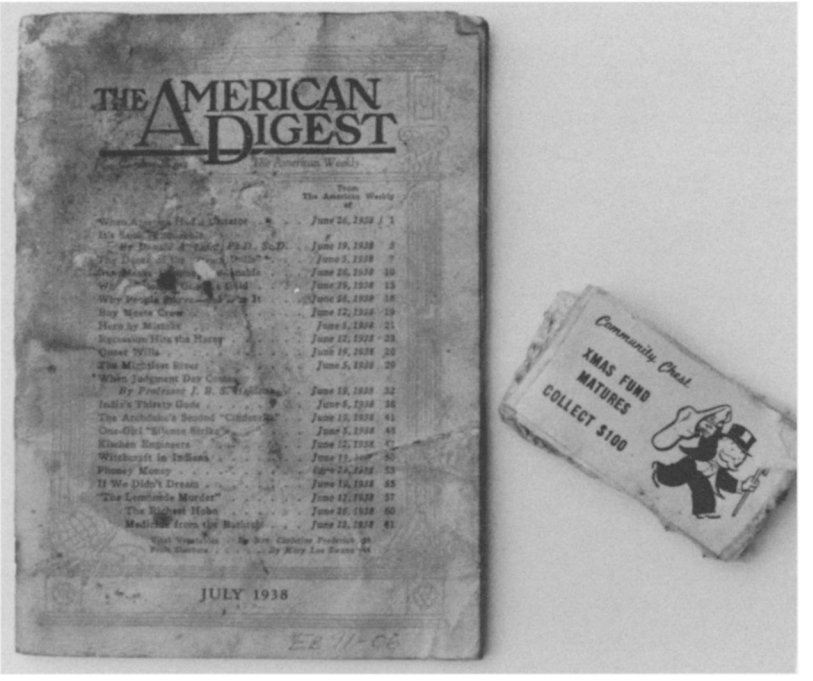
[33] Jennie Darlington and J. McIlvaine, *My Antarctic Honeymoon: A Year at the Bottom of the World* (New York, 1956).



On this page at top is a mitten found among the debris at East Base in the 1992 NSF/DPP archaeological expedition. The great variety of winter clothing and shoes found at the site perhaps shows the hurried, haphazard manner in which it was abandoned in 1941. Like the mitten, the artifacts on this page at bottom (clockwise from top, flash bulbs, radio tube, rubber stamp, and gauze pads) were discovered strewn about the site. The harsh environment proved a boon to the survival of paper. Because of a lack of certain bacteria in Antarctica, the *American Digest* magazine and the Monopoly cards (facing page), along with other paper items, remained intact despite fifty-two years of exposure. (*Photographs Courtesy of Noel Broadbent*)

from Charles W. Sharbonneau, carpenter (1940–41) and Bob Dodson (1947–48); ceramic plates marked "USQMC [U.S. Quartermaster Corps] 6-15-39"; Boston newspapers from 1939; an *American Digest* magazine from July 1938; a *Time* magazine from August 1938; and weather maps marked "U.S. Department of Agriculture Weather Bureau, U.S. Antarctic Expedition 1939–41." These maps show the Antarctic Peninsula as a series of islands and the coastline as dashed lines, indicating the lack of knowledge of these regions. The newspapers and magazines refer to life in the United States and the war in Europe. Books were found as well, including an autobiography of Joseph Smith and a New Testament. An East Base library box survived in excellent shape and was reused for storage.

A cache of trail supplies in wooden boxes including primus stoves, food packets, "Meta" tablets, matches, vitamins, chocolate, coffee, and blankets near the west side of the Ronne hut was removed, stored, and paved over. The embedded bones of one or more dogs were left *in situ* together with other frozen items. It is likely that these animals had survived the explosive charge that had been left to kill the remaining twenty-eight dogs after the last evacuation flight of the Condor. The surviving dogs must have sought food

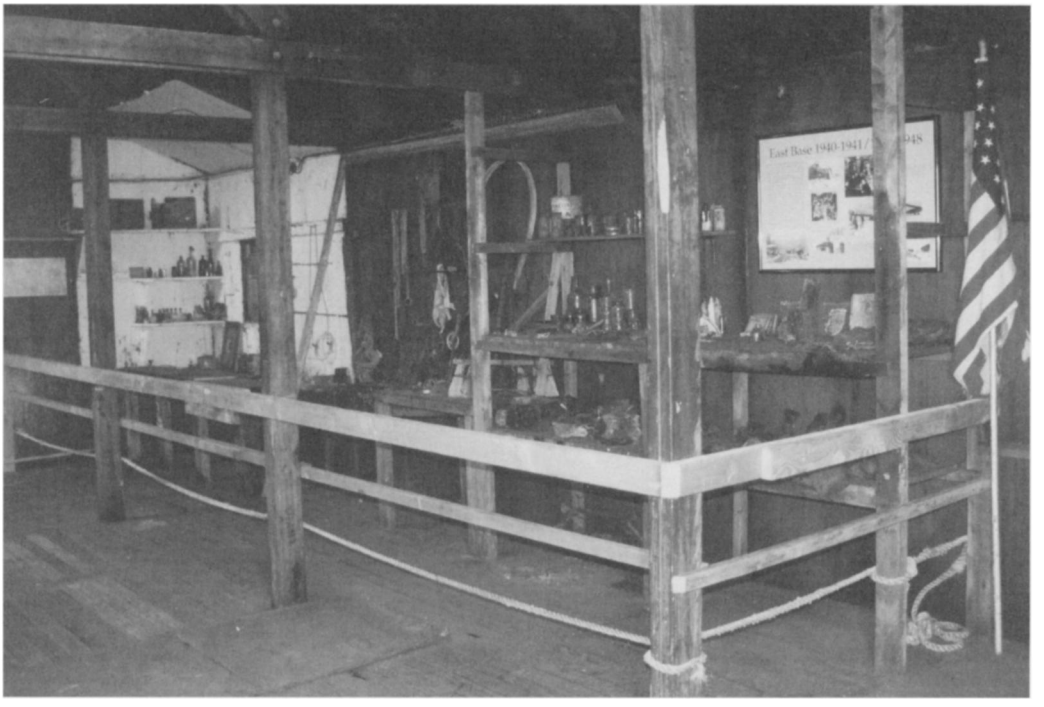


and shelter in the lean-to that had been erected over the cache of trail supplies.

Various measures were taken to preserve and interpret the East Base site. Each building was designated with laminated signs in four languages as a protected historic monument under the Antarctic Treaty. Additionally, wooden signs identifying the functions of each building were placed on the buildings. The midden areas in and around the structures were paved over with gravel and stone collected on the beach slopes below the site. As recommended by the NPS, this approach secured these areas from further exposure, pot-hunting, and possible injury to visitors, as well as providing a clean, even, and attractive ground surface. The result can hardly be distinguished from the natural surface, and the quarrying left no visible impact on the island.

The science building provided space for a prepared historical panel with texts and photographs from the USAS and RARE expeditions. In addition, the National Geographic Society provided a bronzed plaque with the engraved names of the members of both expeditions. In 1994 Jackie Ronne and Karen Tupek added additional photos and texts from the RARE expedition during a visit to the site, the first by the former since 1948.

The convenient shelving, which BAS had installed along the walls of the science building, offered an opportunity to display a sample of artifacts reflecting daily life (clothing, food, razors, and books), exploration (sleds, dog collars and chains, and trail flags), science and health (medical supplies, bandages, and weather balloons), and maintenance (tools, an anvil, cables,



This small exhibit in the science building displays artifacts found at East Base in 1992. Although one of the world's most remote museums, it is visited by ever-increasing numbers of travelers to Antarctica. The increased popularity of the southernmost continent as a tourist destination prompted the concerns about the preservation of East Base as a historic site that led to the 1992 clean up and stabilization effort. (*Photograph Courtesy of Noel Broadbent*)

and turnbuckles). Beside this display, the last message from the commander before abandonment in 1941 is still visible:

> TO THE FIRST VISITORS, GREETINGS!
>
> Materials abandoned in the base are the property of the United States Government or of individual expedition members. Please report to the U.S. Department of the Interior any articles used. If possible, to remove valuable items, the above agency should be notified and instructions will be given for shipment to Washington, D.C., U.S.A.
>
> Good Luck!
> Richard B. Black
>
> East Base
> U.S. Antarctic Service
> March 22, 1941

The small museum, which was improvised on the site, has proven to be a major attraction in spite of being one of the most remote in the world.[34] The science building had once served as the base headquarters, radio room, dark room, and library. A more suitable place could not have been chosen for a

[34] G. C. Iijima, "Our Most Remote Museum," *Odyssey* 3 (1994): 41–42.

display. As Black described the building: "Here would be the center of the life of the base, the headquarters where plans would be formulated for the air and surface attacks on the unknown regions which lay just over the horizon in several directions, where orders and personal messages would come in from the United States and go out to the sledging parties in the field, and where the reels of aerial mapping film would be developed and printed for use in correlating flight data with the ground surveys of the far-flung dog parties."[35]

A guest book was left for comments, and on 29 December 1993, the *Kapitan Khlebnikov* brought the first large tour group to the island. A sizable number of visitors has continued to visit every year since then.

The Antarctic has been the object of exploration and research for more than two hundred years. Although some sixty sites have been designated as historic monuments—East Base is No. 55—many more historically significant sites remain. Bases, ships, vehicles, aircraft, and other equipment and supplies long abandoned reflect the rich and varied activities of many nations. In time, much of the unsightly debris will be documented and removed, although many sites should be maintained as testimony to exploration and scientific endeavor. These historic sites have the potential to be major resources for education and tourism. So should the lives of the people who established and occupied them. Historic preservation requires acknowledging the accomplishments of those who explored Antarctica and documenting them in oral histories. Preservation also requires recognizing places from the past, caring for them, and using them to enrich our lives. These special places help us to understand who we are and to learn the meaning of our accomplishments and shortcomings.

East Base represents a small effort in cultural resource management in accordance with U.S. law. Preservation principles should be applied to all sites of historic interest, even those not formally designated by the Antarctic Treaty nations.[36] Clean up activities should always be accompanied by documentation, otherwise the removal of structures and artifacts will destroy knowledge of them forever.[37] In addition to adding to the cultural and historical heritage of Antarctica, these sites can also provide valuable reference points for understanding changes in the fragile Antarctic environment.[38] For example, the recent rapid melting of the glacial ramp at East Base provides

[35] Black, Narrative of East Base, p. 125.

[36] Noel D. Broadbent, "Project East Base: Preserving Research History in Antarctica," *NSF Directions* 5 (1992): 1–2.

[37] David L. Harrowfield, "Historical Archaeology in Antarctica," *New Zealand Archaeological Association Newsletter* 21 (1978): 95–102; Harrowfield, "Conserving Antarctica's Earliest Buildings," *New Zealand Antarctic Record* 10 (1990): 3–11.

[38] Noel D. Broadbent, "An Archaeological Survey of Marble Point, Antarctica," *Antarctic Journal of the United States* 29 (1994): 3–6.

a measure of climate change in this Antarctic region.[39] Research potential exists for even more recent sites, such as Marble Point near McMurdo Station, which was established in 1957–58 during the International Geophysical Year. Measuring disturbances to exposed land surfaces there provides invaluable baselines for understanding human impact on the Antarctic environment.[40]

The United States Antarctic Service was established at a critical period in American history between the two world wars, and it ended because of war. It existed during the technological transition from human and dog transport to machines and aircraft. The buildings, ships, and clothing of the USAS were antiquated and lacked the standardization and cutting-edge technology found in later national programs. But in other respects much has remained the same, from supplies of popcorn to human loneliness. Finally, the USAS represented the first official United States government commitment to Antarctica. It ushered in the enormous Operation Deepfreeze program during the first International Geophysical Year and led to the creation of the United States Antarctic Program that operates today. This is the finest legacy of Richard E. Byrd: a U.S. scientific program that is still pushing the envelope of human knowledge of the polar environment.

Antarctic research is once again at a crossroads. The post–Cold War world has redefined the geopolitical map and U.S. national interests. Congress has questioned the cost of maintaining three year-round bases in Antarctica: McMurdo Station, Amundsen-Scott South Pole Station, and Palmer Station. The aging South Pole Station, for instance, is undergoing a two-hundred-million-dollar rebuilding effort. The justifications for the program are increasingly defined by scientific results more than national security. The United States Navy, including its VXE-6 Squadron, which flew the NSF ski-equipped LC-130 aircraft, pulled out from the program in 1997. The naval support of Antarctic exploration and science that Byrd and Roosevelt so strongly endorsed has come to an end. As with the space program, new solutions and less-expensive, better-integrated efforts must be sought, including the internationalization of bases around the continent and the greater use of automatic monitoring equipment for scientific research. While one can lament these changes, there is room for optimism. Science is universal, and Antarctica is the only continent that belongs to all mankind. There is no better place to initiate new and daring plans. Admiral Byrd would surely have agreed.

[39] John Splettstoesser, "Antarctic Global Warming?" *Nature* 355 (1992): 503.
[40] Broadbent, "Archaeological Survey."