Building the Atlantic Bases

by Charles Hendricks

The rapid German military victories in western Europe in the spring of 1940 isolated Great Britain as the sole remaining European combatant opposing Hitler's military machine. The capitulation of France and the installation of the fascist Vichy regime there in June ended a season in which German armies had also occupied and overthrown the democratic governments of Denmark, Norway, the Netherlands, Belgium, and Luxembourg. Only the survival of British arms, including the maintenance of its dominant naval power, separated the advancing German forces from possible inroads in the New World.

Heavy air attacks on Britain in the summer of 1940 raised the specter of a German assault on that island. Such an assault, if successful, would leave American security interests in the western hemisphere gravely exposed. While the British proved more tenacious in the face of this onslaught than Americans had at first anticipated, there was still cause for concern. The defeat in September of a combined British and Free French attack on Vichy land and naval forces in the French West African port of Dakar made the German menace to the not-so-distant eastern bulge of South America all the more vivid.

Despite the growing threat to American security posed by these developments, the American public and its elected leaders sought to avoid direct involvement in the European combat. Americans were still disillusioned from another European conflict two decades earlier—one which President Woodrow Wilson had described as "a war to end all wars." Thus, while Congress in mid-1940 approved large new appropriations for American military mobilization, it forbade the administration to sell any American ships, weapons, or munitions of war unless it could certify them as nonessential to the defense of the United States. At the time, many Americans feared that Britain, like France, might capitulate to the Germans and that American munitions

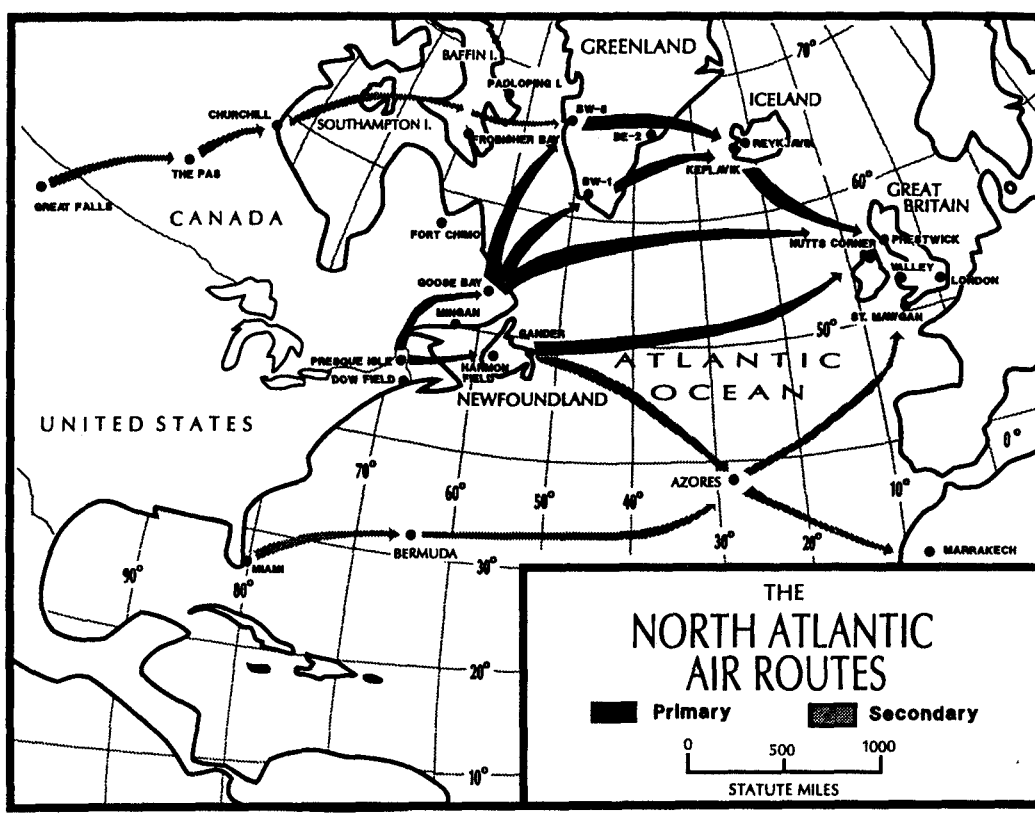
purchased by the British might then be turned against the United States.

Adopting a more optimistic approach, President Franklin Roosevelt wanted to respond positively to British Prime Minister Winston Churchill's plea in July 1940 for some American destroyers and other naval boats and planes. Taking up a suggestion made by a New York group supporting aid to Britain, the administration proposed the exchange of 50 aging destroyers for the right to establish American naval and air bases in seven British possessions in the western hemisphere. These possessions formed an arc from Newfoundland in the north to the South American territory of British Guiana and included the island possessions of Bermuda, the Bahamas, Jamaica, Saint Lucia, and Trinidad. Diplomatic notes exchanged on 2 September by the American and British foreign secretaries effected accords along those lines, including a British promise never to surrender the warships to the Germans and provisions for 99-year American leases on its new bases. The destroyer-base agreement, which proved broadly popular in the United States, expanded the bonds of British and American strategic cooperation and provided the United States with new opportunities to develop forward lines of defense in the Atlantic.

Although the War Department had yet to transfer responsibility for air base construction in the United States from the Quartermaster Corps to the Corps of Engineers, Army Chief of Staff General George Marshall immediately assigned the work in the British territories to the engineers. In October, Chief of Engineers Major General Julian Schley began to create the organizational structure to handle the new assignment. He named Lieutenant Colonel Joseph Arthur, an experienced manager of Corps civil works projects, as engineer of the new Eastern Division, which he placed in overall charge of the new work. Reporting to the Eastern Division would be the Newfoundland and Bermuda Districts, headed by Majors Philip Bruton and Donald White, respectively. In December 1940 new Jamaica and Trinidad Districts were added to the Eastern Division to oversee the work required in the Caribbean.

Before much construction could begin at the sites contemplated in the destroyer-base accord, the Corps obtained

a further base construction responsibility beyond the nation's borders. Using authority contained in a June military appropriation act, the War Department on 2 November 1940 entered into a secret contract with Pan American Airways to build or expand commercial airfields in Central and South America and the Caribbean in accord with War Department specifications. Under the contract, the U.S. government would provide full funding for the work, and a Corps of Engineers officer would oversee the project from the United States. The fields would be designed to accommodate both commercial and military planes, but the use of a commercial airline as construction agent obviated any need for formal military understandings with the host nations.



North Atlantic Air Routes

The danger that German military forces might advance in the North Atlantic from Norway to the former Danish territories of Iceland and Greenland worried both Churchill and Roosevelt. In May 1940, soon after the German conquest of Denmark, Britain occupied Iceland. The United States

acted to protect the North Atlantic the following year. On 9 April 1941, Secretary of State Cordell Hull signed a defense agreement with Free Danish authorities under which the Americans guaranteed the security of Greenland in exchange for broad authority to construct air bases and other facilities on the island. Americans feared in particular that a German attack on the cryolite mine at Ivigtut in southern Greenland would disrupt the supply of a metal crucial to the production of Canadian aluminum, which American aircraft manufacturers needed to build planes. Hoping to free British forces in Iceland for more pressing military requirements elsewhere, the United States also accepted on 1 July 1941 Iceland's invitation to take over its defense. Engineer troops initiated American base construction efforts on both Iceland and Greenland.

Base construction in the harsh climates of the North Atlantic, where ice and snow could interfere with winter work and supply, generally proved more difficult than did the construction jobs in the island and mainland territories to the south, but the engineers pursued the northern work with no less vigor. Major Bruton arrived on Newfoundland in mid-October 1940 and, using local workmen, quickly began building temporary housing outside Saint John's, the island colony's capital. Construction began at Fort Pepperrell, destined to become the major American installation protecting that city, in the last days of 1940. Located on a rocky coastal hillside, the post would eventually accommodate 5,500 troops. In March 1941 work got under way at Fort McAndrew, located 80 miles to the west across the Avalon peninsula. This post protected the large air and sea base that the U.S. Navy built at nearby Argentia.

At the war's outset, Newfoundland's Gander Field appeared adequate to meet the needs of both Canadian and American military aircraft. The Canadians operated this field during the war, although U.S. troops assisted with maintenance. The Corps of Engineers supplemented Gander by building Harmon Field at Stephenville on Newfoundland's west coast. Originally planned as an emergency landing field, the site was expanded beginning in 1942 into a permanent field with facilities for 2,800 troops and four tanker anchorages. The Air Corps judged Harmon to have 10 percent

Pavers work both ends of a 25-foot-wide slab on Runway 2 at Harmon Field on Newfoundland's west coast.

clearer weather than Gander, and it eventually became the primary American air ferry landing site on the island.

Beginning in April 1941, a consortium of four American contractors led by two Minnesota firms undertook the bulk of the Newfoundland work. In a pattern typical of Atlantic base construction efforts, the contractors recruited most of their labor locally but imported the bulk of the materials they used from the United States. An administrative shift occurred in June 1941 when the Eastern Division was reorganized as the Caribbean Division and the Corps of Engineers placed the Newfoundland District under the North Atlantic Division. By the time the Corps' construction efforts in Newfoundland were completed in April 1943, the cost of its projects there amounted to $60.3 million, including $750,000 worth of materials lost at sea.

Elements of the 21st Engineers, the Army's first specialized airfield construction regiment, initiated base construction in both Iceland and Greenland. Engineer troops arrived in Greenland in July 1941 with the first shipment of United States forces there, and they initially concentrated on erecting housing and anchorage facilities. The arrival in September of civilian construction crews provided by two of the contractors already-at work in Newfoundland enabled the

Planes parked at Bluie West 1 Airfield, the Army's primary Greenland base, July 1942.

engineer troops to concentrate on the construction of the primary Greenland field, code named Bluie West 1, located at the head of a fjord in the southwestern part of the island. That winter, troops and civilian workers alike lived in prefabricated buildings erected a few feet off the ground. Twelve-seat latrines, blasted out of the frozen soil and sanitized weekly by spraying with oil and igniting, served each company. Fortunately, the civilian workers had been recruited from an office in northern Wisconsin and were accustomed to cold winter weather.

By 1943 the field at Bluie West 1 would include a 6,500-foot concrete runway and a 5,000-foot asphalt strip. As early as September 1941, however, troops began laying pierced-steel landing mat on a 3,500-foot temporary runway, an early use of this technology. The companies of the 21st Engineers in Greenland sailed back to the United States in June 1942, and civilian crews replaced them. Directed first by North Atlantic Division area engineers and then, after December 1942, by a new Greenland District, the contract workers also built the Bluie West field on Greenland's west coast just north of the Arctic Circle and the Bluie East 2 field on the island's eastern coast at Iceland's latitude. Construction progressed year-round despite delays caused by shipping

Bluie East 2 Airfield nestled at the foot of Greenland's eastern coastal range

problems and winter storm winds which reached 165 miles per hour. By the end of 1943, the Army had 5,300 troops in its Greenland garrison.

While the elements of the 21st Engineers that landed in Iceland in August 1941 comprised the first Army engineer contingent there, they arrived a month after a 4,100-man U.S. Marine force. The Americans joined a 24,000-man British garrison that had already met its housing needs and developed air bases at Reykjavik, the capital, and Kaldadharnes, 35 miles to the southeast. The 41 bombers and 9 fighters at these fields protected the island and adjacent Atlantic shipping lanes, but when 30 American planes joined them in August 1941, the fields became decidedly crowded. The air strength was essential, however, for Iceland lay within range, albeit barely, of the 60 to 90 German bombers based in Norway.

Iceland Base Command Engineer Lieutenant Colonel Clarence Iry directed both Army and Marine troops in erecting the housing that would be needed by a rapidly growing American garrison. He was aided in 1941 by the British contribution of some corrugated-iron-roofed Nissen huts and the contract labor needed to erect them. His task was further eased the following year when the British evacuated almost

all of their garrison, leaving their housing behind. However, as American troop strength in Iceland grew by early 1943 to 41,000, roughly double the size of the departing British contingent, additional building was required.

As elsewhere in the Atlantic, the engineers' most important task in Iceland was airfield construction. Finding the existing fields too small for the volume of air traffic expected and unsuitable for heavy B-24 bombers, the 21st Engineers began in 1942 the construction near Keflavik of the new Meeks Field for bombers and an adjoining fighter base, Patterson Field. American civilian construction workers joined the effort in May, but they were replaced by two Navy construction battalions later in the year. The fighter base progressed quickly, and two of its three runways could accommodate the Eighth Air Force fighter planes that landed in Iceland en route to Britain in July 1942. Meeks Field opened the following March with the landing of a B-18 carrying Iceland Base Commander Major General Charles Bonesteel. Paving was complete at both fields by August 1943. U.S. Army engineers also expanded the asphalt runway at the British-built field near Akureyri, Iceland's second largest population center located on the north side of the island, making it available to medium bombers.

Despite the heavy workload, engineer soldiers who spent several years in Iceland grew tired of their isolation and bleak surroundings. The officers of one engineer battalion sought to combat the soldiers' boredom by issuing an ample supply of harmonicas.

Soon after the United States entered the war, the War Department decided to deploy Major General Carl Spaatz's Eighth Air Force to Britain. This put the North Atlantic facilities constructed by the Corps to an early test. Radioing from Bluie West 1 in Greenland while crossing the Atlantic in mid-June 1942, Spaatz ordered the movement to begin. The P-38 and P-39 fighters, piloted by combat crews that had been given special training in long-distance flying, were escorted by the longer-range B-17 bombers. With stops at the Canadian-built base at Goose Bay in Labrador, Bluie West 1 in southern Greenland, and Reykjavik or Keflavik in Iceland, the planes could fly from the new Presque Isle field in northern Maine to Prestwick Field in Scotland with no leg of the journey longer than 850 miles.

Use of the northernmost Bluie West 8 field in Greenland involved a l,000-mile hop from Goose Bay but provided an alternate landing site when the weather was bad in southern Greenland. A few planes arrived at Bluie West 8 from the Western U.S. via the Crimson route, a line of fields stretching from Manitoba to Baffin Island in northern Canada that the Canadians and the North Atlantic Division of the Corps built in 1942 and 1943. All told, 920 warplanes attempted the North Atlantic crossing during 1942, and with the aid of the fields built by the Corps, 882, or roughly 95 percent, arrived safely. Air ferry traffic peaked in 1944 when some 5,900 planes successfully crossed the North Atlantic.

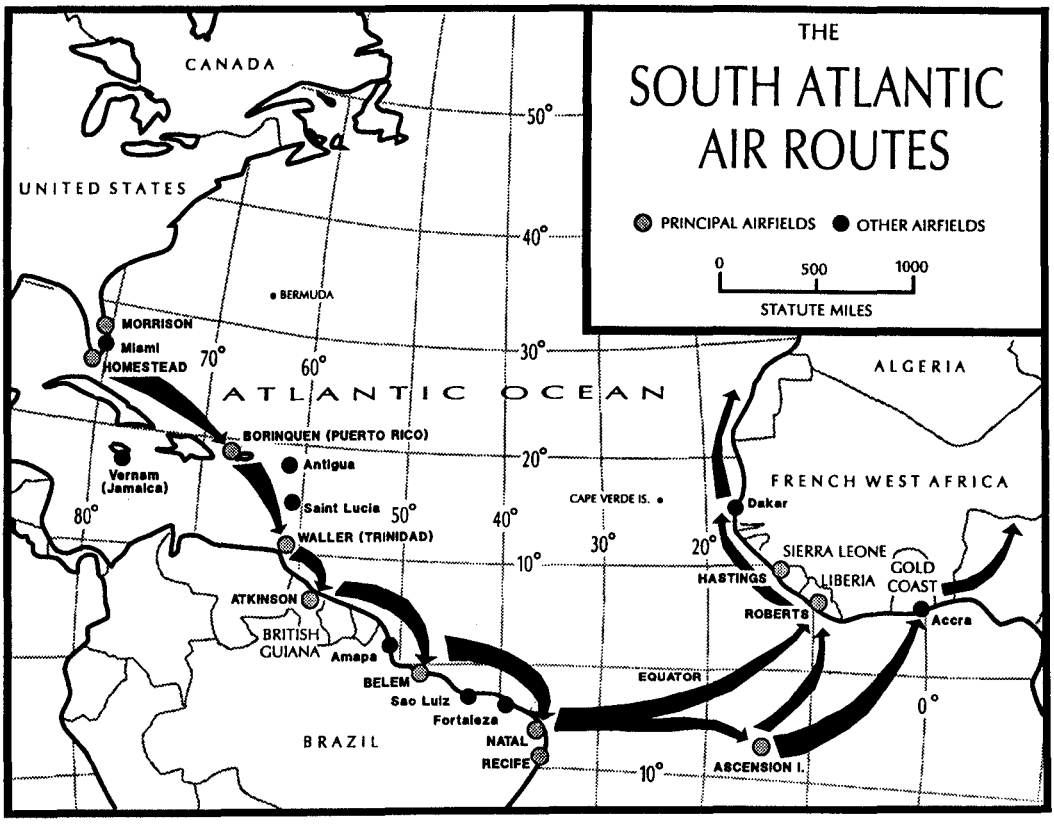
Bermuda, a small British island territory located just 600 miles off the North Carolina capes, anchored the center of the United States' Atlantic defenses. The dearth of land on the 21-square-mile island group led the Corps to build Kindley Field on some 29 million cubic yards of dredged coral

Kindley Field, Castle Harbor, Bermuda, built primarily on dredge fill, April 1942.

and fill in Castle Harbor. A contractor's dredge boat began work in March 1941 and Jacksonville District's hydraulic dredge *Welatka* **joined the effort that summer. While an emergency runway was ready by July 1941, the contractors did not complete the last of the three permanent runways,**

which were 8,300; 5,800; and 5,000 feet long, respectively, and the field's supporting facilities until August 1944. The contractors, who employed some 3,000 workers on Bermuda, also built housing facilities for 2,700 men at the 270-acre Fort Bell and for another 625 at the U.S. Navy's new Bermuda naval air station. While Kindley Field quickly became one of the Corps' largest Atlantic airfield projects, it was not used at first as an air ferry station due to Portugal's refusal until December 1943 to permit Allied planes to land in the Azores.

Like the North Atlantic bases, the facilities built by the Corps in the Caribbean and South America supported both the military security of those areas, challenged early in the war by German submarines, and the ferrying of aircraft across the Atlantic. American airfield construction began in the British possessions of Antigua, Saint Lucia, Trinidad, and British Guiana in January and February 1941 and in Jamaica in May. The Corps also assumed responsibility for the construction of Borinquen Field, Puerto Rico, from the Quartermaster Corps in January 1941. Unlike Greenland and Iceland where engineer troops would initiate work that



South Atlantic Air Routes

summer, civilian contractors undertook the major Caribbean construction tasks from the start.

The island of Trinidad, strategically positioned just north of Venezuela at the southern gateway to the Caribbean, received the largest wartime Army construction effort in the region, outside of the Canal Zone. Waller Field and the adjoining Army post of Fort Read, occupying a 17,000-acre tract in the interior of the island, became the principal Army base in Trinidad. After removing a thick canopy of jungle vegetation, crews of the Walsh Construction Company and the George F. Driscoll Company opened a temporary runway on Waller Field in the summer of 1941 and two mile-long concrete runways the following January and June. They also erected housing for 8,500 men and 51 aviation-fuel storage tanks. The heavy demand for local labor caused by this project and the simultaneous construction of a large Navy facility on the island led the Corps contractors to import 2,000 workers from the neighboring island of Barbados.

While the $52.4 million Waller Field was the most expensive Atlantic base built by Corps contractors, it did not meet all the needs of the burgeoning Trinidad garrison. The Corps thus had its Trinidad contractors begin work in December 1941 on a 5,000-foot runway at Edinburgh Field 12 miles to the southwest and in 1942 on a similar runway at adjoining Xeres Field. They completed the new runways in June 1942 and April 1943. Engineer contractors also oversaw the construction of coast artillery positions and base facilities at Chacachacare and Monos islands between Trinidad and Venezuela. The Caribbean Defense Command took over supervision of the Trinidad and Jamaica Districts in April 1942, leading the Corps to abolish its Caribbean Division at that time.

Construction of $10–16 million fields in the other British sites in the Caribbean followed largely similar timetables, with Corps contractors opening temporary runways in Antigua, Saint Lucia, and British Guiana in June 1941 and concrete runways the following year. A Minneapolis firm completed two mile-long concrete runways at Antigua's Coolidge Field by September 1942, but the area engineer there directly hired the workers who built the housing for 2,200 men completed the following May. Minder Construction

of Chicago finished the two 5,000-foot concrete runways at Beane Field near the African-American community of Vieux Fort, Saint Lucia, even more quickly, opening them in February and April 1942. The engineers at Saint Lucia made full use of locally available materials, employing molasses as a stabilizing agent for the surface of the temporary runway.

While work on the other islands proceeded smoothly, progress at Vernam Field on Jamaica lagged. The Jamaica district engineer found the joint venture responsible for the first year's construction there to be inefficient and in April 1942 replaced it with the McLane Corporation. Three runways, a 6,000-foot concrete strip and two roughly mile-long asphalt runways, formed the center of this field designed to house a heavy bombardment squadron.

Local workmen construct a runway at Atkinson Field, British Guiana.
(U.S. Air Force, National Air and Space Museum, Smithsonian)

The relatively large Atkinson Field, located 26 miles south of British Guiana's capital of Georgetown, included housing for 4,000 men, three permanent hangars, and a 7,430-foot main concrete runway. A lack of adequate land transportation routes hampered the construction effort. Boats carried rock for the project downstream from a quarry 75 miles up the Demerara River, and other construction supplies came upstream from Georgetown.

The United States added several bases in the Caribbean area after it entered the war. Under agreements negotiated with the exiled Netherlands regime, U.S. Army ground and air troops went to Surinam in November 1941 and to the Dutch Caribbean islands of Curaçao and Aruba off Venezuela in February 1942. Using the Walsh–Driscoll joint venture, the Trinidad district engineer expanded Zandery Field in Surinam, which Pan American had built in 1941, and had the KLM runways at Hato Field on Curaçao and Dakota Field on Aruba resurfaced and extended to 5,000 feet, roughly doubling their length. In June 1942, Cuba furnished a 2,000-acre tract 30 miles southwest of Havana, and the Cayuga Construction Company, under contract with the Corps' North Atlantic Division, built Batista Field there. The $17.4 million air base featured two 7,000-foot runways and housing for 3,500 men. A final Atlantic base site was added in March 1943 when the governor of French Guiana shifted his allegiance to the Allies and invited American troops into the territory. During the next ten months, the Trinidad district engineer had a 6,000-foot concrete landing strip built at Rochambeau Field in that territory at the behest of the commander of U.S. Forces, South America. Fifty emergency landings would be made at this field during the last year and a half of the war.

The airfields that Pan American constructed in northern Brazil formed, with the Caribbean bases, an essential link in the South Atlantic air ferry route. Construction began at Amapá, Belém, and São Luís in the underdeveloped regions near the mouth of the Amazon in the spring of 1941. At São Luís, teams of oxen hauled away uprooted trees and 1,000 burros carried off dirt in raffia panniers. Work began that summer at Natal and Recife on Brazil's eastern tip, but with labor and equipment more readily available there, it progressed more rapidly. Prior to March 1942 when Brazil first authorized the Corps to send Lieutenant Colonel Manuel Asensio to oversee Pan American's work from within the country, the commercial firm received only such Corps support as its offices in New York and Washington could provide. Federal funds allotted to this work, moreover, were meager. Nonetheless, by the time of Asensio's arrival, Pan American had readied a good 5,000-foot runway at Natal,

along with temporary runways at half a dozen fields along Brazil's northern coast.

The Corps of Engineers substantially expanded its Brazilian construction effort in late 1942 and 1943. To accomplish its growing mission, it created a Recife District under Colonel Alvin Viney in December 1942, four months after Brazil's entry into the war. With the comparatively small sum of $44.6 million, the district produced by the end of 1943 three modern fields at Belem, Natal, and Recife, each featuring

New construction at Val-de-Caes Field near Belem, Brazil, April 1943.
(U.S. Air Force National Air and Space Museum, Smithsonian)

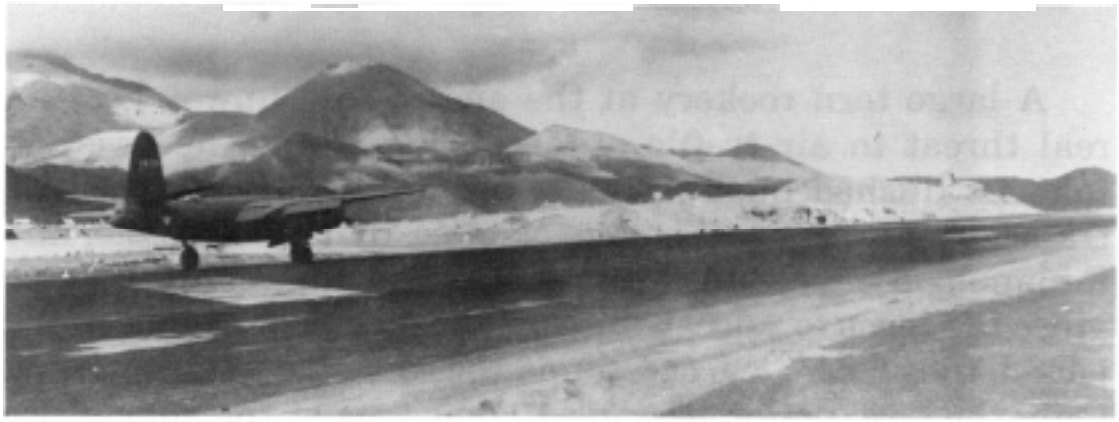
a pair of 6,000-foot runways; new airfield facilities at four other locations on the north Brazilian mainland; and, most impressively, a 6,000-foot asphalt runway on Fernando de Noronha, a harborless island some 200 miles northeast of Natal along the 1,600-mile transatlantic route to Africa. The fields built by the Recife District not only met the needs of the Army but also provided most of the air facilities employed by the U.S. Navy in Brazil. The district also constructed housing, office, and medical facilities in Brazil, including the headquarters of Major General Robert Walsh's U.S. Forces, South America, and a 150-bed hospital, both in Recife.

While airfields in the British western African colonies of Sierra Leone and the Gold Coast could receive Air Corps planes crossing the South Atlantic, the Americans arranged

Local workers complete the thatched roof of enlisted men's barracks at Roberts Field, Liberia, May 1943. *(U.S. Air Force, National Air and Space Museum, Smithsonian)*

in 1941 to build an additional airfield in Liberia. Pan American received the contract to build Roberts Field adjacent to a large Firestone rubber plantation 50 miles east of Monrovia, the Liberian capital, but it subcontracted most of the work to the Firestone Plantation Company. By early 1943 a largely Liberian workforce had laid two 7,000-foot paved runways in an area previously covered by thick jungle vegetation.

Early in 1942 Britain authorized the United States to build an airfield on Ascension Island, a 34-square-mile mass



A Martin B-26 Marauder at Wideawake Field, on bleak Ascension Island, May 1943. *(U.S. Air Force, National Air and Space Museum, Smithsonian)*

of volcanic rock that pierced the surface of the South Atlantic conveniently close to the midpoint of the flight from Natal to Africa. Colonel Robert Coughlin brought his 38th Engineers to the island in February 1942 to build Wideawake Field. One of his battalion commanders was Major Frederick Clarke, a future Chief of Engineers. Carrying supplies and equipment to shore by barge or lighter on this harborless island, the regiment began construction of the 6,000-foot runway in mid-April and opened it to traffic three months later.

Soldiers on Ascension Island could use scarce potable water for drinking and washing, but not fir laundry. (U.S. Air Force, National Air and Space Museum, Smithsonian)

A large tern rookery at the end of the runway posed a real threat to air traffic at Ascension Island, however, as takeoffs flushed huge flocks of birds into flight paths. Air transport officers used smoke candles, dynamite blasts, and a planeload of cats in a series of unavailing efforts to convince the terns to relocate-strong-beaked booby birds on the island, the officers learned, found the cats an appetizing treat. Only the destruction of some 40,000 eggs at the suggestion of ornithologist James Chapin whom the Air Force finally brought in from the American Museum of Natural History,

induced the birds to leave the runway area and join other colonies on the island. The engineers derived some value from the birds, however, as they used guano bricks in the construction of installation housing.

The South Atlantic air route from Miami, Florida, to the Middle East, using fields in the Caribbean, Brazil, and Africa, opened in September 1941 when Lieutenant Colonel Caleb Haynes used it to fly a B-24 carrying Major General George Brett, Chief of the Air Corps, to Cairo, Egypt. Although this trip covered roughly 10,000 miles, far longer than the 2,700-mile North Atlantic route from Maine to Scotland, the better weather on the southern route and its easier access to the busy theaters of operations in the Mediterranean, Eastern Europe, and Asia led it to carry more air traffic across the ocean than did its northern counterpart in the early years of the war.

After the Japanese disrupted the Pacific air supply route passing through Midway and Wake islands in the autumn of 1941, the Air Corps routed airplanes destined for the Far East over the South Atlantic, Africa, and South Asia to Australia. The Japanese seizure of Singapore in February 1942 broke the connection, however, and made a South Pacific route essential. Thereafter, planes ferried across the South Atlantic reached destinations in China, India, the Soviet Union, and the Mediterranean. When winter weather closed the North Atlantic air route, planes that had crossed the Atlantic from Brazil went on to Britain from North Africa.

The Air Corps used the South Atlantic air ferry route in 1942 to deliver 240 planes to the Soviets under the American lend–lease program. The nearly two dozen B-24Ds which began the Air Corps' European combat with a June 1942 bombing raid on Rumania's Ploesti oil fields reached the area over this route as well. President Roosevelt used the Corps' South Atlantic fields when traveling to and from the Casablanca and Teheran conferences in January and November 1943. The South Atlantic ferry traffic, always heaviest in winter, peaked in March 1944 when a monthly total of 1,675 Army tactical planes passed eastward through Natal.

The Corps of Engineers' little-heralded Atlantic air base construction work during World War II helped secure the

western hemisphere from attack. Protecting islands and transoceanic routes of vital importance to the security of the nation, the bases facilitated the shipment of planes and air cargo to Europe, Asia, and Africa and provided support for antisubmarine patrols in the Atlantic. Although the 16 February 1942 German U-boat attack on oil refineries at Aruba and the brief establishment of German weather-data stations in isolated locations in Greenland and Labrador represented the only Axis incursions from the Atlantic onto the hemisphere's lands, heavy German submarine activity made the defense of the area imperative for the United States. Those attacks caused the loss of 270 ships in the Caribbean area in 1942, sending 1.25 million tons of cargo to the bottom. While the Navy conducted most of the antisubmarine campaign, Army planes also chalked up kills from new bases in Puerto Rico and Ascension Island.

Beyond their immediate value, moreover, the Atlantic bases initiated the expansion of American defense installations beyond the United States and its territories. The concept of building more advanced bases for the extension of American power overseas in an age in which air power gained new importance grew from the Atlantic bases of the early 1940s to a network of American installations in foreign territories around the globe. The Corps' valuable work in creating these wartime defensive bases led it to be called upon again after the war for this important construction assignment.

Sources for Further Reading

Stetson Conn, Rose Engelman, and Byron Fairchild's *Guarding the United States and Its Outposts* (Washington, 1964) surveys the wartime development of U.S. Army bases and garrisons in the western hemisphere.

A second book by Conn and Fairchild, *The Framework of Hemisphere Defense* (Washington, 1960), examines the diplomatic and strategic underpinnings of that base development and devotes greater attention to Brazil.

An account of the wartime air ferry and transport operations which those bases facilitated may be found in Volume 1, *Plans and Early Operations* (Chicago, 1948) and Volume 7, *Services Around the World* (Chicago, 1958) of W. F. Craven and J. L. Cate, *The Army Air Forces in World War II.*