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Tracing the remains of World War II on Biak Island

Sonya Kawer and Dylan Gaffney

Abstract

Located in the northernmost part of what is today Papua Province and along the Pacific rim, Biak Island was used as a base for the Japanese and American armies during World War II (WWII). Archaeological surveys have now been conducted around several districts of Biak Island, designed to build a narrative about WWII from the ground up, by examining the distributions of the remains found during fieldwork. The wide array of bunkers, aeroplanes, and amphibious vehicles, and the remains of a now-submerged ship, as well as local toponyms in several areas, make it clear that Biak was a crucial location during WWII, and that the events of the war continue to be resonant for Biakers who live in the area today. It is concluded that the Japanese and American armies used almost the entire land surface of Biak's south-eastern coast as a major base camp. The high value of Biak during WWII was in part related to its location at the crux of Asia and the Pacific, and its geopolitical relevance, especially as a location to establish control in the Pacific theatre.

Abstrak

Terletak di bagian paling utara dari wilayah yang sekarang dikenal sebagai Provinsi Papua, pulau Biak pada masa lalu digunakan sebagai pangkalan tentara Jepang dan Amerika dalam perang dunia II (PD II). Survei arkeologi telah dilakukan di beberapa distrik di pulau ini untuk menarasikan sejarah kependudukan selama perang dunia II ditempat tersebut dengan menganalisis sisa – sisa perlengkapan perang yang masih ditemukan di lapangan. Distribusi bunker, sisa pesawat terbang, kendaraan amfibi, dan sisa-sisa kapal yang tenggelam, serta toponimi yang ditemukan di beberapa titik, menjadi bukti kuat akan pentingnya pulau ini pada masa lalu selama perang dunia II, dimana hampir seluruh bagian dari pulau ini digunakan sebagai markas utama kedua negara tersebut di masa lalu. Digunakannya pulau Biak sebagai salah satu markas besar pada perang dunia II diperkirakan didasarkan pada letak geografisnya yang berada di titik pertemuan antara Asia dan Pasifik, serta relevansi geopolitik terutama sebagai lokasi untuk membangun kontrol di kawasan Pasifik.

Introduction

World War II (WWII) was a major conflict in global history that occurred from 1939 to 1945. It was driven by ideological divergences between the several countries in Europe, the Middle East, America, and Asia, and resulted in political and economic instability in many parts of the world (Mawdsley 2009, 3–10; Weinberg 2014, 1–5). In the Pacific, the United States of America, along with its Australian, British, Dutch, Canadian, and New Zealand allies, fought the Japanese Empire for regional hegemony as each side worked to control strategic archipelagos. Cenderawasih Bay (then called Geelvink Bay, part of the Dutch East Indies) was one such archipelago and Biak Island served as a regional headquarters for Japanese and, later, Allied troops, who used the island to exert aerial control over the region (Beevor 2012, 12–45). Biak Island's strategic location in a sheltered bay at the crux of Island Southeast Asia and the Pacific made it an ideal place for the two superpowers to prepare tactics and to implement bombing runs (Smith 1953, 289–394).

An archaeological survey undertaken in 1997 by the Balai Arkeologi Papua¹ (Papua Centre of Archaeology; then called Balai Arkeologi Jayapura) produced the material evidence for Cenderawasih Bay's crucial contribution to the Pacific theatre in the form of military equipment and several buildings used by the Japanese and American armies, found scattered across almost half of Biak Island. In particular, artefacts relating to WWII were found in several locations in Ruar and Sepse villages. In 2016, a Papua Centre of Archaeology research team conducted a further survey, which identified Japanese and American military equipment in several districts in the Biak–Numfor Regency (Balai Arkeologi Papua 2016). These areas included Kota Biak (Biak Town), Biak Timur (East Biak), Oridek, and Kepulauan Padaido (the Padaido Islands). The research in 2016 also succeeded in cataloguing the remains of two major Japanese caves—Binsari in the Sumberker village area and the Japanese heritage cave area in Samofa village—which are located about 5 km from Biak Town. The results of these provisional 2016 surveys and artefact analyses are the focus of this chapter, which first provides historical information about Cenderawasih Bay's role in the Pacific theatre, before seeking to build a picture of Biak's wartime history 'from the ground up', using the archaeological remains as a guide. This picture is then contextualised by wartime archaeology from the wider Asia-Pacific region.

The Pacific theatre

The New Guinea campaign

The Japanese Empire had gained significant ground in China in the years leading up to WWII and held a League of Nations Mandate over several islands in the western Pacific. This territorial expansion was used as a platform to rapidly attack a wide array of Western-controlled/allied nations in Southeast Asia and the Pacific between December 1941 and January 1942, including Hong Kong, French Indochina, Malaya, the Philippines, Guam, the Dutch East Indies, the Australian territories of Papua and New Guinea, and the British Solomon Islands (Rottman 2005). Japanese expansion, although tied to German and Italian aggression in Europe, Southwest Asia, and North Africa, was stimulated by the empire's growing industrial strength and demand for access to commodities like oil, rubber, and tin (Copeland 2011).

1 Bahasa Indonesia words are underlined at first mention.

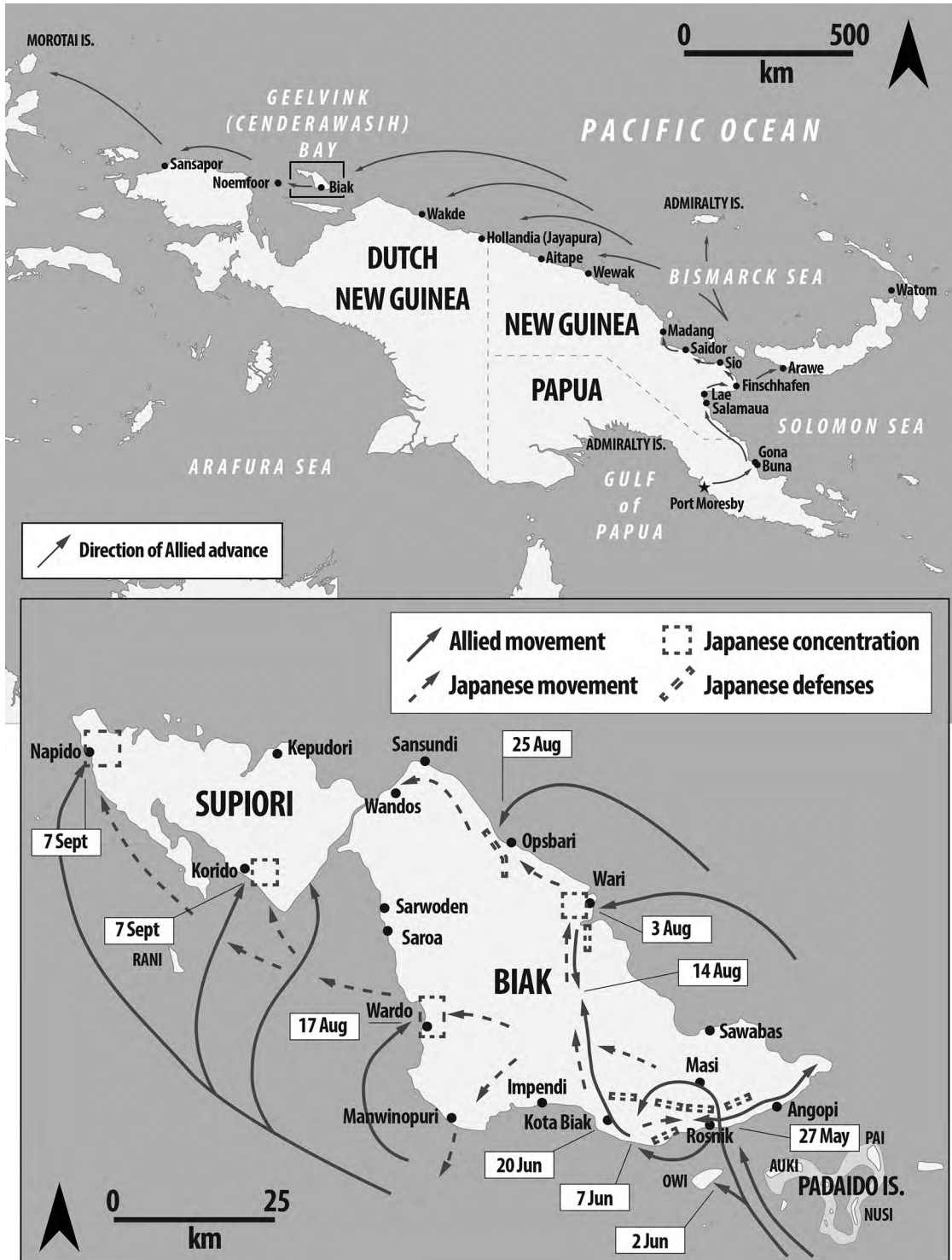


Figure 14.1: The New Guinea campaign.

Notes: above: key sites of conflict during WWII, including Biak in what is now Cenderawasih Bay; below: the Battle of Biak, showing dates of Allied movements and Japanese retreats in 1944.

Source: Dylan Gaffney, redrawn from MacArthur (1966).

New Guinea was quickly identified by Douglas MacArthur, leading the Allied forces from Australia, as a key objective for the recapture of the Pacific. This started with the successful defence of Port Moresby in May 1942, with Allied troops moving westwards to retake Buna-Gona (via the Kokoda track) in January 1943, Lae, Salamaua, and Finschhafen (September–October 1943), Saidor and Sio (January–February 1944), Madang (February–April 1944), Wewak and Aitape (April–May 1944), Jayapura (then Hollandia, April–June 1944), and Wakde (May 1944) along the northern coast of New Guinea (see Figure 14.1). These assaults were increasingly rapid and long-distance, but the tempo was ultimately constrained by the location of Allied airfields on New Guinea and in the Bismarck Archipelago that could support naval operations (Bernstein 1999, 13). As the Allies moved increasingly westwards, they needed new airfields to support their advance.

The Battle of Biak

Biak had been captured by the Japanese in May 1942 and, apart from some early resistance in the form of a guerrilla group that had developed from a local cargo cult (Steenbrink 2010, 316), the island was administered without contest by the Japanese. The development of Biak's defences and infrastructure only started in late 1943 when the Japanese began to realise its potential as a strategic platform to control New Guinea. By 1944, when the Allied fleet advanced towards Cenderawasih Bay (Figure 14.1), it was host to three Japanese airfields at Mokmer, Sorido, and Bosnek (also called Borokoe), and around 12,350 personnel (Bernstein 1999, 20, 32, 38). The island's coral platforms, in contrast to the soft alluvial ground around northern New Guinea, made Biak the most ideal air base between the Bismarck Archipelago and Island Southeast Asia.

The sustained Allied bombing of Biak commenced on 28 April and continued into May of 1944, facilitated by B-24 bombers flying from the Markham Valley and the Admiralties Islands. The first week of May saw intense Japanese retaliation by air, combatted by Allied fighters dispatched from Jayapura, but resistance soon dissipated (Bernstein 1999, 34). From 27 May to 31 August, Allied ground troops numbering 28,580 personnel, supported by 7307 air troops, and offshore naval units, recaptured Cenderawasih Bay, first in the Battle of Biak and then in the Battle of Noemfoor (Bernstein 1999, 35). During the Battle of Biak, the Allies initially underestimated the Japanese numbers because, under the command of Colonel Kuzume Naoyuki, their troops had strategically fallen back to occupy caves and pillboxes around the airfields, but gradually the Allies claimed the island in a bitter contest that lasted several months. According to Allied reports written after the conflict, the core Japanese positions consisted of three cave systems connected by tunnels that could shelter about 1000 people, and these were further protected by the presence of hundreds of smaller entrenched caves along coral ridgelines (Ford 2009). In part, the Allies overcame these defences by pouring gasoline into the windward cave entrances and igniting them with grenades to starve the Japanese of oxygen. The large-scale loss of life and subsequent taking of trophies, including human skulls of enemy combatants, suggests that, by this point in the New Guinea campaign, soldiers on both sides had truly dehumanised each other (Harrison 2006; Scheurer 2015, 10).

The recapture of Biak and its three airfields allowed the Allies to then push into Island Southeast Asia and to run bombing raids to support the recapture of Micronesia. Biak therefore marked a turning point in MacArthur's offensive drive towards the Philippines and eventually Japan itself (Bullard 2010, 28). However, although the occupation of Biak was documented by official war historians (e.g. U.S. Army 41st Division 1944), through interrogations of prisoners of war (e.g. Naval Analysis Division 1946), in personal accounts by individual officers (e.g. Riegelman 1955), and in photographic records (Figure 14.2), the material history of these events, and of life on the island from 1942 to 1945, remains untold. The distribution of wartime remains on Biak and surrounding islands requires documentation because this heritage is now profoundly important to how present-day Biakers define their recent

history. Moreover, the island has become an important focus for the repatriation of human remains by both Japan and America. As such, the chapter now turns to the archaeological evidence of wartime occupation in the form of architectural remains and artefact distributions.

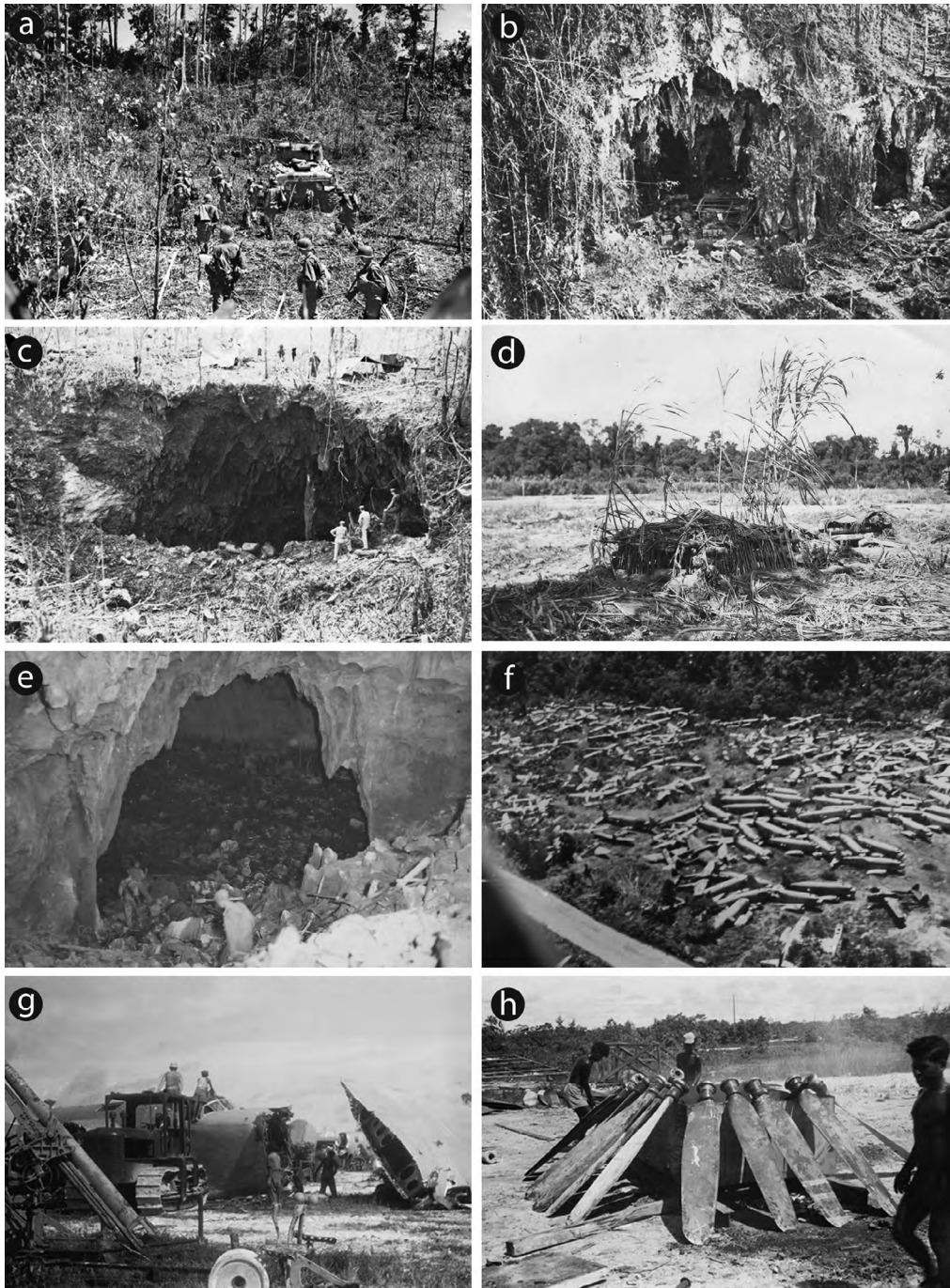


Figure 14.2: The Battle of Biak and its aftermath.

Notes: (A) American troops and Sherman tank moving to attack ridge north of Mokmer, 1944; (B) entrance to 'East Caves' east of Mokmer; (C) entrance to 'West Caves' north of Mokmer; (D) Japanese pillbox; (E) American infantry enter Japanese cave on Biak; (F) wrecked bombers at Biak; (G) demolition of American bombers at Sorido airfield, May 1948 (TM-10029866); (H) propellers at Sorido prior to being melted down, 1949 (TM-10029880).

Source: (A)–(E) from the Centre of Military History Archive; (F)–(H) from the Tropenmuseum.

Archaeological sites around south-east Biak

Cenderawasih Bay is host to four large islands: Biak (2455 km²), Supiori (634 km²), Numfor (335 km²), and Yapen (2278 km²). Biak and Supiori effectively form one landmass, separated only by a small channel, less than 100 m wide and today connected by road. The bay also features several smaller islands including Num and the Padaido group. On Biak Island itself, the Biak Town, East Biak, and Oridek districts are formed of numerous *kampung* (village neighbourhoods), that run relatively contiguously along the island's south-eastern coastal strip, flanked to the north by uplifted limestone coral reefs, and face the Padaido Islands to the south-east. Of these neighbourhoods, several on Biak have so far been surveyed by the Papua Centre of Archaeology: Anggraidi, Sanumi, Mokmer, Orwer, Saba, Sundry, Wisata Binsari, Fandoi, Sorido, and Syabes. During these archaeological surveys, WWII remains were recorded in the field and classified into two site types: (1) built architecture and (2) scatters of fragmentary military equipment. The following section describes the sites recorded around Biak from six areas—Mokmer, Sorido, Orwer, Saba, Sundry, and the Padaido Islands—to provide a representative account of the wartime archaeology of the island (Figure 14.3).

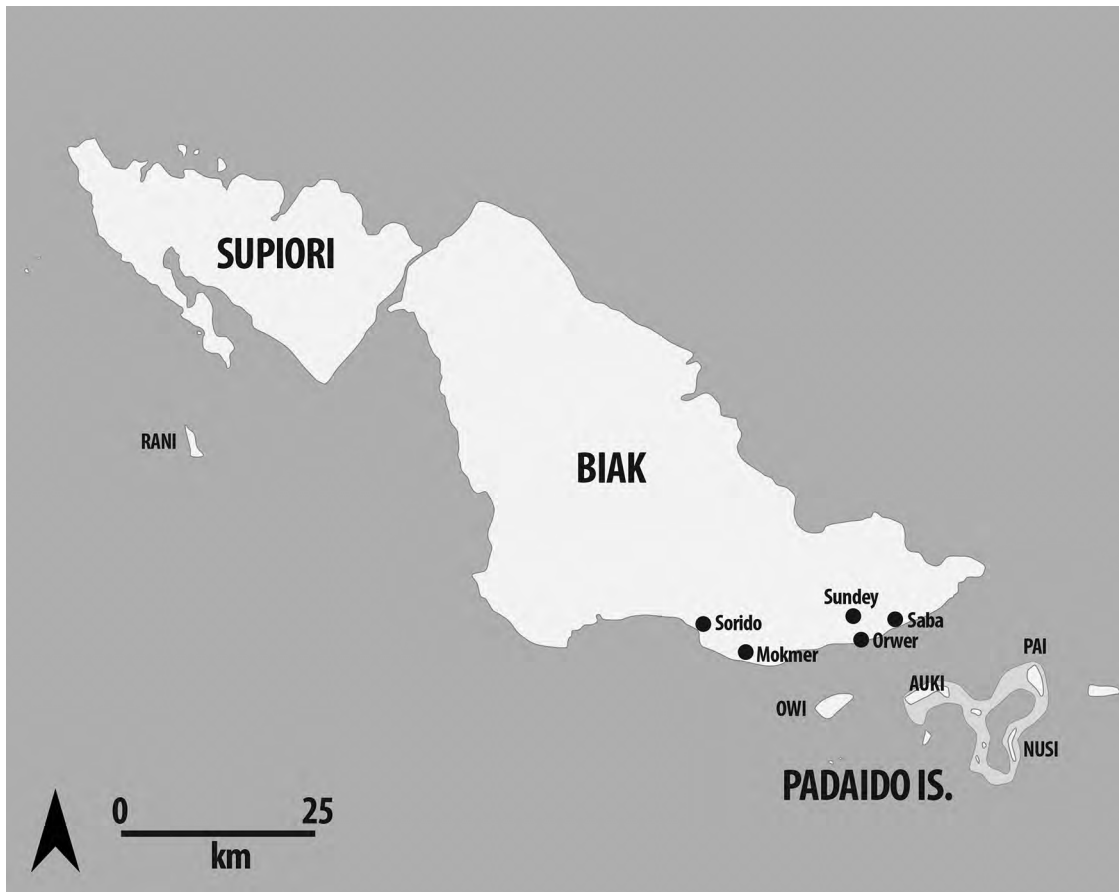


Figure 14.3: The location of survey areas on Biak Island and the Padaido group.

Source: Dylan Gaffney.

Mokmer area

In Biak Town, several sites were recorded around Mokmer and Parai, one of the key strategic landing zones at the Battle of Biak owing to its airfield and defensive position (Table 14.1A). For instance, Mokmer Airfield (S 01° 11'24.0", E 136° 06'27.0") is situated only about 200 m from the present coastline and was the first airfield built by the Japanese (today it is used as an international airport, Frans Kaisiepo International Airport). The original WWII landing strip remains in place but has been extended and widened to accommodate modern passenger jets (Figure 14.4). Farabay, a hill formed of uplifted coral and located to the north of the airfield, was used as a monitoring post by the Japanese army to control Biak, and to support the running of the airfields at Mokmer, Sorido, and Bosnek, and later by the Allies in their naval and air operations around Owi Island (in the Padaido Islands). Allied intelligence maps also record two pockets of caves in the area used for defence by the Japanese; one to the north-west and one to the east of Mokmer Airfield (Figure 14.5). Based on the Papua Centre of Archaeology survey results, there are 14 known bunkers made from natural rock scattered around Farabay Hill, located a few metres from one another. Manggandisapi Cave (S 01° 11'55.7", E 136° 08'37.0") is one such natural cave, part of the eastern pocket of caves, and facing west towards the airstrip (Figure 14.5). It is a small cave with a width of 1.72 m and a height of 1.55 m and was clearly used defensively. Wartime remains were unearthed from this cave, including drinking bottles, broken ceramics, and a part of a soldier's shoes (Table 14.1B; Figure 14.6).



Figure 14.4: Airfields in south-east Biak.

Notes: (A) Borokup Airfield; (B) Sorido Airfield; (C) Mokmer Airfield; and (D)–(F) bunkers in the Mokmer Airfield area.

Source: Photographs by Sonya Kawer.

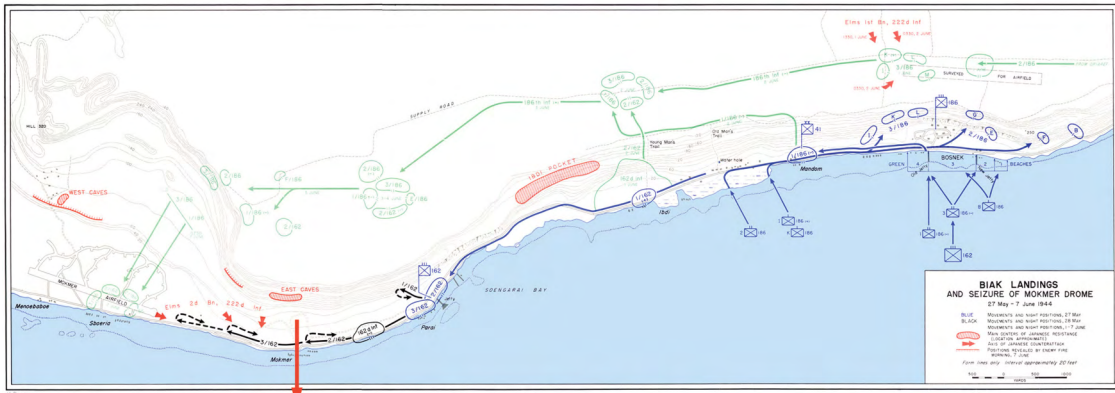


Figure 14.5: Above: Allied intelligence map showing the location of the Japanese-occupied West and East cave systems around Mokmer. Below: Manggandisapi Cave, south of the East Cave system.

Source: Photographs by Sonya Kawer, map from Smith (1953).

Two bunkers have also been recorded just north of Mokmer airstrip. Bunker 1 is located 1 km from the shoreline. The bunker is square and made from metal, facing to the east. Bunker 2 is located a few metres from Bunker 1, with an entrance height of 1.50 m, a width of 0.80 m, and a depth of 3.32 m, placed close to the runway (Figure 14.4).

Binsari in the Sumberker village area and the Japanese heritage cave area in Samofa village represent the two major defensive caves to the west and north of Mokmer. Binsari is a natural cave with a large and spacious chamber. The four walls of the cave contain crevices used to enter the cave. The contents of these caves included bottles, bullets, short buttons, and ceramic fragments (Table 14.1B).



Figure 14.6: Artefacts recovered from wartime archaeological sites on Biak including ordinance, scissors, ceramics, toothbrushes, bullet casings, and glass bottles.

Source: Photographs by Sonya Kawer.

Sorido area

At Sorido, the WWII airfield is still present, but no longer actively in use. In Samofa village, there are several caves and hills that were used as air raid shelters and as gun emplacements by the Japanese. Sorido 1 is a bunker made from a natural cliff, covered by metal building material and located 10 m from the coast. About 15 m from Sorido 1, a rock-shelter that extends 21 m from east to west, faces south and was used as a defence post, evidenced by the remains of weapons and other military equipment found there. Sorido 2 is a raid shelter with an opening 1.5 m in length, 0.8 m wide, and 3.3 m deep.

Orwer area

Orwer village is located in the eastern part of East Biak District. Wartime remains were primarily encountered around caves in the karst, which contained several types of military equipment. At the top of Orwer's karst hill, there is a natural cave called Abyab Mandoryab 1. This cave has a large entrance, 1.40 m high and 1.66 m wide, and it extends 5.11 m in a south-easterly direction. The cave has an uneven floor and is very well lit, although some stalactites are still active. The survey team recorded a military helmet on the cave floor. In Abyab Mandoryab 2 cave, located a few metres from Abyab Mandoryab 1, artefacts included bottles, bullet casings, round plastic from broken oxygen masks, shirt buttons, toothbrushes, cans, plastic boxes, metals, funnels, and army uniforms including helmets and shoe parts.

Sosen Cave is located about 30 m from the Abyab Mandoryab caves. The cave's entrance faces south towards the coast, 0.96 m high, and 5 m wide. Within it were found bullets and explosives.

Saba area

Saba village is located on the coast of Oridek District, facing the Padaido Islands. Five bunkers have been recorded in this area. Bunker 1 (S 01° 09'35.82", E 136° 15'06.4") faces the coast in the south. It was formed by modifying the rock along the coastal strip and breaking into the natural cavity in the limestone (Figure 14.7). The broken opening was then plastered to form a square embrasure (an opening in the bunker from which to shoot) that is 0.65 m high, 1.10 m wide, and 7.00 m long. Inside the cavity, the height of the bunker is 1.50 m. There are seven medium-sized embrasures on either side of the bunker's primary embrasure. Today, the floor inside the bunker is flat, filled with sand and rocks.

Bunker 2 is in line with the first bunker; it was modified from natural boulders. The embrasures are smaller than those of Bunker 1, being 0.50 m high and 0.35 m wide on the eastern side. On the west side, it is connected to a larger embrasure facing the entrance. Bunker 3 is located 7 m from the second bunker, with an embrasure being 1.30 m wide and 0.30 m in height, facing towards the island of Owi at the south-west. The chamber of the third bunker is 3 × 3 m metres. Bunker 4 has two embrasures: one faces to the south-east, being 1.30 m high and 4.10 m wide; the other points to the east, being 0.80 m high and 5.10 m wide.

Bunker 5 is distinct from the first four bunkers, being made from concrete. It is placed in line with Bunkers 1–4, 4 m from the sea. Two embrasures were made with plaster. The first faces south and is 0.30 m high and 0.60 m wide, placed in a low-lying position. The second embrasure is much larger; it faces the south-east, measures 0.50 m high, and 2.10 m wide.

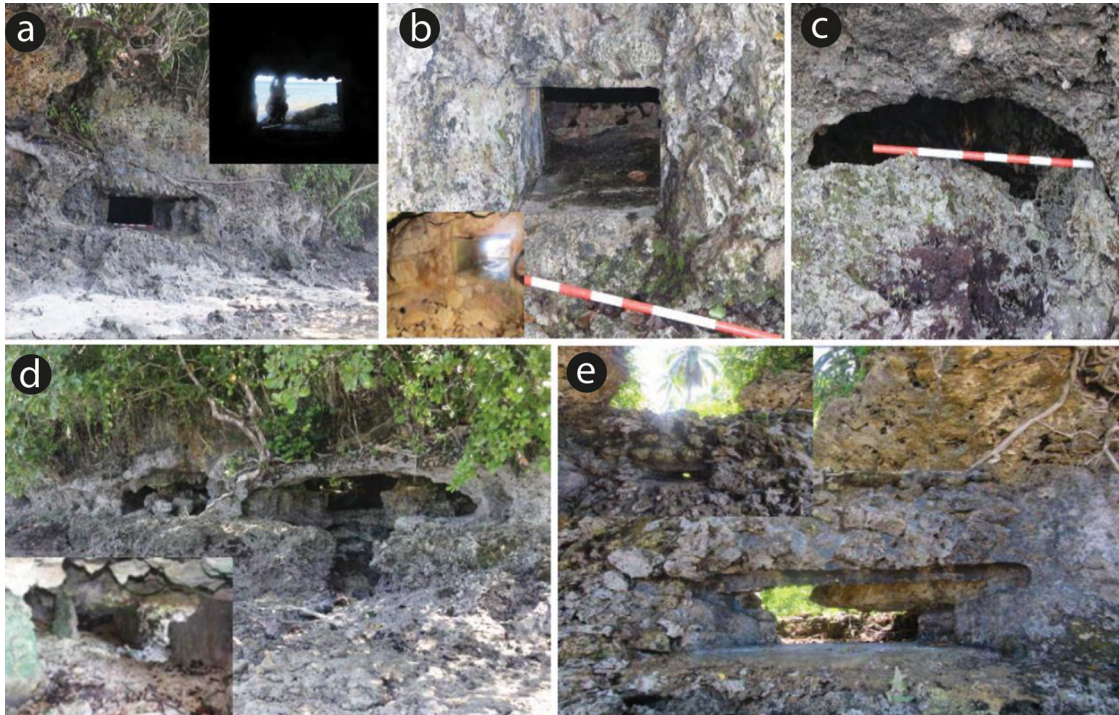


Figure 14.7: Bunkers in the Saba area on Biak Island.

Source: Photographs by Sonya Kawer.

Sunday area

Several caves were also used as Japanese hiding places around Sunday village. Sunday Cave faces north and its entrance, 0.74 m high and 1.26 m wide, is therefore concealed from the coast. The large cave extends 4.9 m into the coral limestone and opens to a second entrance 2.70 m high and 5.00 m wide, facing east. Today, the cave floor is flat and wet, caused by water entering via active stalactites. The archaeological remains distributed on the cave floor confirm its use by the Japanese army during the war. These remains include bottles, cables, drinking glasses, shaving tools, round plastic from oxygen masks, shirt buttons, ammunition, and several pieces of fragmentary metal (Table 14.1C).

These kinds of remains are well known to Biakers who live nearby. For instance, Mr Julianus Masosendifu, a local who lives in Sunday village, found several types of wartime artefacts in the area, including drinking bottles, metal fragments, bullets, shirt buttons, razors, watches, and ceramic marbles. Mr Gerson Rumanasen, another local from Sunday, had collected objects from the forest around the village. These objects include several types of glass bottles in a variety of sizes and two Japanese coins.

The Padaido Islands

The Padaido group consists of several small islands, located between 5 and 45 km south-east of Biak and home to 19 villages. Between the four small islands of Wundi, Urep, Auki, and Nusi is an enormous lagoon and seagrass beds of approximately 530 ha (Kartika et al. 2007, 440). During an archaeological survey for surviving WWII remains, the Papua Centre of Archaeology recorded sites on Auki, Nusi, and Urep islands. On Auki Island were recorded remnants of the former pier, including a 3-m-long wooden pole still embedded in the sea floor (Figure 14.8). On Nusi Island, American-built oil tanks were located, part of a fuel centre to supply military vehicles. Two rusty oil pipelines were found stretching out 100 m into the sea, extending from where the oil tank was once located (S 1° 16'9.455", E 136° 25'0.203"). The pipes were made from metal with a diameter of 0.40 m, with the distance between the two pipes being 1.10 m. In the eastern part of Nusi Island, 10 pier posts emerging from the surface of the water were recorded (Figure 14.8). An aerial bomb was also found in between local people's houses during the survey on Nusi Island and a rusty floating dock was recorded in shallow water between Nusi, Pia, and Pakreki islands (S 1° 15'42.617", E 136° 26'2.436"). On Urep (also known as Ureb, Urip) Island, several WWII remains were recorded, including armoury buildings and four wooden poles, 2.30 m long, embedded into the sea floor about 50 m from today's coast. A former hospital building, 7.15 m × 14.56 m, is also still standing on this island, although its roof has since collapsed.

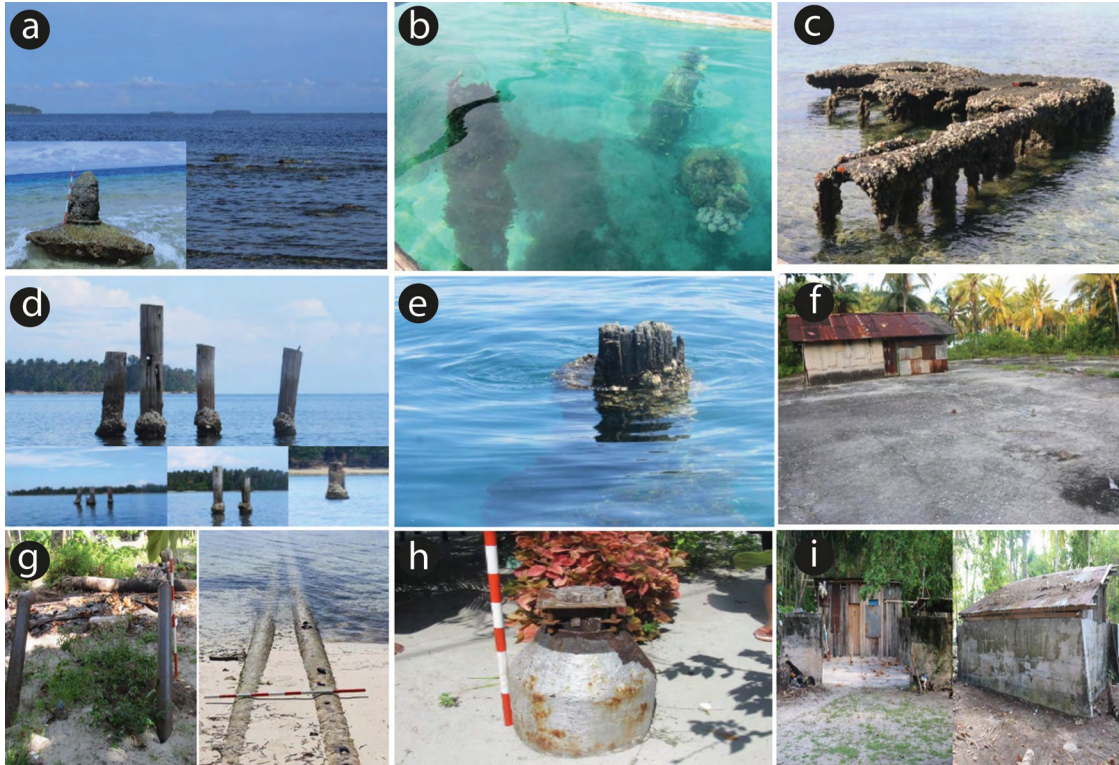


Figure 14.8: Archaeological remains in the Padaido Islands.

Notes: (A)–(E) pier poles and floating dock; (F) hospital building; (G) oil pipeline; (H) aerial ordinance; (I) armoury building.

Source: Photographs by Sonya Kawer.

Table 14.1A: WWII-era artefacts recorded by site during the Papua Centre of Archaeology surveys on Biak Island, 2016.

	Para! 3	Para! 4	Para! 5	Para! 6	Para! 7	Para! 8	Para! 9	Para! 10	Para! 11	Para! 12	Para! 13	Para! 14	Para! 15	Para! 16	Para! 17	Para! 18	Para! 19	Para! 20	Para! Ceruk	Para! 21	Para! 22	Para! 23	Para! 24	Para! 25	Para! 26	Para! 27	Para! 30	Para! 32	Para! 33
Bottle	-	1	-	3	1	-	4	-	-	-	-	-	2	1	1	-	1	-	-	-	2	-	14	4	-	1	-	3	1
Bottle fragment	-	7	-	3	3	5	5	-	2	1	2	6	-	1	-	2	3	4	-	-	-	-	3	-	-	2	-	2	-
Drinking glass (round)	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	-	-
Drinking glass (rect.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass bulb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ceramic fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Scissors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Knife handle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Tin can	3	2	3	-	3	-	-	-	-	-	-	-	1	2	-	-	2	-	-	-	-	2	-	-	-	1	3	1	-
Aluminium fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metal fragment	-	-	-	-	-	-	2	13	-	-	-	-	-	9	-	-	-	2	-	-	-	1	2	-	-	4	2	19	24
Cream box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plastic box	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	-	-	-
Plastic lid	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Helmet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shoe parts	2	15	2	7	3	3	3	3	1	1	-	-	1	5	8	4	4	-	-	-	2	-	-	-	-	1	1	13	3
Button	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1
Gas mask fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Plastic from mask	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	5	-	-
Gun fragment	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Bullet casings	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	3	-	-	-
Explosive	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Cable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nail	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	-	-	-	-	-	-

	Paral 3	Paral 4	Paral 5	Paral 6	Paral 7	Paral 8	Paral 9	Paral 10	Paral 11	Paral 12	Paral 13	Paral 14	Paral 15	Paral 16	Paral 17	Paral 18	Paral 19	Paral 20	Paral Ceruk	Paral 21	Paral 22	Paral 23	Paral 24	Paral 25	Paral 26	Paral 27	Paral 30	Paral 32	Paral 33
Battery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-
Toothbrush	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Medical tools	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Funnel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Metal arrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewing tools	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Razor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric socket	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Human bones	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	18	-	-	8	-	-	-	-	-	-	-	-	-	-
TOTAL	5	26	35	14	13	10	12	16	3	2	2	6	4	19	1	28	35	7	8	1	3	6	30	5	7	11	11	42	30

Source: Authors' summary.

Table 14.1B: WWII-era artefacts recorded by site during the Papua Centre of Archaeology surveys on Biak Island, 2016.

	Manggandi Sapi 1	Mokmer sub	Rumah Radio	G. Binsari	Ceruk Sorido	G. Sanumi 1	G. Sanumi 2	Dekat Bunker	Parit Sanumi	Sanumi Laut	Ibdi Sub 1	Ibdi Sub 2	G. Warbenur	Adibai	G. Wadimor	G. Ruar 1	G. Ruar 2	G. Ruar 5	G. Ruar 6	Kali Ruar	G. Mandon 1	G. Mandon 2	G. Mandon 3
Bottle	3	2	2	1	-	8	1	3	10	-	1	-	2	2	-	-	1	1	-	1	1	2	-
Bottle fragment	1	-	-	1	-	6	2	1	2	-	-	3	-	2	-	-	1	-	6	-	-	2	3
Drinking glass (round)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-
Drinking glass (rect.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass bulb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Ceramic fragment	1	5	7	1	1	-	-	2	2	-	-	-	1	-	-	-	-	-	-	-	11	-	10
Scissors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-

	Mangandi Sapi 1	Mokmer sub	Rumah Radio	G. Binsari	Ceruk Sorido	G. Sanumi 1	G. Sanumi 2	Dekat Bunker	Parit Sanumi	Sanumi Laut	Ibdi Sub 1	Ibdi Sub 2	G. Warbenur	Adibai	G. Wadimor	G. Ruar 1	G. Ruar 2	G. Ruar 5	G. Ruar 6	Kali Ruar	G. Mandon 1	G. Mandon 2	G. Mandon 3
Spoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Knife handle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin can	-	2	-	-	-	-	-	-	-	-	-	-	-	4	-	-	1	1	1	-	1	-	-
Aluminium fragment	-	-	-	-	-	4	-	-	-	-	-	-	1	1	-	-	2	-	-	-	-	-	-
Metal fragment	-	2	-	-	3	-	-	-	-	-	-	3	-	-	-	11	11	22	8	3	7	7	-
Cream box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Plastic box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-	-
Plastic lid	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	2	-	1	2	-	-
Helmet	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Shoe parts	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-
Button	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	1	9	-	1	-	-	-
Gas mask fragment	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	1
Plastic from mask	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	7	-	-
Gun fragment	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Bullet	-	-	-	1	-	-	-	2	3	2	6	2	1	-	-	1	2	-	3	1	-	-	-
Bullet casings	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	2	-	1
Explosive	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	5	1	5	-	1	1	1
Cable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Battery	-	-	-	-	-	-	-	1	1	-	6	-	-	-	-	-	-	-	-	-	-	-	-
Toothbrush	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-	1
Medical tools	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Funnel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metal arrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewing tools	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Razor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	G. Sundry 1	G. Sundry 3	G. Sasier/ Sundry 2	G. Mandaryap 1	G. Mandaryap 2	G. Sosen	P. Urep	P. Wundi	Ansekdo	Kali Warsanan	Nermu Sup	Nermu	Wopes	Rosayendi	Supkaritr
Cream box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plastic box	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Plastic lid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Helmet	-	-	-	1	1	-	-	-	1	1	-	-	-	-	-
Shoe parts	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Button	3	-	1	-	6	-	-	-	-	-	-	-	-	-	-
Gas mask fragment	-	-	1	-	7	-	-	-	-	-	-	-	-	-	-
Plastic from mask	1	-	-	-	5	-	-	-	-	-	-	-	-	-	-
Gun fragment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	-	-	13	-	-	2	4	-	-	-	-	-	-	-	-
Bullet casings	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-
Explosive	-	-	-	-	-	2	-	1	-	-	1	-	-	-	-
Cable	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Battery	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Toothbrush	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Medical tools	-	-	-	-	-	-	-	-	-	-	201	-	-	-	-
Funnel	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Metal arrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewing tools	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-
Razor	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Electric socket	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human bones	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
TOTAL	22	5	21	1	40	4	6	1	1	2	213	0	0	1	5

Source: Authors' summary.

Discussion

Wartime Biak: Hubs of conflict and refuge

Based on the archaeological surveys conducted by the Papua Centre of Archaeology, two hubs of military activity were uncovered: first, along the south-east coast of Biak, which was established by the Japanese in their occupation and subsequent failed defence of Cenderawasih Bay, and second, in the Padaido Islands, where the Allies located themselves at arm's length from the Japanese and subsequently repaired and restocked ships and aircraft as they moved westwards into Southeast Asia.

Around Mokmer and Sorido, runways, bunkers, and several concrete buildings provide the material evidence for the area's strategic position for the Japanese. The local landscape lends itself to defence, with the airfields being protected by limestone hills that stretch from west to east, and where caves are abundantly found that can be used as bunkers for storing munitions and for shooting from. The elevated position of the uplifted coral also provided perfect vantage points for Japanese machine gunners and snipers during the Allied advance. As such, the presence of bunkers in these areas attests to the Japanese familiarity with the local landscape and suggests Kuzume had good reason to tactically withdraw and lead the Allied troops towards Mokmer. From Mokmer, the Japanese army was ready to attack the enemy from the numerous bunkers that surrounded the airfield.

Larger caves were used to conceal personnel and some caves recorded during survey (e.g. Sundry Cave) were probably chosen because their entrances face away from the coast, being concealed from incoming advances. It is clear from the archaeological remains, including toothbrushes and shaving equipment, found within some of these caves that people lived in them temporarily. Conversely, other bunkers identified along the south-east coast were placed in aggressive locations, a few metres from the shore, to fend off coastal assaults. Many of these caves primarily contained bullet casings and explosives. The positioning of the embrasures in the Japanese bunkers also indicates that they were expecting attacks from the south coast, which is the easiest place to land, and was the focus of Japanese military operations around the airfields. The narrow but wide shape of the embrasures suggests they were designed for the occupation of several combatants using machine guns. Along the coast, the intensity of the defensive infrastructure is clear, with the Japanese installing concrete bunkers to supplement those already carved out of the natural rock. However, as mentioned, during the Battle of Biak many of these frontline bunkers were forfeited in favour of a surprise defence closer to the airfields.

Even after the Allies had captured south-east Biak, Japanese soldiers held out in the northern parts of the island, conducting opportunistic guerrilla attacks. Archaeological surveys previously undertaken by the Papua Centre of Archaeology suggest the north coast of Biak was a key location harbouring the Japanese, about 4000 of which had retreated after Mokmer and the other airfields were captured (Smith 1953, 390). For instance, helmets, medical kits, human bones, and other objects were found scattered around a rock-shelter in Wari village (Balai Arkeologi Papua 2016). Additional information obtained from informants in north Biak confirms that this region, especially around the Korimderi River, was the location of a battle between the American and Japanese armies. The historical sources further indicate that skirmishes occurred along the Waferdori River and the Korim-Sorido where Nermnu, Dofyo Wafor, Wari, and Rosayendi villages are located (Smith 1953).

During and after the Battle of Biak, the Padaido Islands were used by the American army as a forward base to hospitalise crew, repair landing craft, and house officers while the lagoon was used as a temporary naval dock to repair and refuel seaplanes and torpedo boats (United States Government 1947, 310). Following the war, the Dutch military continued to use the base for their own purposes.

The high density of American military remains in the Padaido Islands, particularly including piers and docks, oil tanks, and a hospital, are a testament to these offshore bases being used intensively, first to support combat on Biak and Numfor, and later to facilitate the Allied war effort as it moved into Island Southeast Asia.

Coral islands and the archaeology of the Pacific theatre

Coral islands like Biak and the Padaido group were key stepping stones for the rapid Japanese assault on the Pacific and for the later leapfrogging strategy that the Allies used to reclaim the region. The hard underlying geology and insularity, in part, made these locations favourable in comparison with the softer ground on the New Guinea mainland. Similar defensive positions have been recorded on Watom Island in the Bismarck Archipelago (Petchey 2015), Peleliu Island in Palau (Price and Knecht 2012), Torw, Jalwoj, Mili, and Wija in the Marshall Islands (Christiansen 2002), and Guam and Saipan in the Mariana Islands (Mushynsky 2021; Mushynsky et al. 2018; Taboroši and Jenson 2002). In particular, comparison with the military architecture at these Pacific sites indicates similar Japanese building techniques and defensive strategies (previously synthesised by Rottman 2003). These similarities include the opening of coral limestone crevices to produce inconspicuous complexes of wide, narrow, and low-lying embrasures for machine gunners and riflemen. These defensive positions were distributed with overlapping fields of view so that they formed a continuous defence against enemy landing parties. As noted on Watom Island (Petchey 2015, 47), many of these bunkers had multiple entrances to allow escape if the space was overrun or one entrance collapsed owing to bombardment. Monopolising the higher ground and benefiting from the interplay between these coastal defences and inland strongholds also seems to have been common to the Japanese defensive efforts. The vast extent and intensity of landscape transformation by the Japanese in the Pacific has even led some researchers to describe these locations as island forts (Petchey 2015). On many of these islands, the rapid nature of the conflict and subsequent abandonment has meant that large numbers of military vehicles and weapons were left in situ (although Australian personnel and later Dutch were involved in clean-ups on Biak). Today, military equipment is often found in villages and gardens on these islands and sometimes even repurposed as new tools or kept and sold as souvenirs (Arbay and Laksmono 2020). Several of these sites are conserved locally by people like Yusuf Rumaropen who established a small museum in the 1980s relating to artefacts from Binsari Cave (Arbay 2021). The wartime archaeology on these islands is therefore a salient reminder of a very recent and violent time in the past—for some, within living memory or only a generation removed.

Conclusions

The archaeological record of wartime occupation around Biak demonstrates that Cenderawasih Bay became a high-value area for Japanese control of the West New Guinea region, and was a key location for MacArthur's leapfrogging strategy to retake the Pacific. Biak's south-east coast was especially crucial, providing airstrips that the Japanese could run bombing raids from, and that would later support the Allied advance into Southeast Asia and eventually Japan itself. Offshore islands like those in the Padaido group allowed the Allies to remain at arm's length while repairing equipment and gradually bolstering their supplies over several months during the Battle of Biak, one of the most intense conflicts in the Pacific theatre.

The defensive architecture around the airstrips shows that the Japanese military had become familiar with the local landscape in their two years of occupation and used the sheer limestone slopes along the coast and hidden inland cave systems to their advantage, which especially allowed them to dominate in the early stages of the Battle. Caves, modified and extended where necessary, were a key part of Japanese landscape reworking, and a common strategy employed in other parts of the Pacific to conceal the actual numbers of personnel and avoid bombing runs. The archaeological finds within these cave systems, recorded by the Papua Centre of Archaeology, demonstrate that many larger caves on Biak were occupied and lived in temporarily, while smaller limestone bunkers were used primarily militarily. The presence of small human remains in one tunnel is testament to the strategic weakness of these caves in that numerous Japanese became trapped in them and were starved of oxygen by advancing Allied troops. Many similar human remains previously have been repatriated by the Japanese government.

The wartime archaeology of Biak is only beginning to be recorded in detail and large parts of the island, particularly in the interior, remain archaeologically unexplored. Detailed description of the archaeological artefacts and architecture is the focus of ongoing research and is important, not just for Japanese and American military families that seek to repatriate their war dead, but also for the local Biakers who now see WWII and Biak's role in the conflict as crucial to their own recent history. Further description of the island's archaeological remains, alongside oral histories and people's perception of their heritage landscapes, would provide a more nuanced understanding of indigenous experiences of this conflict (as has been explored in other parts of the Pacific, see Poyer 2022), and how local people have reconstituted these experiences through collecting and repurposing wartime remains.

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