

Recovery of Australian service personnel missing in action from World War II

The work of the ADF Forensic Recovery Team

Group Captain Christopher J Griffiths, AM, RFD, BDS, LDS, DPH(Dent), and Wing Commander Johan A L C Duflou, MB ChB, MMedPath, FRCPA

DURING WORLD WAR II the Royal Australian Air Force (RAAF) operated throughout the South Pacific, often without the support of immediate search-and-recovery aircraft. The number of aircraft lost by the combatant nations in the south-west Pacific during WWII is still not known, but is probably more than 1000.

Many aircraft were lost over Papua New Guinea. It is estimated that there are still over 500 aircraft with full crews missing in Papua New Guinea (about 300 American, 150 Japanese and 50 Australian), which means that there are more WWII aircraft missing in Papua New Guinea than in any other country on earth.

Papua New Guinea offers formidable obstacles to location and recovery of aircraft. The terrain is exceptionally rugged and in many areas impenetrable. Villages are frequently isolated from the outside world and even from adjacent villages

Synopsis

- ◆ The highlands of Papua New Guinea hide the largest number of unrecovered World War II aircraft in the world, including about 50 Australian aircraft.
- ◆ Since 1994, the ADF Forensic Recovery Team has recovered the remains of 23 WWII Australian servicemen in or near Papua New Guinea, successfully identifying 21.
- ◆ The ADF Forensic Recovery Team has been developed over the past five years to include a forensic odontologist, a forensic pathologist, an ADF dental officer and an ADF medical officer.
- ◆ WWII service personnel recovered by the ADF Forensic Recovery Team are given a military funeral with full honours.

ADF Health 2000; 1: 47-53



Group Captain Christopher J Griffiths, AM, has had 38 years service with the RAAF, more than half in the permanent Air Force. He has been a Medical Examiner with the ADF Forensic Recovery Team since 1994. He is Adjunct Associate Professor of Oral Diagnosis at the Dental School, Westmead Hospital, and the University of Sydney.



Wing Commander Johan A L C Duflou has had three years' service in the RAAF Specialist Reserve, working as a Medical Examiner with the ADF Forensic Recovery Team. He is Deputy Director and Clinical Senior Lecturer, NSW Institute of Forensic Medicine, and Department of Pathology, University of Sydney.

by the extreme geography. Villages in the highlands within 10km of each other, but separated by a deep ravine, have developed separate languages, cultures and customs.¹

Because of the isolation of these villages, information on crashed aircraft has not been readily available, and most finds have been fortuitous, often as a result of expatriate Australian interest in the Pacific war. When a crashed aircraft is reported to Australian authorities, additional obstacles to recovery may exist. Some villagers have unrealistic expectations of recompense for damage to village land as a result of the accident. Claims as high as two million kina (about \$1 500 000) have been made and can prevent any recovery expedition.

The leading example of a military-based missing-in-action (MIA) recovery organisation is that of the US Army Central Identification Laboratories in Hawaii (CILHI).² Since the end of WWII, CILHI has been engaged in the recovery and identification of American service personnel. The current laboratory is stationed at Hickham Field in Hawaii and has a staff of over 200 full-time service personnel and civilian physical anthropologists. There are six teams of about twelve members in the field at any one time, and each team will investigate a crash site for about a month.³ The current Australian approach to the recovery of remains is largely based on the CILHI model.

After the end of WWII, a group led by Wing Commander

Rundle of the RAAF spent several months searching for the remains of servicemen missing in Papua New Guinea. Since then there has been little active effort to locate and recover missing Australian service personnel in the southwest Pacific. When a missing aircraft was located, a team of aerodrome defence guards and medical orderlies were often assigned to recover the remains. None of these Australian personnel had any training in archaeological recovery techniques or forensic identification. There was no continuity in the staff assigned to these missions, hence no reference to the knowledge gained by previous teams.

In 1994 the then Director-General of Air Force Health Services, Air Commodore G Moller, realised the deficiency of this lack of method, and instituted a new approach during the recovery of a Catalina aircraft on the Indonesian island of Buru. The new team approach involved both permanent RAAF personnel and forensic specialists from the RAAF Specialist Reserve.⁴

This article describes the work of the ADF Forensic Recovery Team over the last five years, during which time the team has recovered the remains of 23 service personnel in six investigations in Papua New Guinea and other islands of the Pacific, and discusses further potential roles and developments of the team.

Operations of the Forensic Recovery Team

Operation Buru

In July 1994, the Forensic Recovery Team located and identified the nine crew members of a 43 Squadron Catalina aircraft A24-45, which had been missing in action since 20 July 1944. The recovery operation was conducted in remote and rugged mountainous and jungle terrain of the Indonesian island of Buru (in the Molucca group of islands, east of Sulawesi) at an altitude of 1800m. The operation required verification of the wrecked aircraft's identity, recovery of the crew's remains and disposal of unexploded ordnance. The team included permanent ADF members and a forensic odontologist from the Specialist Reserve.

On the island of Buru, the RAAF team was met by members of the Indonesian Army and a joint expedition (which included local villagers) climbed from sea level to the crash site with all equipment and provisions.

The aircraft was located in a saddle near the summit of one of the many mountains on this small island. The Catalina had burnt on impact and the fuselage had been all but destroyed. The wings and tailplane had sheared off on impact and were found some distance away. Four of the six 500lb bombs carried by the Catalina remained unexploded in the wreckage. Two craters close to the aircraft were presumably from the other two bombs which exploded as a result of the crash.

The extent of the site was determined, and a 30 × 40m grid pattern was set up to cover the entire site. The area was cleared of undergrowth, and a systematic search was then



I Operation Buru

When an RAAF Catalina was discovered on the island of Buru 50 years after it crashed, the ADF Forensic Recovery Team led a systematic search of the crash site.

The search entailed an excavation over a 30 x 40 m grid. All soil was sifted to find small fragments of bone and teeth.



conducted of each grid square (Box 1). As well as careful excavation of the grid using small trowels and other archaeological tools, all soil was sifted to find small fragments of bone and teeth.

Human remains were found both close to the engines as well as in the burnt area of the fuselage. Unfortunately, several bones had already been retrieved by the local villagers without any reference to their original position. These bones were neatly placed in one box, further complicating the identification process.

After the excavation, unexploded ordnance was detonated by the RAAF Explosives Ordnance Demolition Team. The combined ADF–Indonesian team then returned to the village of Wymurat where the remains were definitively identified. The Department of Veterans Affairs, in conjunction with the Director of Dental Services (Air Force), had managed to obtain the original dental treatment records of all nine crew members, facilitating positive dental identification. Burial of the nine crew members was carried out at a later date, with attendance of over 70 of the crew's family members at the Commonwealth War Cemetery in Ambon.

Operation Kimbe

As a result of a report by an expatriate Australian in New Britain, Mr Brian Bennett, the Forensic Recovery Team located and retrieved the remains of two airmen from a Beaufighter A19-139 of 30 Squadron in November 1995.

The aircraft was lost on 25 November 1943 about 25 km from the town of Kimbe in New Britain. The aircraft had struck an extremely tall tree on the top of a ridge line. The tail of the aircraft sheared off (Box 2) and the rest of the aircraft descended the steep ridge and broke up on impact, bursting into flames.

The recovery team consisted of an ADF detachment commander and the recovery group, with two forensic odontologists, a dental officer and a medical officer. Local villagers assisted with portage and clearing of the crash site. A grid measuring about 20 × 20 m was plotted into 5 m squares. Each of the recovery group was able to supervise a team of villagers in the careful excavation of each grid square. Sieves similar in design to those used by CILHI were used for the first time in this recovery.

The remains of two airmen were recovered over five days, as were both stainless steel “dogtags”, a full upper denture and a number of personal effects.

Both airmen were positively identified and later buried in the Commonwealth War Cemetery at Bitapaka, New Britain.

2 Operation Kimbe

The tailplane of an RAAF Beaufighter that crashed in New Britain in 1943. The ADF Forensic Recovery Team successfully recovered and identified two airmen from this crash site in 1995.



Operation Bugaiu

Expatriate Australians in Lae informed the Australian High Commission in Port Moresby that Papua New Guinea nationals from the village of Bugaiu had found an aircraft. The Australian assistant military attaché from Port Moresby went to the site and identified the wreckage as an RAAF Beaufort A9-106 (Box 3). This aircraft had been reported missing in 1944 with a crew of three and four passengers. Before the discovery of the wreck, it had been assumed that the aircraft had crashed into the sea. At this stage,

3 Operation Bugaiu

Recovery of the remains of the passengers and crew of an RAAF Beaufort that crashed in Papua New Guinea in 1944. The site was excavated with trowels to a depth of 50 cm.



the Forensic Recovery Team was upgraded to include a forensic pathologist from the RAAF-SR.

The crash site was located at an elevation of 1755 m on a saddle between two ridges. The aircraft had disintegrated on impact and wreckage was scattered over a 5000 m² area. A fire had started after the crash, and evidence of this fire was found throughout the crash site, mostly near the fuselage. After a grid was plotted, the area was cleared of vegetation, and excavated to an average depth of about 50 cm, where undisturbed strata were encountered.

Human remains were found under some trees, and had obviously been placed there many years ago by villagers. Identifiable remains were found mainly between the two engines of the aircraft, which was also the area maximally involved by the fire. The remains were transported to the

PNG Army barracks at Lae, where the bones were cleaned, dried and positively identified using antemortem medical and dental information.

The bodies of the seven servicemen were later buried at the Commonwealth War Cemetery in Lae, in the presence of their relatives.

Operation Kokoda

Skeletal remains of two individuals were found by Papua New Guineans in the Kokoda Trail and Sanananda regions. The remains had been forwarded to the Australian High Commission in Port Moresby for further examination.

The remains from the Sanananda area were found to have Caucasoid physical characteristics, with dental restorative

4 Operation Kokoda



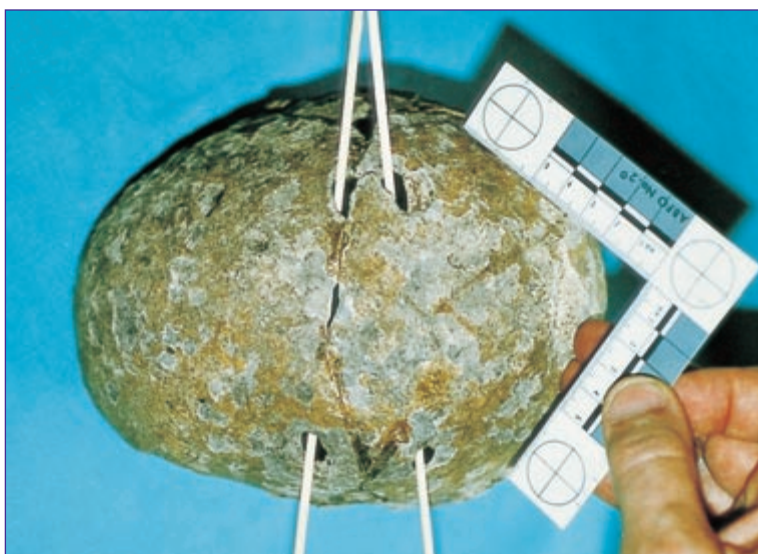
The remains of an unknown Australian soldier discovered in the Sanananda region of Papua New Guinea.

Both tibia showed gunshot wounds at similar locations.

A projectile (standard calibre of Japanese ammunition) is shown (right) fitting the diameter of the bullet track through one tibia.

Bullet tracks through the parietal bones were of the same diameter (below, left).

Below right is shown the reconstruction of the jaw.



work that had been carried out with silver amalgam (Box 4). Additionally, artefacts found together with the remains included a brass "Australia" insignia, and a corroded .303 rifle. On the basis of this information it was concluded that the deceased was an Australian soldier, but his identity could not be determined. Reconstruction of the skeletal fragments revealed a number of gunshot wounds and stab wounds in the skull and long bones, suggesting the soldier had been deliberately shot at close range (Box 4).

The second set of remains, from the Kokoda Trail, consisted of highly degraded fragments of human pelvis, scapula, vertebrae, calcaneus and miscellaneous fragmented long bones. Found with the skeletal remains was a magazine from a .45 Thompson sub-machine gun (likely to be WWII issue). Additional material found with the remains included the baseplate of a magazine, expended ammunition and a brass belt buckle typically found on Australian webbing of the period. It was concluded that it was highly probable that the skeletal remains were those of an Australian serviceman, whose identity could not be determined.

It has been suggested to the War Graves Commission that both these soldiers be buried as unknown Australian servicemen.

Operation Kewieng

Dr Betz, an American anthropologist, was informed of a crashed aircraft by Papua New Guineans from the village of Kewieng, about 90 km north-west of Lae at about 2300m elevation in the Finisterre Range. An expatriate Australian, Mr Richard Leahy, attended the site with Dr Betz, and identified the aircraft as an RAAF Wirraway A20-480. According to villagers, the two occupants of the aircraft had been removed from the wreckage, and buried beside the aircraft shortly after the crash.

In October 1998, the Forensic Recovery Team was flown to a base camp which had been constructed with the assistance of Kewieng villagers. The crash site was surveyed and a 15 × 20m grid was plotted. Although a landowner had been present at the burial of the aircraft occupants, and claimed to know the exact location of the graves, compre-



5 Operation Kewieng

WWII service personnel recovered by the ADF Forensic Recovery Team are given a military funeral with full honours. After Operation Kewieng, two RAAF airmen were buried in the Commonwealth War Cemetery in Lae, more than 50 years after their aircraft crashed.



hensive excavation of this grid square down to 1.8 m failed to locate any human remains.

At this level, a further layer of topsoil was found and it was concluded that a landslide had occurred some time after the crash, and that the aircraft had probably slipped down the mountainside. Further deep excavation higher up the mountain revealed fragments of canopy perspex and aircraft wreckage at a level of 1.8 m. Fragments of human remains were eventually located below this level and under the aircraft.

The remains of the aircraft pilot and observer were positively identified from their antemortem dental records. The remains were buried at the Commonwealth War Cemetery in Lae in the presence of relatives (Box 5).

Operation Manokwari

An Indonesian pearl diver informed a dive tour operator of an aircraft in 28 m of water about a kilometre off the coast of Irian Jaya. A team of Dutch and Australian military divers recovered the remains from the wreckage of a Kittyhawk aircraft. No identifying marks were found on the aircraft because of corrosion. According to Australian historical records, there were three missing Australian Kittyhawk aircraft in the region. The antemortem dental records of two of the three pilots were located in the archives of the Department of Veterans Affairs. The forensic odontologist from the Forensic Recovery Team examined the remains and positively identified the pilot.

The remains were buried in the Commonwealth War Cemetery in Lae in the presence of relatives.

Discussion

Laying ghosts to rest

Having a relative reported missing in action always leaves doubt for the family on how their father, son or brother died. This information is especially important for the families of airmen missing from the war in the Pacific, as Japanese treatment of captured Allied airmen was frequently torture and beheading.

We were able to show that none of the 21 airmen identified by the ADF forensic recovery team in the last five years had been captured and tortured. This knowledge has been of incalculable value to the relatives of the deceased, even though it took 50 years before the remains were found, examined and identified.

An example of this involves the daughter of the pilot of the Catalina in Operation Buru, who was born six months after her father died. Japanese despatches had reported that five airmen had been captured in the area at about the time of the disappearance of the aircraft. The wife of the deceased, thinking that her husband had been captured and tortured, would never talk about her husband to her daughter. On

confirmation that all nine crew members had died on impact on the mountainside, the daughter said “it was like laying a ghost to rest”, and that for the first time her mother began telling her about her father and all his idiosyncrasies.

The ADF has flown relatives to various Commonwealth war cemeteries in south-east Asia, including Lae, Ambon and Bitu Paka, for the funeral of recovered service personnel. The remains of all recovered service personnel are given a full military funeral in the presence of their relatives. This assists in the final grieving process. On occasion, relatives have also visited the crash site.

Skeletal remains recovered from the Sanananda region (Operation Kokoda) showed skeletal abnormalities highly suggestive of torture and mistreatment. Gunshot wounds were noted in both upper tibia in identical locations, there were multiple, closely associated gunshot wounds to the cranium, and at least one stab/bayonet wound to the right temporal region. In this case, the remains could only be identified as a Caucasoid male aged between 25 and 35, with dental restoration work typical of Allied service personnel. Artefacts found with the body strongly suggested that the remains were those of an Australian serviceman.

War graves

Australia is a member of the Commonwealth War Graves Commission (formerly the Imperial War Graves Commission). This organisation was established during WWI to record and mark the graves of the Empire's war dead. A founding principle which still applies to the Commission is that all war dead will be commemorated equally regardless of race, rank or creed, and that the graves of all Commonwealth military personnel killed in conflict will be maintained in perpetuity. It was further agreed by Commonwealth nations that military personnel killed in war would be buried in the nearest War Graves Commission cemetery, and bodies would not be repatriated to their country of origin.⁵ The only variation of this policy involved the remains of Vietnam casualties, which could be repatriated to Australia if so desired by the next-of-kin. However, the government stressed that, if personnel had been buried already in that conflict, permission would not be given for disinterment and reburial in Australia.

Forensic recovery techniques

Military forensic excavations require the modification of rigid archaeological techniques.⁶ For example, there is no need to record the three-dimensional relationship between recovered artefacts and remains, although a rough indication of their location within the site remains essential. Similarly, a two-dimensional grid pattern is set up, but not a three-dimensional grid. If standard archaeological practices were to be undertaken, the anticipated time taken to examine crash sites would generally be in excess of a month, rather than

less than a week (the time currently spent at each crash site). It would be difficult to maintain an investigation team for long periods in these rugged and isolated mountain situations, often at high altitude and in adverse weather conditions. "Academic" archaeological digs frequently use high technology equipment (such as ground penetrating radar),⁷ which has not been adequately tested in the setting of high altitude rainforests.

The ADF Forensic Recovery Team has been expanded over the past five years to include a forensic odontologist, a forensic pathologist, an ADF dental officer and an ADF medical officer. The team is based on the US Army CILHI model. We are planning to add a forensic physical anthropologist to the team, who would greatly assist in the planning of the approach to the recovery and in the osteometric examination of the remains.

Local people

The ADF Forensic Recovery Team cannot carry out a recovery of remains at a remote crash site without the valuable assistance of nationals of the country in which the aircraft was found. The Papua New Guineans who have assisted have been from the local village on whose land the aircraft has crashed. Without the tracking and bush skills of these people, the recoveries would have been greatly delayed.

Despite the difficult terrain, there is a highly developed land ownership system in Papua New Guinea,¹ raising the problem of trespass during recoveries. Realistically, recovery of remains cannot be undertaken without the approval and cooperation of landowners. Landowners and workers seconded to recoveries must be appropriately recompensed in both money and goods. In later recovery operations, medical clinics have been held in the local villages, which have been greatly appreciated, and we plan to expand this service to include dental treatment clinics when requested.

References

1. Flannery TF. The future eaters. Sydney: New Holland Publishers, 1994.
2. Holland TD, Anderson BE, Mann RW. Human variables in the postmortem alteration of human bone: examples from US war casualties. In: Haglund WD, Sorg MH, editors. Forensic taphonomy: the postmortem fate of human remains. Boca Raton, FL. CRC Press, 1997.
3. Hoshower LM. Forensic archeology and the need for flexible excavation strategies: a case study. *J Forensic Sci* 1998; 43: 53-56.
4. Recovery, identification and disposal of human remains and marking of aircraft wreckage. DI(AF) ADMIN 11-3.
5. Missing in action presumed killed: recovery of human remains of Australian Defence Force Members. DI(G) PERS 20-4.
6. Webster AD. Excavation of a Vietnam-era aircraft crash site: use of cross-cultural understanding and dual forensic recovery methods. *J Forensic Sci* 1998; 43: 277-283.
7. Miller PS. Disturbances in the soil: finding buried bodies and other evidence using ground penetrating radar. *J Forensic Sci* 1996; 41: 648-652. □

Coming in the next issue of *ADF Health*



Land mines

Brigadier Robert Atkinson reviews the terrible history and uncertain future of land mines, indiscriminate weapons that kill about 2000 people every month (many of them in places where there is presently no war). In a companion article, Lieutenant Colonel Jeffrey Rosenfeld gives a comprehensive review of the human cost of the land mine problem and the international efforts to relieve it.

The poor man's atom bomb

Commander Andrew Robertson discusses *bioterrorism* — the use of biological weapons by terrorist groups — and the requirements for effective defence.

Head injuries

Patients with head injuries are regrettably common in military medicine. Wing Commander Nigel Jones describes best practice for the examination of the head injured patient.

East Timor

Lieutenant Colonel John Crozier reports on aspects of the early ADF Health Service deployment to East Timor.