Star Wars and Australia's secret past.

Australia once led the world in the optical skills that made possible such weapons as intercontinental ballistic missiles, space satellites, 'smart' bombs and the ultimate American dream of a Star Wars defence missile shield. This little-known story has emerged from the dusty papers of Don Edgar's father-in-law, former Mildura identity Reg Etherington. .It is a story of secrecy, Cold War rivalry and the loss of a potentially advanced industry for Australia

Don Edgar

He was always secretive about the work going on in the Nissan hut behind the Dragon Tower Chinese Restaurant in Langtree Avenue, Mildura. It was airconditioned, but why?

'Top secret', he would say, 'in advance of anywhere else', 'very difficult work, took a long time to perfect'. He would talk about the Ultra Wide Angle Lens vaguely, but with a sense of pride - 'used in the Jindivik pilotless plane at Woomera' - but that was about all he would say. He gave my wife Patricia a piece of rough lens crystal, and a small glass plate with curved edges and a graph-like pattern on the back, made at Pilkington Glass in England, explaining it was the first time anyone had been able to print a grid on a curved surface so it looked flat. But we did not exactly understand its significance at the time.

Reginald Robert Etherington, born in Faversham, London in 1907, died on 3 September, 2000. He was a remarkable man, widely read, councillor and mayor of Mildura, a member of the Victorian Arts Centre Building Committee which developed the now familiar theatres and gallery on the Yarra River bank, Melbourne. He was a jeweler by trade, went to Mildura as a young man, studied optometry by correspondence, was involved in the early formation of the Country and Liberal parties, had a finger in many pies and left his mark not only in Mildura (the Arts Centre, the Mildura Sculpturescapes of the 1970s, the Old Mildura Homestead) but also across Victoria through its unique regional art galleries movement. He was a shrewd wit, loved by his equals, feared by his inferiors, a repeat reader and quoter of Shakespeare, Dickens, Dostoevsky and Mark Twain.

But the one thing he was not known for was producing the world's most advanced camera lenses of the 50s and 60s for the Australian Departments of Supply and Defence. They were so advanced that the Americans bought the cameras made at Salisbury, South Australia which used the Ultra Wide Angle lens developed in Australia. These lenses made possible more sophisticated systems of guided missiles, space exploration and, ultimately, Star Wars.

Australia's Prime Minister John Howard is currently basking in the warm glow of President George W. Bush's approval. He has committed Australia to the invasion of Iraq, has negotiated a free trade treaty through with the USA, and he has promised to join in America's renewed Star Wars program.

Only history will tell if his tagging along with US foreign policy will pay off for Australia. But there is a sense of déjà vu about it all, particularly about the missile defence proposals. Australia was once at the forefront of work on weapons research but got dumped by its protectors, Great Britain and the USA.

I have been going through the papers of my recently deceased father-in-law, Reg Etherington, and have come across a fascinating story of industrial promise, secret weapons manufacturing and business disappointment. It invokes the names of Ben Chifley, Winston Churchill, 'Black' Jack McEwan and the evocative locations of Peenemunde, Woomera, Maralinga and Cape Canaveral. The following account acknowledges the official history of Woomera Rocket Range by Peter Morton (*Fire Across the Desert*, AGPS 1989) which provided me with a detailed historical context for the story hidden in the Etherington papers.

The story begins in London, early 1940s, with the 'brief ominous silence' of German V-1 rockets, after their jet engines stopped and just before the explosion came. The V-1s devastated much of London until the British invention of radar helped airforce pilots locate and destroy them before they reached their target. But after Singapore fell on 15 February, 1942, British intelligence became aware of a new rocket being built at Peenemunde on the occupied Baltic coast. It was to become the terrifying V-2.

In August 1943, Winston Churchill ordered a bombing raid on Peenemunde, in an attempt to put a stop to whatever was going on there. This led to the dispersion of the German weapons team but not to its destruction. In July, 1944, a stray V-2 landed in a Swedish bog, and the British realized their fears had been justified - it used liquid fuel and had a much longer range than the V-1. Then on 8 September 1944, a V-2 landed on the suburb of Chiswick, London and the British authorities knew just how deadly it could be. Fired from The Hague, Holland, this rocket made no noise because it flew on a high trajectory before descent, its sonic boom heard only after the explosion.

As Peter Morton puts it, this "was the harbinger of the war of technicians against the war of soldiers". When you hear Donald Rumsfeld and General Tommy Franks speak enthusiastically of their 'smart' bombs and a 'surgical strike', they merely echo the threat of the German V-2. The V-2 bombardment of London lasted 7 months, till March 1945, killing more than 2700 people (a horror only 'balanced' by the February, 1945 bombing of Dresden which killed tens of thousands in a single night.)

After VE Day (8 May, 1945) the British, Americans and Russians raced to reach the known V-2 bases at Peenemunde and Nordhausen first**.** But the American forces had already captured (11 April, 1945) a huge underground factory at Mittelwerke, near Nordhausen. This was where the V-2 flying bombs had been made, using a large slave labor force, since the British raid on Peenemunde in August 1943. Just a few days before VE Day, they spirited away to the United States (along with thousands of parts and technical designs) the key German rocket scientists Werner Von Braun and General Walter Dornberger, who surrendered and accepted a kinder fate at the White Sands

Range in New Mexico. This manoevre was called ‘Operation Overcast’, later renamed ‘Operation Paperclip’.

The British were furious and protested, but it was too late. They were left with digging up V-2 parts, interviewing the few remaining technicians and the prisoners of war who had worked on the V-2 assembly line. By mid September, they had only enough parts to reassemble eight V-2 rockets for testing.

Back in the dusty country town of Mildura, Victoria, on the Murray River, Reg Etherington was writing to Melbourne jewellery manufacturer Arthur Cocks & Co., asking them to release ‘Johnson’ (Stan Johnson, later to be the key lens grinder for the Ultra Wide Angle Lens project and the newly-established Weapons Research Establishment at Woomera). He could not have known anything about the British-US plans, but argued that ‘This is the only large provincial centre without the services of a grinder and fitter… Cocks & Co puts the interests of the firm first (whereas I) consider service of the public direct’. Johnson wanted to come to Mildura, but the Melbourne firm insisted ‘certain conditions are laid down by Manpower and we are bound to abide by such conditions.’ Cocks & Co. were not, however, doing work essential to the War effort, and Etherington persisted.

The atom bomb dropped on Hiroshima, 6 August, 1945, demonstrated to the worried British that V-2 liquid fuel long-range technology could now deliver the ultimate killer in any future war. Britain had to develop its own missile program. By September 1945, the British test-fired their roughly assembled V-2s, while the complacent Americans merely ‘observed’, as did the Russians, who also had in their hands several German experts and sample materials, from which they were to develop their own ICBMs. Only three of the eight V2s worked, but it was sufficiently encouraging to form the basis for later development of Britain’s own rocket research program, using liquid propellant. This test-firing of the reassembled V2s was called ‘Operation Backfire’. To observe and measure flight paths and trajectories, the British scientists used for the first time what was called the Askania theodolite, developed by the Germans and taken as booty by the British at the end of the war. A decade later, some of these same Askania theodolites were installed along the flight paths of the British Black Knight missiles tested at Woomera. New lenses for them (and those of the later Contraves theodolite) were made secretly in the Etherington Optical Nissan hut in Mildura.

By January 1946, a Guided Projectile Establishment was set up in Buckinghamshire. Australian Prime Minister Ben Chifley was keen for Australia to develop its own new weapons, being acutely aware we could not rely on Britain after its 1943 denial of help in the Pacific. He could see the potential for Australia to gain skilled migrants and new industries if Britain were to cooperate with Australia in its new missile program. Australia might even become ‘the arsenal of the Empire’, a notion Morton says was probably doomed from the start as a new world order emerged and Britain withdrew from its crumbling Commonwealth to concentrate on its own defence and its obligations in occupied Germany.

There were precedents for cooperation in arms development– the British share in a nuclear experimentation plant in Canada, and a joint US, British, Australian chemical warfare establishment at Proserpine in Queensland. **(See Box.)**

In 1946, a British team led by Lt. Gen. J.F. Evetts visited Melbourne and Canberra to sound out the possibility of a missile test range in Australia. Evetts had served with the Iraq Army in the twenties and liked the 'unruly' Aussie troops he had met in Palestine and India. Prime Minister Chifley negotiated what seemed like a favorable arrangement. The program costs would be shared and jointly controlled; the research and development work would be done in Australia; Australian scientific trainees would be attached to British defence establishments; and, he insisted, Australia must have full access to secret weapons information if Australia eventually decided to pursue its own weapons program.

By June 1946 the Evetts Report was tabled, recommending a range be set up on a 320 kilometre wide strip stretching 1850 km north-west to the West Australian coast at Eighty Mile Beach. This would make possible a missile shot of 4800 km, from what was to become Woomera, across Port Hedland, Christmas Island and into the Indian Ocean. There was no plan for a village at that stage, as deserted munitions factory buildings at Salisbury and an airport at Gawler looked as if they might suffice)

CUKAK (Combined UK-Australian Long Range Weapons Committee) was approved by the Australian Cabinet on 19 November, 1946, to operate partly out of Melbourne, partly out of Adelaide. The British would cover the 3 million pounds cost of building the Range, and contribute 3 million pounds a year to run it.

But as early as January, 1947, the project was in difficulty. Chief of the CSIR (Commonwealth Scientific Industrial Research - the O for today's CSIRO organisation came later) Sir David Rivett refused to have anything to do with military research. There were behind the scenes suggestions of bringing it under Public Service Board control, a threat to academic independence which was echoed in 2003 by controversy over Howard government pressure on CSIRO to do more 'commercial' research. Worse, the British Government seemed to be going cold on the idea. Some key people felt it was best to leave ballistic weapons development to the Americans who had all the key scientists and know-how, anyway. However, the Cold War threat was growing, Russia was fast developing nuclear capacity and high altitude bombers, so by December, British Prime Minister Attlee reconfirmed the need for guided weapons and the Woomera Rocket Range plan went ahead rapidly.

Another concern for Prime Minister Chifley was the 1948 signing of a British-US agreement to set up an Underwater Test and Evaluation Centre off the Bahamas. Following this agreement the US embargoed any passing on of classified information to Australia. The Aussies got round this by placing their trainees into British universities where most of Britain's top scientists worked anyway, instead of in the defence laboratories. One of them, Bob Edgar (no relative as far as I can tell) was cheeky enough to point out to a professor several mathematical errors in his new book on antenna design. Over 300 graduates applied for these traineeships, and Kevin Boyle was the first of over

200 who did train in Britain. They brought back with them valuable skills for Australia, forming the core of the Weapons Research Establishment at Salisbury, South Australia.

In post-War Australia, the momentum to rebuild industry was growing. Reg Etherington was sent by the Department of Post-War Reconstruction on a 3 month tour of the UK, Europe and the USA. No details are on record, but he often said he was fascinated to see the little 'backyard operations' decentralised by Britain to hide research and parts manufacturing from the Germans. He was taken to key optical makers and given access to embargoed information, because his small plant in Mildura commenced shortly after his return and he was dealing with both the Department of Supply and the Weapons Research Establishment at Salisbury.

The start of the Korean War in 1950 gave new impetus to Britain's own nuclear and guided weapons research. By 1950 the Salisbury plant was conducting Australia's own research as well as work for the Anglo-Australian project, and some 18 of the trainees had returned from England, bonded to work for Defence for at least 3 years. By early 1951 work had also started on the Mk 11 Jindivik, designed with a more powerful engine and lighter actuators, to be used as a target for guided missiles at Woomera.

In October 1952, Reg Etherington wrote to Defence Research Laboratories: 'It is anticipated that we will be getting into production in the near future', and letters were flying to and from other firms involved in defence production (Fairey Aviation in Adelaide, Field Instruments Co. of Brighton, National Instrument Co. at the Commonwealth Aerodrome, Essendon.) Reg was bringing in supplies of Swedish pitch, 'optical components for lensatic sights', seeking information on the 'proper temperature at which your lens finishing room should be held … to avoid softening of the lapping compound', and receiving (on loan from the Department of Defence Production) an array of glass-working equipment (Roughing Mill, Automatic Polishers, Jorgen Catering & Edging Machine, Blocking Machine, etc.) He was also receiving letters from optical experts in Scotland and the UK wanting to come and work with him in Mildura.

The early tracking of missiles fired at Woomera was a complicated process. Observation stations were set up at intervals along the range, local Aborigines and pastoralists had to be warned to keep out, theodolites and cameras recorded flight paths, exploded rockets and pilotless targets fell in unexpected places and equipment had to be retrieved. Sometimes old Meteor aeroplanes and the more modern Canberra bombers which had their 50th anniversary in 2002 were used as targets.

The need became obvious for wider angle lenses to record flight paths, attitudes, and moments of impact. To do this, cameras had to be mounted in both the missile and the target, but the depth of field and scope of the lens were crucial. A breakthrough design was achieved at Woomera Weapons Research Establishment in 1954, by young Australian scientist Frank Dixon. His new 'fish-eye lens' had an angle of view of 186 degrees, unprecedented anywhere in the world.

It was this lens, and its successors, that Reg Etherington, Stan Johnson, and an expatriate Hungarian remembered by the family as 'Bila', would begin to perfect in the now-complete workshop behind the Dragon Tower Restaurant in Mildura. But it was not quite in working order.

Then started a saga of bungling and delays within Department of Supply that nearly sent Etherington Optical broke. The details are less important than the blindly bureaucratic process it illustrates. Some essential equipment was omitted from the rail freight sent to Mildura. Some could not be released 'under three months … consider the possibility of commencing provision of any optical components that are within the capacity of the plant already delivered' (28 April, 1954). A Trepanning Machine was dispatched without the motor '…sincerely hope you have not been greatly inconvenienced by this mistake'. On 11 November, 1953, 'we must confess that your estimate has been mislaid and/or lost …thank you for your willingness to compile a duplicate estimate … considerable delays.' 'We have placed an order in the UK for a replacement machine, but it may be 2-3 months before we get it. I am sorry for the delay.' The wrong specifications were sometimes sent, e.g. (17 July 1958) 'there is no similarity between the Wollensak field lens and the drawings used 'in aid' of manufacture. How this mistake occurred is known only to Inspection… Army accepts the lenses as produced, paying for them of course, and obtaining from you a new quotation for 48 No. Wollensak lenses.' And faults in the Chance slabs of glass used for the lenses were at times not obvious until the grinding process was complete.

Despite such bureaucratic delays, this small Mildura plant began to turn out Ultra Wide Angle Lenses and many other optical products that did pass inspection. The Etherington papers are full of Purchase Orders, from Department of Defence Production, worth many thousands of pounds. Manufacturing ranged from 'optical blanks' to be used by firms doing other Defence work, to 'prisms for precision optical instruments', 'mechanical components, sub-assemblies and assemblies for precision optical instruments', 'Erector Lenses', 'a thousand sets of a 50mm F 3.5 enlarging lens', 'rifle telescope sights', submarine 'Periscope No. 14A', 'Plano Cx Lenses of variable focus', 'lens eyes for Binocular Prismatic No. 2 Mk. 2 Wollensak Field lens', and so on.

This was the beginnings of what was intended to be and could have become an advanced optical industry for Australia. As early as June 1954, Reg Etherington was telling Defence 'one important aspect of the project here is development, from existing knowledge and skill. I intend to seek advice from the Laboratories in each job I undertake.' By December 1956, he was seeking an import permit for optical glass (rationed by Supply) so he could venture into the commercial field. Having already experienced the unreliability of Defence contracting, and looking to the future viability of his business, Etherington convinced the federal House of Representatives member for St Arnaud, Winton Turnbull, to ask 'Black' Jack McEwan, then Minister of Trade, to expedite the import permit, explaining (24 May, 1957) 'We have the skill and the plant. The industry is a key defence industry, it exists in only three places in Australia, its future depends on being able to manufacture for commercial purposes … in order that the basic skill which was not here before the War, is retained.' An import licence was approved by

McEwan in July 1957 and by 1958, when the first finished Jindiviks were test-fired at Woomera, Etherington Optical looked to have a promising future.

It was in 1958 that the first Jindivik pilotless target plane was trialled, using a camera developed by Murray Zeising and Bob Bonnell in 1957 to track its path. This was the WRECISS , the WRE standing for Weapons Research Establishment at Salisbury, CISS standing for Camera Interception Single Shot. Made by Fairey Aviation Co., the camera incorporated a single circular piece of film exposed at precisely the moment the warhead would have exploded, vital information since such warheads are directional in their effect. This camera and its filed data told the attitude, distance and direction of the target with an accuracy of two degrees.

And its essential component was the Ultra Wide Angle Lens made by Etherington in Mildura. A faded newspaper clipping of 1959 trumpeted the headline 'SA Camera Sold to US', mentioning both the WRECISS and the WRETAR (a later version) and saying, 'The carefully polished lenses (the secret of the success of the camera) were made by a small firm at Mildura.' The French government, too, was seeking information about the cameras and lenses. Others recognized their potential use in aerial surveys and mapping.

By September 1959, Etherington Optical was delivering '40 Large and 91 Small Ultra Wide Angle Lenses', and getting orders 'required at 20 sets per month, test plates to be within 0.0001" of the nominal radii'. One October 1959 quotation lists 150 UWA lenses PSK1248 and 150 UWA lenses P2304, @ 6 pounds each.'

But the promise of boom times was short-lived. I came on the scene courting Reg Etherington's third daughter Patricia in those years, and it was clear that aggravation about the business was setting in. Defence inspections were often too rigid, using inappropriate standards and often quite incorrect comparisons. Stan Johnson did not take rejection of his work well and there were fights in the Nissan hut about faulty machinery versus human error, not reading blueprints properly, not being told by Defence that lenses had to be edged differently.

Worse than the 15% rejection rate was the fact that orders for work from Defence were slowing down. This had nothing to do with the plant's performance, but all to do with the wider political context. Today's renewed controversy over radiation impacts on Maralinga stems from the mid 1950s when Britain's atom bombs were exploded. The Australian public did not know at the time that English Electric was developing for the British Government its own new guided missiles to carry nuclear warheads. Called 'Blue Water' and 'Blue Steel', these were tested at Woomera in 1958-61 in utmost secrecy. New explosion impact zones on the Range were being prepared in 1962. But there was growing unease in Britain and within NATO about the potential escalation of the arms race if such tactical nuclear weapons were deployed. As well, British work had been overtaken by the American ground-to-air 'Skybolt' missile and by Russian improvements in ground defences against attack. So, suddenly, the whole British nuclear missile project was abandoned. English Electric had to sack 1000 workers and close its Luton factory.

But Reg Etherington was still convinced of the future possibilities for the fledgling Australian optical industry. He wrote to the Controller, Ordnance Supply Branch on 19 July 1960, 'You are no doubt aware of the complex nature of precision optics. I feel that a great deal has been achieved here over the past six years in skill and experience, and I can now confidently state that the organization is established on a continuing basis to fulfil current Commonwealth requirements.'

But the Australian political and bureaucratic establishment seemed unable to appreciate the future potential and lost its opportunity to help this entrepreneurial investor develop what could have kept Australia at the forefront of optical and missile research and manufacturing. While the US, Russian, French and British governments could see the future of optics in space satellites and weapons, Australian small-scale thinking let its established advantage go.

In another letter to Mr. C. Quinn, Collector of Customs (15 March, 1961) Reg Etherington pleaded his case eloquently:

'Over the past 7 years I have manufactured for the Department of Supply, optical components of a high precision nature, including prisms and lenses for telescopes, tanks, binoculars, range finders, periscopes, wide angle camera lenses of field, of 220 degrees for Jindivicks and rockets, test plates of many types, graticule blanks, precision lenses of 320 inch focal length for range finder testing equipment. The precision requirements range from contact surfaces (i.e. absolute elimination of error) to an accuracy of 1/250,000 inch in sphericity.
'Conclusion: A. The industry is a vital one to Australia. Its existence to date has been dependent on defence requirements. In my opinion the field for development is dependent on your department being fully informed on the ramification of this vital industry i.e. it is linked with instrumentation. B. That licences to import Optical Components should be issued only after it is established that the work cannot be undertaken efficiently in Australia on a basis that is reasonably competitive. C. A survey should be undertaken of the range and value of optical instruments imported into Australia with a view to that information being made available to manufacturers who are interested in the development of an optical industry.'

Needless to say, the Australian authorities did not respond. Reg Etherington sold his Mildura workshop equipment, Stan Johnson left in acrimony over payouts, and Etherington Optical folded, with major losses.

Reg remained true to his promise of confidentiality, one of the old guard with a sense of honor and duty to his country. Though he wouldn't talk about it, he knew the significance of his work and insisted we keep his papers. They are very incomplete and in his later years he could not have filled in the details. But they give a fascinating insight into yet another example of Australian innovation lost, of Australia being sold out by its more powerful political allies and of the way what goes around comes around.

We could have had our own advanced optical industry. But history has a sad way of repeating itself.

Postscript

Peter Morton argues that the Woomera Rocket Range and the Weapons Research Establishment at Salisbury were doomed from the start because Britain post-War was reduced to a second-rate power on the world stage The British wanted to withdraw from its agreement, and the Australian government knew it could not afford to keep up the $30 million a year running costs of Woomera. The Americans (who had launched WRESAT from Woomera) were losing enthusiasm for space exploration and research. After their successful landing on the moon in July 1969, they announced they would use Kwajalein Atoll in the Pacific for any future tests. And Japan had its own sea range at Kagoshima, so were deaf to any suggestions they might use Australia's land-based-range. Harold Wilson's Labor Government in the UK was determined to cut back spending on overseas military and scientific bases

One proposal for Woomera's future use (from a Flinders University Professor John Bockriss) was ahead of its time, but fell on deaf ears. He wanted South Australia's Premier to spend $20 million a year to establish a solar station which could convert water into hydrogen fuel. We are only now, in 2005, coming to realize this is the best hope for future non-polluting power supply as fossil fuel reserves diminish.

In fact, Woomera Village was saved by Australia's involvement with the US at the Defence Space Communication Station at Nurrungar (part of what was the Woomera Rocket Range). Labor had campaigned against such US bases, and the Governor-General Sir Paul Hasluck had declined to sign the agreement on Nurrungar until after the 1969 election returned the Coalition Government. Prime Minister John Gorton announced its establishment in April 1969, and USAF funds started pouring in.

The Range itself continued to be used for some testing till 1971, but Navy missiles ('Sea Dart' and 'Sea Wolf') really needed a sea range, not land testing. Nurrungar flourished on other, more secretive satellite monitoring and missile guidance research. In 1972 the new Whitlam Labor Government announced, to huge public controversy, that the Woomera Range would be run down. Suggestions of American involvement in the 1975 sacking of the Whitlam Government relate to the threat this posed to Nurrungar's viability and Labor's hostility to US-controlled bases on Australian soil.

Nurrungar was to become, and still is, one of the three key American-Australian 'joint facilities' on our soil. Pine Gap near Alice Springs (1966), North-West Cape in WA (1967) and Nurrungar (1969) are essential to round-the-world coverage in America's global communications and reconnaissance network. They play an essential part in satellite tracking of military and terrorist movements, missile launches or nuclear explosions.

They are also critical elements of what Australia is now apparently committing itself to - Bush's Son of Star Wars program, with no apparent guarantees that Australian science will be privy to the latest research and technological advances, or that Australian manufacturers will benefit in any way. Interestingly, it was Donald Rumsfeld who chaired a 1998 commission which urged a new U.S. defence shield against nuclear attack, despite the CIA view that there was more danger from non-missile delivery. He has asked Britain to expand the Fylingdales early warning radar base, offering technology-sharing and commercial opportunities for British companies arising from research and development contracts. Geoff Hoon (until the last UK election, Britain's Defence Secretary), felt the need to assess the threat of ballistic missiles, possibly bearing chemical, biological or even nuclear warheads. This has raised fears that, like the Cold War proposals to deploy cruise missiles in the 1980s, Britain may (along with Denmark and its radar base at Thule, Greenland) become a base for US missiles. The White House expects to spend $7.4 billion on researching and developing the system over the next two years.

(5077 words)

Box

Australian Chemical Weapons Research at Proserpine and Innisfail

Fearing Japan might use chemical weapons with unknown effects in the tropics, a joint British-Australian chemical research station was set up at Gunyarra near Proserpine in 1944. Volunteers from Australian and British troops fighting in the Pacific were subjected at the 'tropical diseases hospital' to experiments using mustard gas, Lewisite, arsene and other gases, used on their skin in different concentrations and at times dropped from planes over the dense jungle of Cairns, Brook Islands and Bowen. A team of scientists left Britain 14th August, 'two by air via America, remainder by sea. America will not be asked to contribute in cash but contribution in personnel or equipment will be accepted.' Unclassified documents mention 'experimental work such as bombs, operation of aircraft ammunition and associated stores', and 'rental, repairs, maintenance, etc. of properties at Innisfail and Proserpine', 'accommodation at local hospitals', 'rations supplied to civilians on the station to be charged on a per capita basis to the Department of Munitions which would obtain reimbursement from the personnel concerned'. Costs of 'troops from United Kingdom and personnel from the United States would be borne by those countries', and Department of Munitions would recover from the UK half the costs 'in respect of the Australian Chemical Warfare Experimental Stations at Innisfail and Proserpine'. Later claims for injury failed, but the Proserpine Historical Museum Society has a display of photos and other material used at the time. (National Archives, Defence Committee Agenda No. 219/1944; and Proserpine Historical Museum Society Inc.)