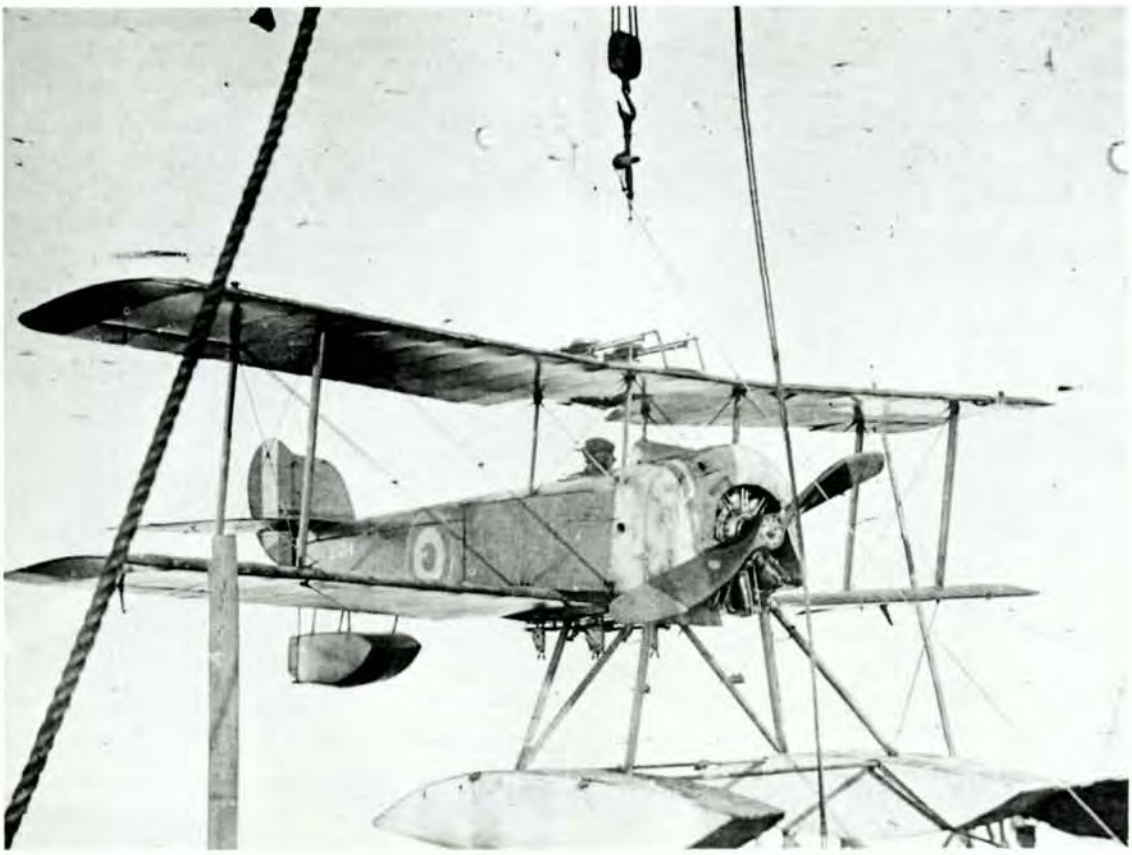

JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE

VOLUME 7 FEBRUARY 1981 NUMBER 1

AUSTRALIAN NAVAL INSTITUTE

1. The Australian Naval Institute has been formed and incorporated in the Australian Capital Territory. The main objects of the Institute are:—

a. to encourage and promote the advancement of knowledge related to the Navy and the Maritime profession.

b. to provide a forum for the exchange of ideas concerning subjects related to the Navy and the Maritime profession.

c. to publish a journal.

2. The Institute is self supporting and non-profit making. The aim is to encourage freedom of discussion, dissemination of information, comment and opinion and the advancement of professional knowledge concerning naval and maritime matters.

3. Membership of the Institute is open to —

a. Regular members — Members of the Permanent Naval Forces of Australia.

b. Associate Members — (1) Members of the Reserve Naval Forces of Australia.
(2) Members of the Australian Military Forces and the Royal Australian Air Force both permanent and reserve.
(3) Ex-members of the Australian Defence Forces, both permanent and reserve components, provided that they have been honourably discharged from that force.
(4) Other persons having and professing a special interest in naval and maritime affairs.

c. Honorary Members — A person who has made a distinguished contribution to the Naval or maritime profession or who has rendered distinguished service to the Institute may be elected by the Council to Honorary Membership.

4. Joining fee for Regular and Associate members is $5. Annual Subscription for both is $15.

5. *Inquiries and application for membership should be directed to:-*

The Secretary,
Australian Naval Institute,
P.O. Box 18,
DEAKIN, A.C.T. 2600

CONTRIBUTIONS

As the Australian Naval Institute exists for the promotion and advancement of knowledge relating to the Naval and maritime profession, all members are strongly encouraged to submit articles for publication. Only in this way will our aims be achieved.

DISCLAIMER

In writing for the Institute it must be borne in mind that the views expressed are those of the author and not necessarily those of the Department of Defence, the Chief of Naval Staff or the Institute.

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JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE (INC.)

CONTENTS

The cover photograph shows a Sopwith 'Baby' aircraft being hoisted onboard HMAS *BRISBANE* (1). *BRISBANE* took onboard this aircraft at Colombo in April 1917 and used it until June 1917 for reconnaissance while searching for the German raider *WOLF*. The *BRISBANE* thus became the first Australian warship to embark an aircraft for operational purposes.

— by courtesy Naval Historian

CHAPTER NEWS

SYDNEY CHAPTER

The Sydney Chapter of the Australian Naval Institute met on four occasions during 1980.

In March, members gathered at the RAN Staff College for a presentation on the US Coast Guard by VADM R.I. PRICE USCG.

Mr John FOZZARD of British Aerospace UK, together with Mr Nat GOULD, Director, British Aerospace Australia, gave a polished presentation on the Sea Harrier on May 20.

Dr R.N. LEBOW lectured the Chapter on the US/Soviet Strategic Relationship on 21 July 1980.

A presentation on the RAAF Tactical Fighter was held in October.

Correspondence

NOM DE PLUMES

Dear Sir,

Commander Bassett's letter in the last Journal, concerning pen-names again raised the question of the validity of such devices in a learned journal. His point that the authority of an article must inevitably be diminished by some extent if published under a pen-name is certainly a fair one. There are, however, certain advantages attached to a system whereby authors are anonymous, or at least obscure.

First, the British *Naval Review* has in sixty eight years of existence demonstrated that a high and consistent quality of discussion can be maintained even with the almost universal use of pen-names. Granted proper editorial discretion, discussion should never become acrimonious or irresponsible.

Second, anonymity allows a freedom otherwise difficult to obtain in such a small organization as the RAN. This freedom not only extends to the time honoured and popular image of the disgruntled junior officer or sailor stepping outside the Service to air his frustrated views, but to the equally constrained senior officer. Is it not right that an Admiral seeking to try out some new idea or propose some scheme at variance with the "Party Line" should be able to do so without affecting his own appointment? If his idea is startling, it is far more likely to receive study and criticism on its merits alone if issued by "Leander" than "Rear Admiral X", just as will be the case for "Midshipman Y". Pen-names also avoid the dreadful and otherwise inevitable third stage of naval argument — that of personal abuse.

Third, certain periodicals in the field of defence studies — not, I hasten to note, the *ANI Journal* — have been displaying a regrettable pre-occupation with famous names and high rank at the expense of good and original writing. This is especially (perhaps inevitably) true of the commercial journals. How many naval officers have read such pieces and come away with a feeling of having neither interest nor sympathies roused nor of having learnt anything new? Articles should be judged by style and content and not by their authors.

Of course there are exceptions. It is not fair, for example, to publish unfavourable book reviews under a pen-name. A famous case of the foolishness of such a proceeding was the decidedly peculiar piece on *The Cruel Sea* which appeared in *The Naval Review* and lost that journal temporarily a great deal of credit.

There may be one happy compromise between pen-names and the excessive employment of ranks and titles and that is the use of initials or unadorned names. As all members of the ANI receive a list of the membership each year and new members in each issue, a little detective work is all that should be required to establish the identity of a particular author. Very few who write under pen-names really fear eventual discovery as "the bloke who wrote that nonsense". What they do fear is that their "nonsense" should not be read.

In sum, therefore, I take Commander Bassett's point, but I must remind him that the primary function of the Journal is 'to provide a forum for the exchange of ideas concerning subjects related to the Navy and the Maritime profession', thereby encouraging and promoting 'the advancement of knowledge related to the Navy and the Maritime profession'. If pen-names help achieve a greater freedom of discussion, there should be no objection to them.

I am, in lieu of pen-name or initials,

Yours sincerely
JAMES GOLDRICK
Sub-Lieutenant, RAN

HMAS TARAKAN
Warships Section
Central Mail Exchange
NSW, 2890

ELIGIBILITY FOR REGULAR MEMBERSHIP (1)

Dear Sir,

I would like to join Sub-Lieutenant J.V.P. Goldrick (August 1980 Journal) in supporting Commander A.W. Grazebrook's suggestion that members of the RANR on active training lists be granted regular membership of the Institute.

'I Claudius' is possibly right in saying that some Reservists (not those who are already members) see themselves as being second-class citizens in the eyes of the ANI. Making regular membership available to all active members of the Naval Forces could create more interest in the Institute among members of the RANR who could bring broader views and interests to the stated main objects of the Institute.

The total allowed complement of the active RANR, as compared to the RAN, would prevent the Reservists being anything other than a minority group within the regular membership.

Yours faithfully,
A.M. WHYBROW
Commander, RANR

Sydney Port Division RANR,
HMAS WATERHEN,
Waverton, NSW, 2060

AUTHORSHIP OF JOURNAL ARTICLES

Dear Sir,

Being a member of the ANI, I find the journal extremely good reading. I would like to point out, however, that from the 'lower deck' point of view, there is too much 'brass hat' material in each copy. Come on chaps of the 'lower deck' ashore and afloat, who are members of the ANI and send your contributions to the Editor!

Some examples that could be included are:

- A main feed pump failure and the trouble it takes for the 'tiffies' working until the pump is brought back on line. This happens mostly during the silent hours.
- The troubles that occur for the stores and victualling branch when, although all the paper work has been put in on time, they don't get the stores to the ship before sailing.
- The brief life of a leading seaman, who has been in the navy for 25 years or so and some of the highlights of his career.

I feel strongly that the ANI Council should give far more encouragement to these suggestions, as it would make the journal far more interesting overall.

Yours faithfully,
G. VOLLMER
Chief Petty officer, MTH3

Tongan Defence Force,
Tonga,
South Pacific

The ANI Council certainly provides the encouragement along the lines sought by CPO Vollmer. ANI membership, authorship of Journal articles, or, for that matter, any other participation in Institute affairs has never been inhibited by considerations of rank.

THE EDITOR

ELIGIBILITY FOR REGULAR MEMBERSHIP (2)

Dear Sir,

In his haste to take offence and defend his amour propre, Surgeon LCDR Collings in the last ANI Journal apparently failed to read my earlier letter fully and carefully.

If doctors, dentists or any other RANR personnel have regular training commitments (say at least once a month) then they should, in my view, be eligible for full membership of the ANI. If, like retired Officers of the RAN, RANR personnel have no regular training commitments then they should be eligible for Associate Membership.

Yours faithfully,
A.W. GRAZEBROOK
Commander, RANR

2 Lucifer Street,
North Balwyn, Vic. 3104

AUSTRALIAN AMPHIBIOUS CAPABILITY

Dear Sir,

May I seek space in your columns both to respond to Colonel Duncan's letter in the November 1980 issue of the Journal and to comment upon Major Bowman's medal winning essay in the same issue on an 'Appropriate Maritime Strategy for Australia in the 1980's.'

It was most encouraging to read the article of the combat infantryman who perceptively observes that the Australian Defence Force requires an amphibious capability as an essential element of sea power projection for defending island territories, responding to requests for assistance from neighbouring friendly states, and conducting raids as part of deterrent strategic strike operations. In contrast, it was disappointing to find in the same issue a senior Army logistician still apparently unable to acknowledge that there is a need for changes in defence strategy when Australia no longer maintains a large proportion of its Army overseas, with either UK or US forces providing secure base areas for Australian troops.

In his letter to the Journal, Colonel Duncan has ignored that my February 1980 article was **not** aimed at proposing the number and types of ships and landing force units that Australia requires (for which he must await a later article) but to make the point that amphibious forces need to be recognised as essential elements of a viable **maritime** force for an island nation as are ASW forces. In doing so, he has apparently failed to notice that in Australia's area of interest, the trend in the navies of Pacific and Indian Ocean area countries has been to **increase** significantly their amphibious capabilities during the 1970s.

Colonel Duncan also accused my article of failing to state a role for an Australian amphibious force, whereas it **was** stated therein several times that the successful maritime defence of an island nation requires the ability to seize and hold strategic islands and/or deny same to an enemy — a truth brought out again very positively in Major Bowman's article. The current clandestine raiding capabilities of the small SASR and Commando parties that a submarine can insert should not be confused with the need for company to battalion group size strategic raiding capabilities. I suggested in my article that **recent** history has shown these capabilities to be a most useful employment of amphibious forces.

In view of these considerations, I am not able to accept Colonel Duncan's suggestion that recent military lessons of the 1970s available to Australian planners, concerning the use of amphibious forces, provide an approach that could also be used to justify re-establishing a Camel Corps!

In a Defence era, when the emphasis is on developing capabilities for independent national joint operations, there is little point in possessing the large logistic sea transport forces that Colonel Duncan advocates if the Defence Force does not possess the capability for tactical lodgement of ground forces into areas beyond the radius of operation of utility helicopters and tracked or wheeled vehicles. This is apart from the limited capability provided by a small parachute drop or by the clandestine lodgement of the very small numbers of SASR or Commando raiders that can be carried in a submarine.

As I wrote in the October 1978 issue of the Defence Force Journal on an 'Operational Concept for the Australian Amphibious Force', I contend that the Army's best contribution to national defence would be in supporting RAN and RAAF efforts to hold any enemy as far back from Australia's shores as is practicable by providing trained landing forces able to reinforce, recapture or seize strategic islands and strike at strategic targets. For this reason, I consider Colonel Duncan is quite wrong in his suggestion that an island nation's defence 'will normally evolve around what is fundamentally a land campaign'.

Readers without easy access to a recent copy of *Jane's Fighting Ships* may be interested to know that it is Colonel Duncan, not I, who has ignored (or is unaware of) the trends of other nations in developing amphibious warfare capabilities.

During the past decade while Australia has been very slowly recreating a limited amphibious operations capability, *Jane's* lists the following capabilities acquired by navies of Pacific and Indian Ocean countries:

- Chile — 3 LST acquired in 1973, and 2680 marines
- France (Pacific Fleet) — 1 LSD and 4 LST, with 2 new LST ordered in 1974 and 2 more ordered in 1979
- India — which acquired 4 LCT in 1975/76 has ordered a further 6 x 1000 tons LCT and 4 LCU
- Indonesia — 9 LST and 5000 Marines
- Japan — 6 LST acquired between 1972-77 and 2 LCU on order
- Korea — 8 LST and 11 LSM, with 20,000 Marines
- Malaysia — 3 LST acquired in 1976
- Peru — 3 LST and 3 LSM, with 1400 Marines
- Philippines — 21 LST (10 acquired in 1976-78) and 4 LSM, with 7000 marines
- Singapore — 6 LST acquired in 1975-76
- Taiwan — 2 LSD acquired in 1976-77 and 21 LST with 29,000 Marines
- Thailand — 5 LST, 3 LSM and 7000 Marines
- US Pacific Fleet — Of the US Navy's 66 ship amphibious force, it is noted that 32 were built during the 1970s, and a new LSD class is currently on order together with a new class of air-cushion LCT. Approximately half this force is in the Pacific Fleet.

In the very different strategic situation of the NATO area, Colonel Duncan's quote from the UK RUSI meeting was very selective. Also in the same report from which he quoted were the statements more relevant to Australia that:

- 'the meeting saw this (the Indian Ocean) as providing a better rationale for an amphibious capability than did NATO'
- 'prior to commencement of hostilities, amphibious forces could be deployed to areas with greater ease than was possible using conventional shipping'
- 'it would be easier for a politician to despatch an amphibious force than an airborne force as the former provided him with time in which to change his mind' and
- 'the USMC representative indicated that the US Marines were seeking support to increase their amphibious capability which is very limited at present'.

To allay the fears of any reader not acquainted with the Canberra scene, a whole series of conceptual studies was undertaken into the needs for amphibious shipping before the procurement of the first LSH was approved. The LSH type was selected because of its proven capabilities to be used for either amphibious operations or for sea transport support.

The procurement of more LSHs would thus provide both the capability to lodge ground forces tactically where either a Maritime or a Land Force Commander wished and also, the capability that Colonel Duncan seeks of sustaining a force in a remote area of Australia or overseas.

Yours faithfully,

P.J. Shevlin
Commander, RAN

Director of Joint Warfare Policy
Department of Defence (Navy Office)
Canberra

SEAPOWER 81

The Australian Naval Institute's second National Seminar, *SEAPOWER 81*, will be held in Canberra on Friday, 10 and Saturday, 11 April 1981. The seminar theme is 'Australia's Maritime Defence and its Relation to Industry' with distinguished speakers addressing a wide range of topics related to Australian industry's long term contribution in support of our maritime forces.

Seminar registration forms were included with the November 1980 edition of the Journal, and others have been despatched around the country in a mailing campaign. Inevitably though, someone will have been missed; if readers are aware of somebody who has been missed, additional registration forms may be obtained by telephoning the Seminar Registrar in Canberra (062-65 5076 or 66 4284) or by writing to —

The Registrar,
SEAPOWER 81
Australian Naval Institute
P.O. Box 18,
DEAKIN, ACT 2600

FROM THE EDITOR

This will be the last Journal before the ANI's second National Seminar, *SEAPOWER 81*, to be held in Canberra, 10-11 April 1981. In view of the theme of the seminar, 'Australia's Maritime Defence and its Relation to Industry', an appropriate major article in this journal is 'The Mobilization of Australian Defence Industry.'

The author of the article, Major Bradley of the New Zealand Army, makes a timely contribution to seminar debate through his examination of the feasibility of Australia mobilizing its defence industries to support the defence forces in their preparations to face a major threat. The shipbuilding industry is singled out for specific comment, along with the munitions, electronics and aerospace industries.

Major Bradley points out that whilst Australia is sound economically, it lacks a flexibility that would otherwise easily allow a rapid build-up of defence production. He notes that the existing capability of the defence industries is not good, especially when considered as a basis for expansion. He concludes that it is unlikely therefore that Australia would be able to meet the total indigenous defence production mobilization criteria within the likely warning time of the emergence of a major threat.

The major articles in this Journal also include a review of the early days of naval aviation in the RAN by Lieutenant Commander Ray Jones. Appropriately therefore our cover photograph shows the first aircraft to be flown from an HMA Ship for operational purposes.

In other major articles, Tony Grazebrook reviews the philosophies of some Pacific Ocean oriented Admirals of the USN and suggest some lessons for the present and Sub-Lieutenant Peter Leschen gives his views on Antarctic ship operations, drawing on his experience in HMS *ENDURANCE*.

Although this Journal includes a good number of what the editorial staff call minor articles, i.e., book reviews, letters to the editor, 'Ships and the Sea', 'Nobody Asked me But . . . ' etc., we still believe we could do better. Our feed-back suggests that these minor articles often stimulate considerable interest. After all, a major aim of the Institute and the Journal is to provide a forum for the exchange of ideas and a major article of several thousand words is not necessarily essential for that.

The two columns I have in mind particularly are 'Shiphandling Corner' and 'Technical Topics' (we have not had one of the latter now for well over two years).

More contributions to minor articles are sought for the Journal. They do not have to be long — just a few short paragraphs, if you like, to convey a point, promote an idea . . . . or give a laugh.

An Egyptian *RAMADAN* Class missile-armed fast patrol boat.

— by courtesy James Goss

FROM THE SECRETARY'S DESK

The Council and the Editorial Sub-Committee are at present investigating ways of keeping members' addresses up to date and ensuring that every member receives his copy of the Journal on time. This is proving no easy task as a career in the Navy necessitates frequent postings to ships at sea and shore establishments. Yet the problem must be overcome.

Every member can do his bit by forwarding to me his new address every time he is posted. We can have the most efficient distribution procedures, yet unless we have your latest address all is to no avail. Remember it gives neither you nor us any joy to have journals returned stamped 'not at this address'.

There are still members who have not paid their subscriptions even though this will be the third Journal they will have received for the Institute's financial year. If you are one of those people, I would like to remind you that you are adding to the administrative costs of the Institute and are an extra burden to those members who give up their spare time in order that the organization functions efficiently on its limited budget. Remember that you are not being fair to the editor, treasurer and officers who must find the money for the printer, postage and stationery.

Finally bookings for SEAPOWER 81 are now well advanced especially from members. I want to remind you that not every member will be able to attend as the auditorium only has 380 seats.

Further the seminar is designed to promote the exchange of ideas between members, industry and governments and thus the number of seats available to members must be limited accordingly. So if you are thinking of coming, and the seminar is good value specially if you eat, then I suggest you make your booking as soon as possible.

NEW MEMBERS

Lieut. Cdr. D.T. Bennet
21 Jemalong Street
Duffy A.C.T. 2611

Midshipman M.F. Gallagher
HMAS *MELBOURNE*

Sub-Lieut. R.J. Rudge
HMAS *MELBOURNE*

Lieut. Cdr. Clark Stitz
38 Pandanus Street
Fisher, A.C.T.

Mr Geoffrey Fulton
60 Kilgour Street
Geelong Victoria 3220

Lieut. Christopher Le Marshall
HMAS *CERBERUS*

Captain Ian MacDougall
HMAS *SUPPLY*

Mr Terrence O'Rourke
SIP,
F-1-08A

AUSTRALIAN NAVAL INSTITUTE PRIZES — 1980

Australian Naval Institute Medal

The Australian Naval Institute Silver Medal for the best essay on maritime strategy submitted during each course at the RAN Staff College was awarded as follows:

Course 1/80 — Major N.A. Bowman RAR
Course 2/80 — Lieutenant Commander P.F. McGuire RAN

Journal Awards

The ANI Council is pleased to award the following prizes for articles printed in the Journal editions in 1980:

The Best Major Article:

$75 to Lieutenant K. Clancy, RAN, for his article *The RAN and the JMSDF — Pacific Partners* in Volume 6, No. 2 (May 1980).

The Best Minor Articles:

$10 to Commander R.J. Pennock, RAN, for his 'Ships and the Sea' article *Sailing Ship PREUSSEN* in Volume 6, No. 2 (May 1980).

$5 to Commander C.J. Littleton, RAN, for his 'Shiphandling Corner' article *Shiphandling with a Bowthruster* in Volume 6, No. 2 (May 1980).

$5 to Able Seaman G.B. Canning for his 'Nobody asked me, but' article *The Cost of Living* in Volume 6, No. 3 (August 1980).

THE EARLY DAYS OF AUSTRALIAN NAVAL AVIATION

by Lieutenant Commander R.M. Jones RAN

The First World War (1914-18) was a period of intense development and growth in naval aviation as the Royal Navy sought to apply the aircraft's attributes to naval warfare. A very close relationship between the RN and the RAN in those years meant Australia shared in this development and Australian cruisers serving in British waters were modified to carry and launch wheeled aircraft at sea. Yet in the post-war years RAN cruisers rarely operated aircraft. Even allowing for the neglected state of the Australian Defence Force in the decade after the 'war to end all wars' it still seems unusual that Australian ships so rarely operated aircraft.

One cynical reason sometimes given in ignorance is lack of naval interest in aviation but this is too simple, as well as quite wrong. Events in the 1914-18 war had confirmed the value to a cruiser of aircraft reconnaissance and the Australian Naval Board sought to continue the carriage of aircraft in some form. One problem was the minority opinion within the Navy that aircraft and ships should not mix; but other circumstances, mainly ship and aircraft availability, combined to make continued operation impracticable in the 1920s and forced the RAN to reluctantly discontinue the operation of aircraft from cruisers until the 1930s.

Size of ships in commission was an important determinant. During the war the battle cruiser HMAS *AUSTRALIA* (21,600 tonnes) [1] was flagship and the major unit, but after September 1920, she rarely left harbour because of high running costs and was paid off in December 1921. After *AUSTRALIA* was scuttled in 1924, under the terms of the Washington treaty, light cruisers were the largest warships available to the RAN.

Four light cruisers (HMA Ships *MELBOURNE, SYDNEY, BRISBANE* and *ADELAIDE)* were then the major strength of the RAN. Armed with 15.2 centimetre (6 inch) guns and displacing about 5,600 tonnes, they were about 140 metres long. *SYDNEY* and *MELBOURNE* were built in Britain and arrived in Australia in 1913; *BRISBANE* was built at Cockatoo Island dockyard, Sydney, and commissioned in 1916. The marginally larger *ADELAIDE* was built at Cockatoo Island but did not commission until 1922.

The first three of these light cruisers were transferred to Admiralty control during the war and each had operated an aircraft. While engaged in an Indian ocean search for a raider in April 1917, *BRISBANE* borrowed a Sopwith Baby seaplane from an RN seaplane carrier. This diminutive aircraft, spanning 7.8 metres and weighing 778 kilograms loaded (26 feet and 1715 pounds), was stowed on deck and hoisted out onto the water to take off on its searches. The operation was most successful and converted the cruiser's commanding officer, Captain C.L. Cumberlege, into an aviation enthusiast. After the search ended, *BRISBANE* returned her borrowed seaplane and did not, despite Cumberlege's endeavours, again carry an aircraft.

Around the other side of the world, in the North Sea, RN ships were subject to frequent harassment and observation by German Zeppelin airships. Some means of taking fighter aircraft to sea to defeat the Zeppelin was urgently sought. Of the many solutions tested, the flying-off platform was simplest, cheapest and quickest to install and many cruisers were fitted with platforms from which wheeled fighter aircraft routinely operated. In larger ships, such as *AUSTRALIA*, the platforms were built on gun turrets extending out over the barrels; in smaller cruisers, such as *SYDNEY* or *MELBOURNE*, the gun mounts were too small to support the structure and platforms were built over the gun but supported from the deck. In either case the platform was rotated into the relative wind and the aircraft took off under its own power. At the end of 1917 and during 1918 *SYDNEY, MELBOURNE* and *AUSTRALIA* operated standard RN ship-borne aircraft. For the light cruisers these were the Sopwith Pup and later the Sopwith Camel.

THE AUTHOR

Lieutenant Commander Ray Jones joined the RAN in 1963 as a Supplementary List (Air) Midshipman. He completed Observer training with the RN in Malta and later served in various Fleet Air Arm Squadron postings, including service in Vietnam (1967-68) and RN exchange service (1969-71). He was Basic Aircrew Training Officer at HMAS *CERBERUS* between 1971 and 1973 before joining HMAS *BRISBANE* for watchkeeping training. Postings since 1974 have included Air Operations Officer at NAS *NOWRA*, the Directorate of Naval Aviation Policy in Navy Office, Canberra, and SNO at the RAAF Base, East Sale.

Hoisting a Sopwith '1½ strutter' onboard HMAS *AUSTRALIA* Firth of Forth, Scotland, 1918. The '1½ strutter' was a two-seater reconnaissance aircraft.

— Australian War Memorial negative No. EN 542

SYDNEY's aircraft was launched on one occasion in pursuit of two German reconnaissance aircraft and the pilot claimed one shot down but he had been unable to see it hit the water because of cloud and the kill was not awarded. His aircraft nearly met the fate common to fighters launched from platforms when it was ditched at the end of the flight. On this occasion, the aircraft was successfully recovered but loss of the aircraft was a common and accepted event. Aircraft were relatively cheap, the need for their services was great, and the not inconsiderable personal risk was acceptable in wartime.

After the Armistice in Europe, RAN ships returned to Australia where the Naval Board was developing plans for an aviation arm of the Navy. When the cruisers left England in 1919 these plans had not produced an established aviation organisation and, on RN advice, the cruisers landed their aircraft since there were inadequate facilities in Australia for continued operation. The platforms were retained in the light cruisers (photographs taken in 1919 and 1920 show both still fitted)[2] but were not used in Australia. They remained unused partly because the Naval Board's plans for a Royal Australian Naval Air Service were overtaken by political and financial concern at the future of aviation in Australia.

In the immediate post-war years, aviation in Australia was characterised by little actual flying by the Army's Air Corps and deep disagreement over future permanent organisations. Agreement could not be reached on whether there should be separate Naval and Military Air-Services or a single, independent air service on the British model. Final resolution of different opinions took several years, resulting in the formation of the Royal Australian Air Force early in 1921. In the interim, only a little practical experience in operating aircraft from cruisers under Australian conditions was gained.

1920 Experiments

At the instigation of Commodore J.S. Dumaresque, now Commodore Commanding the Australian fleet and formerly active in the wartime application of aircraft to cruiser operations, the Naval Board arranged with the Army for an Australian Air Corps seaplane to embark in HMAS *AUSTRALIA* for an Island Cruise in the latter part of 1920. An Avro 504K, the only seaplane type in the Air Corps inventory, was modified for ship based operation and despatched from Point Cook by train to join *AUSTRALIA* in Adelaide. A pilot, two mechanics and two spare engines accompanied the aircraft and an observer was to be sent

along when the Air Corps had recruited an officer with wartime observing experience.

The seaplane was stowed on the main deck amidships, aft of 'Q' turret, where the main derrick could be used to transfer it to the water. The Avro flew in Hobart and Sydney, sometimes with Dumaresque as passenger, until September when *AUSTRALIA* was restricted to harbour. Overall, the embarkation until then appears to have been successful with the seaplane operating from the large vessel in temperate climates.

Now *AUSTRALIA* was unavailable, *MELBOURNE* became flagship. Although this much smaller cruiser had earlier been assessed as too small to carry or operate an Avro 504, she was now the largest ship available and the seaplane was transferred to the light cruiser before she sailed from Sydney on 29 September. During her five week cruise around New Guinea and the Bismarck Archipelago, calling at Woodlark Island, Rabaul, Port Moresby and then Cairns enroute back to Sydney, several attempts were made to operate the aircraft. It took off from the water twice (at Woodlark Island) but engine failure terminated both flights in a few minutes and severe power loss occurred during all engine test runs, including those with the spare engines installed. The wooden airframe also deteriorated in the humid, hot, salty environment and was further damaged by striking the ship during hoisting. Further attempts to operate the seaplane were abandoned during the Cairns visit.[3]

The trial was unsuccessful partly because, as predicted, the aircraft was too big for the ship, and often bumped against the side during hoisting, and partly because the aircraft engine simply did not develop enough power to operate in the tropics. Wing Commander Goble, the Naval Board's aviation adviser, suggested further trials but the Third Naval Member, Engineer Rear Admiral Clarkson, strongly opposed the proposal because the cruisers were already too heavy.

While this disheartening series of trials was in progress in *MELBOURNE*, the more permanent installation of aircraft facilities in *ADELAIDE*, still under construction, was considered. As early as September 1920, at about the time the Avro 504 was transferred to *MELBOURNE* and after the apparent success in *AUSTRALIA*, the Second Naval Member proposed that *ADELAIDE* be fitted with aircraft operating facilities. Admiral Clarkson did not object and necessary drawings were sought from the Admiralty. The original minute was couched in terms of operating a seaplane to be hoisted out for waterborne operations but the

Searchlights at work onboard HMAS *AUSTRALIA*, December 1918. The aircraft on the turret platform is a Sopwith '1½ strutter'. Some RN battlecruisers during the First World War carried this reconnaissance aircraft on one turret and a fighter (usually a Sopwith Camel) on another.
— Australian War Memorial negative No. EN17

A Sopwith Camel leaving the forward turret platform of HMAS *SYDNEY* at Scapa Flow in May, 1918. HMAS *MELBOURNE* is in the background.

— Australian War Memorial negative No. 224

drawings sent from England were for a 1918-vintage flying-off platform suitable only for a small wheeled aircraft. The Board was unwilling to act on such old information and deferred a decision until the type and size of the aircraft to be operated had been determined.

In January 1921, after reports from the *MELBOURNE* trial had been received, the Naval Board considered aircraft and light cruisers.[4] Contributing to deliberations were; recent advice from London that the RN had removed flying-off platforms from light cruisers; the Third Naval Member's adamant opposition to any weight increases in the cruisers; and Commodore Dumaresque's belief that, with adequate hoisting and stowage arrangements, suitable aircraft would be very important in naval warfare. The board abandoned plans to fit a flying-off platform in *ADELAIDE* and decided not to permanently modify any cruiser to operate aircraft. Dumaresque was advised that the decision, based on Admiralty policy, was not final and the overall place of shipborne aircraft in the RAN was still under consideration.[5] Board thinking was tending more towards a seaplane carrier as a central aviation unit rather than aircraft in cruisers but the financial situation precluded serious consideration of any new ships.

Fairey IIID Seaplanes

Further consideration of the place of aircraft in the RAN was promoted within a few months by availability of aircraft supposed to be suitable for cruiser operation. Between 1918 and 1921, when the Air Force assumed responsibility for Service aviation, several committees and boards were responsible for different aspects of aviation. One of these was a temporary Air Board established early in 1920, with Navy and Army representatives, and responsible for supervising the formation of a permanent air force. At the request of this board, staff of the Naval Representative in London selected the Fairey IIID seaplane as the first RAN aircraft; the intended role was cruiser embarkation and survey flying.

The first RAN seaplane was launched on 12 August 1921 with a bottle of champagne broken across the propellor boss by Mrs Hughes, wife of the Australian Prime Minister.[6] By the end of the year, all six were in Australia, still marked ANA-1 to ANA-6 (Australian Naval Aircraft), but now taken over by the Air Force and stored awaiting events.

Impending availability of the Fairey IIID promoted consideration of the employment for seaplanes and, in May 1921, a Seaplane Committee was formed to examine the embarkation of

one Fairey IIID in each of four light cruisers and three sloops. Illustrating a lack of unanimity on the subject was the decision of the Naval Board, in the absence of the First Naval Member, that the Navy wanted nothing to do with the aircraft. That decision was reversed when Rear Admiral Sir Percy Grant returned.

The Seaplane Committee, composed of two Air Force officers, one confirmed Naval aviation enthusiast (Captain Cumberlege) and a member of the Ship construction Branch, quickly agreed reconnaissance aircraft were an essential auxiliary to a cruiser but recognised several problems including overall weight, top weight and lack of deck space. Overall weight increases could be held within limits by carrying less coal; the reduced steaming range was, in the Committee's view, more than compensated by aircraft capability; the top weight problem could be solved by removing the mainmast. Lack of deck space remained a problem. To round off the plan a site for the seaplane base was selected next to the Naval Depot in Rushcutters Bay on Sydney Harbour.[7]

Commodore Dumaresque agreed with the Committee's report, commenting only on the need for a hangar to protect the aircraft from the weather and stokers' fingers, and suggested to the Naval Board that *MELBOURNE* be modified during her July 1921 refit. The only opposition at Board level to this proposal was from Admiral Clarkson who remained adament that RAN cruisers were already far too heavy. As a compromise, the embryo Naval Staff was instructed to examine the carriage of aircraft in Australian warships.

This Naval Staff Report concluded that the assistance provided by an aircraft was essential, especially in a numerically small force. Light cruisers needed aircraft for reconnaissance whether operating independently or in Fleets and very marked loss of speed and endurance in a cruiser would be an acceptable penalty in obtaining aircraft capabilities[8]. This report and strong recommendation were taken by the Naval Board on 22 August 1921 and the decision to fit one cruiser to carry a seaplane was made; selection of the ship was deferred until the Estimates for the financial year were being prepared.

In January 1922, nearly two months after the Air Board had advised that all six Fairey IIIDs were in Australia, the Naval Staff's Director of Operations Division nominated *BRISBANE* as the first cruiser to be modified but a Board decision was again deferred, this time until the previously absent First Naval Member could read the relevant papers. By August, the Ship Construction Branch had confirmed that removal of the mainmast was feasible and would compensate for aircraft weight. In that month, Admiral Everett — now First Naval Member — directed that plans be drawn up for the installation of a Fairey IIID, with canvas hangar and hand derrick, in a light cruiser. In October, plans for *MELBOURNE* carrying a seaplane were forwarded to Sydney for preparation of a cost estimate [9]. These plans showed a Fairey IIID on a new platform over the site of the existing mainmast which had been moved aft and shortened for use in connection with the 12.2 metre (40 feet) derrick taken from *AUSTRALIA*.

Further progress was delayed while the size of the aircraft in relation to the ship was re-assessed. Although weight and size of the Fairey IIID had been made available to the Seaplane Committee by Navy Office, there appears to have been little apprehension of the sizes and weights of the various aircraft discussed until late 1922. Quite possibly most of the Naval personnel involved visualised the Fairey aircraft as about the size of the Camel which had operated successfully from these vessels during the war. It was far larger. The Camel had a wingspan of 8.2 metres (27 feet), the IIID's was 14.0 metres (46 feet); loaded weights were 694 and 2291 kilograms respectively (1530 and 5050 pounds). The Avro 504, which had caused *MELBOURNE* great difficulty because of its size had a wingspan of 11.0 metres (36 feet) and weighed 844 kilograms (1860 pounds) loaded. Compared to the Camel and the 504 the Fairey IIID was a large, heavy aircraft, clearly too big for existing cruisers, and there was no likelihood new cruisers would be obtained until the national financial condition improved.

Local Construction

After thus tardily deciding the Fairey IIID was too big, the RAN prepared an outline specification for a small, single seat seaplane for carriage in RAN cruisers. Maximum weight was to be 1016 kilograms (2240 pounds) and performance was to include a range of 500 miles, maximum speed of 87 knots at 8000 feet and the ability to climb quickly and high enough to evade anti-aircraft fire from ships. Folding wings were desirable but not essential. The role would be scouting only and good visibility ahead and below were essential while armament was not required. Launching method would be catapulting or hoisting out onto the water and the Air Board was requested to comment on launch technique and to provide details of catapults. [10].

Navy's outline specification was passed to the Air Board for comment early in December 1922 and the Air Staff began working on it, considering aircraft already in the RAAF or in production in England. Some requirements were mutually exclusive; for example, long endurance demanded large fuel capacity and thus quite a large aircraft while high speed would be easier to attain in a small aircraft. The Air Force was correctly sceptical of the option of hoisting out

The forward aircraft platform onboard HMAS *SYDNEY* photographed at Invergordon, Scotland, December 1918. The aircraft is a Sopwith Camel.

— Australian War Memorial negative No. EN341

onto the water because of probable weather limitations and concentrated on devising some method of flying off the ship. After brief reference to the catapult as experimental, the Air Staff plunged into calculations of power, weight and take off distance needed to fly off a ship under way. Flying off required a powerful engine in a light aircraft and the Sopwith trio of Pup, Camel and Snipe were rejected partly because of an assessed lack of installed power but each had other drawbacks, including poor visibility forward and downward.

The Air Staff turned then to consider local design and construction of a small flying boat and believed this course of action was feasible but, even using engines already in stock, the aircraft would be expensive, slightly heavier than requested, and with 100 miles less range than specified. Methods of taking off from the ship were examined and ways of providing the 24.4 metres (80 feet) of runway calculated as necessary for a 1134.0 kilogram (2500 pound) aircraft to take off from a 20 knot ship were studied. The recommended method would have had the aircraft fitted with wheels placed to engage a light railway running from forward of the bridge, over the forward gun mounting, to the bow; the aircraft would normally be stowed on deck forward of the bridge and aft of the gun mount, sitting on a short length of rail inside a collapsible hangar. For launching, the hangar folded down and the aircraft, still on its rails, was raised until the piece of rail was aligned horizontally with the permanent trackway. The aircraft would then take off down the track and alight on the water subsequently for recovery by derrick. This interesting proposal did not, unfortunately, explain the relationship between trackway and forward gun [11].

Staff work by both Services displays notable ignorance of events in the United Kingdom. Admiral Jellicoe, in his 1919 report, had commented on the lack of information being passed from Britain to Australia and this deficiency had not been corrected [12]. The Naval suggestion to hoist the aircraft out onto the sea for take-off shows little familiarity with Admiralty experience of this evolution during the recent war. The Royal Naval Air Service had quickly discovered that, even in low sea states, seaplanes were frequently damaged and the procedure was quite impracticable. The Admiralty had been led to investigate catapults and flying-off platforms to avoid the necessity of relying on calm sea to operate aircraft. Australia's Air Staff correctly perceived the severe weather limitation but their own paper on the cruiser aircraft shows equal ignorance of aircraft operations from ships during the war or of the extensive body of experience extant in

The light cruiser HMAS *MELBOURNE* fitted with an aircraft platform over 'A' turret. *MELBOURNE* carried a Sopwith Pup at first then later a Sopwith Camel.

— Australian War Memorial negative No. A3347

England. The Second Air Member's statement that neither Pup nor Camel had enough installed power to fly off a ship indicates complete ignorance of the routine wartime operation of these aircraft from ships and must also cast doubt on the mathematical basis used for this report. [13]

The paper containing the proposal for an Australian designed flying boat was forwarded to the Naval Board on 16 January 1923 with a request for Naval comment before further design work proceeded.[14] No attempt was made to persuade the Navy of the value of the aircraft; there was simply a statement responding to the outline requirement. Nevertheless, the message that an aircraft suitable for cruiser operation was not in service or readily available was clear. A formal Naval response has not come to light, and probably one was not sent, but Naval support for further design work would have been most unlikely on the grounds of weight and interference with the guns.

Final Decision

A further Air Board letter, in May 1923, sought a firm Naval statement of wartime aviation requirements for inclusion in a War Book. This request prompted a Naval Staff meeting on 1 June 1923 called to reach a firm conclusion on the place of aircraft in the RAN; the First Air Member attended by invitation.

This important meeting decided that aircraft would not be flown off turret platforms in the RAN[15]. Dominant among the reasons was the rapid deterioration, due to exposure, suffered by aircraft on turret platforms. Reference was made to Royal Navy operations in the North Sea where aircraft remained on platforms for only a few days (usually three) before being landed for overhaul. Projected wartime operations against Japan envisaged ships away from bases for weeks in waters subject to monsoonal extremes. Hangars would have provided some protection but there was no space in existing cruisers for hangars. Furthermore, the turret platform aircraft could be used once only, as there was no way of recovering it in an airworthy condition, and even this single use depended on the fragile aircraft not previously being damaged by blast from the gun below it. Available evidence indicated that use of the gun for any reason would damage the aircraft so badly it could not be repaired onboard. Under these conditions the turret platform aircraft was of no value to the RAN.

Seaplanes, which could have been stowed away from the risk of blast damage and would have been available for more frequent use, were discarded because there was insufficient deck space and because of the high cost of cranes to handle them. Overall was a keen awareness that the light cruisers were already too heavy with resulting loss of speed and endurance; this Staff meeting did not take the Seaplane Committee's view that an aircraft was so valuable that loss of endurance in the parent ship was justified.

Carriage of seaplanes by the Fleet oiler *KURUMBA* and collier *BILOELA* was deemed desirable and plans were prepared showing *KURUMBA* with two aircraft and *BILOELA* with sixteen (but no coal). This latter modification was possibly intended to substitute for the seaplane carrier the Admiralty had mentioned at the 1921 Imperial Conference as suitable for Australia. When the plans were forwarded to the Admiralty for comment the idea of diverting the two

auxiliaries from their primary task of supporting the Fleet with fuel was condemned, while the conclusion that the light cruisers should not carry aircraft was strongly endorsed with the added advice that future cruisers should be designed for aircraft operation.

The June 1923 meeting and decision marked the end of Naval participation in aircraft operation from cruisers for some years. Under the prevailing circumstances, the 1923 decision was reasonable; the light cruisers were too small, a suitable aircraft was not available and, even if an aircraft could have been found, the nature of wartime operations envisaged for the RAN promised to be far more strenuous than any planned for Royal Navy cruiser-borne aircraft. Contemporary aircraft structures were extremely susceptible to exposure damage in the marine environment and protection of aircraft from exposure was a primary requirement if they were to be effective.

Postscript

The June 1923 decision not to carry aircraft did not mean the end of Naval Board interest in naval aviation. Two RAN observers and one pilot were trained in 1923 and, in 1924, a Fairey IIID embarked in the survey sloop *HMAS GERANIUM* for a brief, but useful, period. In the late 1920s the seaplane carrier *HMAS ALBATROSS* commissioned but aircraft did not again operate from Australian cruisers, even on a temporary or trial basis, until the early 1930s. The next two generations of cruisers (HMA Ships *AUSTRALIA* and *CANBERRA; SYDNEY, HOBART* and *PERTH*) were large enough to carry and operate an aircraft but by the time they entered service, the flying-off platform had fallen from favour and been replaced by the aircraft catapult. All five ships were to make effective use of their aircraft during the early years of the Second World War but that is another story.

NOTES AND ACKNOWLEDGEMENTS

1. Lengths are expressed in metres and feet, aircraft weights are in kilograms and pounds; all to the nearest unit except for metres which are to the nearest tenth. Ship displacements are to the nearest 100 tonnes. Still used navigational units of knot, mile and feet of altitude are retained.
2. On Page 53 of *Cockatoo Island* by R.G. Parker is a 1919 photograph of *SYDNEY* in dock with a turntable platform clearly visible above the forward gun mount.
3. The periodic reports of the embarkation are contained in file 20/0204 in accession MP 1049, series 1, Australian Archives, Melbourne Branch (AAM). Most of the post trial papers are in 21/032 (also MP 1049/1). Movement of aircraft, engines and personnel to and from Point Cook are recorded in Australian Air Force Corps Routine Orders 66, 67 and 77 of 1920 and 1, 4 and 5 of 1921 held at the RAAF Museum, Point Cook.
4. Minutes of meeting of 19 January 1921 in file 18/0468 — MP 1049/1, AAM.
5. Letter to Dumaresque is in 21/065 — MP 1049/1, AAM.
6. *Flight* magazine of 18 August 1921 covered the launching fully including reports of the speeches made.
7. Papers concerning the formation of the Seaplane Committee are in 21/0271 and the report is in 21/0318 — both in MP 1049/1, AAM.
8. The Naval Staff Report is in 21/0318 op.cit.
9. 21/0318, op.cit.
10. Naval Board letter of 5 December 1922 to Air Board is in Item 199/1/7, CRS A705, Australian Archives, Canberra (AAC).
11. Report by Squadron Leader Barnwell of January 1923 in 199/1/7, op.cit.
12. For background to Admiral Jellicoe's Australian Report see 'Jellicoe and the RAN' by R.M. Jones in *Defence Force Journal* No. 18 of Sep/Oct 1979.
13. Second Air Member's minute for First Air Member of 10 January 1923 in 199/1/7, op.cit.
14. Item 199/1/7, op.cit.
15. The results of this meeting were reported to the Admiralty by Admiral Everett (First Naval Member) in a paper of 21 November 1923 now in ADM 1/8646 in the Public Records Office, London. Copies have not been found in Australian Archives and it appears the report was submitted in London while Everett was attending the 1923 Imperial Conference.

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'The whole aspect of sea war is so utterly changed by the prodigious and daily development of aircraft . . .'

— Admiral Lord Fisher, the inventor of the Dreadnought battleship, speaking in 1919 after the experience of the First World War

FLEET ADMIRAL KING AND OTHERS — PACIFIC ADMIRALS

by Commander A.W. Grazebrook, RANR

The publication earlier this year of the USNI edition of Thomas B. Buell's biography of Fleet Admiral King [1] completes an informal trilogy of biographies of three of the U.S. Navy's most prominent World War II admirals — King himself, Admiral Raymond A. Spruance [2] and Fleet Admiral Chester W. Nimitz [3].

These two authors, Buell (the biographer of Spruance and King) and Potter (Nimitz), have picked the optimum time for writing in depth biographies of their particular subjects. They wrote soon enough after World War II for enough of their subject's staff officers, subordinates and political colleagues to make available the fruits of their memories, but long enough afterwards for the need for sympathy with their subject's susceptibilities to be removed by their having passed on, and for formally classified documents to become available.

In this resulting atmosphere of frankness and objectivity, Commander Buell's biography of King is much more informative than the autobiography written for King by W.M. Whitehill [4] before King's death in 1956. Thus, in Buell's new work, we read not only of King's many and undoubtedly significant achievements, but also of his (much fewer) errors. The views of King, Nimitz and Spruance on major strategic and tactical matters are compared.

Readers will recall that the trio of prominent U.S. Admirals all held vitally important posts:—

- E. J. King
  - — C in C U.S. Atlantic Fleet (or similar titles) during 1941, whilst the U.S.N. was providing protection for trade in some parts of the Atlantic.
  - — C in C U.S. Fleet, in command of all U.S. naval forces in the world, from December 1941 until March 1942.
  - — Concurrently C in C U.S. Fleet (COMINCH) and Chief of Naval Operations from March 1942 to the end of the war. Thus King was in both executive command and administrative charge of the whole United States Navy.
- C. W. Nimitz
  - — C in C Pacific Fleet and C in C Pacific Ocean Area, responsible for both USN and US Army operations north and east of the East Indian Archipelago and Australian Continent. Through the US Army, Nimitz controlled strategic air power in this area — there was, of course, no independent airforce.
- R.A. Spruance
  - — Starting the Pacific war as a cruiser division Commander, he commanded a carrier division, the carrier task force in the Battle of Midway, was Chief of Staff to Nimitz, and later Commander 5th Fleet in the Battle of the Philippine Sea and elsewhere.

The lessons to be learned from a study of these three biographies are many. Whilst some apply to World War II tactics and circumstances, and have been overtaken by technical progress, others can be applied with advantage to the 1980s and 1990s. Four of these struck this writer as of significance to Australia's maritime forces during the next two decades:—

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- The predominence of the Pacific campaign in the minds, decisions and activities of all three Admirals.
- The birth, growth and march towards a four decade pre-eminence in USN affairs of US naval aviation.
- The ultimate recognition by King, who hated the press, of the importance of having them on side — even if only to obtain their confidence in his personal professional capabilities and thus ensure the limiting of their criticism.
- The prior attention given to those aspects of maritime warfare which predominant contemporary USN officers found professionally rewarding — resulting, on occasion, in insufficient attention to other vitally important aspects.

In regard to the first point, all three subjects of these biographies were Pacific Admirals. In part, this was due to the USN's Atlantic Fleet having been abolished in the early 1920s, and the bulk of the USN concentrated in the Pacific until the outbreak of World War II. Each of the three Admirals spent much of their Captain's time in the Pacific. Nimitz built the submarine base at Pearl Harbour, commanded a submarine division in the Pacific, an NROTC unit in California, the Battle Fleet's submarine divisions in the Pacific, the reserve destroyers at San Diego, the heavy cruiser *AUGUSTA* in the Asiatic Fleet and, as a Flag Officer, the 2nd Cruiser Division in the Battle Force.

Spruance served in the Pacific in command of the battleship *MISSISSIPPI*, as Chief of Staff to the Admiral commanding destroyers in the Scouting Force, in command of the 5th Cruiser Division, and spent much time at the Naval War College where Japan was considered the inevitable enemy and Germany and Italy ignored [5].

Although King's earlier career was unique — he served with (and grew to dislike) the Royal Navy in World War I, qualified in submarines and then, as a middle seniority Captain, qualified as a Naval Pilot. From that point, he became strongly navy aviation and Pacific oriented. He commanded the fleet carrier *LEXINGTON*, was Chief of the Bureau of Aeronautics, was the contemporary equivalent of *COMPATWINGSPAC* (then a force of sea plane tenders and flying boats), and then served for 18 months in command of the main U.S. carrier force.

In all these posts, King developed a strong preference for fleet action — against the Imperial Japanese Navy. In these circumstances, it is ironic that early 1941 saw King appointed in command of the USN seagoing forces in the Atlantic. In this command, King was responsible for preparing and organising the training of the

Admirals Nimitz and King during a press conference at Pearl Harbour, 22 July 1944, following a visit to Saipan.

USN's forces in the Atlantic and increasingly, as 1941 progressed, for protecting merchant ships from the German U-Boats in certain parts of the Atlantic.

King thus had both the opportunity and the responsibility for ensuring that the USN was prepared for the onslaught of the U-Boat in the Western Atlantic. It is a matter of recorded historical fact that the USN was substantially unprepared for that onslaught when it came in early 1942.

King's biographer Buell offers an excuse — that the resources for preparation were not available — which seems somewhat lame with the advantage of hindsight:—

- There **were** a large number of ships (albeit not well equipped for ASW) in the form of the 100 or so flushdecked destroyers remaining in the USN after the 50 were transferred to the RN/RCN.
- Funds (for operations and training at least) were **not** short in 1941 for developing and practising tactical doctrine.
- King had the opportunity to learn from hard earned British experience the other side of the Atlantic regarding command and control in the protection of trade in the circumstances of World War II. However, Buell has described the organisational conflicts of Vice Admiral Adolphus Andrew's Sea Frontier Command, the naval districts, the Atlantic Fleet, and the U.S. Army Airforce's land based patrol aircraft.

This writer finds it difficult to avoid the conclusion that at least a significant proportion of the 1942 merchant ship losses in the Western Atlantic could have been avoided and that King must be held responsible at least in the major part.

Whatever may have been his failings in the Atlantic, King certainly produced the desired results in the Pacific. His reign as *COMINCH/-CNO* saw the optimisation of the combined and independent use of the fast carrier striking force and amphibious forces in the projection of maritime power across great distances. Perhaps following the lesson of his sharp setback in the Atlantic, King saw to it the U.S. submarines were used to great (in due course virtually annihilating) effect against Japanese merchant shipping.

Both the Buell biography and the memoirs of many other prominent World War II Commanders and authorities show King to have been a Pacific man. His results in the Pacific show that, when doing that which he found professionally satisfying, and that which he felt convinced should be done as a first priority, King did it well.

The differing demands upon the USN of the Atlantic, and the warfare and strategic circumstances in the Pacific in World War II, are of relevance to Australia today. For the past decade or so — at least since the enunciation of President Nixon's Guam Doctrine — the U.S. Government has given priority to the Atlantic. Disclaimers notwithstanding, a study of statements of the United States' treaty obligations under NATO, the forces that would have been left for the Pacific after meeting the U.S. NATO obligations, and a comparison of the ages of ships, aircraft and weapons deployed in the Pacific and the Atlantic/Mediterranean, demonstrate that the USN was bound to become primarily an Atlantic navy.

Thus, just as it was in the Pacific in the years before World War II, so long as the USN's strongest and newest forces were stationed in the Atlantic, the more promising USN officers would tend to gravitate to service in that ocean. Over a decade, as the more promising officers have risen, so the USN must be expected to have become an Atlantic oriented navy. A material example of the effect of this is the decline in construction of afloat support ships for the USN.

It remains to be seen whether the developments of the past two years, with the deployment of Russia's newest and strongest ships in the Indian Ocean/Western Pacific region, and the response of the United States Navy with newer and more numerous maritime forces, reverses the trend in the USN towards Atlantic thinking.

King's biographer throws light upon another aspect of the influence of King's personal preferences upon the World War II Pacific operations of the USN. King considered that the first objective of Nimitz's Pacific fleet should be the destruction of the enemy's fleet. King contended that once that had been accomplished, the U.S. Pacific Fleet could project power as it pleased — without hindrance from the Imperial Japanese Navy. The more pedestrian role of defending trade appealed to King in the Pacific no more than it had to King in the Atlantic.

Nimitz concurred with King's first priority of the destruction of the Japanese fleet — at least at the time of the Battle of the Philippine Sea — but did not make his priorities sufficiently clear to Spruance — at sea in command of the 5th fleet.

However, Spruance himself (widely regarded as an exceptionally able strategic thinker) concluded otherwise. As his force had been formed to capture the Marianas and strike the Bonins, Spruance treated those operations as his primary objective. When the Japanese fleet approached, Spruance kept the 5th Fleet in position to defend his invasion force and forewent the opportunity to optimise his attack on (and probably destroy) the Japanese fleet.

This disagreement on primary strategic objectives has been debated at length and in depth in world naval circles. It has been argued that King wanted the Japanese fleet destroyed because he wanted revenge for Pearl Harbour. It has been

argued that King was right in the reasons he gave for attacking the Japanese fleet. Conversely, it has been argued that Spruance — who no doubt also strongly regretted Pearl Harbour — was the more objective of the two and chose the correct, if less dramatic, course of action.

Whether King or Spruance was right, the episode demonstrates clearly a need for a clear understanding, on the part of all Commanders of forces, of their primary strategic objectives.

It can be argued that this point of principle is of particular relevance to Australia in the 1980s. During the 1970s, at a time of allegedly low perceived threat to Australia, it has been difficult to define the strategic objectives of the Australian defence force except in the very broadest of terms such as "to defend Australia". This admitted difficulty notwithstanding, there are signs (through periods of Government of both parties) that strategic objectives have not been established as clearly as they could have been in the light of the known capabilities and potential of regional forces.

In evidence of this, some force composition and equipment acquisition decisions/proposals can be quoted. Thus, although a major amphibious invasion of Australia is far beyond the capabilities of any world (much less regional) power, and an attack upon our trade is already within regional capabilities, money is to be spent on an air to surface maritime attack capability for the tactical fighter force — an air to surface attack capability which could only be useful in the event of the least likely threat to Australia. Similarly, there are reports that the *ORION* P3Bs are to be fitted for Harpoon at the expense of an improvement in ASW capability — an ASW capability needed to meet the most likely threat. Whether these particular decisions are due to difficulty in defining strategic objectives in the context of relative probability of threats, or whether this is due to the professional preferences of role on the part of some officers in strong positions, is of interest in the light of the influence of professional preferences of strong officers on equipment and force composition decisions in the USN.

Admiral Zumwalt, in his book [6] has described the relative strength of the different "unions" in the USN, and how a succession of naval aviators established themselves in key positions and ensured the predominence of attack carrier capabilities at the expense of surface forces. The more mundane protection of trade (ASW and MCM) was neglected, just as it was by both the USN and the RN in the 1930s.

King's biographer describes the rise of naval aviators, and the very high and growing proportion of promotions to flag rank that were allocated to naval aviators in 1943/45.

With the objectivity of hindsight, it can be seen that the rising importance of naval aviation **should** have been recognised by the USN and that more flag officers with aviation experience were needed to fill the growing number of naval aviation command and staff positions. However, it is clear from Zumwalt's book that the process was perpetuated indefinitely — to the point where the balance of able officers between surface, air and submarine forces was destroyed and some "unions" (amphibious warfare and MCM) became seriously neglected "poor relations".

Happily, this problem of a dominant "union" has not been apparent in the RAN. (Until the last five years or so, we have had no amphibious warfare to become a poor relation!!) Within the conventional specialisations of the GLEX officer there has been a spread of selections for Chief of Naval Staff — of the nine most recent holders of that post, three have been navigators, four gunnery officers, one torpedo officer and one fleet air arm officer. Whether or not fighter pilots are a dominant "union" in the RAAF lies outside the scope of this article.

Nevertheless, the lesson of the danger of allowing one "union" to become the dominant union in any Service is clearly relevant to Australia in the 1980s and 1990s.

Although the RAN's avoidance of an attack of "unionism" is clear, there have been occasions when a tendency for professional preferences to influence strategic assessments — the wish fathering the perception of the need for a particular weapon capability — has been suspected. A recent instance was when a prominent retired gunnery officer debunked the RAN's role in the protection of trade (with what he described as a predominance of ASW) in favour of a projection of power overseas.

Thus the lesson for Australia is the need to avoid "unions" (in the form in which they have inbalanced the USN) and the need to keep an eye on our main strategic role. If that role — the protection of trade — sounds pedestrian then that is regrettable but unavoidable. Any objective analysis demonstrates the importance of the protection of trade.

King's biographer also shows his grudging recognition of the importance of the media to the USN — even in war time with censorship. King hated the press (with no television, the press were the predominant media), and refused to recognise to his staff and subordinates any need for publicity. However, his biographer reveals that King conducted a series of private meetings (in the home of a close friend) with press reporters. Much of what he said at these briefings was wholly in confidence — and the nature of the information he imparted was such that press

persons present could neither deny the confidentiality of the information nor fail to recognise King's breadth of strategic vision and soundness of judgement. King used these opportunities to answer criticism, and potential criticism, in the press.

King's reasons for ultimately accepting the need for these briefings are not clear. Whatever those reasons may have been, he effectively nullified uninformed press criticism. Whilst it must be recognised that much of the information involved was of a type likely to arise in time of war, this method of handling the media is similar to that used by Admiral of the Fleet Lord Fisher of Kilverstone, First Sea Lord from 1905 to 1910 — at the time Fisher was building up the Royal Navy to meet the Imperial German menace.

Although King, Nimitz and Spruance were all senior USN officers of virtually the same generation, and had Pacific outlooks, they differed significantly as men. King has been described by the official US Naval Historian of World War II [7] as "a hard grim determined man". Spruance was a deep thinker who believed in delegation. Nimitz was kindly and perhaps a little too lenient with those in key positions who failed.

Nevertheless, there is much that can be learned from the way in which these three men exercised senior command in World War II. Their successes and strengths exceeded their failings and weaknesses. The key to profiting from a study of their actions lies in identifying those lessons which are applicable in the 1980s and 1990s, and those whose relevance is of purely historical interest.

NOTES

1. *Master of Seapower: A Biography of Fleet Admiral Ernest J. King*, by Thomas B. Buell. Naval Institute Press Edition publ. 1980.
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ICE PATROL SHIP OPERATIONS IN THE ANTARCTIC

by Sub-Lieutenant P.D. Leschen, RAN

Introduction

This article looks firstly at some of the problems associated with maritime operations in the Antarctic, and goes on to suggest some simple specifications for an ice-patrol ship suitable for general supply, hydrographic, scientific and survey work in the area. Secondly it outlines some of the administrative and operations procedures that have been used successfully in the Royal Navy's ice patrol ship, HMS *ENDURANCE*, and suggests some changes that might need to be made given the different Australian situation. The information herein has been derived previously from discussion with the Captain and Officers of *ENDURANCE*, but also from the Mariners Handbook and from my own observations while onboard *ENDURANCE*.

Operational Problems

The Mariners Handbook provides a good description of conditions and hazards in the Antarctic, as well as details of maritime operations. There are four main problems facing a ship in the Antarctic: remoteness, lack of surveying, climate and ice.

Firstly, remoteness. The Antarctic Circle is some 1500 miles south of Tasmania, and with the exception of Macquarie Island, there is nothing between the two continents. Thus once a ship sails south from Australia, she cannot be restored or fuelled until she returns. Nor, in the event of accident, can she expect rapid assistance, as ships and aircraft operating in Antarctic waters are few.

Secondly, charting and surveying of the area is generally poor. There are few soundings, and land is often charted inaccurately. Exacerbating this problem, the Antarctic seabed tends to be dotted with pinnacles of volcanic rock which rise very quickly from considerable depths to just below the surface. Thus, unless an area has been recently and thoroughly surveyed, extreme caution has to be exercised when navigating a ship there.

Thirdly, climate. In winter, operations are virtually impossible, due to the darkness, ice and extreme cold. In summer, the days are long, ice is usually passable, and the temperatures around the edge of the continent average about 0 ^{0}C, so operations are quite possible. However, the weather can be very unpredictable, and fog and high winds are always a possibility. Curiously upper deck icing is not generally a problem in the summer: pack ice near the cost prevents the build up of big seas, and this, combined with the modest temperature, prevents it.

Lastly, ice. As mentioned, the Mariners Handbook is comprehensive on the subject, giving descriptions of different kinds of ice, and a guide to ship handling in and around pack ice and icebergs. Sufficient to say that the presence of pack ice or bergs can disrupt a schedule or completely prevent planned work from being carried out, so great flexibility must be included in all aspects of planning.

Suggested Ship Specifications

To meet Antarctic conditions a ship with specifications similar to the following seems suitable. She should displace about 4000 tons, her length and draught should not exceed 100 metres and 6 metres respectively, and the hull should be ice strengthened to the standards required to meet Lloyds Register + 100A1 (Ice & Finnish Ice-class 1A).

THE AUTHOR

Sub-Lieutenant Peter Leschen joined the RAN as a Junior Entry Cadet Midshipman in January 1974. After matriculating, he attended the University of NSW graduating with a Bachelor of Science degree in early 1979. He recently completed bridge watchkeeping training in the RN where he served in HM Ships *GUERNSEY* and *AURORA*, as well as in the *ENDURANCE*. After his return to Australia, he joined HMAS *TORRENS* as a billet watchkeeping officer.

The similarity to the specifications of *ENDURANCE* is obvious, and there are several reasons for this. Due to the large distances and rough seas that must be crossed, and the nature of her work, the ship must be large enough to have good seakeeping qualities, carry plenty of cargo for bases, and carry ample internal stores for her own use. However, if she is too big, her manoeuverability must suffer and the draught increase to the point where many places become inaccessible to her, due to insufficient depth of water. 4000 tons provides a good compromise. At this point, it is interesting to note that Captains of the British Antarctic Survey Organisation (BAS) consider that their ship *BRANSFIELD* (5300 tons) is rather too large for the base supply work they have to do.

As for length, manoeuverability is the prime consideration. When operating in ice a ship must be able to turn very rapidly, and a long hull is unlikely to meet the requirements. More importantly, a long hull will swing the stern through a large arc when turning, greatly increasing the risk of the stern colliding with growlers or ice flows, with the attendant risk of damage to the screw or rudder.

Ice strengthening is of course essential. However, in ninety per cent of summer ice, an ice breaker is not required to make progress. For example, *ENDURANCE* meets the classification mentioned earlier and manages quite adequately, as do the BAS ships *BRANSFIELD* and *JOHN BISCOE*, both of which are ice strengthened but not ice breakers. Lloyds Register and 100A1 (Ice and Finnish Ice Class 1A) seems a sufficient classification, though a less ice capable ship might be at risk in some situations.

There is one additional advantage in having a strong, ice strengthened ship. Groundings are a fairly common occurrence in the Antarctic, as evidenced by *BRANSFIELD*, *ENDURANCE* and *LJINBLAD EXPLORER* in recent years. This is mainly due to the lack of surveying and unpredictable nature of the bottom mentioned earlier. The point is that all three of these ships survived and were able to make port under their own power. Ships of lesser strength would doubtless have suffered more severe damage, possibly have been lost, and in any event would have been at great risk had they needed to do any ice breaking to get to safety.

One final feature of the hull should be some form of stabilisation. Ice dictates that this should take the shape of internal tanks rather than external fins or bilge heels. Stabilisers would be useful in the rough seas and large swells of the Southern Ocean, but also in wresting the ship free of ice should she become frozen in. This procedure is detailed in the Mariners Handbook.

It has been suggested recently, in *Navy News*, that an icebreaker of the Finnish URBO class might fill Australian requirements. Such a ship would have several advantages. She could operate throughout the year, due to her formidable ice breaking capability but what could be achieved in winter is questionable. She would also meet the requirements for cargo capacity and manoeuverability, due to the multiple screw arrangement.

However, the URBO class, and other ships designed for Baltic operations, fall short of requirements in three main areas. Firstly is their size. With a loaded displacement of about 10,000 tons, these ships would be unable to come close inshore in many places in the Antarctic. The

HMS *ENDURANCE* with Whirlwind helicopter (two Wasp helicopters are now carried).
— Director of Public Relations (RN)

Argentinian *MARTSILA*, for example, is unable to get inshore at Deception Island. Secondly, these ships are designed for operation in the smooth seas and thick ice of the Baltic. They are built "like a block of flats", and as such roll badly in the heavy swells encountered in the Southern Ocean. The third shortcoming is cost. The size, very strong construction, and complexity of these ships makes them expensive. If such a ship was entirely suitable for Australian needs, perhaps the cost could be justified. However, a smaller, cheaper ship should be entirely adequate in most situations, and in some ways would perform better than a large ice breaker. Hence the added expense is probably unnecessary.

Propulsion and Steering

The first requirement of a ship's propulsion in ice is fast reaction. The aim is to keep a slow and steady speed, so it is important to be able to adjust power ahead or astern quickly, in order to prevent excessive speed building up in clear water, or losing all way in heavier ice. The best way to achieve this would seem to be a controllable pitch propeller, though this has the drawback of relative weakness compared to a solid screw. Therefore, more protection would be required.

Given a variable pitch propeller, the type of main machinery is not important, and a large diesel would be ideal for the job. However, due to the large distances involved, it would be an advantage if the main engine could give a good passage speed, enabling a speed of advance of, say, sixteen knots to be maintained. *ENDURANCE*, for example, has a cruising speed of 12.5 knots, allowing an SOA of about eleven knots, provided the weather remains good. This allows no margin for error in a passage, and means overly long periods spent at sea, when no useful work can be done.

As far as twin engines and screws go, such a system would undoubtedly provide superior manoeuverability. However, the positioning of twin screws and rudders would make them far more vulnerable to ice than a single screw, and on balance, the added complexity and expense seems unnecessary.

The rudder and steering system of an ice patrol ship need vary very little from normal practice. However two features are important. The first is a tiller system of some description. When negotiating pack ice a ship generally has to weave about a great deal, so large amounts of helm are in constant use. If a quartermaster has to turn a wheel for each movement, he is liable to become tired very quickly. A tiller which allows wheel to be put on simply by holding a lever over until the required helm is shown is far more suitable for this kind of work. The other requirement is an autopilot. This is necessary for the very long periods spent passaging between the ship's home port and the Antarctic.

Lastly, it is useful to have the wheelhouse and engine controls on the bridge, aiding quick reaction by eliminating communication problems. On the *BRANSFIELD* this has been carried a step further. She has a set of wheel and engine controls on each bridge wing and at the pelorus, so that the conning officer has direct control over wheel and engine movements. Thus he drives the ship more like a small boat, and there is no requirement for a quartermaster. Such a system should be ideal for operations in ice, though I have never seen it in use.

Navigational Equipment

The navigational fit of an ice patrol ship need not vary from that of any modern vessel. The first requirement is a SATNAV system, and this must be considered essential. Weather and ice often make astro navigation impossible for long periods, so that making a landfall without SATNAV becomes a hazardous job in the Antarctic. Many of the passages giving access to the coast extend many miles off shore, so that normal visual and radar fixing techniques become almost useless. SATNAV is the only solution to such a situation unless one has time to wait for a good astro fix. The system used in *ENDURANCE* is the Magnavox MX 1107, which works very well. However it needs a good electro-magnetic log to operate to its full capacity.

Secondly, two gyros are required. A magnetic compass is of little use in the Antarctic, particularly on the Australian side of the continent, near the Magnetic Pole. Thus a second gyro is required as a backup system.

Thirdly a ship needs two echosounders, one for shallow, pilotage waters, and the other for deep water. The need for the first echosounder is obvious. The deep water echosounder is needed for passage sounding and survey work. In view of the lack of soundings on most Antarctic charts it would be a waste of a tremendous opportunity if a ship did not passage sound at all times when in unsurveyed waters.

Fourthly, a good navigational radar providing high definition at short ranges is necessary. Without it it is most unsafe to proceed at night or in poor visibility. Such a radar will pick up icebergs at about twenty miles, and pack ice or growlers at about three miles. Even brash ice, which floats just about awash will paint in a smooth sea. A three centimetre radar is best for this kind of work, and a similar back-up radar is certainly desirable if not essential. On *ENDURANCE*, two identical Decca radars were carried. The first was mounted on the A frame forward and coupled to the bridge display to give the best possible picture ahead of the ship. The second was mounted above the bridge and coupled to the Helicopter Control

Room display to give a good picture astern for helicopter control work.

Lastly a powerful ice-light is needed, mounted well forward in the ship. Such a light can pick up most ice at ranges of about a quarter of a mile. This gives plenty of warning for avoiding manoeuvres at night, so long as the ship is proceeding slowly.

Other Design Requirements

There are three other points that need consideration in the design for an ice patrol ship. The first is an efficient heating and airconditioning system, though in my experience, this need not include upperdeck de-icing equipment. The Antarctic summer is just about warm enough, and the sea calm enough to make it unnecessary. Secondly, the ship's design must allow plenty of hold space for base cargo and enough store rooms to accommodate the unusually wide variety and quantity of naval stores that need to be carried. Lastly, solid guard rails are far less vulnerable to encounters with ice bergs and bergy bits than the conventional type used on today's warships. They are also far more likely to prevent men being washed over the side in a heavy sea.

If a ship meets the above conditions over and above the requirements of normal ship design, she should be quite capable of working in the Antarctic.

Administration

Administration in a polar vessel need vary very little from normal practice, though there are a few points that could be borne in mind. The first concerns personnel. Very few people have any experience of operating ships in the Antarctic, so most personnel joining an ice patrol ship will have much to learn. Therefore experienced personnel should be relieved at carefully chosen times so that the ship is not denuded of expertise. This applies particularly to the Captain, First Lieutenant and Navigator. Ideally they should be changed at times chosen so that two of them have experience of ice operations at any one time. Thus if postings are going to be of two years duration, one of the three should change every eight months. The same goes for other personnel, but is less important.

Also with regard to personnel, it is desirable that the ship's company be volunteers. *ENDURANCE* is manned by volunteers, and this has led to a noticeable lack of discipline and morale problems.

Because of the long periods spent at sea, accommodation, food and recreation need to be of a high standard. With regard to recreation, films and closed circuit television are particularly good for breaking the monotony of a long ocean passage. Also, because of the impossibility of receiving mail while in the Antarctic, subsidised radio telephone calls and "familygrams" can do a lot to assist morale.

Naval stores present no problem, except that a particularly large range and quantity of items must be stocked; enough to keep a ship at sea and fully operational for three or four months without any need of outside assistance. *ENDURANCE* carries a vast quantity of stores — certainly more than other ships of equivalent size. It is not generally realised that she carried enough Antarctic tents and equipment to put the entire ship's company ashore in the ice.

The last administrative problem is that of upperdeck maintenance. Once in the Antarctic, it is unreasonable to expect men to work in the open for long: the cold and wind are too severe. Therefore most maintenance has to be done on passage to and from the work area, and in port when there will also be a requirement to send people on leave, and on various training courses. Therefore the base port needs to have good backup facilities so that the necessary assistance can be given to complete required maintenance.

Planning

ENDURANCE does most of her work in the Antarctic summer, returning to the United Kingdom for refit and leave during the British summer. Her time in the Antarctic is divided up into three work periods, each of about four weeks duration: in the 1979/80 season, the first period was spent on the Antarctic Peninsula, the second at South Georgia, and the third back at the Peninsula. The work included providing a British presence, surveying, photography, and a penguin survey at South Georgia. Base supply is not normally one of the tasks: however, after *BRANSFIELD* ran aground, *ENDURANCE* did assist her with the resupply of Antarctic bases Rothera (UK), Faraday (UK) and Pamer (USA).

Between work periods, *ENDURANCE* spends time in the Falklands and various South American ports where routine maintenance is done, and leave given. Normally, the ship spends ten days in Mar del Plata, Argentina, and has a series of shorter four day visits at other times during the season. To do this, considerable periods of time are spent passaging between areas. For example, the nearest port to the Antarctic Peninsula is Port Stanley in the Falkland Islands. This is a three day trip given good weather and reasonable ice conditions. The South American ports are a further three days run to the north, so a visit to Mar del Plata, for example, requires about two weeks at sea for the return trip.

A ship operating from Australia is faced with a slightly different problem. Obviously she is not faced with the seventeen thousand mile return trip from the United Kingdom to the Antarctic, so her season can be usefully longer than that of *EN-*

DURANCE. However, she has considerably further to travel from the nearest port to the ice — an additional six hundred miles in fact. Bearing this in mind, it may be that it would be better to have two long work periods with an extended leave period in between, perhaps over Christmas. I am assuming that the winter would be used for refitting the ship, so that no operations could be carried out in this season.

As far as the planning of tasks for each work period goes, flexibility must be the keynote. It is entirely possible that the ship may be unable to reach her work area due to unfavourable ice conditions. Equally she could become trapped by ice for a period while trying to leave an area. For example, in the 1979/80 season, *ENDURANCE* became stuck in pack ice while attempting to reach Faraday base through the French Passage. In a day of hard ice breaking, she covered only four hundred yards, after which she had to wait a further two days before the ice thinned out.

Similarly, weather can disrupt passage schedules by forcing ships to heave to until the weather moderates. Again, this happened to *ENDURANCE* in the early part of 1980. To counter these problems, time schedules must be very flexible. Also, the ship must have one or two secondary tasks to carry out should the primary objective be impossible to attain.

Operating in Ice

Once in ice conditions, some additional safety precautions are taken in *ENDURANCE*. Firstly, the ship does not operate at night as the risk from ice is too great, and very little can be achieved. Generally the water is too deep to anchor, so the ship drifts in a preplanned box chosen so that it contains relatively clear water. Should the ship drift out of the box, the OOW has instructions to get underway and regain position. The same applies should ice threaten the ship. This means that, unless the ship has to get underway, only one OOW is required on the bridge. Similarly, main engines go to thirty minutes notice when drifting so only a few hands are required below. In fact, night in the Antarctic summer is fairly short, so not a great deal of useful time is lost drifting.

Once underway in ice, two Officers of the Watch are always on the bridge. The first deals with administrative problems and navigation, while the second looks after the conning of the ship. In pack ice, conning is a job that requires complete attention. Naturally this system requires a large number of watch keeping officers. Therefore, in *ENDURANCE* a Bridge Watchkeeping Certificate (BWC) is not considered essential, and it is quite normal not to have a ticketed officer on the bridge. In fact, bridge watch keeping in ice requires many new skills, for which a BWC is quite irrelevant. For the officer with the con, it is more important to be able to recognise the hazards associated with different kinds of ice, and to be able to drive the ship accurately around or through ice, taking the line of least resistance.

Material precautions when operating in ice are minimal. Two steering motors are run to give quicker rudder response, but other precautions are normally only taken when operating aircraft. Damage control state is usually 3X except on the rare occasions that special sea dutymen are closed up.

Handling a ship in ice is covered comprehensively in the Mariners Handbook, so I do not intend to discuss it in this article.

Helicopter Operations

There are no particular problems associated with operating helicopters in the Antarctic. Most of the precautions only take effect in the event of an emergency, though in this situation they become critical.

Modifications required on the aircraft are minimal. *ENDURANCE* operates two Wasp helicopters, and aside from normal checks and servicing, only three precautions are taken. These are:

- Wipe the rotor blades with de-icing fluid.
- Standard anti-icing procedure on the windscreen.
- Standard Wasp cold weather modification.

Presumably most helicopters could be equally simple to modify.

Operations are more strictly limited. The most important safety precaution is the two helicopter principle. Normally both aircraft fly at the same time, under the control of a Helicopter Control Officer, and the radius of operations is kept within about ten miles. If only one aircraft is flying, the other is kept at short notice, usually fifteen minutes. This procedure means that rapid rescue by the other helicopter is possible in the event of a ditching. For additional safety, no flying is done at night.

Should only one aircraft be serviceable, operations are severely restricted. The criterion is that the crew must be close enough to be rescued within an hour of a crash. Boat rescues are impossible in pack ice, and as a ship can only make about three knots in ice, this limits the flying radius to a couple of miles from the ship. In addition, work over land often becomes unsafe. Much of the Antarctic waste consists of undesirable ice cliffs which render rescue of a crashed crew impossible except by another helicopter.

On *ENDURANCE*, flying is normally carried out in blocks of two or three hours, otherwise all personnel involved are liable to get too cold and tired to work effectively. This particularly applies to flight deck personnel who have no opportunity to go below during the flying period.

Shipborne preparations for flying are quite simple. Manning can be kept down to a Helicopter Control Officer (HCO), Flight Deck Officer (FDO) and flight deck crew. On *ENDURANCE* the flight provides the HCO, and the FDO is either the Instructor Officer, Medical Officer, or Royal Marine Officer. Machinery wise, preparations are restricted to running both steering motors, an additional generator, and making sure that fire-main pressure is over 80 psi. On the flight deck, additional precautions are taken to prevent icing. These measures consist of spraying with a mixture of KONSIN/UREA. Should the deck become iced up or covered with snow, this is removed with KILFROST, shovels and brushes.

Weather also plays a large part in determining the feasibility of flying operations. Generally, snow need not prevent flying, but freezing fog/cloud/sleet/rain are considered more hazardous. These conditions are frequently encountered so, once again, there must be plenty of flexibility when planning a job. It is reasonable to expect that the weather will be fit for flying about half the time. Therefore a job expected to take three days to complete needs to be budgeted with six days to be reasonably safe.

Lastly is the problem of wind. Katabatic winds of great strength can develop very rapidly, giving very little warning of their arrival. Often they are very localised, only affecting an area two or three miles wide. As an example, last season a Hi-Lo mast that had been set up for surveying was blown down overnight by winds that were estimated at 100 knots. At the time, *ENDURANCE* was drifting some ten miles away, but experienced nothing more than light winds. The hazard to flying operations is obvious.

Surveying

Surveying in the Antarctic presents some problems not experienced elsewhere. On *ENDURANCE*, the control problem is solved using trisponders to fix the ship's position. However this system seems to suffer wooding and propagation problems caused by the presence of ice. On many occasions the trisponder masts are obscured from the ship by icebergs, with resultant loss of the signal. Sometimes, however, if there is ice between the mast and ship, but the trisponder is still visible, unreliable readings result. This is apparently due to strange propagation caused by 'reflection' off the ice.

Echo-sounding is not a problem, provided that there is not a great deal of ice around. When in pack ice, the trace often becomes faint and unreliable, because of ice passing under the ship. By the time this becomes a problem, however, the ice is normally too thick to make accurate navigation possible, so surveying becomes impossible.

Lastly, a survey boat can be of great assistance to the ship. If fitted with a trisponder and echosounder it can be used to cover "holidays" left by the ship, and also to cover other parts of the survey area. Ice strengthening, as on any boat the ship carries, is essential, as is additional protection for the rudders and screws. Such a boat can be used effectively so long as the ice is no thicker than loose brash.

Shore Parties

On *ENDURANCE*, shore parties are primarily used for setting up survey control stations, though people also go ashore to visit bases and occasionally to engage in skiing training. Whenever people are put ashore, the first equipment must always be the survival kit, which contains food and shelter adequate for about three days.

As people are generally put ashore by helicopter, most parties don't spend more than three hours on the ice. For such a period there are no problems, provided adequate clothing is worn, and suitable precautions are taken against sunburn and snowblindness, both of which can be serious in the brilliant light of the Antarctic.

Summary

To summarise the main points of this report:

- An ice patrol ship for base supply and general survey/scientific work should displace about 4000 tons and have a fairly shallow draught. Ice strengthening is essential, but an ice breaker is unnecessary.
- A single, controllable pitch propeller powered by a large diesel, giving a cruising speed of about eighteen knots would be a suitable propulsion system. The steering gear should include a tiller system.
- Navigation presents no great problems, provided a SATNAV system is fitted.
- Operations should not be carried out at night, and whenever underway in ice there should be two OOWs on the bridge. Ship handling in ice is best covered by the Mariners Handbook.
- Helicopter operations present no great problems. However, two aircraft should always be flown if possible, otherwise safety dictates a very small radius of operations.
- Surveying presents no great problems over those experienced elsewhere.

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THE MOBILIZATION OF AUSTRALIAN DEFENCE INDUSTRIES

by Major N.A. Bradley, RNZE

In 1977, the Joint Parliamentary Committee on Foreign Affairs and Defence reviewed the industrial support available within Australia for defence purposes. In setting the guidelines for the review, the committee accepted as a planning figure that a period of five years warning would be able to be given by the intelligence community of the likelihood of an invasion. [1] In agreeing to this the committee stressed that a difference existed between the period of warning given by advisers to the politicians of the day and the time made available by those politicians for preparations to be carried out to counter the threat.

Preparations to bolster a nation's defensive capability take many forms. All are aimed at the end result of protecting the nation, but all are competing for the scarce resources of money, manpower and materials to get there. The defence industries form part of this matrix of complementary but competing activities and it is in this area that this essay will concentrate.

Current defence industrial policy is contained in the 1976 White Paper. Its aim was:

> '. . . to ensure that the Defence Forces can be supported and maintained in Australia, utilizing for provision of equipment and material, a combination of local industry, selective stockholding and reliable overseas sources of supply.' [2]

It was a policy consistent with the strategic assessment at the time. [3] One year later however, the Joint Parliamentary Committee found it necessary to qualify this assessment and for one possible scenario against which the study was carried out, to think in terms of international tensions and chaos. Under such conditions it was foreseen that major allies could be absorbed by events elsewhere, traditional overseas sources of supply for military equipment and materials could be closed and the nation left to its own devices. [4] It was agreed that this was an extreme case. In todays thinking, it must be considered a possibility when viewed against the tensions that the OPEC cartel created in its formation [5] and more recently, the problems in Indo-China.

The committee recognized that self sufficiency did not necessarily mean that Australian industry was to be pushed into the manufacture of high technology items and weapons systems. A lower level of sophistication would be acceptable for total manufacture while maintaining an ability to service and maintain with spare parts and repair facilities, the higher technology items currently in the arsenal. This level of self sufficiency was deduced on the basis that under conditions of international tension, any potential enemy would probably be no better placed. [6]

THE AUTHOR

Major N.A. Bradley graduated from RMC Duntroon in 1966 and was commissioned into the NZ Army. He served to tours on active service with 161 Bty RNZA in South Vietnam. On his return to NZ in 1970 he attended Canterbury University to complete a Bachelor of Engineering (Civil) in which he was awarded Honours in November 1972. He then served in a number of staff appointments in both the NZ Army General Staff and Defence Headquarters following which in 1976 he attended Auckland University gaining a Master of Engineering degree. He then commanded the First Field Squadron RNZE from 1977 until he attended the Australian Staff College, Queenscliff in 1979 where he submitted this paper as part of his course of study.

He is now the Deputy Regional Commander of the Third NZ Task Force Region which is located in the South Island of New Zealand.

The Defence White Paper accepted the need for any preparations to be carried out well in advance of a definite threat finally emerging. To do so would allow a timely and effective response.[7] The achievement of these preparations rested on an assumption that both the Government and Parliament of the day would be willing to respond to changes in the defence situation.[8] This assumption of positive response highlights the weakness of both the present white paper and the Joint Parliamentary Committee Report on the question of defence industrial capability. Both avoid the issues involved in the required reallocation of economic resources. This factor more than any other consideration will be the controlling one in the gearing of defence industries in time of preparation and or mobilization.

This paper will examine the feasibility of mobilizing the Australian defence industries, within a five year warning period, such that the industries would be at a level of self sufficiency that would allow Australia to face the threat of an invasion. Particular emphasis will be given to the feasibility of the Government's ability to shift economic resources in aid of the mobilization prior to hostilities breaking out.

Three principal themes will be developed within the essay to draw together the relevant data. The first will deal with aspects of politico-economics in which nations find themselves enmeshed when they are attempting to mobilize industry in preparation to face a military threat. The second will consider, on a historical basis, the problems that have been faced by the nation in earlier periods and consider similar problems in the light of present day factors. Finally the first two themes will be drawn together with a 'state of the industry' discussion from which the Australian defence industrial potential will be determined.

A Mobilizing Economy

The transition from peace to a mobilizing economy involves a tremendous number of readjustments and maladjustments caused by the dislocation of previously stabilized economic influences. Many of the adjustments can be modified and or minimized if there is sufficient time to plan and reorganize the economy to suit. Unless a country prepares for war during peace, the greatest shortage that the country will come up against in periods of adversity will be time. The less time that is available the more painful becomes the transition due to lack of preparation.

Maximization of war production rests on three legs: facilities, raw materials and manpower.[9] Even in periods of protracted peace it is difficult to secure an even balance of all three. In periods leading up to hostilities this problem is compounded by the pressure of time. Initially the major shortage is facilities, then comes manpower to work those facilities and finally raw materials to match the production rate of the facilities. It can be seen that the system is dynamic, constantly changing and requiring adjustment. It is this constant change that has such an intoxicating effect on the economy.

In terms of resources, a mobilizing economy passes through several stages. The initial stage is characterized by an expansion in total production of both civilian and military goods. Civilian goods are produced to meet the demand created in the economy by the money that is spent on the manufacture of military goods. The extent of this expansion and the duration of this stage will depend upon the proportion of the nation's productive capacity which was being utilized before mobilization. For example, a recessionary economy such as Germany's in the mid 1930's was able to expand quite rapidly due to the hitherto idle manufacturing capacity resulting from the depression. The second stage shows a levelling off of civilian production as all spare manufacturing capacity is used up and a continued expansion in military goods production as new facilities are created. The production of military goods reaches a peak in the third stage after which any expansion of production is carried out at the expense of civilian goods.[10]

In large economies such as the United States or Japan each of which has a large and diversified industrial base, each of the stages is normally fairly long in terms of mobilization period. In a country with an industrial base the size of Australia's, there exists very little scope for a sudden absorption of greater production capacity which means that the first two stages of a mobilizing economy are rapidly passed. Civilian production capacity is quickly affected and cut back as gearing for war production takes place. These cut backs show as shortages which create part of the politico-economic problems for the politicians of the day.

For an economy to stay healthy and confident even during periods of tension, it is essential that once shortages start to occur that steps are taken to reduce demand. Traditional methods of doing this have been to remove money from circulation by increasing taxation and decreasing credit; or at the other end of the spectrum to control sales by the imposition of rationing.[11] All steps are painful to the man in the street who is having to give up the things that until now he has regarded as the necessities of life.

The necessities are defined less by biological needs than by psychological ones. This makes the consumption habits of a nation very insistent. If a nation is going to have to alter its consumption patterns so that production can be directed towards war materials, it must be done either over

a long period of time to minimize the effects of the change, or with the popular support of the people. For a government to plan for or to allow the bureaucracy to act outside these guidelines would invite political retribution — a fact, as will be shown, that has not been overlooked by Australian politicians in the past.

It is the perception by the Australian population, that the nation is being threatened by a foreign power, that is the secret. If the population is able to perceive the 'actualized' form of the threat then the efforts of the nation can easily be emotionally motivated into future mobilization preparations. If on the other hand the population is unable to recognize a threat or is confused as to what constitutes threat, then there is little incentive for the population ot make any form of sacrifice when encouraged or directed to do so by a government.

A further difficulty in modern times that confronts a nation is the political nature of the threat. In the 19th century and earlier, party politics had little if any input into the reasons for nations going to war against each other. In contemporary times this is no longer so. With the decline in the concept of the temporal sovereign and the rise of communism and socialism, conflicts in support of these ideals are a rule rather than an exception. It is a reality that western nations must accept, that if a threat develops from a foreign country politically left of the spectrum, then a degree of resistance must be expected within the population, particularly the trade union movement, against preparations of the nation to counter the threat. Such resistance was apparent in Australia prior to Germany's attack on Russia during World War II [12] and in more recent times over Australia's involvement in South Vietnam. [13] This acts to confuse the population as a whole and further restricts the speed with which a government can act.

The problem that exists for the government once it is warned of a threat, is how far can the economy be modified to prepare to counter the threat in the period before the population is consciously aware of it. This is the issue that the Joint Parliamentary Committee alluded to in the difference in time that would exist between the warning being given to the politicians and the time the politicians would make available for preparations. Historically no democratic nation has fared well in this area prior to hostilities breaking out.

Historical Perspectives

From time to time, all governments find themselves caught in a 'cleft stick'. They may have given strong political support to a bad policy or they may have allowed themselves to be duped into accepting a point of view contrary to reality or the nation's good. History records that such dupery and diplomatic manoeuvrings do take place. With regards military threats, the classic cases that stand out are Chamberlain's misjudgements at Munich, [14] Hitler's couting of Russia prior to his attack of Poland [15] and the Japanese diplomatic efforts in the United States prior to Pearl Harbour. [16] Governments who are caught in this way will attempt to extract themselves without publically losing ground: as Chamberlain attempted to do. Such a political move takes time and as Chamberlain was to find out to his expense, time is the resource in shortest supply.

There is no reason to suspect that the Australian Government would be misled by a diplomatic offensive by a potential aggressor. There is, however, every reason to suspect that a skilfully contrived offensive could mislead Australia into ignoring intelligence indicators of intent for a short period, as Israel did in October 1973. [17] Not only would such deception delay Australia's preparations, but it would also serve to confuse the population as to exactly what was happening. It is in the confusing of the population that a potential aggressor stands to make maximum gains and delay preparatory measures.

Australia has not been without its own problems in this area. Prior to World War II there was considerable unrest in political circles both inside and outside Parliament regarding Australia's defence preparations. [18] Australia had been aware of the prospect of war since 1934, [19] but the Government was not able to obtain an unanimity of purpose of the nation until early 1939. Even in mid 1938 the then Government Opposition resisted moves towards defence preparations [20] even though its leader had been kept informed of developments. This was the party that was to form a new government in 1941 and direct the nation aggressively and loyally through the remainder of the war. The resistance in 1938 was obviously a politically expedient stance, as Curtin moved a vote of no confidence in Lyons leadership with regard to inadequate defence preparations in November 1938. [21] This about face represented a change of political stance and brought Curtin into line with the government's preparations.

Political expediency should be expected where substantial ballot box advantages will accrue and must be accepted as part of political strategy in democratic societies. United Kingdom recognised the volatility of Australian politics as the British War History shows:

> 'Australian politics have a bitterness . . . and Commonwealth Governments always had to be looking over its shoulder at its election prospects.' [22]

Recent political history in Australia, such as the sacking of the Whitlam government in the mid 70s, shows that none of this bitterness between any of the opposing parties in parliament has disappeared. Equally this is reinforced by the present problems that exist between the coalition parties throughout the country outside parliament. From the viewpoint of preparing for war, such opposition and the induced civil unrest that opposition creates in times of hardship, blunts the impetus required by a government in galvanizing and motivating a nation to great effort and possible sacrifice. This makes the harsh political decisions that much more difficult and above all, costs time for preparations.

It is worth noting that no Australian government to date has felt itself sufficiently ahead in the political race nor the population motivated enough to accept economic sacrifice until war or hostilities have actually broken out. Witness to this is the national economy prior to and during World War II. As mentioned, war was foreseen as early as 1934 but between 1934 and 37 defence expenditure increased a mere 0.75% of gross national expenditure (GNE). [23] However, once war had become a reality to the population at large in 1939, spending on defence was able to be increased as noted in Table 1.

It can be seen that it took four years for expenditure to peak and the initial years showed very slow growth. This trend however, is reflected in other countries in the world. The United States prior to her entry into both World War I and World War II exhibited similar characteristics as shown in Table 2.

Although a similar comparison cannot be made with the United Kingdom prior to World War II due to her methods of internal financing, the growth in production effort, i.e., military goods produced, shows a very similar growth pattern. [27] This similarity of growth between these countries of such vast differences in industrial potential and proximity to the war, tends to indicate that growth in this area is naturally restricted to the proportions shown.

Current defence expenditure has averaged in the range of 2.6% GNE for the years 1973-77. [28] It is a political and economic realism that to change this pattern of expenditure substantially, will require a shift of resources. Even when a shift is made, it does not guarantee that more money will immediately be spent. In 1937/38, 11.6 million pounds was appropriated for defence. This represented an increase of 44% over the previous year's expenditure. Only 9.7 million pounds was able to be spent. This shortfall emphasises the time factor involved in getting industry to react to the new production need and also the initial delays that bureaucratic systems set up. It is of significance that recent history shows that even under conditions of relative stability of financial allocation coupled with five year programmed lead times, the Department of Defence has difficulty in spending its total appropriated monies.

Present Day Perspectives

To analyse the Australian position in economic perspective, both the problems of mobilization and the historical considerations need to be examined along-side the reality of the Australian way. In this section four groups of factors will be considered:

- *The population's ability to provide latent production capacity and flexibility of production effort.*
- The natural resources available and their significance.

TABLE 1.

Year	1938/39	1939/40	1940/41	1941/42	1942/43	1944/45
% GNE	1.0	1.4	5.0	24.0	32.5	26.5

World War II Defence Spending as Percentage of GNE [24]

TABLE 2.

Year	1914	1915	1916	1917	1918
% GNP	0.8	0.8	1.0	9.4	23.2
Year	1939	1940	1941	1942	1943
% GNP	0.9	1.6	6.3	22.7	34.5

USA Defence Spending as Percentage of GNP [25,26]

- The tastes and disposition of the population. In particular, the extent to and the conditions under which they would be willing to accept risk and responsibility.
- The strength of the economy.

Australia be world standards, has an extremely small population relative to the size of the country. The population is located around the main industrial centres and is ideally poised for involvement in the production process. In the late 1950's early 60's, a distribution such as this would have implied a pool of labour that could have been exploited should the need have arisen. A natural level of unemployment reaching up to 5% of the workforce, bolstered by an underemployed female workforce, provided a latent pool on which industry and the nation could call upon at times of need.

Over the last decade, the situation has changed somewhat in that more females are now permanently part of the workforce. This has been brought about by lower rates of fertility making more women available, women's liberation and the ever increasing cost of living pushing more females out to work. [29] Those that do leave the workforce for family reasons normally return in their mid 30's. On the other hand, increasing automation in process work has released more persons for other areas of productivity, but this gain is normally very quickly absorbed as the growth of industry in Australia tends to lead the natural growth of the workforce. [30] When times are economically stingent, unemployment still remains as a labour reserve; but this needs to be balanced against the increasing manpower demands that military recruitment would be making over the same period, plus the natural expansion of production work generally that goes with the first economic stage of mobilization. Thus a large proportion of the latent work capability that the nation was previously able to call upon will already be in use and the flexibility of production resulting from that pool, has been lost.

This loss of flexibility and latent production capacity, makes the economy much more susceptible to the ravages of the third stage of economic mobilization, namely military goods will only be produced at the expense of civilian goods. This in turn will create shortages that in no way can match the increases in demand that will occur. To control that demand, positive and normally unpopular policies would be required which in the short term the government, with 'its eye on the ballot box', would need to be wary about implementing.

Australia is particularly well blessed with an abundant supply of raw materials. In an independent but authoritative strategic assessment carried out in 1977, she was rated second only to Russia in critical minerals; [31] about doubling the capacity of the United States. However, in finished product, the refined metal, the output is barely worth measuring on a world scale. All is not pessimistic, as this in itself represents a position of strength. It is likely that in iron, steel and aluminium she could be self sufficient to meet her military demands in addition to her civilian commitment by further easy development of existing facilities. It is Australia's ability to supply the world raw minerals and the world's dependency on that supply that will act to satisfy the nation's demands in the area of the less readily available materials such as the titanium alloys, rubber and the modern exotic carbon derivatives. It can be assumed that over a period of mobilization, Australia would be able to provide or obtain the raw or refined basic materials that it would require for its defence industries. [32]

The tastes and dispositions of the population can be summed up in terms of the 'national will'. Such an assessment takes into account national integration, strength of leadership and relevance of nation strategy — it represents an expression of the aggregate emotions and desires of a people. The 1977 assessment shows Australia well positions on a world scale with a positive national will, heading leading countries such as the United Kingdom and the United States but trailing others such as Japan, Vietnam, Israel and Sweden. [33] Such an assessment would indicate that the nation could be relied upon to respond to the needs of the nation given good leadership and a clear but relevant guide of the role that is required of the population. The unknown quantity is the political environment under which the nation may be tasked. A contrary environment, of the type that existed prior to World War II, would hamper and probably nullify any expression of national will.

There can be little doubt that the economy of the country is sound. The mineral reserves on their own provide a good basis on which to seek international credit if and when it is needed. International loans and existing capital are the principal methods by which a country the size of Australia finances its mobilization requirements of expanded and diverted productivity. The nation's current credit rating is triple A in terms of the World Bank estimate. This places it in the highest category of international credit worthiness. These factors would indicate that in times of adversity, if Australia demonstrated a firm willingness to counter a threat, then the world money markets would be able to provide the capital necessary. The price of that capital and the problems of repaying it could have long term effects on the national economy but in the past an obstacle such as this has not deterred previous government resolves.

The Australian Potential

The Australian potential in the area of defence industries is a function of: the problems of mobilizing an economy, the proven historical performance of the nation in times leading up to and during periods of adversity, present day economic situational factors and the existing capacity from which any expansion must take place. The first three factors have been covered in earlier sections of this paper. In this section those three factors will be used to give meaning to the present day production capacity of the industries so that the Australian potential can be assessed.

The defence industries fall into four areas which relate to specific industrial groupings: munitions, aerospace, electronics and shipbuilding. There also exists a fifth area that is of concern to this essay, that of the administrative interface between the Department of Defence and the industrial manufacturer. Each of these five areas will be dealt with in turn. [34]

Munitions

The munitions industry in in a serious state of decline. [35] The work force has decreased to levels that are barely adequate to maintain essential capabilities and skills. As the level of manpower on the factory floor, the declining potency of the industry is vividly illustrated in Table 3.

This decline is highlighted when it is realized that in this specialized area of industry, up to 20% of the figures shown represent non defence type work and substantial numbers of the workforce are being held on the payroll in an underemployed capacity.

Besides the declining workforce and the consequent loss of skills, much of the equipment and plant in the factories is now obsolete or in a worn condition. Munitions work, by its very nature, requires high standards and close tolerances of work. In some areas these are no longer easily achievable. The practice in past years has been, like normal industry, to have a plant replacement programme running against forecast future sales. With the decline in defence orders this replacement programme has been held in abeyance. Such plant and equipment, because of their specialized nature and high accuracy requirements, cannot quickly be replaced and long lead times can be anticipated if new plant is purchased. As availability of manufacture of munitions equipment is relatively centralized and specialized with a small number of manufacturers, and if such purchases are only made during periods of international tension, then Australian may well have to join a queue of other nations and lose still more time.

Within the industry itself, there is almost a complete lack of design capability which results in a limitation on the types of product produced. This lack of design makes the industry dependent upon overseas developments. Such dependency limits the industry's ability to compete in the international arms market and also limits the scope of vision that is available to defence planners. Israel, a country smaller than Australia, has been able to maintain and even build up her munitions industry by active research and development and the production of design innovations. This has allowed her to expand her sales onto the international market and allowed the industry to remain at a satisfactory level of production during her periods of low tension. [36] Whilst Israel's problems are more pressing than Australia's it does demonstrate the ability of a small country to produce arms and to maintain the productive capacity of its own industries.

Even though the industry is in a debilitated state both in manpower and equipment, the basic facilities from which to expand munition production do exist. In addition to the presently established government factories, a detailed number of production annexes exist in private and state government enterprise. These annexes were called upon to good effect during WW2 and would undoubtedly be called upon again. [36] Thus, so long as the shortages of trained manpower can be made up and sufficient resources were allocated early enough to allow an efficient equipment and plant replacement programme to be carried out, then it is likely that the industry could meet the planning requirements of self sufficiency within a five year period. The saving grace of the industry is that with the exception of the annexes, the production facilities currently exist and they are only really suitable for munitions production. Thus increases in munitions would not necessarily effect production of civilian goods except in the area of the numbers of skilled workers that may need to be drawn from civil industry to man the munition production lines.

TABLE 3.

Year	1969/70	1972/73	1975/76	1976/77
Manhours (millions)	5.75	3.66	2.33	2.0

Level of Manhours in Australia's Munitions Industry.

Aerospace

The aerospace industry is currently centred around a series of interdependent firms, both government and private enterprise, which exist by maintaining the air transport fleets of Australian operators and carrying out selective maintenance and partial contruction of RAAF aircraft. [38] In general terms, they are adequate for the peacetime requirements of servicing, maintenance and providing selected spares, but they have lost the capacity to manufacture.

During World War II, the aerospace industry developed to the point that it was able to design and manufacture operational aircraft in large numbers. [39] Because of leaps in technology and the vast research and development required to back up the manufacture of a modern operationally suited aircraft, it would be beyond the resources of Australia to contemplate competing on or against world markets. There is however a case that the industry should be able to manufacture and maintain the spares for aircraft purchased overseas. As all significant spares are presently imported, this capacity needs to be developed.

Many of the problems that confront the aerospace industry are reflected in the stop go nature of the industry elsewhere in the world. It is an expensive industry, requiring constantly updated equipment and plant. At all levels, trade and technical skills need to be constantly exercised to maintain the competitive and hence cost effective edge that the industry demands. In all areas the Australian aerospace industry is lacking. For example local industry is not able to forge many of the heavy wing and fuselage frames of modern aircraft, equally the casting of turbine blades is beyond local capability. Materials, such as carbon fibres, are becoming more exotic and there is virtually no commercial incentive to produce them locally. In addition, since World War II manufacture closed down, many areas of the industry such as avionics no longer exist at any level of expertise.

Within all the constraints stated, the industry has been able to design and manufacture Ikara, Malkara, Jindivik and Turana. Nomad, a low level technology aircraft with a large imported content, is in manufacture and is achieving commercial sales. Thus a degree of capacity does exist on which to built, but because of the shortages in the manufacturing field and the limited market, a build up to any reasonable level will be a long and costly effort.

The Joint Parliamentary Committee concluded in 1977 that the industry would be unable to provide the support required within a five year period. The situation has changed little since that date. The future of the industry rests with its own ability to develop and manufacture arrangements for the international market and or the offset manufacture arrangements that the government is able to negotiate with the next large RAAF purchase, the Tactical Force Fighter. Regardless of which course or combination of courses is followed, the aerospace industry would not be able to mobilize itself to the level required within a five year period.

Electronics

The electronics industry in recent years has become more heavily dependent upon overseas sources of supply than any time since World War II. [40] It is an industry that is in a corresponding debilitated state. The industry is geared to manufacture or assemble for the civilian market. The majority of defence equipment has been and continues to be purchased from overseas, despite attempts by local industry to manufacture equipments matching the defence specification.

Although there has been evidence that expertise has declined in areas which were once well established, several initiatives have been taken in recent years in defence work: namely the development and manufacture of the Barra Buoy and the present development of Jindalee. Whilst these are steps in the right direction and at the right end of the technology spectrum, it represents only the use of current skills and these on a scale insufficient to stop the decline within the industry as a whole. The loss of professional, sub professional and skilled tradesmen, coupled with an exhibited reluctance on the part of young people to enter the industry, when measured against the time taken to train a person in this field, indicates that the industry could not successfully expand to meet the defence requirements over a five year period.

Shipbuilding

The shipbuilding industry in Australia built its last naval ship some 12 years ago. [41] Construction since that period has concentrated on merchant vessels and the occasional patrol craft. As the construction of naval ships varies considerably from the construction of merchant ships, namely in the standards involved and equipment systems that need to be installed, a large degree of expertise has been lost. This has been lost either through people previously involved having left the industry, or more likely the expertise has not been kept current with modern naval technology. To keep such skills alive requires continuous application to naval construction and not just the piecemeal approach that exists at present.

The level of shipbuilding envisaged by the Joint Parliamentary Committee was for the complete construction of merchant vessels in the region of 20,000 dead weight tonnage with repair facilities extending to both naval and merchant

vessels of 100,000 tonnes size. Coupled with this was a capacity to build naval patrol craft minesweepers and landing barges.

Not only has expertise been lost, but the existing construction facilities are very old and out of date with modern construction methods. This last point coupled with continuous industrial unrest has made the industry non cost effective when compared with the alternatives offered in countries such as Japan, Korea or even Singapore for repair work. There is a need for substantial and expensive modernization to be carried out to allow more cost effective modern construction techniques to be used. In addition the existing range of docks and repair facilities show a strategic deficiency on the west coast. To build a new facility in this area capable of repair of the existing range of naval ships and boats, would take a minimum of two years without taking into the problems of staffing with tradesmen and management of the right calibre.

Of all the defence industries the shipbuilding industry is potentially the best situated, but also potentially the most liable for demise. It is an industry plagued by industrial unrest, hampered by old and antiquated plant, equipment and facilities and in need of rejuvenation. For all this, a level of expertise still exists in a lot of areas and where it is missing it could probably be brought in. Whilst this industry could probably meet the five year requirement, it would be just as likely, with its multiplicity of problems, to cease to function.

The Interface

A perusal of a defence five year rolling equipment programme gives indication of the problem faced by Australian industry in serving the national defence need. All but the very basic capital purchases made are foreign equipments. The reasons on the surface are fairly basic. Research and development is carried out by the manufacturer usually at the instigation of another larger defence force. The consequent production runs and export sales allow a favourable amortization of costs making the weapon system cheaper than anything that could be manufactured in Australia.

Officially in identification of a staff requirement [42] comes from an analysis of the functions and desired performance of equipment relative to Australia's strategic needs. Because Australia is a follower in the development of defence technology, most of the functions and performances identified for new equipments exist in the current range of foreign equipments. Thus current foreign equipments exert an influence over the specific nations and parameters for the future defence capital purchases. This influence often limits the ability of local industry to compete especially where substantial propriety research and development has been involved, as it normally has in the newer higher-technology items. Local industry complains that there is a lack of early consultation between the Department of Defence and industry regarding future requirements. [43] It is only with early consultation that local industry can afford to allocate research and development effort and or expect to compete against foreign suppliers.

Following the publication of the Joint Parliamentary Committee Report matters have improved somewhat. The Defence (Industrial) Committee has appeared to have greater input into policy and defence research and development has received new direction with the appointment of a new head from outside the public service and defence system. [44] In addition there has been a publicized increased involvement of Australian industry in the research and development field. [45] If this theme of improved relations continues than propects for the successful development of a defence industrial base can only improve. Meanwhile until such time as local industry is able to attain the comparative level of research and development reached by foreign firms, then the industry will be hampered by a preference to purchase foreign items when they are available and thus denying local industry to develop areas of expertise.

Prospects

The prospects of the Australian defence industrial protential in the short term, are not good. The four major areas of defence industry: munitions, aerospace, electronics and shipbuilding have been allowed to run down to the point that massive rehabilitation is required. Some of the problems that created difficulties for local industry to compete against foreign manufacturers are being alleviated by the opening of contracts between Department of Defence and the local manufacturer. For all this though, there are vast deficiencies in trained manpower, modern and or appropriate production equipment and in the area of defence industrial management.

Raw materials to feed industrial production are or can be generally made available although deficiencies do exist in some specialized areas. The impact of these deficiencies should not be over stated as the raw mineral reserves of the nation provide a powerful bargaining lever for allies to make them available on an exchange basis.

Some factors that have acted to the benefit of Australia in periods of adversity in earlier years no longer exist. Technology has taken a quantum leap out of the area of short term basic trade skills that allowed quick adaptions and improvization

with a minimum of training. Technology in industry today requires a continuous and dedicated level of support if it is to be used with any degree of success. Flexibility of the workforce has almost disappeared and Australia, apart from unemployment figures, has very little latent workforce capacity on which to draw. Increases in defence industrial productivity will only be able to be achieved at the expense of the production of civilian goods and services; this in turn creates shortages in the market place which in turn create fiscal difficulties leading directly to political problems.

Economically and politically, Australia has not performed well in periods leading up to hostilities. Whilst a number of problems common to all countries in times of mobilization will be acting to restrain industrial development, the more volatile political arena that Australia provides, acts as an uncertain influence prepared to sway the population either way toward supporting or opposing the mobilization effort. It is this support or lack of it, given that everything else is able to be carried out, that will make or break a nation's preparations.

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It is concluded that the aerospace and electronics industries could not be mobilized to the required level of self sufficiency within a five year period regardless of the economic resources allocated to them. The munitions industry although in a declined state may be able to reactivate itself to the required level of production. Its future will depend upon retention of existing staff and expertise, training of new staff to the required levels of skill and the replacement of obsolete machinery. The ship building industry is currently capable of building up to and providing the support required. It is however an industry rife with troubles and it will require a massive injection of funds in the near future or the industry will be lost as a whole.

Economically and politically, it is doubtful that the Australian Government would be able to shift sufficient economic resources into defence industrial production to allow a five year mobilization period. The key to the ability to shift resources lies in the ability of the population to see the need for the shift: as any such change in the Australian environment will involve hardship.

The size of shifts of economic resources is naturally controlled by restraints within the economy such as the availability of facilities and a productive workforce. The intertia imposed by these restraints, together with the bureaucratic system, will restrict spending and limit the consequent expansion of the Australian defence industrial base. Within all these restraints it is unlikely that sufficient economic resources could or would be applied soon enough to the defence industries unless a massive overt long term threat was mounted to motivate the population. Such an open threat is equally unlikely.

Clearly from the conclusions, Australia is not able to satisfy the strategic requirements that politicians, assigned by Parliament to study the problem, see as being needed. The evidence would indicate that most of the problems are generic to the Australian way and as such will probably never be able to be completely rectified. Steps however can be taken by the Government in anticipation or future problems without alarming the population. A gradual but permanent shift of economic resources into the area of defence production, in advance of a warning of threat, would provide a basis by which industry could develop within the restraints of being located in Australia. Such an allocation of resources is correctly a political decision and this is where the future of defence industrial potential lies; the decision to commit resources on a long term basis so as to minimize the difficulties when short term warning is given.

There are several courses which the Government can follow. If extra finance was allocated to defence purchasing it would need to be 'tagged' for expenditure in Australia. Without such action, the proven expedient style of the Department of Defence would be to make purchases from the cheaper and more easily available overseas alternatives. Even if more finance was allocated in this way, the scale of manufacture required by the nation's defence forces would probably be insufficient to encourage industry to produce substantially in the electronics and aerospace area. Further, the shortage of skilled professionals and tradesmen will take years to make good in all areas. Thus extra finance, if it is used in the correct manner, could be used to assist the munitions and shipbuilding industries. The amount of finance though, needs to be controlled to ensure the potential for expansion to a normal operating mode for these industries is not over extended in the early years.

It is unlikely under the present planning arrangements, Australia will be anything other than a client state to other manufacturing nations in some of the fields of electronics and aerospace industries. Admittedly, research and development is taking place, but it is on a scale which leaves Australia lagging behind the major world manufacturers. The example of Israel shows what an investment in substantial research and development can achieve when carried out on the appropriate scale. The nation can not afford to rest on its laurels of past developments, it must innovate and develop systems and defence technology to a level that will encourage export

potential interest and thus future markets large enough to justify the costs of production development.

The client status of Australia in certain fields has to be accepted, but the impact of that status can be lessened. There is an absolute need to safeguard sources of supply of critical items, no matter what level of international tension prevails. Ancillary industries to manufacture substantial spares should be encouraged by offset manufacturing agreements negotiated into all major military purchases. Such bilateral arrangements are not easily achieved, but Australia is uniquely placed in the world, for example with her mineral resources and strategic metals which provide a firm bargaining tool capable of being used politically to Australia's long term advantage. Without such bilateral international trading to assist in the development of Australian defence industries, the nation will remain hopelessly deficient in those areas outlined and will not be able to meet the threat of any potential future invasion.

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25. Mixed use of GNP and GNE is made as figures have been presented in references in this form. The purpose of the table is to indicate the trend of expenditure which comparison of the two tables allows. WWI figures are not shown for Australia as very little was spend during this war in the industrial sector.
26. Backman. p 42.
27. History of the Second World War: Statistical Digest of the War. HM Stationery Office and Longmans Green and Co., London, 1951.
28. Australian Bureau of Statistics. Year Book Australia 1977-78. Government Printer, Canberra, 1978. p 78 and p 637.
29. Dixon, Geoff. 'Resources and the National Economy in the 1980's'. In Hastings, P. and Farrand, A. *Australia's Resources Future: Threats, Myths and Realities in the 1980's*. Nelson, Melbourne, pp 186-188.
30. Dixon. p 103.
31. Cline, Ray S. *World Power Assessment 1977; A Calculus of Strategic Drift*. Waterview Press, Colorado, in cooperation with the Centre for Strategic Studies and International Studies, USA. p 68.
32. Australia is rapidly developing a capacity for producing refined metals, especially those of a strategic nature. There is still a shortfall in production of modern alloy derivatives.
33. Cline. pp 172-174.
34. Basic industries such as food, clothing and vehicle manufacture are ignored due to the 'relatively' high levels of production that are currently achieved.
35. Joint Committee Report. pp 40-66.
36. Samuel, Peter, 'Australia can Learn a Lot from Israel's Defence' *The Bulletin*, March 6, 1979. pp 75-77 and March 13, 1979. pp 80-85.
37. Mellor, D.P. *Australia in the War of 1939-1945, Series 4 (Civil), No V. The Role of Science and Industry*. Australian War Memorial, Canberra, 1958. pp 50-56.
38. Joint Committee Report. pp 78-116.
39. Mellor. pp 409-422.
40. Joint Committee Report. pp 117-148.
41. Joint Committee report. pp 157-195.
42. JASP (AS) 101. A staff statement in broad terms of function, main features and performance, of a piece of equipment which is required to be developed for service use and in respect of which sufficient scientific and technical information is available, or can be confidently expected to become available to enable development to be put in hand immediately with reasonable expectation of success.
43. Joint Committee Report. p 11.
44. McLennan, Sir Ian. 'The Defence Capability of Australian Industry'. *Australian Journal of Defence Studies*, Vol 2, No 1, April 1978.
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SHIPS AND THE SEA

GARTHWRAY

The sailing vessel *GARTHWRAY* (ex *WRAY CASTLE*) was a three masted full rigged ship of 1791 tons register built in 1889 by R. Williamson (Worbington) for J. Chambers of Liverpool. Sold in 1911 to R. Thomas & Co. also of Liverpool for £3,600, *WRAY CASTLE* was again sold, this time to Sir William Garthwaite of the Marine Navigation Co. Ltd. of 92/94 Gracechurch St., London on 27 August 1917. William Garthwaite was one of the last British owners of sailing ships and in fact owned the last British Windjammer, *GARTHPOOL* (ex *JUTEOPOLIS*) wrecked off the Cape Verde Islands 11 November 1929.

To return to *GARTHWRAY*. Whilst her career prior to being owned by William Garthwaite was, no doubt, quite honourable it appears to have been quite normal for a ship of that time. After her last change of owner she did distinguish herself for two vogages of note, one lasting 4 years and the other voyage from Grangemouth to Iquique (Chile) that took 519 days. To avoid undue confusion the name *GARTHWRAY* is used throughout, where in actual fact the ship's name was officially *WRAY CASTLE* until October 1920 when the name *GARTHWRAY* was adopted. At that time the ship was at Lourenco Marques and had just changed articles.

To clarify some of the terms:

Windjammer is a colloquialism, first coined in America in 1899 for the last type of square rigged ships.

A ship is officially classed as a vessel of *more than two masts square rigged on all masts.*

Rounding the Horn was sailing from 50°S in the Pacific Ocean to 50°S in the Atlantic Ocean (or vice versa) passing to the southward of Cape Horn (55°59'S 67° 16W) Although no full records have been kept it has been established that no less than 53 sailing ships foundered on their attempt to Round the Horn in the period 1900-1914.

The first voyage of *GARTHWRAY* is fully documented and in essence commenced at Newport (Wales) on 1st November 1917 and completed in Leith (Scotland) on 16 February 1922. During that time she carried many cargoes, rounded the Horn several times and in chronological order visited:

Newport (Wales), Gryticken (Sth Georgia), Melbourne, New York, Melbourne, Newcastle (NSW), Gatico (Chile), Caleto Bueno (Chile) Cape Town (Sth Africa), Newcastle (NSW), Iquique (Chile), Laurenco Marques, Sydney (NSW), Newcastle (NSW), Valpariaso (Chile), Taltal (Chile) and finally Leith (Scotland).

Total time elapsed was 4 years, 3 months 15 days (and we worry about a 3 month deployment!).

GARTHWRAY was a ship of 1800 tons with a total crew of 17 including the Master and 2 mates (officers). Captain Frampton did have some consolation, his wife accompanied him officially as the Purser at one shilling per month. Miss Eva Frampton (18) joined her parents at Lourenco Marques signing on as 'Flag Maker' also at one shilling per month. Indicative wages at that time were £25 per month for the 1st Mate, up to £20 per month for the 2nd Mate come Bosun and £12 for an Able Seaman (AB). All except the Master and the women, were in two watches, i.e. 4 hours on and 4 off.

The second, and last, voyage under Sir William's ownership was to prove the more arduous of the two. Loaded with 3,000 tons of briquettes for Iquique, *GARTHWRAY* departed the Firth of Forth on 22 July 1922, passed north of Scotland and set course for Cape Horn. Freight for windjammers by this time was becoming scarce and thus a restriction in wages came about. For this voyage the crew consisted:

> Captain Edward Mann, Master; Mr J.M. McLeod, 1st Mate (£19.10s per month); Mr D.T. Robertson, 2nd Mate (£15); ten Able Seaman (at £10 per month); Sailmaker; Carpenter; Cook-Steward; and 9 Apprentices. Of these 3 (E.V. Hayward, F.W. Simpson and W.R. Hobden) were Australian.

Whilst there was no usual or predicted time to travel Grangemouth to Iquique rounding the Horn was the time consuming factor. It is recorded that 92 days *(CAMBRONNE)* is the longer period taken and 6 days *(PRIWALL)* the shortest, when going in a westerly direction.

To continue, *GARTHWRAY* was met by adverse weather. Beating against a full westerly gale and swells 70 to 80 feet high she headed towards the Antarctic. The ship reached 60°S latitude before the seas eased and the wind shifted to the south. Now was their chance to beat to windward and *GARTHWRAY* heeling over raced across the swell. At 0600 the next morning Captain Mann, acting on experience decided to shorten sail and ordered the two top-gallant sails taken in. As this was happening a terrific squall hit the ship beam on and she heeled 40° degrees. Shortly after, the upper topsails blew out and after two hours the squall had passed. When the damage was assessed it was worse than anyone thought. The fore topgallant mast was sprung and split, the main top-gallant mast was sprung and fractured, the rudder and rudder post damaged. The deckhouses, main deck and fo'c'sle head were also damaged. As an aside, this all happened on 11 November 1922, 81 days out of Grangemouth, a date when the wind force was recorded in Magellan Strait at 120 mph.

Damage to the ship was such that Captain Mann decided that new royal and topgallant masts were needed and so the ship squared away for Montevideo (Uruguay) arriving there on 9 December 1922, 140 days out. New masts were sent out from England and here crew changes took place. Captain John Henry replaced Captain Mann and a 35 year old Swede, Mr Siegfried Larsen relieved the 2nd Mate. After 4 months, *GARTHWRAY* sailed once again for Iquique. Once again *GARTHWRAY* attempted to round the Horn. 32 days out of Montevideo, identical weather was encountered and the same miserable conditions met. In almost the exact position as the disaster 6 months earlier, the main lower topsail yard truss carried away and after much hard work the yard had to be cut away and dropped over the side. Time was needed now to rest the ship's company.

After two days of being hove-to, a further examination of damage was carried out. Apart from the loss of the yard it was found that the steel fore and main topmasts had fractured. Discretion being the better part of valour, *GARTHWRAY* squared away, arriving at Cape Town on 21 July 1923. They were now 364 days out.

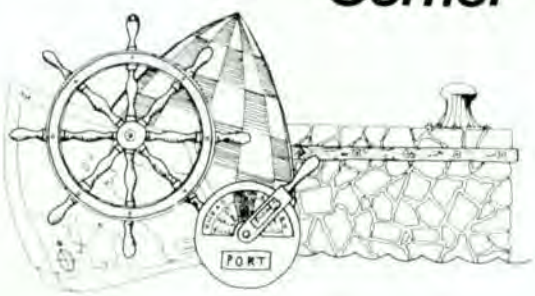
Prior to departing Cape Town on 27 September 1923, Mr E.F. Letts had relieved Mr J.M. McLeod as 1st Mate, his pay being £17 per month. On their departure, it was decided not to test the Horn again and so *GARTHWRAY* ran the easting down arriving in Iquique in 87 days. Total time for the complete passage was 519 days, the longest passage ever by a windjammer to that Chilean port. The cargo was in good order and unloaded, as usual, by the crew.

As the final part of the voyage, ballast was taken aboard for the passage to Tolcahuano (South Chile) to load wheat, departing for that port on 15 March 1924. On 24 April 1924, whilst standing in towards the coast *GARTHWRAY* was driven ashore on the rocks of Santa Maria Island where very rapidly she became a total wreck. All hands managed to scramble ashore.

The survivors finally arrived in Liverpool via Coronel, by steamship, on 13 June 1924.

ROBIN PENNOCK

Shiphandling Corner



SHIPHANDLING THE FFG 7

(This article, written by LCDR D.J. Van Buskirk USN, is reprinted by kind permission of the Editor of the USN Journal Surface Warfare)

Driving one of the FFG 7-class guided missile frigates is a thrill not unlike that first"spin" in a brand new, high performance sports car. It offers superb responsiveness to the orders of the conning officer and its maneuvering capabilities exceed those of its steam propelled sister-frigates. To use this capability to its optimum potential, however, requires some fresh, new ideas in frigate shiphandling. Additionally, some of those same features that give *Oliver Hazard Perry* its sports car like performance may also provide limitations.

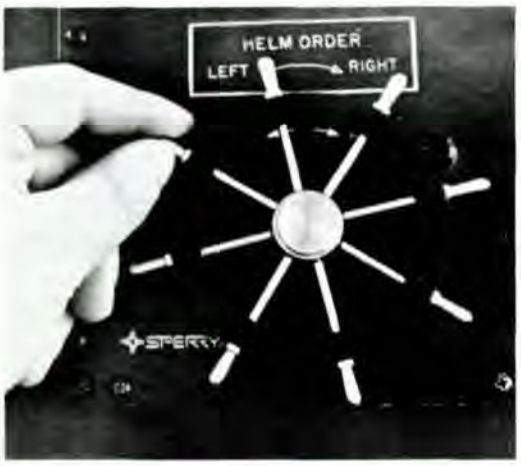
The *Oliver Hazard Perry* Class is a 3600 ton, single controllable pitch propeller, single rudder ship. Main propulsion is provided by two General Electric LM 2500 gas turbines capable of developing 20,000 SHP each. The gas turbines are connected to the reduction gears by two synchronized self-shifting clutches. Although one or both clutches may be automatically engaged with the engine at idle, the clutches (one per turbine) are designed to engage an overtaking engine automatically and positively to the reduction gear at the point of synchronous speed. Thus with one turbine "on the line", the second turbine may be engaged or disengaged from the reduction gears at any speed. Since the shaft will be rotating (clockwise view from astern) at all times when either one or both turbines are connected to the reduction gear, FFG 7 Class ships have been fitted with a controllable pitch propeller system. At idle (or all stop), the controllable pitch propeller is constantly turning at 45 RPM with one engine on the line and at 60 RPM with both engines on the line. Forward or reverse movement is accomplished by a combination of altering the pitch and changing the shaft RPM. The pitch of the screw is measured in feet (which is based on the actual distance that the propeller travels with each revolution). On *Oliver Hazard Perry*, when the pitch of the screw is at 1.5 feet ahead, it is equal to "all stop", or zero thrust.

The pitch and RPM of the screw may be controlled independently of one another, or together through a processor located in the ship's Central Control Station. When the pitch and RPM are controlled separately it is referred to as the "remote manual" mode. When the processor is utilized, it is referred to as "programmed control". This method of propulsion control automatically provides the optimum pitch and RPM combination for any given speed. Essentially, in the programmed control mode, the ship will go from all stop to about 8 knots when pitch is increased from 1.5 to 23.5 feet ahead. Above 8 knots, the screw remains at full pitch and the RPM is increased through full power.

Propulsion control is available at a variety of locations. These include an emergency mode which can be connected directly at the turbine modules, a Local Operating Panel in the engine room, the Propulsion Control Console located in the Central Control Station (CCS), and a Programmed Control Position contained within the Ship Control Console in the Pilot House. Separate pitch and RPM control (in the remote manual

mode) are available at the control positions within the engine room and at the Propulsion Control Console in CCS. Processor control of pitch and RPM (or programmed control) is available at the Propulsion Control Console in CCS and in the Pilot House. The best configuration, and the one normally utilized at sea detail evolutions, is the programmed control mode maintained at the Pilot House position.

Recessed in the hull on either side of the keel at about frame 100 (just forward of the pilot house) are two 325-HP electrically powered auxiliary propulsion units (APU's). Each APU may be extended and rotated independently through 360 degrees of arc. Each unit is single speed, offering "on" or "off" conditions only. They may be controlled both in train and operation by either the helmsman (ship control console operator) in the pilot house or by an operator in the APU machinery room, but they must be raised and lowered by the operator in the APU machinery room (the control space located directly above the APU's). Since the APU's are electrically powered, the surge load on energizing normally requires a third generator on the line and it is important to minimize the starts and stops to prevent the motors from overheating. It is also important that the conning officer, when using them in a maneuvering situation, maintain a good mental picture of his APU positions and combinations because they should not be opposed in thrust, propeller to propeller, nor should one APU's propeller wash be directed into the other APU. APU position orders are given in degrees relative to the bow with the bearing ordered indicating the direction of desired movement rather than the direction of propeller thrust. As an example, energizing an APU at 090 degrees (R) will cause the bow to move to starboard, or energizing the APU's at 180 degrees (R) will cause the ship to move astern.



The small but effective helm on the ship control consoles of FFG 7s.

There are other factors which must be considered when conning an FFG 7-class ship. Because of the starboard rotation of the propeller (whether ahead or astern pitch is utilized), *Oliver Hazard Perry* backs smartly to starboard. Even when at all stop (pitch ahead 1.5 feet), the constantly rotating screw will cause the stern to walk to starboard. The rate of this starboard movement of the stern increases with two engines on the line due to the increased shaft RPM.

When proceeding at slow speeds, moving the throttle to the "stop" position may cause a loss of steerage way even though three to four knots of headway is still indicated on the pit log. Without screw wash on the rudder, the tendency of the sterm to walk to starboard caused by the shaft rotation at 60 RPM will cause the bow to fall aft to port. However, it is often not necessary to increase the speed of the ship through the water above the three or four knots of headway, but only to get the commensurate pitch on the screw needed to regain steering control.

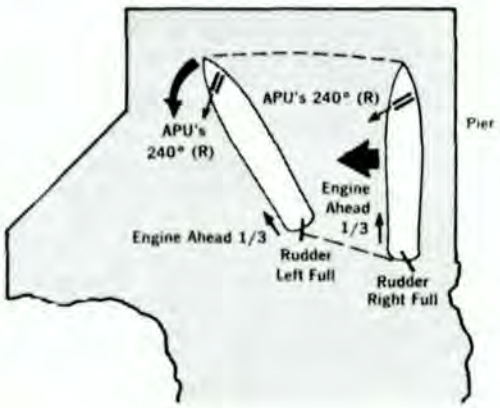
A product of modular construction and innovative weight-saving techniques, this 445 foot long ship has a lot of topside sail area and is particularly susceptible to wind conditions in any maneuvering situation. Except in a distinctly disadvantageous wind or strong currents, there are few situations in which the *Oliver Hazard Perry* class ship cannot maneuver unassisted.

Perhaps the strongest case for the FFG 7-class maneuvering capabilities can be seen alongside the pier. These are the opportunities to crab the ship to port or starboard, twist, radically adjust the turning diameter, or even walk the ship sideways to port or starboard. All of these maneuvers can be accomplished by varying combinations of APU's, propeller pitch and RPM, and rudder position. All of these maneuvers were routinely utilized on *Oliver Hazard Perry*.

From the completion of *Oliver Hazard Perry's* fitting out in April of 1978 until the beginning of the ship's post shakedown availability in October of the same year, the ship has 137 sea details. These numerous evolutions provided the opportunity to prove the following techniques. They were later "fine tuned" during the many restricted maneuverability evolutions experienced during Great Lakes Cruise '79. They are not *all* the FFG 7 class can do, but serve to illustrate some of what this class ship has already done and provide examples of some of the most frequently utilized maneuvering techniques.

Crabbing

Perhaps the easiest way to clear a pier is to crab away from it into the channel. Crabbing to port is accomplished by placing the APU's at 240 degrees (R) (thrust directed towards 060° (R)) and the rudder at right full. Then, in sequence, energize one APU, order ahead ⅓ on the main engine, and then energize the remaining APU. In essence, the ⅓ ahead with right full rudder moves the ship forward and the stern to port. The APU's trained and energized at 240° (R) will retard the ⅓ ahead somewhat and move the bow to port along with the stern. Thus both the bow and stern move to port while the ship slowly gains headway and the result is crabbing to port.

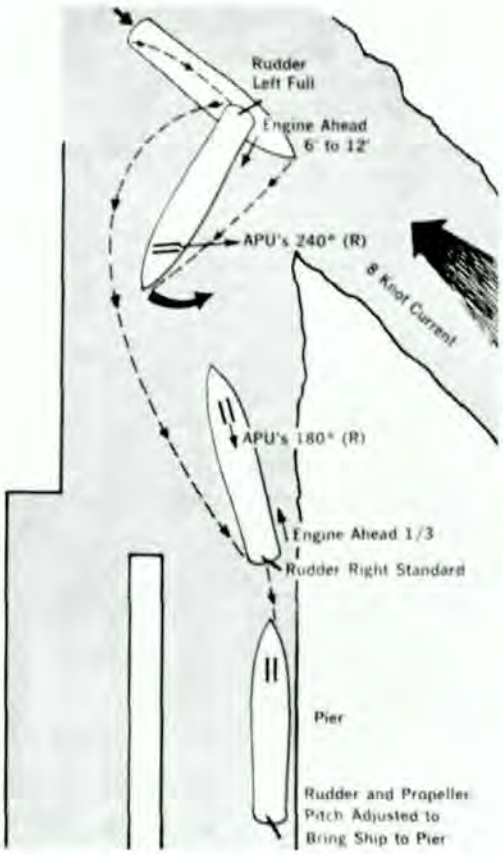


Crabbing to starboard will vary from the straight-forward port crabbing method due to the tendency of the stern to walk to starboard as soon as the lines are slacked. Flexibility is the key to these situations, as the traditional variables can easily require a change in the game plan. Normally, crabbing to starboard can be initiated by putting the rudder left full and training the APU's to 120° (R).

Crabbing was routinely accomplished at the Naval Station in Mayport, Florida, where ships are berthed within a basin. Using this technique, *Oliver Hazard Perry* frequently moved to the center of the basin where a twist was utilized to head the ship fair in the channel.

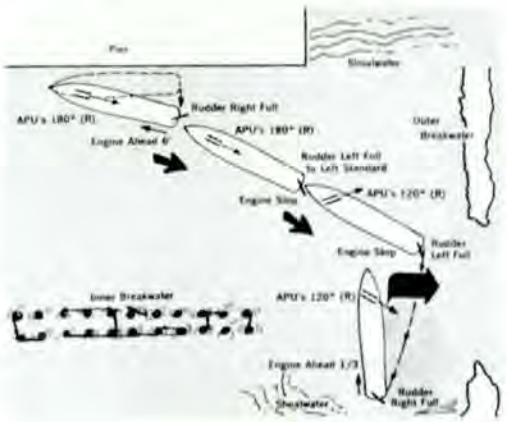
Twisting

Twisting used the same principle as crabbing, but instead of the APU's opposing the rudder action on the bow, they are rotated to assist. With the APU's at 120 or 240 degrees (R) and the rudder assisting at right or left full respectively, the amount of pitch will then become the determining factor in the radius of the turn the ship will make. Dynamic use of the propeller pitch and APU positions may then reduce the turning circle to zero and the ship will remain DIW and continue to twist about its pivot point. For example, a port twist would start with left full rudder and APU's provide mutual assistance in moving the stern to starboard and the bow to port. As the ship twists, changing the propeller pitch between 6 and 12 feet ahead and the port APU between 240 degrees (R) and 180 degrees (R) will assist in cancelling any fore or aft movement while the ship makes a stationary turn to port. This twisting maneuver was used more effectively in Montreal, Canada's Bikerdyke Basin. Bikerdyke Basin includes a turning basin only slightly wider than the ship's length and berthing slips situated at the end opposite to entry. After an initial approach was made from the left side of the basin to compensate for an approximate eight-knot current produced by the St. Lawrence River at that point (Step 1), the APU's were lowered and the ship brought to all stop (Step 2). With the APU's initially at 240 degrees (R) and the rudder at left full, a twist was completed through approximately 190 degrees while remaining in the center of the basin. *Oliver Hazard Perry* was then able to back into its berth, accomplishing the entire maneuver without the assistance of tugs.



Backing

The natural tendency of the *Oliver Hazard Perry* — class to back to starboard can be advantageous, as it was initially in the Montreal moor. Once the ship was turned in the basin, it had to be backed to starboard to prepare for a satisfactory final approach to the pier. Of course, once in this approach position, it became just as important to back the ship on a steady heading and, finally, to back slightly to port to move alongside the pier in a starboard-side-to, bow-out position. It was found that not until the ship reached about two-thirds backing speed could the use of left full rudder overcome the starboard movement of the stern. Although useful at times, that kind of speed is normally unacceptable for prudent maneuvering in close quarters. Once again, the APU's can again be of profound assistance. By training and energizing the APU's at 180 degrees (R), the ship will rapidly gain sternway. To prevent the stern from walking to starboard as the ship backs, the rudder is placed at right full and about six feet ahead pitch is applied to the idling propeller. The ahead pitch on the propeller will furnish sufficient water flow across the rudder to hold the stern, but not enough ahead force is generated to prevent the APU's from moving the ship astern. As sternway is gained the rudder can be shifted and the main engine brought to all stop. While backing, controlling the position of the bow can be achieved through careful manipulation of the APU's. As an example, by putting on left full rudder and training the port APU to 120 degrees (R) (with the starboard APU remaining at 180 degrees (R)), the bow will fall off to starboard causing the stern to move to port. This technique was successfully utilized during the departure from Navy Pier in Chicago. The situation required the ship to back straight for several ship lengths until clear of the pier and inner breakwater, and then back 90 degrees to port, stopping just short of shoal water, and finally twisting 90 degrees to starboard to exit the harbor through an opening in the outer breakwater. From the starboard-side-to-moor (Step 1), the APU's were placed initially at 180 degrees (R) with the rudder put to right full. With both APU's energized, sufficient ahead pitch was placed on the propeller to move the stern away from the pier (to port). The starboard APU was rotated occasionally to 240 degrees (R) to hold the bow in position while the stern moved away from the pier. When the ship was at an approximate 30 degree angle from the pier (Step 2), propeller pitch was reduced to permit backing away from the moor. When the ship had gained ample sternway and was well clear of the pier (Step 3), the main engine was stopped and the rudder shifted to left full. This resulted in a slight falling off of the stern to starboard because of the 60 shaft RPM at idle, but as the ship gained sternway it was possible to ease the rudder to left standard while continuing to back on the APU's on a steady heading. As the ship neared the end of the inner obstruction (on the port quarter) (Step 4), the ship was backed to port by placing the rudder at left full and rotating the APU's to 120 degrees (R) (pushing the bow to starboard). After the completion of the 90 degree turn, sternway was stopped by increasing the pitch of the propeller and gradually shifting the rudder to right full. The position of the APU's remained unchanged and the resultant starboard twist was maintained until the ship was headed for the center of the opening in the outer breakwater (Step 5).



The combinations available to handle various restricted maneuvering situations are virtually infinite, but success depends on very dynamic utilization of the controls at hand. For example, with the APU's at 180 degrees (R) and the propeller at six to eight feet of ahead pitch, it is not unlike a two tug power make-up. Fore/aft motion is a function of the pitch applied to the propeller and port/starboard movement is a function of the rudder (for the stern) and train of one or both APU's (for the bow).

By an understanding of each force at hand and anticipating the results of each pitch, rudder, and APU train order it is possible to handle the ship alongside a pier in a smooth, professional manner without the use of tugs on a routine basis.

Nobody asked me, but...

THE R.A.N. AND THE RACETRACK SYNDROME — A SOLUTION?

Ten years ago, the Royal Australian Navy was, at the one time, providing a DDG for service off the coast of Vietnam and two escorts for the Strategic Reserve. The fast transport *SYDNEY* was also making frequent trooping runs to South Vietnam, and the *MELBOURNE* and accompanying units went north at intervals for SEATO and other exercises. Clearly, the RAN was at this time heavily, perhaps too heavily, committed to operations outside the Australian Station.

Yet, on reflection, and certainly by comparison with the past few years, these were halycon days, as far as operational expertise, the acquisition of valuable experience and high morale applied to ships' companies operating their ships (in other words, simple job satisfaction).

Why so? In the first place, the Navy was operating in a fully operational environment and thus acquiring the best experience possible. The DDGs were being tested to the limit and the RAN learnt more about them in the years off Vietnam than could ever have been learnt in ten times that much peace time service.

Second, the presence of strong British and American forces in the S.E. Asian area and our operations as an integral part of their forces meant that we were 'keeping up with the Joneses' in terms of operations and tactics in every way — exercises with four or more aircraft carriers present, for example, were not uncommon.

Third, and most important, there was a goal in sight and something definite for the crews to match up to. The flesh-pots of the East and all the exotic sights of Asia may mean a lot, may still cast an aura of glamour over the departure of an escort 'Up Top', but what gave the most satisfaction to all concerned — in the ships off Vietnam and in the Strategic Reserve — was that RAN ships proved themselves to be as good as, or better than any in the world. When Singapore Basin was croded with ships and there were still three or four of the 'heavies' anchored in the Roads, this meant a great deal, just as the fine record of the DDGs and *VENDETTA* means a great deal when it is compared with the number of USN ships which operated off Vietnam at any one time. A successful deployment was a great achievement, the high point of a career, and it is significant with what pride those who went to Vietnam and those who were involved in Confrontation wear their ribbons.

This attitude extended to other parts of the Service. I have already mentioned the *SYDNEY* and her role as 'Vung Tau Ferry', but there were also those who manned the *JEPARIT* and the *BOONAROO*, those who did so well in the Helicopter Flight and, not least, the tremendously successful Clearance Divers.

One must, of course, not look at the Vietnam period through rose-coloured glasses and I do stress that I am not trying to make a political point or declare that the Vietnam War was necessarily a good or bad thing. But a navy needs to be stretched; needs to be kept on the move, needs to be made well aware of how quickly it may have to be mobilized and ready for war. By and large, I do not believe that the present RAN is entirely sure of its aims.

I think that we are too insular, too bound by false economies and to much concerned with our own small affairs. I do not think that any branch of the Service is entirely free from guilt.

Perhaps the Navy it self is not entirely to blame for letting this happen. The British have, apart from occasional visits, gone, the Americans have reduced their presence and our excursions abroad seem confined to a single unit in the Strategic Reserve, the biennial RIMPAC exercise off Hawaii, minesweepers and landing craft in Indonesia and a quick dash around the Indian Ocean by the odd Task Group.

We are falling behind NATO. We can hardly do otherwise, since our exposure is limited to visits 'en passant'. We may have access to the publications and procedures, but operational experience is the major — perhaps the only — determinant of a truly efficient force. Continual operations with first-rate navies are the nearest that we can now get to operations as they will really be 'come the revolution'.

Morale in the RAN is not as high as it should be. The deployments to S.E. Asia are not what they were. Ships seem to be spending too much

time alongside, too much time by themselves and not enough time operating with the Fleet. Attempts to exercise with the Americans have not always been greeted with enthusiasm by our Allies — in fact, more than once an Australian ship has arrived in Subic only to find the major part of its planned exercises cancelled.

Furthermore, the vast majority of the remaining time allocated to exercises is occupied by operations with the Singaporeans, Malaysians and Thais. I do not deny the necessity for these exercises, but whereas before the Australian ship had to extend itself in every activity to keep up with the 'big boss', we have now had to step down our operations to ensure that they can keep up. Certainly we have a duty to assist our Allies in every way we can, and in as many ways as they require, but we have very sophisticated ships, and we cannot let our equipment go to waste.

The solution to this lengthy lament? Primarily it lies within our own orbit. We must exercise a little more imagination and a little less economy in terms of fuel and foreign exchange. We must be willing to send our units abroad far more often. The measures proposed by the Prime Minister to increase defence spending and increase our presence in the Indian Ocean all point in these directions.

Yet I feel that a more radical measure is due — specifically, I propose that we send an Australian ship to join the Standing Naval Force Atlantic *on a permanent basis*. Let us consider the measure. Our DDGs and Type 12s — and the FFGs to come — could join the force without any real problems. The normal American contribution is a *CHARLES F. ADAMS,* while the British and the Dutch generally send a *LEANDER* type each.

The operational work load of the force is heavy. STANAVFORLANT is involved in almost every NATO maritime exercise, many of the major national exercises and in not a few of its own devising. STANAVFOR tests many of the latest tactics of NATO and to have completed a deployment means that the unit concerned has been through the whole gamut of NATO operations and procedures.

It would also be an opportunity for NATO to try out any Australian innovations and would ensure that Australian proposals do not take as much time to wend their way through the system as seems the present case.

The programme of the Force as far as visits is certainly one that demonstrates the old conundrum 'Join the Navy and See the World'. The morale boosting effect of the excursions of *HOBART* and of *MELBOURNE* and *BRISBANE* was obvious. An Australian ship taking in the various ports around the Atlantic and the North Sea, to name but some, would certainly be a desirable posting.

The system of rotating command of the Force would ensure that at least some Australian officers would have command at sea of a fair sized force before they reached flag rank, thus providing valuable experience for a future FOCAF. The normal system of rotating command for various serials and evolutions would ensure that no Captain returned to Australia without a *more than average measure of such experience.*

The need to keep a ship in the Standing Naval Force would stretch the Navy's resources to a considerable extent. Maintenance and stores support programmes would have to be devised, since any ship would have to rely on RN and USN dockyards as its base ports. The creation of such systems and their use in such a way would improve the ability of the support organization to react to far flung and out of routine requirements.

The quality of training in the Australian Fleet at large would improve. Each returning vessel would bring with it a vast fund of expertise, while no vessel could be allowed to go to NATO without an adequate work-up. There would be very clear indications if we were to slip behind the NATO nations in any areas.

An Australian ship in the Standing Naval Force would be a continual reminder to the NATO nations of our presence and of our joint interests. It would act as a most effective damper to any moves which may be made to cut Australia's links with NATO and our access to its doctrine and systems.

Furthermore, there is no reason why the Standing Naval Force could not deploy, say for two months in every two years, to participate in such as the KANGAROO series exercises. The resultant strengthening of the naval forces involved would be extremely useful — and the move would give the NATO forces novel experience and a change in their routine which would probably be most welcome.

It is conceivable that New Zealand would be able to despatch a frigate on a one year in two, or three, basis. The New Zealanders suffer from the same problems as we, only in a rather more extreme fashion, and although their Navy is too small to permit a permanent detachment in addition to its present responsibilities, such a venture would be of great value.

In conclusion, I consider the major benefit of the plan to be that it creates a requirement — an *additional* requirement — to have an operational escort on deployment overseas and that it would stretch the RAN's resources to a considerable extent. It would provide both a challenge and an encouragement and, in the end and if successful, a source of deep satisfaction for the officers and men concerned.

'MASTER NED'

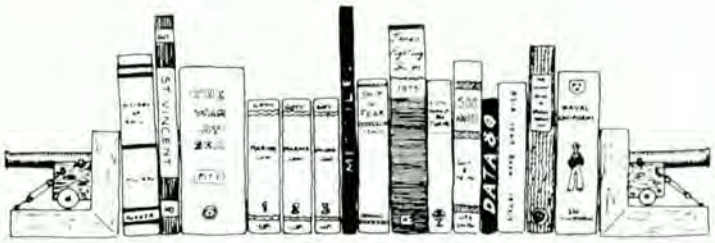
EXERCISE AUCKEX 80

Ships of the RAN, RNZN and USN took part in the major exercise AUCKEX 80 off the North Coast of New Zealand between 20 and 31 October, 1980. Air support and strike forces were provided by RAAF F111s and Orions and RNZAF Orions, Skyhawk and Strikemaster aircraft. Leading Seaman Photographer Mark Lee of HMAS *BRISBANE* supplied these photographs of surface units leaving Auckland at the commencement of the exercise.

The Spruance Class Destroyer USS *OLDENDORF*.

HMNZS *WAIKATO* with HMAS *BRISBANE* in the background.

BOOK REVIEW



OUR WAR by Brian Lewis. Melbourne University Press 1980. pp 328. Recommended Price $18.60.

In *Our War*, Brian Lewis has presented a boy's eye view of World War I, from a vantage-point in contemporary suburban Melbourne. In adopting this view-point, Lewis allows himself considerable stylistic and factual licence: he neither aims at 'telling a story' in true novelist fashion, nor tries to emulate the labours of the historian. Instead, he attempts to recreate, by anecdote, the atmosphere of World War I Australia, and the propagandized myths that were so much a part of it. What faces the reader as a consequence, is a loosely-integrated collection of World War memorabilia, drawn from personal reminiscence, family correspondence and scrapbooks, newspapers, and other contemporary publications.

At the outbreak of the Great War, the author was eight years old, of upper middle-class background, and attending a private school. His youth and personal circumstances thus sheltered him to a considerable extent from the impact of the trauma which Australian society underwent during the 1914-18 conflict. The naivete with which the young Lewis and his class-mates absorbed contemporary accounts of the War's progress, was, Lewis suggests, only a reflection of the pathetic ingenuousness exhibited by a still-young, largely Royalist Australian anxious to join in a victorious display of arms. It is this proposition that provides the author with a consistent style and theme.

Viewed in toto, *Our War* is essentially an anti-war diatribe, delivered retrospectively by a sadder but wiser man, who has the added advantages of not just age and maturity, but also access to more accurate records than were available in 1914-18. If the simplistic, pseudo-childish style which dominates the greater part of the book palls at times, it provided Lewis with ample scope for humorous, as well as bitter cynicism:

'The Russians — sank the German cruiser *EMDEN* off the China coast and she remained sunk for six weeks. Then she appeared in the Bay of Bengal and immediately sank five British merchant ships'.

Similar ironic comment abound in reference to land and sea campaigns. However, it is not primarily the blunders of generals that Lewis seeks to attack. Rather, it is the cynicism of the Establisment propaganda machines, which condoned the apparent ineptitude of wartime leadership and which exhorted nations such as Australia to sacrifice a generation of young men in the name of some stylized form of Imperial glory.

Who then were the real villains of the piece? If we are to believe Lewis — the Northcliffe Press, and its 'creatures', Haig and Lloyd George: this unholy alliance of press, general and politican bled Britain's Empire white of men rallying to an ultimately irrelevant cause.

As a balance interpretation of World War I and Australia's involvement in it, *Our War* falls well short of respectability. However, as an indictment of the 'grossly clumsy' propoganda machine which ultimately did so much to intensify disillusionment with the war effort, the book is brutally effective, if heavily biased. *Perhaps Lewis decided to fight fire with fire.*

I.J. TURTON

A LOG OF GREAT AUSTRALIAN SHIPS by Graeme Andrews, A.H. & A.W. Reed, 1980. Recommended retail price $18.95.

In his introduction to this book, Graeme Andrews explains that he has collected a pot-pouri of ships which helped make Australia, picking representative ships and trades.

Whilst devoting one small section "the First Australian Ships" to the history of locally built and owned ships (1831-1856), the title becomes somewhat of a misnomer when reflecting on the book as a whole. Whilst all the ships examined traded to Australia, many of them could not be classified as Australian or New Zealanders.

But be that as it may, the author has chosen a wide selection of ships for the reader to examine, a true A to Z. *Albatross* to *Zealandia.* Space precludes Graeme Andrews detailing all the ships he would like to, and like me, many readers will argue his choices. No matter, his choice is representative, comprehensive and well balanced. Paddle Steamers, warships, tugs, liners etc. make up the varied selection and each ship (or class) dealt with is accompanied by at least one photograph.

What gives this book its quality is the wealth of information contained on each page. Much research has been done; dates and places of building are given together with a brief history. Even more importantly, the ultimate fate of the vessel is given.

Some of the better known ships mentioned are:
SS *HELLENIC PRINCE*, ex HMAS *ALBATROSS* (1928-1953);
SS *ITALIS*, ex *AMERICA*, ex *AUSTRALIS*, ex *AMERICA* (1940-1978)
SV *CUTTY SARK* ex *MARIA DI AMPARO*, ex *FERREIRA*, ex *CUTTY SARK* (1869 -)

The *BATHURST* Class minesweepers are also detailed and their subsequent fate has been traced, including those that still survive.

Smaller trading vessels also are mentioned. The '60 milers' of the NSW coast, the Port Philip paddle steamers and of course the more famous of the Sydney harbour ferries. Auxilliary sailing vessels of the South Australian and Tasmanian coasts are represented by *KERMANDIE* and *ADONIS*. Suitable recognition is also given to the Huon built *MAY QUEEN* (1867 -). Retired from active service in 1974 she was presented by her owners (remember the IXL factory in Hobart?) to the people of Tasmania.

Whilst expressing some dissent with the author, I do believe that Graeme Andrews has come up with an informative and readable book well worth all his obvious efforts.

Definitely one for the bookcase.

ROBIN PENNOCK

AGENDA FOR THE EIGHTIES edited by Coral Bell, ANU Press Canberra, Australia 1980. 256pp, $12.95 Paperback.

1980 was a year of great moment in defence and foreign affairs. The events in Iran, Afghanistan, and Kampuchea served to emphasise the fluid nature of international relations: in fact they dominated the news to such an extent that most Australians would be unaware of most other problems. *Agenda for the Eighties* is a collection of essays which explores the problems facing Australian policy makers now and discusses the way in which these may develop in the eighties.

The editor, Coral Bell is a Senior Research Fellow in International Relations at the Australian National University (ANU) and a former Professor of International Relations at the University of Sussex in the United Kingdom. She is a regular contributor to the *Melbourne Age* and an author of several books on International Relations. Most of the contributors will be well known to students of International Affairs from the excellent series of publications produced by the ANU in recent years. The essays and authors are as follows:

'The Central Balance and Australian Policy', by Coral Bell.
'Economic Choices and Chances', by Professor J.D.B. Millar, head of the Department of International Relations at the ANU.
'Diplomacy and Defence', by Dr Robert O'Neill, Head of the Strategic Studies Centre at the ANU.
'Nuclear Policy', by Dr Desmond Ball, a Senior Research Fellow at the ANU currently in London with the International Institute for Strategic Studies.
'China and Japan', by Dr Ralph Pettman, a Senior Research Fellow in International Relations at the ANU.
'Australia and South East Asia', by Professor J.A.C. Mackie, head of the Department of Political and Social Change at the ANU.
'The Indian Ocean Littoral', by Dr Mohammed Ayoob, a Senior Research Fellow in International Relations at the ANU.
'Near Northern and Pacific Neighbours', by Mr Peter Hastings, Associate Editor of the Sydney Morning Herald.
'The Antarctic', by Mr R.H. Wyndham of the Department of Foreign Affairs.
'Debates and Options' by Coral Bell.

The formidable coverage of the essays is rounded off with four appendixes which are documents relevant to the theme; namely, the ANZUS Treaty, the North West Cape Agreements, the Antarctic Treaty and the Model Agreement on Nuclear Materials. By now the reader would be aware that *Agenda for the Eighties* is not light reading. Fortunately the essays are well written and the book lends itself to reading each essay as a separate identity. The drafts were presented as papers for a seminar series in International Relations at the ANU during 1979 and they bear the stamp of well produced lectures.

Collectively the authors are not very optimistic about the eighties. No general war is predicted but the international situation will continue to deteriorate much as in the late seventies. The superpowers will be less acting than reacting to events, largely the result of regional aspirations of local powers. In general, the authors advocate that Australia attempts to understand regional problems and aspirations more so that we may play a more effective role in helping to preserve peace. Blaming all regional trouble on the Soviet Union only disguises the local problems and allows the Soviets to actually increase their power base.

In Coral Bell's summation, she is critical of the lack of debate and interest in foreign affairs. This lack of interest is dangerous as in many ways it contributes to the dangers we face. A rational contribution to regional stability can only occur if we understand the interests of those involved in conflict. Our understanding of foreign affairs is often complicated by our Press which reports emotionally rather than rationally. A very good example of this is given by Mr Hastings in his discussion of the East Timor crisis in the essay on our near northern neighbours.

Anyone who doubts just how complicated our region is would certainly benefit from reading Dr Mohammed Ayoob's essay on the Indian Ocean Littoral. I offer one example of a very poorly publicised dispute which, in so far as strange bedfellows is concerned, make Bob, Carol, Ted and Alice look like amateurs. I refer to the conflict between Somalia, a socialist and former Soviet client state, and Ethiopia, a repressive military dictatorship. The USSR, Libya, Israel and South Yemen provide arms, finance and training to Ethiopia. Supporting the socialist Somalia are Egypt, Saudi Arabia and two of Moscow's closest friends, Iraq and Syria! Apart from Somalia, the Ethiopian regime is also assailed from within by the socialist Eritrean Peoples Liberation Front (EPLF). When the EPLF rebellion started being successful it was put down with the assistance of Cuban troops! When the Ethiopian regime falls, as it seems certain to do in the 80's the regional impact will be great.

The essay on Antarctica is also of particular interest as this area may be the cause of difficult relations with the United States. Our territorial claims are not recognised by the USA or the USSR. While this seems of little relevance at the moment, the discovery of oil or minerals would upset the relative harmony that exists. Although there is very little Australia could do about the USA's failure to recognise our claims, undoubtedly relations would be strained to some degree. The author concludes that perhaps we should accept the inevitable and attempt to gain some goodwill by being magnanimous and unilaterally renouncing our territorial claims.

The other essays are just as good and the reader will find not only information but some thought provoking suggestions. Some may disagree with the findings of the authors on particular issues but the facts are laid out for the reader to make his judgement. *Agenda for the Eighties* identifies potential problems that must be faced by our defence and diplomatic policy makers in the future. The western world has been faced with a series of embarassing questions 'Who lost China?', 'Who lost North Korea?', 'Who lost Vietnam?', 'Who lost Iran?'. Until we look at problems before they occur and analyse the long term interests of both the participants and ourselves, our debates on the future will continue in the same pattern, 'Who lost ....?'. Perhaps the answer will be 'us'.

S.P. LEMON

WARSHIPS IN ACTION TODAY by E.L. Cornwell. Ian Allan Ltd. 1980. Price $17.50.

The author's stated objective was to produce an attractive and interesting picture book which provided a reasonably balanced coverage of the warships in service around the world in the 1970s. In selecting the photographs for the book, the author has not attempted to include ships of every nationality nor of every class.

Emphasis is given to European, NATO and the Soviet navies. Some two thirds of the photographs are of aircraft carriers, submarines and destroyers. However the RAN is represented by photographs of HMA Ships *MELBOURNE* and *BRISBANE* taken during their visit to the United Kingdom in 1977 for the Silver Jubilee Review at Spithead.

Overall the photographs are of good quality and provide a pictorial view of each ship. There are a number of "action" shots involving aircraft operations from both carriers and escort ships, submarines surfacing, missile firings and a notable photograph of the RFA *REGENT* in heavy seas. In addition there is an interesting sequence of photographs depicting an underway replenishment collision.

The source of photographs used is official sources, shipbuilders or from such notable warship photographers as Michael Lennon.

Detailed captions are provided throughout covering the subject's displacement and armament, or describing the particular nature of shipboard operations depicted.

Reproduction of photographs throughout is good, as is the case with most of Ian Allan's publications, and the paper quality is first class, resulting overall in a most pleasing product.

JOHN MORTIMER

AUSTRALIA'S MEN O' WAR. Paintings and sketches by CPO Geoff Vollmer and text by Lewis Lind. A.H. & A.W. Reed Pty. Ltd. Recommended price $16.

As Sir Anthony Synnot writes in the foreward to this book 'We have not done as much as we could to record the illustrious history of our Navy'. 'Australia's Men O' War' goes some way towards overcoming this deficiency. With the present generation of ships having reached or nearing the end of their lives, the book can already be claimed as one of history.

Geoff Vollmer loves ships, and has come to love painting them. Since starting to sketch and paint in 1975 he has used virtually no other subject, and his work has matured over the years. The collection in this book comes from various stages of his development as an artist, adding interest for readers, each of whom no doubt will find a different favourite among the illustrated ships. A nice touch is the addition of sketches of former ships bearing the same name as those depicted in the paintings opposite.

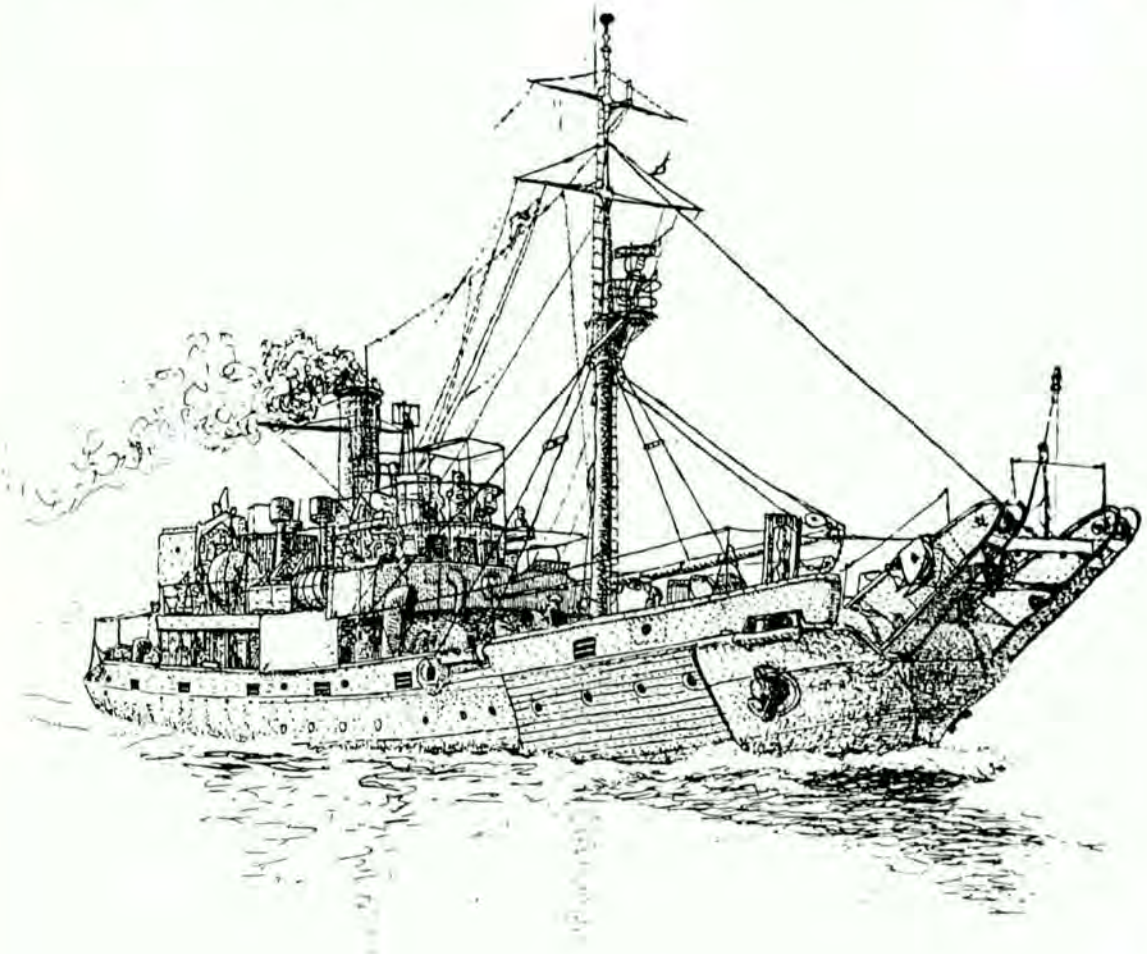
With Vollmer's art come interesting notes on each ship by Lew Lind who, although an ex Army man, is a lover of the Navy and its ships. He has collected appropriate quotations which indicate the role or character of the ship types depicted. 'A destroyer is a maid of all work', 'It is His Majesty's pleasure that you endeavour by all acts of hostility to reduce, sink or otherwise destroy the enemy'; 'To neglect mine warfare is to give an alert enemy a quick advantage'; and 'The Fleet which you could operate must be limited by the Fleet Train' could well be digested by those pondering our maritime strategy.

There are 22 paintings of individual ships. Some will appeal more than others, but each one illustrates the artist's feelings — a genuine fascination for life at sea.

The book is well presented, with a striking cover showing HMAS *DIAMANTINA* steaming away from what looks like a water spout. It ends fittingly with Admiral Sir Victor Smith's statement that 'Whoever commands the sea commands the trade, whoever commands the trade of the world commands the riches of the world and consequently the world itself', and with MELBOURNE leading a trio of escorts into a glorious sunset.

Australia's Men O' War is a worthwhile addition to the library of anybody interested in ships.

V.R. LITTLEWOOD



HMAS *KOOKABURRA.*

— Sketch by Geoff Vollmer

UNFINISHED VOYAGES — WESTERN AUSTRALIA SHIPWRECKS 1622-1850. By Graeme Henderson. University of WA Press. 240 pp. Recommended price $19.95.

The cover story for this book describes it as an 'invaluable guide for sports divers, amateur archaeologists, coastal residents, developers and planners, those interested in maritime and Western Australian history, and social studies and history students'. Having read it I am convinced there is certainly something in this work for each of the individuals identified but whether there is enough to encourage each to buy the book is perhaps another question. I rather suspect that this book will take an important place in reference libraries and in the libraries of enthusiasts, without becoming a best seller, even in the narrow confines of Western Australia.

Having said that, I hasten to add that as a work of reference it is very good. The author is well qualified to address the subject and this work is obviously the culmination of many years of his full time efforts in the field of maritime archaeology. It will not be the last book of its type; the author intends completing the record up to 1920.

The book is well laid out and presents in considerable detail a record of all ships and boats which are known or suspected to have been lost along the Western coast. In some cases the record is a simple entry in a diary which describes the loss of a ship's boat; for other wrecks which have attracted much greater publicity (e.g. the *GILT DRAGON* or *BATAVIA)* the stories are very interesting short historical stories in themselves. The whole is what one can believe is a complete coverage of the subject.

The individual cases are well supported with photographs and maps and the book's value as a reference is enhanced by the inclusion of current legislation relevant to shipwrecks, a record of lost anchors and a very detailed bibliography. I feel the presentation could have been improved by the use of colour but the University press may be constrained by economics. As it is, the book still represents good value at its price.

One minor point to be raised is the lack of any reference to the assistance provided by the RAN in the early examinations of at least two major wreck sites. This is of course not vital to the historical record but is noticeable to the reader who may have taken part.

In summary, Mr Henderson has produced a valuable reference which I would recommend to any library claiming to cater for maritime historians or archaeologists. It certainly appears to indicate that the Western Australian Museum has been most effective in its pursuit of local maritime history and one wonders whether similar work is being done in other states to fill in the spaces in the total Australian context — our coast must be an archaeological goldmine.

R. S. BLUE

TO KILL HITLER. By Herbert Malloy Mason. Sphere books. 1980. pp 303. Recommended price $4.50.

Mason's presentation is, as a narrative, more than readable; but as a history, less than satisfying.

While the writing is not elegant, in fact clearly literal translation in many parts, the reader, despite the certainty that Hitler survived until April 1945, turns each page with anticipation, hoping that this time the Oster plan of 1938, the Elser attempt of 1939, or Stauffenberg or the Generals or someone will be successful. But the student is less well served. Mason's documentation is most conspicuous by its absence. Not that there is reason to doubt the veracity of the account — a flick through documented versions, seven such readily available ones as Shirer's shows the parallels and reveals primary sources. However, if the student has to read some other to verify Mason, he may as well read some other and be done, for apart from the account there is little, Mason making his sympathies clear but offering almost nothing in the way of interpretation or commentary.

The synthesis of all the attempts into one volume makes for sobering reading. Hitler survived all the plots despite their variety, numeracy and meticulousness. (Were the subject not so black and the actor still alive, the account of Hitler's continual but apparently unwitting thwarting of the attempts would make a superb script for a Peter Sellers movie). Since the notion that he may have had some sort of divine protection is too unpalatable to entertain, the reader is forced towards the conclusion that life is a series of accidents without order, justice or point.

Reflection on the synthesis is sobering too, for it forces the realization that the majority of the plots, and all of those collectively hatched, were fuelled not by idealism but by chauvinism — to protect from Hitler, not humanity, but Germany.

JOHN HYMAN

RETHINKING AUSTRALIA'S DEFENCE by Ross Babbage. University of Queensland Press. Recommended Price $24.95.

This book is an edited version of the thesis which earned Dr Babbage his doctorate, and I stand in some awe at his industry. When one considers the vast amount of material he has had to gather, to sift through and select from, and then to shape to a logically consistent framework — well, like the Sentimental Bloke, I 'dips me lid'. PhDs are obviously earned the hard way.

The work begins with an examination of the changes in Australia's strategic circumstances as a result of Nixon's Guam Doctrine which, together with developments in the technologies of warfare, Dr Babbage says, demand a rethink of our security policies. He then draws attention to areas likely to impede the adoption of new approaches. He discusses various strategic options or themes which could be blended in different proportions to produce a selection of strategic policies; these, he says, should then be tested against a 'wide range of contingencies', with the aim of arriving at an optimum policy to deter, or cause military action to be deferred, or, failing both of these, to provide active defence. In all, he proposes a coherent approach to developing security policies to replace the incremental and often fragmented way Australian defence policies have been patched together in the past.

The Appendices are as full of meat as the main body and need to be read carefully. There is an interesting proposal in Appendix C for deriving acceptable scenarios. Appendix D sets out very clearly how a sound long range plan for force development could work, demonstrating the all important aspect of not precluding desirable options for the future on a basis of current short-term judgements.

Obviously there is a very great deal with which I agree, particularly in the book's basic premise that the demise of Forward Defence has produced no perceptible change in our force structure design, and that it is foolish for Australia to act as if the US will always be available to bail us out of serious trouble. Dr Babbage promotes the cause of C3 as a force multiplier — splendid! I applaud his call for Australian Governments to develop a comprehensive national strategy blending in defence as one of its elements; simple co-ordination of defence with foreign policy is no longer enough — if indeed it ever was. The introduction of modern long range planning techniques to administer defence programmes is long overdue. I could go on listing so many things I was delighed to see in print but there has to be a limit. It is enough to say that there is a very great deal of sound and well argued material in this book, and this should not be obscured by the fact that I am now about to discuss some aspects with which I do not agree.

A small point to begin with, but I think it was too ambitious to try and range over the whole field from national strategy through the detailed consideration of the technologies of future warfare, and embrace civil surveillance as well. I believe it would have been better to outline an approach to national strategy and the place of defence in it, and then get on with the military strategic considerations which are the main burden of the book. It would have made the distinction clearer to the reader. As it was, I was not given the impression that Dr Babbage himself is entirely clear — this is not to say he is not, merely that I was left uncertain.

My second point concerns the problem — accentuated since the Industrial Revolution — faced by Dr Babbage in having to gauge the impact of technology on strategic concepts. He quotes a number of esteemed authorities and the inference is he agrees with them. So far as maritime warfare is concerned this puts him squarely in a new Jeune Ecole; which a hundred years ago said, among other things, that big ships were finished because of the torpedo. There has been a lot of conclusions on similar lines publicised over the last century, which have been proved wrong in practice. Dr Babbage's experts may be right, but history seems to indicate that if the strategic concept is essential then counters will be found to beat, or at least minimize the effects of 'unbeatable' weapons.

On the evidence presented, Dr Babbage concludes that surface warships larger than destroyers are finished. It is his opinion but one I do not share. Clearly the Soviets do not share it either.

Related to maritime interests and the mercantilism which lies close to the heart of seapower, Dr Babbage considers a variety of potential pressures and threats having to do with Australian trade, including commodity embargoes, resource crises and blockade. His broad conclusion is that oil would be the only significant import and he does not appear to believe that reduction in living standards or the economic dislocation resulting from the loss of 27% of GNP would be all that important. I wonder whether the econometric data at Melbourne University could be used to cast more light on these important issues. Certainly the Navy ought to have some evidence if it has any serious intentions of arguing for trade protection capabilities.

As to blockade Dr Babbage has an each way bet. He begins by suggesting that inshore blockade of Australia is the only practicable option, and easily countered, then returns recalling earlier remarks about ocean surveillance systems. Either way he does not appear to believe it would be very effective, or a significant form of military aggression to counter.

On the other hand the author considers a series of enemy military options involving landings on Australian territory, from small scale raids on specific targets up to and including a major invasion following a pre-emptive strike. He acknowledges that surprise is an important factor in low and medium level raids, and in the Pearl Harbour-revisited scenario. He then goes on to consider the consequences if it were achieved, and leaves the impression that surprise **would** be achieved. My observation is that if our Intelligence support is as complacent and amateurish as *these assumptions imply we have no business being in* defence.

Despite the Intelligence power game often played in Canberra I think it is pretty good by world standards. Navy is the worst at using it because the Navy relies on gifted amateurs, for the most part, who have only one Intelligence posting. There are no career prospects in it. Formal training, apart from languages, and planned continuity of experience is apparently too difficult or beneath us, despite the 60 odd officers continuously required. It is not their fault. They do remarkably well. But that is a side issue.

My last and most serious disagreement with Dr Babbage concerns the proposed scenario method for determining force structure. This, together with operational research techniques, is an attempt to bring the process of force structure design to a sort of scientific method of arriving at conclusions. It is a clever and comprehensive proposal following the route pioneered by McNamara's whizz-kids.

The perceived need for acceptable scenarios seems to originate from a quote on page 80 which says that '... the NAP/TAWS study was only relevant so long as the scenarios on which it was based were relevant. These scenarios however, were not created by the higher defence machinery but by CSE. The scenarios are in fact no longer legitimate reflections of the most probable future states of the world.' Anyone who had some involvement with NAP/TAWS will know how far off the marker that quote is; in my view the study suffered not so much from the scenarios which were approved at a very high level in Defence, but, rather, from the compounding effect of multiple assumptions and the uneven quality of the inputs.

For example, existing weapon system performances down to the last decimal place were compared with manufacturers claims for systems under development.

This is a continuing difficulty in using operational research techniques for long range force structure planning. The quote from James Woolsey (ANI Journal August 80) that this approach 'has become mired in its own intellectual pretensions' is a bit strong but is nearer the realities, in my experience. This is not to say CSE's valuable capabilities should not be exploited but solutions should be regarded only as very broad guides, and subjected to a continuous process of wargaming and operational exercises to test their validity.

Historically the future scenario approach to force structure design has been wrong so often — and it does not have to be very far wrong — to suggest that it needs to be used with some healthy scepticism. There is unfortunately, no substitute for fallible human judgement but we could help it a lot with a much more generous budget for trying out new technologies. A few million spent on well designed trials could save us ten times the amount we spend in other ways, and wasted years of interminable paper arguments.

As a general conclusion, Dr Babbage's book is crammed with material to get your mind working. He says a lot that needed to be said and his well thought out proposals have the merits of coherence and consistency.

The fact that I disagree in some particulars, and with his principal proposal does not diminish its value in any way for me, and it certainly won't for those readers who will be attracted to his ideas. Altogether it is a valuable addition to the growing number of contributions to the public discussion of defence in Australia.

The University of Queensland Press is to be congratulated on the publication. At $24.95 a copy it is expensive but serving members should be able to claim that as a tax deduction. It is well worth it.

ALAN ROBERTSON

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