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JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE

(INCORPORATED IN THE ACT)



AUSTRALIAN NAVAL INSTITUTE INC

- The Australian Naval Institute Inc is 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.
 - to provide a forum for the exchange of ideas concerning subjects related to the Navy and the maritime profession, and
 - c. to publish a journal.
- The Institute is self supporting and non-profit making. The aim is to encourage 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
- rs (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 Force, 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 Persons who have made distinguished contributions to the naval or maritime profession or who have 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 \$20.
- 5 Inquiries and application for membership should be directed to:

The Secretary, Australian Naval Institute Inc, PO Box 80 CAMPBELL ACT 2601

CONTRIBUTIONS

In order to achieve the stated aims of the Institute, all readers, both members and non-members, are encouraged to submit articles for publication. Preferably, submissions should be typed, double spaced, on A4 paper; the author's name and address must be shown clearly, even if a pseudonym is required for printing purposes; to be eligible for prizes, original articles must be accompanied by statements that they have been written expressly for the ANI; and short biographies will be welcomed. The Editor reserves the right to reject or amend articles for publication.

DISCLAIMER

Views expressed in this journal are those of the authors, and not necessarily those of the Department of Defence, the Chief of Naval Staff or the Institute.

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Cover:

BHP Transport's new bulk carrier Iron Pacific. The ship and her task are discussed in the article on page 43. Photograph courtesy BHP Transport.

FROM THE PRESIDENT



Late 1986 saw the publication of the Cooksey Report, a review by Mr. Robert J. Cooksey of Australia's exports and Defence Industry. The report resulted from Mr Cooksey's appointment as a consultant to the Minister for Defence and contains a wide ranging analysis of Australian defence industry potential. Its release at this time is quite apposite as far as the ANI is concerned for the matters addressed relate nicely to the theme of our forthcoming 1987 seminar. Close reading of the Cooksey Report makes for ideal delegatorial preparation!

The relevance of the seminar theme to Australia, its economy, and its people emerges clearly from the pages of the report. Mr Cooksey identifies that no comprehensive data base or overall assessment of industry capability is currently available, a fact fundamental to the Institute's efforts to probe this capability potential from a maritime viewpoint. I hope that seminar debate will be lively and instructive, allowing the ANI to feel that in this aspect of its being, at least, our charter to promote and encourage advancement of knowledge of the Navy and the maritime profession is fulfilled.

Some changes have become necessary in seminar planning, the most important concerning the date. September 1987 sees the culmination of winter sporting programmes in most Australian states and the previously chosen dates 25-26th clash with Melbourne VFL activities which gather nationwide interest. Council has therefore decided that because of the consequent inavailability of some speakers, and in the interests of promoting good seminar attendance, the prudent action is to amend the seminar dates. These are now Friday/Saturday 16-17 October 1987.

Invited speakers include Dr. Coral Bell (ANU Centre for Strategic Studies), Mr. Robert Cooksey, Mr. Simon Crean (ACTU President) and the Managing Director of Budget Transport Industries, Mr. Bob Ansett. The Minister for Industry, Technology, and Commerce, Senator John Button has been asked to give an after dinner address. The CNS, Vice Admiral Hudson AO, RAN will be invited to give his views on the likely maritime requirement early in the 21st century. An industry panel is also planned but speakers and format are not yet decided. The final arrangements will depend upon the availability and willingness of the above eminent Australians but council is hopeful that most, if not all, will participate.

As you can imagine, the seminar planning team is hard at work. The co-Directors are Commodore Ian Callaway and Commander Ken Railton (Ret); if any Institute member wishes to assist in either the planning or the conduct of the seminar then Ian or Ken would be very pleased to hear from you. I can also be contacted on (062) 655125.

Sincerely Alan Brecht

ANNUAL PRIZES

The Sub-committee tasked with selecting contributions from Volume 12 of the ANI Journal to receive annual prizes has reached the following decisions:

- Best major article (\$200)
- Sub Lieutenant T. Frame In Spirit and In Truth Vol 12 No. 1
- Best minor article (\$100)
- Group Captain P. Rusbridge Managing Management Information Systems Vol 12 No 4 • Best book review (\$25)
- D.J.C. Mermaids Do Exist Vol 12 No. 4
- · Best letter (\$25)

Master Ned — Letter from Britain — Vol 12 No. 4

The President, Council and the Editor congratulate these winners.

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FROM THE EDITOR

The view of BHP's new bulk carrier *Iron Pacific* on the cover of this issue should serve as a reminder that the Institute is concerned with maritime matters generally and not just Naval matters — with defence rather than Defence. Such a broad base needs to be maintained if we are to achieve our objectives, and all members may assist by encouraging contributions from their contacts within this wider sphere.

This issue presents measures of our health. The President's report to the Annual General Meeting is printed on page 6. Details of our financial state are provided in the audit statements and the Treasurer's report on page 3. One detail which the accounts reveal is that each copy of the Journal costs something more than \$6 to produce. Again here, some members may be able to assist by increasing our advertising revenue. Bludgeons and twisted arms are not recommended but advice of the opportunity to potential advertisers with whom you may be dealing may prove efficacious.

While discussing housekeeping, Chapter Convenors are invited to use the Journal — to advertise or report on Chapter activities, to publish addresses which may have been presented to their group, or in whatever other way may promote the health of their organization.

This issue contains a variety of material. One (but only one) member has written to me. His letter, which raises two important issues, is printed on page 4. Two prize-winning essays are reproduced: Lieutenant Commander Bill Ruse's essay which won the ANI Silver Medal considers whether or not technological change is altering the strategic equation; and Lieutenant Blades' Peter Mitchell Prize-winning essay discusses the consequences of social change upon a uniformed service. Other major pieces discuss exchange postings, the RAN's dilemma in developing facilities for fleet support on the east coast and the morality of serving in a military force.

One notable omission is Tom Friedmann's Washington column. We allowed him to take seasonal leave but only on the understanding that he was back in print by our next edition.

The deadline for the next edition is 21 April. That issue has no theme so there is no limitation upon the scope of material you may offer for publication. Early advice (by telephone or mail) of an intention to contribute, including some indication of the topic to be discussed and the likely length of the submission is always appreciated so that the issue can be progressively shaped.

That next issue will be edited by my successor. A change of job and a need to complete major tasks deferred over the past 18 months have forced me to stand down. I take this opportunity to thank all those Councillors, members and contributors who have assisted my preparation of the last six editions; and to express my hope that they offer the same support to our next editor.

John Hyman 062-482602

FROM THE TREASURER

The annual audit was carried out by Paul Reis and his report and support statements are published in this journal. The past financial year was a 15 month period as we aligned our accounting period to our publishing year and, hopefully for the benefit of members, to the calendar year. Despite an increase in subscriptions, the requirement to cover the cost of publishing five journals at the same time that we experienced a reducation in advertising revenue resulted in a small operating loss for the period. The small expenditure on Chapter support reflected the lack of activity except in WA and Victoria; while the cost of the computer system was balanced by a reduction in office services.

A major disappointment was that we had 68 fewer financial members at the end of this year than at the end of 1985. Twenty non-financials have now paid their 1986 subscriptions with their 1987 subscriptions, but the Institute can no longer afford to carry members on our books for a full year in the hope they will pay up. Renewal notices go astray with postings but now that we are aligned with the calendar year it should be easier to remember when subscriptions fall due. Please check your address label and if it shows 86 and you have not paid recently please send your cheque for \$20.00.

Peter Coulson

CORRESPONDENCE



Long Term Sales Operations and their relevance to Australia's Navy. Sir,

It appears to me that the policy makers in today's Australian Navy have not yet understood the complexities and realities of the present social, economic, and political situation as it affects all Australians. Because of this, it is time for Navy to start consciously planning and executing its own long term sales operation.

Long term sales operations are, by their nature, aimed at important if not critical objectives. Feedback and the ability to predict and modify events comes after years of consistent, careful, conscious application.

During World War II, heads of state preferred to travel by sea and many important conferences initiated or concluded in the solid were atmosphere of a warship's wardroom. The Japanese surrender was accepted on board a warship. Today, all over the world, heads of state prefer to travel by air. Aircraft are now comparatively fast, safe and comfortable, as well as appearing to confer a higher status on the VIP using them. This situation will apparently continue while peace prevails. In a war situation, of course, if a head of state must travel, warships are likely to become more preferable to aircraft for reasons of personal safety and accommodation. The current VIP aircraft fleets have no apparent offensive or defensive armaments, and therefore are 'soft' targets.

The position which the RAAF has reached with government funding reflects on that Service's ability to perceive reality and their professional approach to the problem of suitable funding. Perhaps technical logic helps. The size of the Government's commitment to this single Service on a single item purchase is proof of the effectiveness of the RAAF's selling campaign. The FA/18 deal in dollar terms meant that the other Services had to rapidly readjust their thinking and outlook, in terms of funding and indeed in terms of retention of the most valuable defence assets in Australia, people with dedication, conviction, and loyalty. The RAAF success in this funding goal was certainly not hampered by the efficient and professional

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attention to detail given to VIPs by the VIP fleet's staff and Service Police.

This is one small but continuing and visible contribution to the RAAF's position in being apparently first on the list for funds. Commercial advertising rules of Impact, Message, and Repetition, are well presented to users by this highly visible transport and security operation.

Of course, if an opportunity arises where serving personnel of whatever rank can make life a little easier for their VIP charges in some distant and strange place, then a professional serving person will take that opportunity almost as a matter of duty. If VIPs only travel with the RAAF, then only the professionalism and common sense of personnel of that Service will shine if such an opportunity arises. During a long tour, the opportunities for both large and small courtesies must surely arise. If a VIP is properly looked after, then that VIP and associated staff must look favourably on the personnel and the staff doing the looking-after. Over two or three years, exposure of many VIPs to many personnel from one Service, through the full range of situtations experienced in travel of this type, must have a positive effect on the way VIPs look on that Service.

If the rules of the game are accepted to be those of normal commerce, then in gaining funding Navy needs to apply the rules of advertising and promotion directly to government in ways analogous to the VIP fleet. This application of commercial rules of 'selling' for funding must be accompanied by the same dedication and idealism for the objective as that displayed by all underground communist movements — single mindedness and tenacity are main requirements.

In commercial selling, it is well known that the sales person who is face to face with a prospect has a much better chance of clinching the deal. Any objections can be sincerely countered and other offers can be counter-balanced with onthe-spot adjustments. The prospect actually comes to place trust and faith in the sales person who has gone to the trouble of meeting and talking to him. This faith and trust will never be generated by someone who is remote from the point of sale. This up front contact was not a serious problem when there were three ministers. Now there is only one minister, and it is the duty of every arm to maintain some sort of balance in defence force development.

Many people in Australia would agree that at the moment there is a glaring imbalance in the composition of the Australian Defence Force. The Soviets must be amazed with this Government to the point of incredulous laughter at the lack of reasoning on the composition of the ADF.

Victor Suvorov's book *Inside The Soviet Army* provides the following information:

- In the Soviet Union the Air Defence Forces have around 3,000 combat aircraft, mostly fast interceptors, and are the third arm of the service after Strategic Rocket Forces and Land Forces. The Fourth arm of service, the Air Force, has about 10,000 aircraft and helicopters, and less than half of these are pure fighter aircraft. The Fifth arm, the Navy, has about 1,215 aircraft and helicopters, including the most modern bombers of the Soviet union.
- In the Soviet Navy, order of importance of the six arms of service in the four fleets is Submarines, Naval Aviation, Surface Ships, Diversionary (Spetsnaz) troops, Coastal Rocket/Artillery troops and finally Marines.
- Submarines and Aviation are the primary arms of service in the Soviet Navy; all the rest are considered as forces auxiliary to these two. Aircraft carriers and through deck cruisers are considered part of naval aviation.
- In 1938, the Politburo adopted a resolution to construct a bluewater fleet, as the future enemies of the Soviet Union were seen to be Great Britain, USA, and Japan. These nations were then major sea powers and are still major sea powers.
- After the 1950s, the Soviets wished to project themselves into places like Indonesia, Laos, Africa, Cuba, and South America. Submarines and Naval Aviation were seen as the most efficient and effective way to achieve this aim.
- The Soviet Navy is not building any more diesel electric subs.

The British Armed Services and the British Navy agree with the Soviets that Nuclear submarines and Naval Aviation are the primary arms of the Navy. The Falkland war was a modern example of the type of medium threat Australia could face in the near future. It didn't involve a lot of ground, and the Navy was vitally involved from start to finish. This little war clearly demonstrated the absolute necessity of Nuclear Submarines and Naval Aviation for total success when the war involves islands.

If the Soviet Union and Britain see Nuclear Submarines and Naval Aviation as the two primary arms of the Navy, what lessons are there for us? These two nations have decided that Nuclear Submarines and Naval Aviation for long or short term Naval power projection, sea control, sea denial, call it what you will, are the most efficient and effective means of achieving their overseas political and economic objectives. Indeed, Britain has demonstrated this concept's validity in the Falklands.

The USSR is a mostly landlocked or ice bound part of the largest and most populated continent on this planet. Britain is a small island next to this continent. Both have arrived at the same conclusions about the structure necessary for their Navies to do their job efficiently.

Both nations require that the duty and responsibility of their Naval Forces is for homeland defence, protection of sea lines of trade and political intercourse, and power projection. Both nations have given their naval Forces the capacity to discharge their duties and responsibilities to the people of their own nations.

Australia is an island continent, without Nuclear Submarines or Naval Aviation. A Navy without these two primary arms of service may as well tie up the ships and sell them, to avoid suicidal repeats of the General Belgrano or the Argentine submarine and patrol boat losses, or the Atlantic Conveyor or Sheffield, Ardent, Antelope, Coventry, and Sir Galahad.

No attacking force could possibly airlift enough men and material into Australia to have a significant impact. The main thrust must come by surface transport over the sea. In the final analysis, no government has the right to govern a place which it cannot defend from attack. Without Nuclear Submarines and Naval Aviation, the defence of Australia by Australian forces is not possible.

It is clearly Navy's duty and responsibility to find the dedicated, singleminded professionals who will begin and continue a long term selling campaign, with the final goal being the ability to defend this country in the great tradition of Australia's seafaring warriors.

B. Parr.



1986–87 PRESIDENT'S REPORT

In the past year the Institute has made steady progress towards achievement of its main objectives, namely the promotion of maritime knowledge, provision of a debating forum, and the publication of a journal; but 1986/87 has been principally a year of change. Commodore Ian James relinquished the post of President upon his retirement from the RAN, some senior Councillors gave up their positions due to postings, the Institute experienced its first newly formatted financial year and its first computer assisted year. And members of the Council and of the Institute suffered the loss of our founding President, Commodore Vernon Parker, who died in September 1986 after a mercifully brief illness.

As 1986/87 drew to a close Council took the opportunity to reflect upon the state of the Institute as it moves into its second decade of existence. This report therefore addresses the perceived future as well as the past year.

Membership

In some respects the Institute has marked time. Membership has remained static with little growth evident despite efforts by Council to overcome natural wastage and unfinancial members. We currently have 560 individual financial members, 70 Defence subscribers and 51 non-defence subscribers; this represents a slight decline against the figures for 1984–85 but more importantly shows that membership has not grown significantly over the past five years. Our nett gain is a bare 20 members in that period.

Your council has therefore identified membership as a key objective for the Institute in the coming year. We must encourage young officers, sailors, and WRANS to join, and must increase our efforts to interest others in the community. The membership sub-committee has recommended that a councillor visit Service colleges such as the Defence Academy, RANC, and the RAN Staff College, to explain the Institute's aims and activities so as to promote its profile. This will be a prime item for consideration by the incoming Council.

Before leaving the subject of membership I offer the comment that the Institute must grow year by year or the aims and ideals which have nurtured it thus far will wither away like unwanted fruit on the vine. So too will the ANI itself. New members, young members, and renewed enthusiasm are needed if we are to ensure the decline becomes only a remote possibility. In this respect I urge all members of the Institute to make a firm resolve that in 1987-88 each will recruit one new member.

The Journal

One highlight of the past year has been the continued high quality of the quarterly ANI journal. On your behalf I congratulate the Editor and his team for a job well done. Many comments have been received as to the ANI's professionalism with respect to the journal which reflects credit upon all concerned, authors and editorial staff alike.

As may be seen from the Treasurer's statement which follows my report, advertising for the journal had a mixed year. Sales for the first three journals were disappointing at around \$2,100 per edition which is below budget. Advertising increased for the November '86 edition to \$3,200, almost on budget, and the advertising Councillor is working to retain this sales level. There is strong competition from other journals and newspapers with greater circulations and small advertising budgets therefore Council must look closely at the kind of advertising that we should use. Economies may force a move away from the traditional sources which have been quite restrictive thus far. The journal remains the lifeblood of the Institute and advertising shortfalls have to be overcome from general income which impacts upon the financial well-being of the ANI itself. This matter must be carefully monitored throughout the coming year.

Chapter Activity

Your Council had disappointing results with its 1986-87 objective to stimulate Chapter activity. For many reasons the Chapters were quiet except for those in Melbourne and Perth. Vigorous Chapters help to vitalise Institute life and together with the journal are foremost in the regular achievement of Institute aims. Promotion of the Chapters must remain a prominent objective.

Council Administration

The financial state of the Institute remains satisfactory. As shown in the Treasurer's report our capital stands at \$23,605, a small decrease in the past year. As previously reported, a 1985 decision to acquire a computer for the ANI management system was a significant financial investment for the Institute at that time, and remains so today. I am therefore pleased to report that the computer has greatly smoothed the administrative workload and is proving to be a very worthwhile asset.

The ANI computer is currently used to maintain all forms of library, journal, and membership records. It also prepares research reports such as the Calderwood investigations at the Australian War Memorial, and has been used for updating and maintaining a record of ANI addresses. In the next twelve months computing support could be given to Council in two other areas; the ANI Constitution needs to be placed upon the word processor to facilitate any changes which become necessary; and spread sheet capabilities would greatly assist the Treasurer in maintaining his financial records. Your Council will investigate these matters as the year progresses.

Throughout its history the Institute has assessed its administrative structure on several occasions. I believe that another review is appropriate and highlight this as an objective for Council in 1987/88. Manpower shortages in the Navy are such that members working in the Canberra area are mostly very busy people who have many commitments to meet in their everyday employment. Their workloads now are perhaps higher than they were five

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years ago, and are certainly higher than in 1975 when the Institute was founded. One consequence is that ANI members in Canberra have found it more difficult to serve on Council than was the case in past years. Your Council has, for example, been two members short for most of the past year and the position of Junior Vice President was vacant from July 1986.

A properly functioning Council is essential if the Institute is to achieve its aims. Continuity of Council membership is a most important part of this and the time may have come for the ANI to consider making use of the talents and management abilities of retired officers or other associate members. Your Council therefore proposes that the next AGM (1988) should consider changing the Constitution to permit associate ANI members to serve on Council. Such amendment could provide for a civilian Secretary or Treasurer and perhaps one or two ordinary Councillors. Opportunity will be given for the proposal to be debated in the pages of the journal through 1987 so that the views of the membership at large can be well known when a vote is taken in 1988.

ANI Library

The Library Officer succeeded in his objective to develop the ANI library during the past year. New books were kindly donated by Mr. W.T. Guidice of Sydney and others were received from our Washington correspondent, Tom Friedmann, and also from a small library at Navy Office which closed in 1986. Members are encouraged to use the ANI library (outside Room A-3-25 at Russell Offices) for research or for enjoyment. The range of titles is quite diverse and will be again published in the journal, probably next May.

Donations were also received of the journals and other books and papers belonging to late ANI members Commodore George Jude and Commodore Vernon Parker who died in 1986. No decision has yet been made for these documents but the ANI may seek to create memorial libraries at colleges such as ADFA, RANC, or RANSC. Council has yet to consider this matter and its decision will be advised in the journal.

Book Publishing

One disappointment for your Council in the past year was our inability to bring our book publishing venture to a successful completion. The history of Garden Island would have been a unique ANI contribution to the bicentenary celebrations in 1988 but despite interest from the Bicentenary Authority, the Australian War Memorial, and others nobody was prepared to make funds available because of the limited sales projection. The publication costs are outside current ANI budgeting capabilities and so the project has been placed in abeyance for the present.

I believe that publication or sponsorship of works concerning the RAN or of books with a naval flavour is a very suitable endeavour for the ANI to follow, and is one which directly relates to the fundamental aims of the Institute. Your Council will continue to consider such projects and subject to funding at some time in the future we may yet see the establishment of the ANI Press. For the moment it remains a worthwhile long term goal.

Seapower '87

Planning for the next seminar is well advanced. Seapower '87 has its theme 'The Maritime Challenge to Industry — Beyond 2000' and will be held in Canberra on 16th-17th October 1987 at the Australian National University. Our patron has graciously agreed to open the Seminar and a number of prominent Australians will speak. The theme is relevant to major RAN new construction contracts which will be let by the Australian government in the next few years, for submarines, destroyers, fast patrol boats, and shore installations. Defence industry will be greatly involved in these projects, both in Australia and overseas, thus your Council looks to the Seminar as a forum for interesting and stimulated debate on matters dear to the heart and interests of Australian companies in the field.

Management of the Seminar is led by Commodore Ian Callaway and Commander Ken Railton who as joint Seminar Directors will be supported by a large band of voluntary workers. Seapower '87 is an Institute venture and as such I encourage members not on Council to join the team and assist the preparations.

Regular reports on planning progress will be given in the journal editions leading up to the Seminar. Applications for registration of delegates will be sought around June this year. Judging by the enthusiasm shown so far, particularly from persons in the Canberra defence industry, I am confident that Seapower '87 will continue the fine tradition of success set by its predecessors.

Conclusion

Before concluding my remarks I would like to publicly thank your Councillors for their loyal support and dedicated work in 1986. Despite pressures from vacancies due to postings Council has achieved much throughout the year and I look forward to continued success in the future.

After eleven years the Institute is on the threshold of great things. Its reputation is high thanks to well organised and conducted Seapower seminars in past years, and the excellent journal standard keeps the ANI to the fore in informed maritime comment. The challenges which lie ahead require the Council and Institute members to resolve the issues of membership, low chapter activity, and administration; these are firm objectives for 1987 and I am confident they will be achieved.

Throughout the coming year your Council will look at some of the longer term matters which will influence the Institute's future, such as whether we should consider a project to build a headquarters on the land which has been allocated, and whether our Constitution truly reflects the opinions and desires of all of our members. I believe that with our foundations now set the Institute must chart its course ahead so that the next decade will consolidate the sound start which has been made to encourage and promote debate and knowledge of naval and maritime affairs in Australia.

I am confident that with the active interest and encouragement of its membership the Australian Naval Institute will continue to prosper and set a good example in its chosen field.

Paul Reis A.A.S.A. F.T.I.A.

CERTIFIED PRACTISING ACCOUNTANT

Correspondence to PO BOX 20 MAWSON A C T 2607 Telephone

(062) 811566

ROOM 207 2ND FLOOR MLC TOWER PHILLIP, A C T

02 February 1987

The President The Australian Naval Institute Inc P.O. Box 80 CAMPBELL ACT 2601

Dear Sir

Please find attached various Operating Accounts, Income and Expenditure Account and Balance Sheet of the Institute which relate to the fifteen months ended 31 December 1986.

In my opinion the attached accounts are properly drawn up so as to give a true and fair view of the state of affairs of the Institute.

The rules relating to the administration of the funds of the Institute have been observed.

All information required by me has been obtained.

Yours faithfully acola P. O. REIS

enc

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AUSTRALIAN NAVAL INSTITUTE INCORPORATED

BALANCE SHEET FOR 15 MONTHS ENDING

31 DECEMBER 1986

1985		1986
	ACCUMULATED FUNDS	
\$22,452.97	BALANCE AT 1 OCTOBER	\$24,503.37
2,050.40	ADD SURPLUS FOR YEAR	(898.26)
\$24,503.37	BALANCE AT 31 DECEMBER 1986	\$23,605.11
\$ 200.00 300.00	PROVISION FOR REPLACEMENT MEDALS LEGAL FEES	\$ 300.00 400.00
	LIABILITIES :	
-	SUBS IN ADVANCE : 1987 LIBRARY SUBS	1,276.00
5,800.00	1986	3 670 00
60 00	1988	120 00
40.00	1989	40.00
-	SUNDRY CREDITORS	5,295.00
\$31,023.37		\$34,706.11
	REPRESENTED BY :	
	ASSETS :	
\$ 1,711.00	SUNDRY DEBTORS	\$ 3,372.00
6,000.00	COMMONWEALTH BONDS	-
123.28	CHEQUE ACCOUNT	999.49
18,678.90	DEFENCE CREDIT UNION STOCK ON HAND	26,787.50
1.359.11	INSIGNIA	1.086.12
450.00	MEDALS	300.00
1.00	MEDAL DIE	1.00
2,700.00	COMPUTER	2,160.00
\$31,023.37		\$34,706.11

AUSTRALIAN NAVAL INSTITUTE INCORPORATED

INCOME AND EXPENDITURE ACCOUNT FOR THE 15 MONTHS ENDING

31 DECEMBER 1986

1985

EXPENDITURE

\$ 6.333.98	JOURNAL OPERATING COSTS	\$14	.532.34
123.90	POSTAGE		81.40
210.00	AUDIT FEES		225.00
10.00	COMPANY FEES		4.00
100.00	DONATION TO LEGACY		100.00
	ADVERTISING		62.16
773.47	STATIONERY		30.94
41.85	LIBRARY ADDITIONS		17 50
3.85	BANK CHARGES		8 80
92.43	PRESENTATION MEDALS		150 00
952.49	CHAPTER SUPPORT		150.00
100.00	PROVISION FOR REPLACEMENT MEDALS		100.00
100.00	PROVISION FOR LEGAL FEES		100.00
375.12	OFFICE SERVICES		276 06
1,290,50	COMPUTER SERVICE	1	082 96
333.42	WRITE OFF BAD DEBTS		235 08
-	WREATH		50.00
		-	20.00
\$10,841.01		\$17	206.24
2,050,40	SURPLUS TRANSFERRED TO ACCUMULATED FUND	5	-
\$12,891.41		\$17	206.24
	INCOME		
\$ 121.91	INSIGNIA TRADING	ş	59.80
154.40	SEAPOWER		
235.00	JOINING FEES		135.00
9,165.00	SUBSCRIPTIONS	10,	849.00
2,715.10	INTEREST	5,	264.18

500.00	MEDAL PROVISION TRANSFER	-
	OPERATING LOSS TRANSFERRED TO	
-	ACCUMULATED FUNDS	898.26

\$12,891.41

\$17,206.24

AUSTRALIAN NAVAL INSTITUTE INCORPORATED

JOURNAL OPERATING ACCOUNT

FOR 15 MONTHS ENDING 31 DECEMBER 1986

PRINTING: \$ POSTAGE 1	EXPENDITURE	1985	1986	INCOME	1985	1986
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TECHNOLOGY AND MARITIME STRATEGY — RADICAL CHANGE OR ETERNAL PRINCIPLE?

by Lieutenant Commander W.F. Ruse, B.Sc., RAN

INTRODUCTION

Since the Industrial Revolution, the world has experienced an ever-increasing rate of technological change, the rate often being described as exponential. Nowhere is this more apparent than in the computer explosion, which has brought increasing capability in decreasing size.¹ The effects are all pervasive, virtually no field is untouched. In warfare this has brought greatly increased capability in many areas. This is particularly evident in such diverse areas as command and control (and communications), the development of guided weapons, and vastly increasd surveillance, detection and intelligence capacity; these are all areas which benefit from computer technology.²

As typical of the paradox which may be raised by technological change, one need only consider the following, though not directly related, example. Until the mid eighteenth century, ships were virtually exclusively sail-driven. Then came the advent of steam power, requiring maritime nations to have available stocks of coal to power their ships, both commercial and naval. Even as coal gave way to other sources of power for steam driven ships, so remained the requirement for widely dispersed fuel supplies. This often difficult, limiting, logistic problem has been alleviated in part by the introduction of nuclear power. Those nations so capable now have at their disposal some vessels capable of virtually unlimited freedom of movement, should other logistic requirements be met. However, this capability differs little from that possessed by sailing ships by bygone days, other than that sail was at the whim of the elements, or divine will. Where, then, have these several major technological advances taken maritime nations - full circle, but with greater flexibility, or into some hitherto unavailable position of superior strategic capability?

To answer such a question, both specifically, and, in this essay, for the broader implications of technological change upon Australia's maritime strategy, one must, perforce, examine the nature of strategy, and of technological change as it influences maritime warfare. Until relatively recently, around the eighteenth century, the study of warfare was devoted almost entirely (with the occasional exception, such as Sun Tzu) to tactics and the results achieved. Only in the last couple of hundred years has significant effort been directed to the development of principles, recurrent themes, or general notions to guide the controllers of military power — in other words, strategy.

Based on the JSP(AS)101 definitions.3 maritime strategy can be described as the art and science of employing the maritime forces of a nation to secure the objectives of a national policy by the application of, or threat of, force. In addition, there can be found in the theoretical literature, widely-used terms such as command of the sea, sea control, sea assertion, denial, deterrence and power projection. These are all elements of the broader concept of maritime strategy. Strategy is the level of warfare above the tactical; in other words tactics are the means by which strategy is implemented. The JSP(AS)101 definition does not assist greatly in delineating the two. Nor is the ADF blessed with a three-tiered concept of war, as developed by the US, which interposes a third level, the operational level of war, between the strategic and tactical, at theatre level.4 This approach would leave a clear divide between strategy and

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tactics, and, here, merely serves to set the scene for the notion of strategy as applicable to this essay.

Thus Australia's maritime strategy can be said to be the broad thrust or policy of the use of maritime power to meet national objectives. As strategy is developed to meet national objectives so, conversely, must that strategy be practicable. There is little point in having an ambitious strategy without the capacity to implement it. Strategy must therefore be commensurate with the tactical capability the nation can acquire. To a certain extent, one's tactical capability will depend upon the technology applied in the maritime sphere, with particular emphasis on weapons, surveillance and command and control (C^2).

Accordingly, only these three areas will be addressed in this essay. The tactical implications of these developments are clear, leading to many a radical tactical change. As tactics derive from technology, so too is strategy built upon the aggregated tactical capability of one's forces. What is not clear, however, is the nature of the concomitant influence of technology on strategy.

This essay will examine whether, and to what extent, these rapid technological changes impinge upon Australia's maritime strategy. This will be achieved by addressing, generally and philosophically, the extent and pace of technological change, its influence upon tactics in the areas mentioned, broad concepts of maritime strategy, with reference to Australia, and the inter-relationship of these areas.

AUSTRALIA - A MARITIME NATION

In examining the area of Australia's maritime strategy, it is first necessary to look briefly at Australia as a maritime nation. That Australia is a maritime nation is clear: Australia is an island nation. As a result, the lifeblood of the nation's prosperity, trade, depends upon the sea. Australia's share of world seaborne trade is low (5.3 per cent by tonnage), but more than it was some 25 years ago (2.7 per cent). Similarly, in value, it has increased significantly. Of this, only a tiny proportion is transported by air (well under 1 per cent by weight, though more by value), leaving almost all trade dependent upon sea communications. Thus the country's reliance on overseas maritime trade is undiminished, and is, indeed, on the increase.

Despite this great reliance upon the sea for trade, Australia's merchant marine is disappointingly small. Only a small amount of her large trade is carried in Australian registered shipping. This figure — 4.8 per cent — while low, is, encouragingly, a several-fold increase from that of the 1960s and 1970s — around 1 per cent. (In

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tonnes this is an increase from 50 million in 1964–5 to 198 million in 1982–3.)⁵ That the nation has a bounden duty to safeguard the national shipping assets is unquestionable. Similarly, but perhaps less evident, is the need to safeguard national trade carried in foreign hulls, this being part of the nation's lifeblood.

The implications of being a maritime nation do not stop here, however. Increasingly, resources being developed and exploited lie beyond the nation's shores. Foremost among these, in Australia's case, are oil and natural gas. At present such accessable resources are located primarily in Bass Strait and, on the rise, the North West shelf. Fishing is a nation-wide industry, and technological advances are bringing ever-closer the day when minerals will be commercially available. Thus there are further reasons to consider Australia a maritime nation, where dependence upon the sea is expanding.

TECHNOLOGICAL CHANGE

As previously mentioned, technology is growing at an exponential rate. The reason for this is simple: the greater the available technology, the greater the scope for innovation and development - the latter is a function of the former. This has manifested itself for all to see in computers a field of such increase in capability, and decrease in size, due to miniaturisation (very large scale integration), that today's pocket calculator is more than a match for the roomsized computer of only 25 years ago. Similarly, this rapid technological advance has permeated all fields of military science, and not just through the direct application of computing power, though often so. Whilst all areas are affected. those which have particular impact upon maritime warfare are guided weapons, surveillance and C3 (command, control and communications).

Firstly, the advent of guided weapons has brought a dramatic increase in both the accuracy and lethality of a single round. One round may have as high as 50% probability of achieving a kill. This, combined with gains in accuracy resulting from precision guidance, represents an improvement, in recent decades, in kill probabilities of 10 to 100 times.4 The ongoing developments in guidance systems means that such precision weaponry can be fired from more diverse, and smaller, less sophisticated, platforms. The increase in range of these weapons has been such that their capability may exceed the range of target identification, a problem solved in part by the vastly increased surveillance facilities. Developments such as passive surveillance, infra-red, maritime patrol aircraft, satellites, electronic warfare and radar

have drastically increased the rate of search, and possibly, though not necessarily, the chances of success. Utilisation of this greatly enhanced intelligence supply for advantage requires the capacity to process, collate and disseminate information. Without such command and control systems, the advantages of weaponry and intelligence could not be fully translated into action, and results.⁷

One major impact of this rapid technological development is the effect on cost. The aforementioned quantum jumps in capacity are not achieved without expenditure increases. Firstly, as the available technology increases, so does the demand for more diverse research. Secondly, miniaturisation facilitates the inclusion of greater weapon complexity in small packages ('smart' weapons, countermeasures, countercountermeasures, for example). Thus, escalation in cost of weapons, systems and platforms abounds. As an example, consider the cost of a fighter aircraft: an F-4 in 1965 cost \$5 million, in 1980 an F-15 cost \$15 million. (World War II fighters were produced at about \$100 000 apiece.) Similar trends exist for warship costs and other military hardware. To graph such costs is to reveal a greater than linear increase."

What are the implications of this? Several, in fact. The obvious one is that, if such trends continue, military hardware will be priced out of existence. (In the case of the United States, extrapolation of such trends would show a situation where, by 2036 the entire Defense Department could only afford one aircraft^[9]) Whilst this results in ever more capable weapons, less can be purchased. Thus the importance, and cost of loss, of one aircraft, ship, etc is increasing, in tandem with its capability. The same complexity, which has increased capability and forced up cost, has also lengthened time to develop and manufacture, complicating logistics.

What must not be forgotten, of course, is the purpose of this application of technology to warfare. This can be simply summed up as success through superiority. Weapon improvements give rise to a more capable weapon; better surveillance and command and control lead to more effective weapon utilisation and tactical advantage. It is not necessarily the case that more modern and complex technology is required; often an appropriate technology will outperform a more complicated, but less relevant, one. The achievement of advantage will then be through principles such as surprise and concentration, which will be examined later.

MARITIME STRATEGY

Looking at the definition of maritime strategy given earlier in this essay, the matter is about the employment of maritime force to achieve national objectives. Strategy is a higher level of warfare than tactics, the latter being the mechanics of warfare, the former encompassing the broader field of what one is out to achieve. Tactics have been examined throughout recorded history; strategy, on the other hand, has only evolved as a serious academic subject over the past two centuries, and maritime strategy over less than that. (Whilst nations had implemented strategies, those strategies had not been examined academically.)

Serious study of maritime strategy gained much wider acceptance with the writings of Mahan, and flourished under those who followed. These include Corbett, Richmond, Philip and Sir John Colomb, Roskill, Stansfield and Henry Eccles.10 The primary purpose of such study was not, as it sometimes claimed, to reduce strategy to a set of mathematical formulae which would produce forever correct answers. Rather, it evolved as an attempt to derive, from study of past events, consistent themes, elements of strategy or broad concepts, whose purpose is to assist one in one's current circumstances. It is concerned with aiding thought through historic perspective, in providing an intellectual tool to assist in practical application."

The aforementioned writers, whilst propounding their own preferred strategies, developed a number of terms which, in describing these strategies, provide the elements of maritime strategy, and warrant definition here. This will be done by paraphrasing the words of those writers, with no particular favoritism. Sea command implies virtual total dominance of the entire maritime environment at issue; this is more ambitious that sea control, which may vary in both scope and time, leading to such selfexplanatory notions as limited control, temporary control and local control. To achieve the desired control, one may employ sea assertion, control sufficient to allow use of the area in guestion for one's own purpose, or in a more limited sense, sea denial, prevention of enemy achievement of his purposes. In tandem with these are the concepts of deterrence, which implies a relatiatory capacity, and power projection, the display of capability and resolve. These, then, are the more important elements of maritime strategy.

The application of the elements of maritime strategy is what leads to the formulation of a maritime strategy for a nation. In the early part of Japan's involvement in World War II, her prime aim, typified by the attack on Pearl Harbour, was sea command — not permanent, but temporary, with, approximately, a six-month time frame in mind.¹² This was to have been sufficient for the

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planned expansion of empire. In the longer term, if war were to continue, localised sea control only was envisaged, in support of trade routes for essential supplies. The latter was not achieved. due, in significant degree to a lack of ASW capacity.13 For many of the Allied amphibious assaults in the western Pacific, control was both local and temporary, sufficient only for the specific operation. Similarly, in the Falklands campaign. British forces exercised only sufficient control for the landing of troops and their continued re-supply - at times a very tenuous control. This comprised both sea denial and assertion - they prevented enemy use of the sea, partly by the threat of submarine attack (denial and deterrence) to a degree sufficient to permit their own use (assertion, albeit limited).14

It is evident, from these brief examples, that the degree of control of the sea required, and hence the strategy employed by a nation's forces, is that which will meet national objectives pertaining in the particular circumstances. Permanent, total, sea control (sea command) is, generally, an unaffordable luxury. Conversely, the strategy must be supportable by the forces at one's disposal — there must be sufficient numbers and capacity to achieve that strategy. This will involve various factors: tactics; human considerations; and the basic capability of equipment, weapons and platforms. The last is very much a matter dependent upon technology, of both forces involved.

A MARITIME STRATEGY FOR AUSTRALIA

In developing a maritime strategy for Australia, national objectives must be taken into account. At the start of such a conceptual exercise, it is necessary to remember that Australia, as a maritime power, has certain interests - offshore resources and sea trade. It is wise not to overlook such matters when considering the more basic requirement of protection of one's sovereign territory from invasion. Consideration of the preferred method of protecting these vital interests, and other matters such as diplomacy, support of allies and power projection will, ultimately, lead to the desired maritime strategy. For example, the United States, as a major world maritime power with world-wide interests and alliances, has in its evolving maritime strategy a policy of forward defence which entails fighting battles distant from its own territory.15 This is a strategy developed to fit that country's interests and circumstances, and supported by her capability.

Australia's policies have, since Federation, been essentially defensive. For the first forty years, great reliance was placed upon the United Kingdom to provide for 'ultimate security'. Nevertheless, Australia contributed forces to serve as part of these broader interests of the Empire, for example in the Boer War, the Boxer Rebellion and even in support of White Russia after the 1917 revolution. The Japanese aggression of World War II cast doubt as to the ability of the Royal Navy to continue to provide this umbrella, and Australia looked to the United States. Whilst Australia continued to develop and maintain independently capable forces, participation in Allied military activities continued as a lynchpin of defence strategy — de facto forward defence, as it were.¹⁶

The continued reliance upon alliances has been nowhere more evident than in agreements with the US. (primarily the ANZUS treaty), which bring both strategic support through the possibility of US defence of Australia (deterrence). intelligence, and technological and scientific assistance. Since the enunciation of the Guam doctrine, the guarantee of direct military assistance has decreased. This has reduced both the desire and opportunity to participate in allied military activity in the region. The result has been an increased emphasis on self-reliance, and on the development of thinking of how best to defend the Australian continent. Whilst there is little in black and white which clearly defines Australia's strategy, it can be, perhaps, paraphrased as Fortress Australia, or Continental Defence.17 This, however, is an over-simplification, there still being some power projection and deterrent elements.

The difficulty in clearly defining Australia's defence, especially maritime, strategy, is highlighted by the Dibb Report into force structure. and the ensuing debate. It is evident that, in compiling his report. Mr Dibb experienced some dificulty in identifying precisely the present strategy. For example, whilst espousing denial as a desirable strategy, the report says '... it does not depend upon deterrence as a force concept'.18 This is contradicted in a discussion, on the very next page, on a layered defence, by 'For higher levels of conflict, it also means having forces capable of striking at an adversary's latter is the capacity of deterrence, demonstrating the problem of accurately stating Australia's strategy.

Whilst the strategic thinking behind the report is not clear (and defining the nation's strategy was not, incidentally, a task imposed upon Mr Dibb), it has generated considerable debate. The principal focus has been upon the abovementioned contradiction, the question of to deter, or not to deter.²⁰ The thrust of the debate, and of the report, has been, primarily, what should the strategy be? The issue of what the country can, or should, be capable of is not to be the determinant of the strategy, other than within

broad, realistic, limits, but rather the result of the eventual strategy. Whilst the report must not be construed as a statement of official maritime strategy, it does highlight some vital interests. The need to protect offshore territories and resources, support of alliances (primarily with the US) and maintaining regional stability number among these interests. This debate and uncertainty is not necessarily a bad thing; due to changing circumstances and interests, the strategy must be continually evolving, rather than cast forever on tablets of stone.

However, what the strategy to support these interests will be is less clear. Will the current capability, defence with some deterrent ability (sea assertion) continue, or be replaced by a purely defensive posture — denial? It should be remembered that what capability the country is able to possess is not being held up to be the determinant of the strategy, but the outcome.

SOME THEORETICAL AND PHILOSOPHICAL CONSIDERATIONS

In considering strategy, tactics and technology, the overall relationship must be borne in mind. Strategy is dependent upon national objectives, and in turn determines the forces and tactics to be employed. Edward Lasker underlined the relationship as:

... Strategy sets down the whole of the problems which must be solved in war, in order to attain the ultimate result aimed at; tactics solve such problems in various ways, and according to the conditions prevailing in the particular case. Sound strategy, when setting the task, must never lose sight of tactical practicability, and only a thorough knowledge of tactical resources makes correct strategy possible'.²¹

Whilst the strategy of Lasker's writing was of the game of chess, this observation is pertinent as it highlights the essential point that, whilst strategy is the master of tactics, strategy must remain responsible for making available the 'power appropriate to the results demanded'²² This, then, merely iterates the theme that the development of a strategy is a two-directional process. As well as needing to be appropriate to national objectives and circumstances, the strategy has to be founded upon tactics. It is at this stage, the relationship of tactics with strategy and their interdependence, that the effects of technology become relevant.

It was described above how technological advancement is having a pronounced impact upon tactical activity in three main areas weapon effectiveness (accuracy and lethality), surveillance and command and control. The first is a matter of hard kill capability, the other two matters of supporting and enhancing the first.²³

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In this regard surveillance and command and control increase the tactical efficiency, or provide tactical advantage, and thus earn the hackneyed title of 'force multipliers'. Effective use of surveillance and C³ can, in this regard, give one advantages of both surprise and concentration. The purpose of technology in tactics, as shown earlier, is to help achieve tactical success; so far the 'how' of this problem has not been addressed in depth.

Operations Analysis, as it is known today, had its genesis in simple, mathematical, treatment of this very tactical problem carried out by Frederick Lanchester in 1914.24 Considering the numerical strengths and unit fighting values of two opposing forces, and applying some calculus which will be dispensed with here. Lanchester determined that the overall fighting strengths of two forces are identical if the formula $Nr^2 = Mb^2$ holds true, where r and b denote the numerical strengths of red and blue forces, and N and M the fighting value of each unit. Whilst this treatment makes the fairly broad assumption that all red units have equal fighting value, and the same for blue, it nevertheless provides an attempt, a most useful attempt, at quantifying an otherwise abstract, semantic, and difficult problem. The principal thrust of his work, and that of others such as Fiske who developed this general theme, was to show the theoretical and practical advantages of surprise and concentration tactically.25 However, there is more that can be gleaned from the one simple formula. It demonstrates that parity can be achieved by number when lacking capable weapons/ platforms, or vice versa, and the nature of the relationship - a square one.

Analysts such as Fiske used further of Lanchester's mathematical treatments to develop the 'cumulative effect of preponderant force'.20 Whilst this can be achieved by either numerical strength - concentration - 01 superior fighting value - a possible result of superior technology - the result is the same. The tables so developed can be found in the US Naval War College Review article by Captain Hughes, USN, along with a comparison with actual battles such as Midway.27 Without actually iterating the numbers, the results, both in theory and practice, show overwhelming ultimate advantage, in residual firepower, to the force with greater initial strength, all else being equal. Similar treatment of the advantage of surprise reveals a similar ultimate advantage. What has all this to do with the subject at hand? Simply, this: it shows the overwhelming ultimate advantage that can be derived from a much smaller initial advantage.

The purpose of this treatment was not to support Napoleon's disparagement to the effect that 'on the sea, nothing is genius or inspiration, everything is positive or empiric'. Rather, it was to develop the theme that tactical advantage, shown to be a derivative of technology through better surveillance and C2 (collectively called 'scouting' by Hughes), and thus principles such as surprise and concentration, or superior weapons, are the rocks on which strategy is founded. A small tactical advantage, based on small capability or technological advantage, may provide decisive results and large final advantage. Thus technology may be said to be the tool of the strategist, the essential implement employed to achieve the aim.²⁸

The line cannot be drawn here, however: there is another side to the coin. The effect of advancing technology, discussed earlier, is to drive up costs of military systems, making the acquisition of desired numbers, or, more importantly, the desired balance between numbers and individual unit capability, more difficult. This may result in compromise in either numbers or capability, making effective use, through application of principles, more important. Another, less direct effect, is in the sphere of education. With an ever-increasing amount of technology to be considered, those concerned with strategy have increasing need for a technology-oriented education. The effects of technology upon tactics - frequent change - mean that a similar demand for continuing tactical update is required. Thus, there is a tendency for minds to focus more upon the tactical sphere of warfare, at the expense of broader strategic issues - in part, a kind of bewilderment by, or obsession with, technology,

As an important side issue, evidence of the direction of channelling of thought can be found by a simple perusal of the index of professional journals. For example, a look at the US Naval Institute Proceedings shows far greater emphasis on tactics and, to a lesser extent, technology related issues, than on strategy. An interesting comparison can be made by a look at the same journal for the first few years of this century. This was a time that technology spawned rapid change in maritime warfare, with the development of mines, torpedoes, submarines and radio.29 Similarly, the focus was away from strategy and onto tactics. (In the present-day Proceedings the emphasis is again on strategy. but the cause has been a high-level debate on maritime strategy, to redefine that strategy officially - something that may be happening in parallel in this country, via such efforts as the Dibb report.) Thus a concerted effort is necessary, in times of rapid technological advancement, to focus thinking upon matters of strategy. On the other hand, such debates do focus one's mind on these important issues, discussed above.

The net effect of the relationship of technology with strategy - that technology is what one uses, indeed needs, to implements one's strategy - for Australia is thus as follows. The evolution of Australia's strategy has been principally based upon matters of national interest. and rightly so, including considerations of alliances as part of the Western world. In the current economic climate, the technological capability that can be acquired is a function of dollars. Australia is generally willing to expend around three per cent of GDP on defence, and there is little likelihood of this changing in times of peace and stability. From this technological and tactical basis comes the capability to support the national maritime strategy. The evolutionary strategic thinking of the Dibb report was, as outlined above, based primarily on national interests and perceived threat (or lack thereof). and not, other than to a slight degree, upon capacity. In fact, the author was required to report on force structure required 'in the light of the strategic and financial planning guidance endorsed by the Government'.30

CONCLUSION

The form of an Australian maritime strategy is by nature an evolutionary one. The broad strategy was, for almost seventy years, based on reliance upon, and assistance to, a foreign world power. Firstly this was the UK, then the US. Circumstances, both international and domestic, brought a reappraisal of what could be termed Forward Defence in the early 1970s, leading to its abandonment and replacement by a more independent, self-reliant strategy. Continuing debate has helped to determine more precisely this 'new' strategy, though reports generally tend to hone in on capability, rather than the reason, the strategy, for that capability.

The national military strategy, including maritime, has come to the fore of debate as a result of the Dibb Report. It is here that the importance of the study of strategy comes out. Study of strategy is not for the purposes of developing immutable principles, but of trends and themes, which give a helping hand to thinking, and hence to understanding present circumstances. Even Mahan himself acknowledges this, with his realisation that 'control of the seas was an historical *factor*'.³² Thus, there is the essentiality of an understanding of concepts such as sea denial and assertion, deterrence and power projection to the development of a strategy.

Technology gives rise to the capability of fighting forces. Technology impacts upon all areas of maritime warfare, but nowhere more



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strikingly than in weapon power, surveillance and C³. The latter two translate into greater tactical advantage, by factors such as surprise, concentration and fighting force. These, the products of technology, are the tools of strategy.

Development of a strategy is thus a two-way process — consideration of national interests and objectives and based upon capability and tactics, the latter a function of technology. The strategist, therefore, needs to keep this capability, or the potential or affordable capability, squarely in mind when developing his strategy, which must be in support of national objectives. This is as true and pertinent for Australia specifically as in the general, theoretical, sense.

In short, technology, through tactical capacity, supports strategy; and strategy is an indirect function of technology.

Notes and Acknowledgements

- Seesholtz Captain J.R., USN Is Technology the Culprit? US Naval Institute Proceedings, June 1982. p. 49.
- Chew R., The Strategic Implications of Current Developments in Conventional Weapons Technology, *Pacific Defence Reporter*, March 1978. p 23.
- JSP(AS)101 Australian Joint Services Glossary, p S-26, M-12.
- 4. FM 100-5 US Army Field Manual, (Air-Land Battle).
- Figures based on information in: Australian Bureau of Statistics Year Book Australia, (various years) Australian Government Printing Service, Canberra.

Department of Transport Port Authority Cargo Movements (various years) Australian Government Printing Service Canberra.

- Dudzinsky S.R., and Digby J., The Strategic and Tactical Implications of New Weapons Technologies. *The Defence of Australia — fundamental new aspects*, Conference Proceedings, Strategic and Defence Studies Centre, ANU Canberra, October 1976, p. 40.
- Skinner Commander C.J. RAN, Impact of Technology on Maritime Warfare in the 1980s, *Defence Force Journal* September-October 1982, pp 15-17.
- 8. Didzinsky and Digby, op cit. pp 51-53.
- 9. Ibid p 51.
- Notable writers in the evolution of maritime strategy can be found in, inter alia: Till G., Maritime Strategy and the Nuclear Age, MacMillan Press, London, 1985, and Essays by Rosinski H., Development of Naval Thought, Naval War College Press, Newport, RI, 1977.
- 11. Till, Op cit, pp 221-224, and Rosinski, Op cit, p x, pp 1-2.
- Layton Admiral USN (Ret'd), And I Was There, US Naval Institute Press, Annapolis, MD, 1985, pp 72-73, pp 151-153.
- Potter E.B. (Editor), Sea Power A Naval History, US Naval Institute Press, Annapolis, 1981, pp 336-337.

- 14. Till, op cit, pp 133-134, p 252, p 256.
- Watkins Admiral J.D. USN, The Maritime Strategy, Supplement to US Naval Institute Proceedings, January 1986, Annapolis, MD.
- Leach Vice Admiral D.W. RAN, The Naval View, Australian Naval Institute/Seapower 84 Proceedings, pp 89-90.

- Dibb P., Review of Australian Defence Capabilities — Report to the Minister for Defence, Australian Government Printing Service, Canberra, 1986, p 50.
- 19. Ibid, p 51.
- As shown in, for example: The Dibb Report No. 1 — Basic Strategy is Wrong, Pacific/Defence/Reporter, August 1986, pp 17-18.
- As quoted by: Eccles Rear Admiral H.E. USN, Strategy — The Essence of Professionalism, Naval War College Review, December 1971, Newport, RI, p 47. citing Lasker E. Chess: Strategy, New York, 1969, p 17.
- 22. Ibid, p 47, citing Naval War College, Sound Military Decision, Newport, RI, 1942, p 9.
- Melly Lieutenant Commander R.G. RN, The Effect of Technology and the Roles and Value of Seapower, *The Naval Review*, October 1985.
- Taylor T.R., Tactical Surprise and Concentration — In Theory, Naval War College Review, May-June 1985, Newport, RI, pp 41-57.
- 25. Ibid.
- Hughes Captain W.P. USN (Ret'd), Naval Tactics and Their Influence on Strategy, Naval War College Review January-February 1986, p 11.
- 27. Ibid, pp 9-14.
- 28. Hughes, op cit, p 7.
- Hattendorf Lieutenant J.B. USN, A Study in the Professional Thought of the USN 1900-1916, Naval War College Review, p 27.
- 30. Dibb P., Op cit, p xv.
- As cited in Footnotes to Reitzel W., Mahan and the Use of the Sea, Naval War College Review, May-June 1973, p 82.

Bibliography

Books

- Bateman W.S.G., Australia's Overseas Trade Strategic Considerations, Australian National University Press, Canberra, 1984.
- Thibault G.E. (Editor), The Art and Practice of Military Strategy, National Defense University Press, Washington DC, 1984.
- O'Neill R. and Horner D.M., Australian Defence Policy for the 1980's, University of Queensland Press, Brisbane, 1982.
- Babbage R., Rethinking Australia's Defence, University of Queensland Press, Brisbane, 1980.
- Jans N.A. (Editor), Technological Change and the Military Canberra College of Advanced Education, 1984.
- O'Neill R. (Editor), New Technology And Western Security Policy, International Institute for Strategic Studies, MacMillan Press, London, 1985.
- Hill J.R., Maritime Strategy for Medium Powers, Croom Helm, Kent, 1986.

^{17.} Ibid.

Periodicals

- Gallotta Rear Admiral A.A. USN, The Naval Information War, Armed Forces Journal International, February 1985, pp 86-92.
- Weaver Lieutenant Commander R.G. CF, The Effect of High Cost Technology on the future of NATO Navies, The Naval Review, July 1984, pp 208-215.
- Eccles H.E., Strategy The Theory and Application, Naval War College Review, July 1984, pp 11-21.
- Owen Commander M.R. RCNC, Can the Cost of a High Technology Navy be Controlled and still fulfil its Roles? *The Naval Review*, October 1983, pp 278-284.
- Grazebrook A.W., Weapons Change; Strategic Concepts Stay, Journal of the Australian Naval Institute.

- Dupuy Colonel T.N. USA (Ret'd), The Influence of Technology on War, Marine Corps Gazette, September 1983, pp 50-59.
- Moore J.E., Technology in Modern Maritime Affairs, NATO's Fifteen/Nations, October-November 1978, pp 45-57.
- Feigl H., The Impact of New Maritime Technologies, Adelphi Papers, No. 122, International Institute for Strategic Studies, pp 22-31.
- Robertson Commodore J.A. RAN (Ret'd), The Fundamentals of Maritime Strategy, *Journal of the Australian Naval Institute*, November 1978, pp 20-25.
- Simpson Lieutenant Commander B.M. USN, Current Strategic Theories, Naval War College Review, May 1972, pp 76-85.





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WHY JERVIS BAY?

by Commander W. Burroughs, RAN

Lieutenant James Cook is credited with the discovery of Botany Bay in 1770. By standing to seaward he sailed past the much broader expanse of Jervis Bay. This might suggest that establishment of the first European settlement is something of an historic accident and a more detailed survey could have resulted in it having been located at Jervis Bay. Shortly after the move of the First Fleet from Botany Bay to Port Jackson came the first pemanent naval presence ashore when Garden Island was laid out as a vegetable garden by sailors from HMS Sirius. This was the begining of a long naval presence in Port Jackson which grew in support of the Fleet and which peaked in World War II when a number of naval establishments were established in Sydney, with many still being evident today.

Development at Jervis Bay was not entirely neglected. Since Federation and the creation of a national capital in Canberra there has been a long term design to establish a major port at Jervis Bay and a extensive area of land was later set aside for defence purposes. The first tangible evidence of national intentions became clear with the establishment of the naval college there (now HMAS Creswell) in 1913. An act was passed by the NSW Parliament in February 1915 providing for the surrender to the Commonwealth of the Territory of Jervis Bay. The Bill mentions that the Royal Australian Naval College is situated within the area, and that in due course buildings such as dockvards will be constructed in the naval port development within the Territory. However, little else eventuated primarily because economic conditions constrained such developments but the Bay was used extensively as an anchorage for warships exercising in the areas off shore. With the advent of World War II the strategic potential of the area was recognised with the establishment of British Pacific Fleet airfields and a torpedo factory. Since these airfields then have been transformed in providing the shore base for the Fleet Air Arm at HMAS Albatross, together with the target services fleet exercise complex; while the torpedo factory site has long since been subsumed and now forms part of a timber mill. The whole of the waters of Jervis Bay have also been restricted as declared 'Naval Waters'.

The Commonwealth Government is now considering moving a number of naval facilities from the greater Sydney area to Jervis Bay. The

Prime Minister and Minister for Defence have variously announced the following proposed relocations:

- The RAN Armament Depot from Homebush Bay
- The Fleet Base from Woolloomooloo Bay
- HMAS Platypus, the submarine base, from Neutral Bay
- HMAS Waterhen, the patrol boat and mine warfare base, for Waverton

In addition the Minister for Defence has endorsed the concept of a Two Ocean Navy and indicated that *HMAS Stirling* will be developed as a major submarine base. In the longer term other facilities will be required in support of the Two Ocean Navy concept. Ideally, for this concept to be fully realised, sufficient facilities to support two thirds of the fleet should be provided on both east and west coasts of the continent.

The argument of relocating known facilities such as an armament depot or submarine base may be largely self-evident. However, the term 'fleet base' is omniscient. It attempts to cover all amenities required to enable ships to shut down their onboard systems for maintaining and routine servicing. Therefore a fleet base requires ready access to specialised workshops, general stores, an armament depot and fuel installations. It is desirable for all these supporting elements to colocated: however. the large safety be distances associated with armament depots necessitate some separation between facilities.

In considering the optimum location for fleet bases, operational and strategic considerations are of prime importance and must be addressed. From an operational view there is a need for deep water approaches to minimise the threat from mines and to allow rapid access to ocean areas thus facilitating freedom of movement. There is a need for sheltered water with a low tidal range for the protection of ships in harbour. Importantly, in fields of engineering feasibility the chosen site must be suitable on technical grounds as well as being economically

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Commander Walter Burroughs has recently completed a posting as Project Director Naval Base Development (although the views expressed in this article are his own and not necessarily those of the Project) and is presently serving as Project Director for the Modernisation of Garden Island Dockyard. Commander Burroughs is a councillor of the Naval Institute.



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sustainable. From a strategic view point Australia's major focal shipping areas are off the south-east and south-west of the continent, with some important choke points in the archipelago to the north. While some forward support is necessary north of the Tropic of Capricorn there is a prime need for major shore facilities to be located in the south-east and south-west of the continent where they can be readily supported by the existing industrial infrastructure. At the same time such bases are less vulnerable to attack. The needs of the fleet must thus be determined by operational strategic considerations and not be driven by operational strategic considerations and not be driven by preconceived dispositions based on unrelated issues.

In recent decades there has been a general progression of enhancement to naval facilities particularly since the commissioning of HMAS Stirling in WA in 1978, followed by HMAS Cairns, in NE Queensland and the Darwin Naval Base both in 1982. In addition, logistic support of the Navy has been improved significantly through the acquisition of the Zetland site in Sydney enabling centralisation of the general stores function. Also, naval warfare training has improved with the introduction of advanced warfare system trainers at HMAS Watson. Later developments now underway include the modernisation of Garden Island Dockyard and construction of a new fleet base and maritime command centre at Woolloomooloo. A feasibility study is also underway for the modernisation of HMAS Waterhen.

Having regard to this recent and costly development some observers might question the intention to move naval support operations from Sydney as the cost of relocation will be significant. However, problems do exist as it is becoming increasingly difficult to undertake such basic functions as weapon system testing through high powered electrical transmissions and general industrial and noise pollution are also factors to be taken into consideration. The fleet base is also largely constrained against any future expansion. In the future the RAN might acquire nuclear powered vessels, in which case the port of Sydney would be unsuitable for their operation and maintenance. To address these problems the Government has commissioned a Fleet Base Relocation Study which was to have been presented to the Minister for Defence by June 1986; owing however, to the complexity of the issues there has been a delay in finalising this report. In parallel with this study a Notice of Intention is required outlining the Defence case for relocation, since this is a necessary step in the environmental legislative process. The Notice of Intention will lead to an Environmental

Impact Statement to assess the impact of any relocation to Jervis Bay, and to consider prudent alternatives.

Environmental issues are now becoming a cause celebre viz: Franklin Dam, Daintree and more recently Kakadu. While Jervis Bay is not in this league the vet environmental consequences to large scale development in the region are considerable, notwithstanding the offsetting benefits that may be brought to the Sydney area. There is mounting opposition to the proposal which if fully realised will inevitably mean the relocation of thousands of naval personnel and their dependents from Sydney to the Jervis Bay region. Concern has also been voiced regarding the effects that visiting warships, some nuclear powered and/or nuclear armed, might have on this predominantly rural and holiday area. The past decade has also introduction of seen the environmental legislation both at the State and Federal levels. These factors have not escaped political awareness and the House of Representatives Committee on Environment and Conservation has recently tabled a report on proposed naval development in Jervis Bay signalling even at this early stage that any decision the Government may make will come under the close scrutiny of Parliament. At the same time heightened media interest and increased public interest mean that as planning and studies unfold every point will inevitably be debated and aired as part of the decision-making process.

The proposal as it now stands is primarily for the relocation of the Royal Australian Naval Armament Depot (RANAD) RANAD Newington and the associated small transit area at Spectacle Island. These are 19th Century establishments and a logistic anachronism in today's world of smart weapons. The whole of the existing ammunition supply chain from the principal depot RANAD Kingswood (near Penrith) by road to Newington, thence barge, staging at Spectacle Island, to ships lying at buoys off Garden Island is labour-intensive and time consuming. The frequent handling and storage of large quantities of explosives in highly urbanised areas is also of concern in respect of public safety. A recent compounding factor is that RANAD Kingswood lies close to the proposed new Sydney airport at Badgerys Creek which could impose restrictions on the future utilisation of the depot. There can be little doubt of the need to close Newington with its antiquated facilities dating back to the 1890s, but before this can be done an alternative means of supply remote from metropolitan areas must be established.

To this end studies have been ongoing for a number of years to determine the most suitable

location for a new armament depot. Twelve alternative locations for an explosives wharf on the NSW coastline were examined in a NSW Explosives Wharf Study in 1972 and again reexamined in 1979. All except Jervis Bay were factors rejected because of such 26 environmental issues, unavailability of suitable land or high capital costs. Further studies have been conducted and again these led to the Jervis Bay region being found to be the most suitable location to site an armament depot and associated wharf facilities.

As well as planning the relocation of the Armament Depot it is no secret that the RAN has for many years considered the eventual relocation of the fleet base and training facilities from Sydney to Jervis Bay. The Government has indicated, possibly optimistically, that these

changes may now take place much earlier than first thought practicable. However, the Ministerial announcements of a move some 15 to 20 years hence with a new armament depot to be commissioned in 1992, gave new impetus to these considerations. In concert with later stages of the armament depot studies, planning activity was undertaken into the adequacy of reserved land at Jervis Bay for other forms of naval development. The 1979 Garden Island Modernisation Environmental Impact Statement discussing alternative sites for a naval dockyard and fleet base considered that: 'In the long term it may become necessary to relocate some of the fleet base from Port Jackson. This should be to Jervis Bay as it has outstanding advantages over alternative locations for a fleet base in south-east Australia'.



Jervis Bay

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From a Defence Public Relations Map

In preliminary planning for the fleet base some 60 ports and bays stretching from South Australia around the eastern seaboard to northern Queensland are said to have been studied. When narrowed down to reasonable alternatives there are few locations that are of sufficient size and with features suitable to accommodate naval requirements. Westernport in Victoria and Gladstone in Queensland are possibilities. The former is dismissed as it does not have ready access to deep water and consequently is susceptible to a mine threat; air space is limited and exercise areas are not readily available. The latter is dismissed owing to the high capital cost of development, the lengthy passage to deep water and the remoteness from suitable industrial infrastructure. The advantage of Jervis Bay compared with other options is that it is adjacent to the principal east coast exercise areas and the naval air station at HMAS Albatross. There is sufficient land to accommodate an armament depot and it is relatively close to the existing Sydney/ Wollongong-based industrial infrastructure. including the naval dockyard. In fact it is close to all the facilities that directly support the fleet. Jervis Bay also affords good shelter, deep water and rapid access to the open sea. There is sufficient room for future expansion should this contingency ever become necessary. A brief comparison between some of the more suitable

ports is shown in Table 1.

The Table shows that there are decided advantages in remaining in Sydney, and to relocate to ports other than Jervis Bay would be Navy's distinct disadvantage. is to This particularly important for modern warships which are designed to rely heavily on shore support facilities to maintain a high degree of operational availability. In Port Jackson, since the First Fleet, there has been conflict between commercial needs and military requirements for foreshore land. These arguments have been mainly fought on economic grounds, tempered with strategic imperatives in time of real or imagined threat of invasion. The economic argument continues, although this may be disguised in other contexts. The question is often asked: can the Navy afford to retain prime water frontage now comprising some of the most valuable land in the country? That the Army occupied significantly more waterfrontage than Navy may have been overlooked; but was not this the real issue in the Cobar/Orange debate? Any relocation is likely to be expensive: should the taxpayer therefore be footing the bill in order that developers, local and state governments achieve greater levels of revenue? Whatever the platitudes of foreshore policies in returning land to the people, historic perspective does not demonstrate an enviable record of public benefit: on the other hand the

Î		Jervis Bay	Port Jackson	Port Stevens	Westernport	Gladstone
	Deep Water	x	x	×	х	×
	Clear Approaches	×				
	Sheltered Position	x	x	x	×	
	Low Tidal Range	x	x			
	Land Availability	x			x	×
	Expansion Capability	x			×	×
	Industrial Support		x		x	
	Naval Logistic Support	×	×			
	Community Services	×	×	×	x	
	Docking Facilities		×			
	Proximity to Exercise Areas	x	×			

TABLE 1.

military occupation of prominent areas of the foreshore of Port Jackson has enabled significant tracts of foreshore to be retained in their natural state.

Likewise, in considering the Commonwealth's involvement at Jervis Bay we should also be conscious that the major undeveloped and now in highly attractive areas are those Commonwealth ownership. This is because land ceded by the State to the Commonwealth for a national port has largely remained undeveloped and the large naval exercise area on the Beecroft Peninsula has precluded other transformation. This is in contrast to the remainder of the Bay which is rapidly becoming urbanised, and where already 25% of the foreshore has been given up to seaside town development, much of it without aesthetic merit.

If previous Budget planning is used as a guide it is clear the Defence Department will not be issued with any new pot of gold to effect this massive relocation. Such expenditure will come from normal appropriations or at the expense of other Defence outlays such as capital equipment. There is unlikely to be any savings through the sale of land as this will almost certainly be transferred to the State under the Commonwealth/State Lands Exchange Agreement. The overall strategic and budgetary outlook is well summarised by Paul Dibb in his 'Review of Australia's Defence recent Capabilities' as follows: There are some potential operational benefits for Navy in the use of Jervis Bay and other sites, but the substantial expenditures and dislocation involved in an accelerated move out of Sydney Harbour would not be justified by any pressing strategic imperative. The major benefits relate to civil access to the land to be vacated in Sydney Harbour. Thus, the move out of Sydney should be designed as far as possible to meet the needs of Navy and be phased to minimise the burden on the Defence Vote."

Port Jackson is the traditional home of the Navy, partially through historical reasons but mainly because it presents one of the finest harbours in the continent. However, since the establishment of an oil refinery and, later, container berth terminals in Port Botany, the significance of Port Jackson as a major maritime port has been in decline. The time may also be fast approaching when the RAN must take a fresh look at the future maritime implications of these changing circumstances. If there are other suitable economic alternatives the RAN cannot or should not expect to go unchallenged in occupying some of the most desirable tracts of real estate. The question surely is what is best for the nation and for national defence. Issues of national interest should not be debased through

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becoming embroiled in local issues. It is not necessarily for the Navy to find a new home that will cause the least inconvenience to the community, it is rather the community at large and specifically its political representatives that should ensure its defence forces are located in appropriate areas to ensure the most effective use of national defence resources.

Despite procrastination within the bureaucratic progress is being made. process. The Submarine Escape Trainer is presently under construction at HMAS Stirling in WA and this will undoubtedly be the forerunner of other submarine training facilities there, making the relocation of the major portion of the submarine force that much easier to accomplish. With the permanent basing of submarines on the west coast it makes sense to increase the number of fleet surface ships based on HMAS Stirling and this is likely to occur as the Navy moves closer towards a Two Ocean concept. This will ease congestion in Sydney and with the added benefit of a new fleet base, which is now under construction at Woolloomooloo, the RAN will be in much better shape ashore than it has been since World War II. The new fleet base might also be adequate for the remaining east coast based submarines allowing for the disposal of HMAS Platypus. There is a need for the new MCM vessels now coming into service to be strategically located on the east coast (with some also based at HMAS Stirling, where they can be rapidly deployed on mine clearing operations off Newcastle, Sydney, Botany Bay and Port Kembla. Desirably they should be separated from major surface units owing to a large number of differing operational and training requirements. The proposed modernisation of HMAS Waterhen is therefore strategically sound and should proceed as a matter of urgency noting that these new vessels are highly dependent on shore support to maintain operational proficiency. Dibb is also of the opinion that the minewarfare base should continue in Sydney.

This still leaves the vexed and urgent problem of moving the armament depot to Jervis Bay. The need can readily be established on safety grounds, adequate land is available in Jervis Bay and the proposed location is close enough to the existing naval infrastructure. Once an armament depot is established it might be appropriate to gradually centralise a new generation of naval facilities away from the metropolitan area. This might also lead in the very long term to the relocation of facilities that are presently unspecified such as training schools and even the dockyard. In the latter case the concept of dockyards and their function is changing from that of heavy engineering to high technology. Changes must be effected as the logistic and technical support for modern warships and submarines changes. For example it is likely that the new submarines to enter the RAN in the early 1990s may need only one major refit/ modernisation during their lifetime and this may well be done in their building yard. Thus the naval dockyard, like the factories of the industrial and post-industrial revolution, is something of the past to be replaced by smaller, fragmented and less labour-intensive, production units. Future generations of ships are unlikely to require such structures as the Captain Cook Dock which now remain as a relic of the battleship era.

To the question of why Jervis Bay, the answer is rhetorical - where else? In the Two Ocean Navy context the west coast is being catered for by the staged development of HMAS Stirling, with a vague possibility of a future forward operating base in the north-west should this prove necessary. Operations off the northern approaches are covered by the forwarded bases of Darwin and Cairns. To the east we have Sydney which is adequate in most respects for present purposes. To move north of Brisbane within the confined and relatively shallow waters of the Barrier Reef would result in penalties, inappropriate to major warship operations. Likewise other ports south of Sydney, in Victoria, Tasmania and South Australia have major disadvantages compared to Jervis Bay. It is logical therefore that 'because Jervis Bay has outstanding advantages over other alternative locations' planning should proceed on the basis of it being developed over time as the principal fleet base in SE Australia. To by pass the development of Jervis Bay for defence purposes on environmental grounds is not in the national interest.

In any major national undertaking with long term implications involving national security like the development of Jervis Bay for naval purposes there is a need to engineer a degree of political cohesion at all levels of the political spectrum. At the present time this is lacking and political views on these embryo proposals cut across party lines, and across Federal, State, and local government boundaries depending very much on the particular constituency of the politician concerned. At the Federal level there is strong support across party lines for the

development of a naval shore infrastructure at appropriate strategic locations to enable self reliant naval operations to be carried out in both oceans - Pacific and Indian. Variations may exist as to the extent to which such facilities should be developed, but in all these considerations it is the national interest that prevails. In the Sydney area, with its huge and expanded population pressing on a finite seaboard, there is political mileage in being seen to be in the forefront of any move 'to return the land to the people'. The fact that the Navy comprises people too, loval and uncomplaining. may sometimes be overlooked. This political undercurrent is strong in Federal, State and local government levels, and moves which will eventually rid Sydney Harbour of 'the unsightly presence of warships and submarines and their encumbrance' can only bring benefit to the citizens of Sydney. This view may have lost some of its currency in 1986 when more than half a million citizens flocked to vantage points around 'our harbour' to witness the RAN's 75th Anniversary Naval Review.

In the Jervis Bay region political views vary enormously. There are those which embrace the national interest, those that see development bringing added amenity to the area such as improved communications, and enhanced employment opportunities, improved social infrastructure and the like. There are also strong views against any development which it is claimed will not only induce major environmental damage, but bring social disharmony as well as making the whole area a potential nuclear target. These views can be found at all levels of government and will inevitably gather strength as the views of different interest groups are pressed forward in various political forums and as part of the public process of developing the associated environmental impact statement. Eventually, judgements will need to be made as to what is best in the national interest. Do we have a Navy supported by the best the nation can provide or will second best do? These are essentially political decisions involving all levels of government, and subsuming party political interests. Any national project of this magnitude, to proceed successfully, will require a degree of political hegemony that has at its core the true national interest.

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THE EFFECTS OF CHANGING TRENDS AND STANDARDS ON A DISCIPLINED SERVICE

by Lieutenant P.J. Blades RAN

INTRODUCTION

In this essay the effects of changing trends and standards on a disciplined service will be analysed from an organisational viewpoint. Firstly the essential features and characteristics of a military organisation will be examined to find out what is meant by the term 'disciplined service'. Secondly, these characteristics will be compared to civilian organisational characteristics to highlight those features which distinguish a disciplined service from other organisations. Thirdly, the transformation of military organisations in response to changing trends and standards will be investigated. Finally, the conflict between organisational goals and individual goals will be examined to see if the changing aspirations of individuals exert pressure on a disciplined service.

CHARACTERISTICS OF THE MILITARY ENVIRONMENT

The modern Armed Services qualify as complex organisations irrespective of size. This becomes evident when one considers the diversity of skills and specialists currently represented in the armed forces and the variety of tasks they may be called on to perform. As a consequence military organisations share many of the problems of other organisations of comparable complexity. However, discussion of military organisations as a distinct category is justified on the grounds that 'both the tasks of the armed forces and the use of violent means create features unique to the military'.'

Status/Skill Structure

Status/skill structure does not mean merely the particular technical and professional requirements which are essential for military service. Rather it means the logic of the organisation including the rules by which it operates in the allocation of its manpower. The military is an organisation through which each year groups of men and women enter. Once the person is admitted into the institution there is no question but the organisation must incorporate him or her into a functioning role. In this sense, despite its complex skill and rank structure, all its members are equal. All members of the services are soldiers, sailors or airmen in the basic sense.

There is no need for the new recruit to have any doubt as to whether there is a place for him in the organisation. This is not to assume that all new members adjust to the system or that the system does not seek to reject some person but ... it is an organisation based on the complete availability of opportunity plus a basic standard of acceptance of each member'.² Each person quickly recognises that he/she has real work to perform and that he/she has a real capacity to assist or retard the function of the group. Regardless of the hierarchical features of the system. To be effective requires not military compliance with orders but positive participation. Further, for countless people it provides the most obvious escape from provincialism and even the enlisted career has and still can be an important avenue of social mobility.

The Author

Lieutenant Patrick Blades joined the RAN as a direct entry Instructor Officer in 1984, prior to which his experience included teaching in secondary schools at Toowoomba and eight years with 25 Battalion Army Reserve. He is currently serving at the Marine Engineering School, HMAS Nirimba.

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Training

The military operates with a set of training procedures which assume maximum potentials for personal growth. The very notion of basic training implies that there is a set of skills which all members of the institution can and must know. Basic training is required of all members as a mechanism of assimilation. Prior social characteristics are de-emphasixed during this period and this includes, in particular, social disabilities accumulated during civilian life. But even more pointedly, the training procedures operate on the assumption that each person has the potentiality of mastering the contents of basic training or that it is up to the system to teach each person the essentials for success.

Basic training also serves another purpose. 'It is out of the agonies of training that they develop pride in having done what they believe many of their former friends could not have done and which they themselves never thought they could do.th This builds pride and motivation within the individual. The individual will be much more motivated to carry out tasks beyond those expected of the rest of the community if this sense of accomplishment can be achieved and if the individual believes he/she belongs to an elite.

Organisational Climate

The organisational climate of the services supplies an appropriate context for their basic education and socialisation function. Life in the military is organised and, despite the large amount of recent publicity, still relatively satisfactory from a material point of view.

The uniform is of special significance both because of its intrinsic quality and the fascination that develops around being conspicuously dressed. The physical activity and athletic-like character of basic training also need to be mentioned. Of equal or greater importance is the fact that the culture of the enlisted man is a direct outgrowth of civilian working-class existence. 'The standards of personal language and physical contact, and the style of indulgence such as beer drinking do not require the recruit to suddenly denounce earlier patterns of gratification."

Social Context

The basic social context of the services is strikingly important. A recruit soon discovers that the services operate under a judicial system which, despite its particular features, offers a person, regardless of socio-economic background, a great sense of protection of his rights. His medical needs, welfare needs, welfare and protection are all directly available. This is not to say that resentment of authority never develops. However, the point needs to be emphasized that the members are in a stable

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environment relative to many of the ocupations found in civilian life.

The military accepts responsibility for the wellbeing of its members. This implies that specific personnel are responsible for observing and monitoring the member's experiences and results. The machinery is elaborate, cumbersome and at times inefficient, but there is a peculiar sensitivity to the needs of individuals especially those who are in need of assistance. This derives, in part, from the 'professional ethic that the officer - both commissioned and noncommissioned - has prestige among other officers to the extent that he takes care of his men."5 Further, it is a result of the information system which makes it possible to follow up a particular recommendation or a particular action. If a member has a problem a report will be generated and this followed to a final outcome.

ORGANISATION - CIVILIAN VERSUS MILITARY

If an organisational perspective is applied to the armed forces it becomes necessary to contrast civilian and military organisations. Many features and characteristics of military organisations such as authoritarian hierachical structures are to be found in varying degrees in organisations." The special civilian characteristics of military organisations derive from its goals, namely, the management of instruments of violence.

However, the content of military goals has undergone tremendous changes under the impact of new technology and as the range of political considerations which impinge on military operations is altered. In general 'the trend has been toward narrowing the differences between organisations civilian military and organisations'.' To analyse the comtemporary armed service it is therefore necessary to assume that it has tended to display more and more of the characteristics typical of any largescale non-military bureaucracy. The decreasing difference is a result of continuous technological change which increases the interdependence of civilian society on the military and alters the internal social structure of the military. These technological developments in war-making require more and more professionalisation of military personnel. At the same time the impact of military technology during this century can be described in a series of propositions about social change." Each of these conditions has had the effect of 'civilianising' military institutions and blurring the distinction between the civilian and the military. Each of these has limitations but they will be discussed in turn.

Size of Defence Budget

A large percentage of the national income is spent for the preparation and maintenance of modern armed forces. Therefore there has been a trend toward total popular involvement in defence policy. The military is responsible for the distribution of a progressively large share of available economic resources. In a nation like Australia the defence budget competes directly with expenditure on welfare and education programmes. Therefore civilian agencies have been keen to direct, and in some respects have sought to control, defence policy.

Military Technology

Military technology both vastly increases the destructivness of warfare and widens the scope of automation in new weapons. Both of these trends tend to weaken the distinction between military roles and civilian roles as the destructivness of war has increased. Weapons of mass destruction socialise the danger to the point of equalising the risk of warfare for both soldier and civilian. No longer are there areas free from the threat of attack in wartime.

Shifts in Mission

New military technology has meant the mission of modern armies has been to act as a deterrent to war as compared to preparing to apply violence. This shift has tended to civilianise military thought and organisation as 'military leaders concern themselves with broad ranges of political, social and economic policies'.[®]

Reliance on Civilian Technicians

The complexity of the machinery of warfare and the requirements for research, development and technical maintenance tend to weaken the organisational boundary between the military and the non-military, since 'the maintenance and manning of new weapons requires a greater reliance on civilian or at least civilian-orientated technicians'.¹⁰

The countertrend is the greater effort by the military establishment to develop and train military officers with scientific and engineering backgrounds. However, this can have the effect of creating a large group who are more oriented towards their professional and their specialised skills than to the larger organisation." In many respects these people are civilians in uniform rather than professional military personnel.

Threat of War

While no direct threat to Australia has been diagnosed by present policy makers, the 'permanent' threat of war throughout the world is well recognised. Given this state of mind the tasks which military leaders perform tend to widen. The need that political and civilian leaders have for expert advice from professional soldiers about the strategic implications of technological change serves to mix the roles of the military and the civilian.

Comparison

These propositions do not deny that differences persist between military and nonmilitary bureacracies. It is the goals of the military organisation which supply the basis for understanding the difference. The military establishment has unique characteristics because the possibility of hostilities is a permanent reality to its leadership.

'The consequences of preparation for future combat and the results of previous combat pervade the entire organisation. The unique character of the military establishment derives from the requirement that its members are specialised in making use of violence and mass destuction.'¹²

The narrowing distinction between military and non-military bureaucracies can never result in the elimination of fundamental organisational differences. Two requirements for combat set limits to these civilianising tendencies. First, while modern warfare exposes the civilian and serviceman to more equal risks, the distinction between their roles has not been eliminated. Traditional combat formations are maintained for limited warfare. The necessity for naval and air units to carry out hazardous tasks far from base always require the maintenance will of conventional forces. More importantly no nation can rely on victory based on initial exchanges of firepower. Subsequent exchanges will involve military personnel. Secondly, with the increase in the importance of deterrents, military elites become more and more involved in diplomatic and political warfare, regardless of their preparation for such tasks. The specific and unique contribution of the military to deterrence is the actual threat of violence. The types of weapons do not alter this situation. Deterrence still requires an organisation prepared for and capable of combat.

TRANSFORMATION OF MILITARY ORGANISATIONS

These basic changes in the military over the last several decades can be summarised by a series of basic propositions:¹³

 Changing organisational authority. The organisational revolution which pervades contemporary society and which has seen a shift in theories of motivation14 and implies management by means of persuasion, explanation and expertise, is also to be found in the military. There has been a change within the educational system of Australia in the basis authority and discipline, a shift from of authoritarian domination of greater reliance on manipulation, persuation and group consensus. How this has affected the individual within the organisation and how

organisations respond will be discussed later.

- Narrowing skill differential between military and civilian elites. The new tasks of the military require that the professional officer develops more and more skills and orientations common to civilian administrators and civilian leaders. The narrowing differences in skill between military and civilian society is an outgrowth of the increasing concentration of technical specialists in the military.
- Trends in political indoctrination. The officer is less and less prepared to think of himself as merely a military technician. As a result the profession has developed a more political ethos than it had before.

In partial summary the armed services are becoming fused with civilian enterprise. The increased political necessity for the services to act without unduly dislocating the civilian sector serves to make this a greater reality.

THE INDIVIDUAL IN A DISCIPLINED SERVICE

As mentioned previously, many of the administrative problems of formal organisations like the armed services have arisen from the conflict between the needs of the individual and requirements of the the bureaucratic organisation.16 The ratio of bureaucratic expectations to individual needs which at least partially determine behaviour will vary with the type of organisation, the job and the individual. Figure I represents this reaction pictorially. Military organisations are considered to be represented by line A, 16 whereas research and organisations better development are represented by line B.



Fig.I. Interaction of Bureaucratic and Individual Elements Affecting Social Behaviour.

In order to describe how an individual reacts to this type of setting the works of Chris Argyris are particularly relevant. Firstly he begins with the assumption that human beings are needfulfilling, goal achieving entities." The formal organisation attempts to mould and fit individuals into roles which best achieve organisational goals. This is particularly true of a disciplined service. As described earlier much of the training

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is designed to do just that. However, when the goals of individuals and of organisations are incompatible, then there is continuing tension between the formal organisation and the individual.¹⁹ Argyris concludes 'that the needs of healthy individuals tend to be incongruent with the maximum expression of the demands of the formal organisation.¹⁹ This general conclusion is summarised into a number of propositions:

- There is a lack of congruency between the needs of healthy individuals and the demands of the formal organisation.
- b. The resultants of this disturbance are frustration, failure, short time perspective and conflict.
- c. Under certain conditions the degree of frustration, failure, short time perspectives and conflict will tend to increase.
- d. The nature of the formal principles of organisation cause the subordinate, at any given level, to experience competition, rivalry, inter-subordinate hostility, and to develop a focus towards the parts rather than the whole.
- The employee adaptive behaviour maintains self integration and impedes integration with the formal organisation.
- f. The adaptive behaviour of the employees has a cumulative effect and feedback into the organisation and reinforces itself.
- g. Certain management reactions tend to increase the antagonism underlying the adaptive behaviour.
- Other management actions can decrease the degree of incongruency between the individual and the formal organisation.
- Job or role enlargement and employeecentred leadership will not tend to work to the extent that the adaptive behaviour (propositions c, d, e, f) has become embedded in the organisational culture and self-concept of the individuals.
- j. The difficulties involved in proposition i may be minimised by the use of reality oriented leadership.

Argyris believes individuals adapt to the 'frustration conflict, failure and short time perspective' by creating any one of a combination of the following activities:²⁰

- a. Leave the situation (turnover).
- b. Climb the organisational ladder.
- c. Become defensive (daydream, become aggressive, nurture grievance, regress, project, feel a low sense of self-worth).
- Become apathetic, disinterested, non ego involved in the organisation and its formal goals.
- e. Create informal groups to sanction the defence reaction in c and d.
- Formalise the informal groups in the form of unions.

- g. De-emphasize in their own minds the importance of self-growth and creativity and emphasize the importance of money and other material rewards.
- h. Accept the above described ways of behaving as being proper for their lives outside the organisation.

Argyris sees the process outlined as cyclic.²¹ Managment tends to increase the employees' dependence and subordination, which in turn will increase their frustration, which will increase the informal activities. Managment's response to this is directive leadership and more control, which again increases dependence and continues the process.

RELEVANCE FOR THE ARMED SERVICES

The needs of the individual within the organisation create conflict and unanticipated consequences which cause people to adapt their behaviour to the system. It was shown in an earlier paragraph that the proliferation of skills and specialities of the modern armed forces has deprived traditional authority of some of its power to evoke allegiance.22 As technology demands more skilled people, the armed forces are directing greater effort to training programmes. However, once trained, these men find greater opportunities opening to them in industry, where many of the same skills are in equally high demand. In trying to prevent turnover, a response described by Argyris, the armed forces face major problems in promoting rewards to retain those with scarce skills and high levels of competence.23 Moreover, the concept of a total institution which the services' management applies to its members has more relevance to recruit training and ships than to the work situation at auxiliary units. Unless there is strong identification with military goals, the curtailment of freedoms to regulate one's own off-duty activities can be felt as deprivation.24

The rise of the Armed Forces Federation of Australia could be seen as a response very similar to the one anticipated by Argyris. The emphasis on the importance of money and other material rewards, also predicted by Argyris is also clearly evident amongst members of the services.

In addition, the dichotomous character of military stratification, with its highly visible system of privilege for officers and ratings, contradicts the career orientation prevalent in a society whose members are increasingly better educated and more oriented towards the middle-level occupations. The movement across the enlisted-officer line is easier today and being made easier, but the system has remained basically unaltered for over a century.²⁶ This contradiction has seen the services lose a great

number of their highly skilled senior noncommissioned officers who leave for civilian employment.

The formal organisation tries to counter these responses by an emphasis on promtional opportunities i.e. people are encouraged to climb the ladder and by emphasis on esprit de corps. A high emphasis on team sports also tries to develop this further. These responses are designed to create a sense of purpose, strengthen loyalty to the organisation.²⁶ If Argyris is correct, and the indicators seem to show up a number of his predicted responses, then more of his responses will become apparent in the future as a result of this reaction from the formal organisation.

CONCLUSION

Many of the characteristics of the armed services are found in civilian organisations. Division of labour and specialisation, an impersonal orientation, a hierarchy of authority rules and regulations and career orientation are not unique to the services. It is the requirement for the services to be prepared for combat which gives them their unique character and sets them apart from civilian organisations. It is the goals of the military which make them disciplined services. But changes in society and in the role of the military within the community have seen a transformation of the military organisation. The need for greater and greater numbers of technicians and professionals to maintain and operate the technology associated with modern armed services, has seen the differences in the skills and orientation between many civilian and military personnel reduced.

Further, the last several decades have witnessed the concepts of individual rights and needs being placed in the foreground politically and socially. The changes in concepts of discipline and in the perceived needs and rights of citizens associated with this shift, are reflected in changes within the educational system and within the workplace. These changed attitudes and concepts are also evident within the services. The conflict between individual and organisation is clearly evident when examined in the light of Argyris' predictions about individuals responses. Whether the services become locked into the predicted cycle of further management impediments to the needs of individuals. followed by further individual reactions and so on, or whether ways can be found to break the cycle is the challenge facing management at all levels in todays' 'Disciplined Service'.

Acknowledgements

 Lang K.Military Organisations in March J.6 (ed) Handbook of Organisations, 1965 p.836.

- Little R.W. (ed), Handbook of Military Institutions, 1971, p.202.
- 3. Lang K. Military Organisations, 1965, p.859.
- Little R.W. (ed), Handbook of Military Institutions, 1971, p.206.
- Little P.W. (ed), Handbook of Military Institutions, 1971, p.206.
- 6. Janowitz M. Military Organisations, 1971, p.19.
- 7. Janowitz M. Military Organisations, 1971, p.19.
- 8. Janowitz M. Military Organisations, 1971, p.20.
- 9. Janowitz M. Military Organisations, 1971, p.19.
- 10. Janowitz M. Military Organisations, 1971, p.19.
- 11. Pugh D.S. et al, Writers on Organisations, 1983, p.22
- 12. Janowitz M. Military Organisations, 1971, p.21.
- Janowitz M., The Professional Soldier: A Social and Political Portrait, 1960, p.7-17.
- 14. See McGregor D. in Pugh et al, Writers on Organisations, 1983, pp 164-170.
- Argyris C., Personality and Organisation: The Conflict between System and the Individual, 1957, p.66.
- Hoy, W.K. and Miskel C.G., Educational Administration Theory: Research and Practice, 1982, p.63.
- Argyris C., Understanding Human Behaviour in Organisations, 1959, p.115.
- Hoy W.K. and Miskel C.G., Educational Administration Theory; Research and Practice, 1982, p.68.
- Argyris C., Personality and Organisation: The Conflict between System and the Individual, 1957, p.229.
- Argyris C., Individual Actualisation in COmplex Organisations, 1960 p.190.
- Argyris C., Management and Organisational Development: The Path from XA to YB, 1971, p.191.
- 22. Lang K. Military Organisations, 1965, p.843.
- 23. Lang K. Military Organisations, 1965, p.848.

- 24. Lang K. Military Organisations, 1965, p.845.
- 25. Lang K. Military Organisations, 1965, p.847.
- Blau P.M. and Meyer M.W., Bureaucracy in Modern Society (2nd ed), 1971, p.51.

Bibliography

- Argyris C., Personality and Organisation: The Conflict between System and the Individual, Harper and Row, New York, 1957.
- Argyris C., Understanding Human Behaviour in Organisation: One Viewpoint in Haine Mason (ed), Modern Organisation Theory, John Wiley and Sons Inc, New York, 1959.
- Argyris C., Industrial Actualisation in Complex Organisations in Carver, F.D. and Sergiovanni, T.J. (eds), Organisations and Human Behaviour, McGraw Hill, New York, 1960.
- Argyris C., Management and Organisational Development: The Path from XA to YB McGraw Hill, New York, 1971.
- Blau P.M. and Scott, W.R., Formal Organisations. A Comparitive Approach, Chandler Publ. Coy, San Francisco, 1962.
- Hoy W.K. and Miskel, C.G., Educational Administration Theory: Research and Practice, (2nd ed) Random House, new York, 1982.
- Janowitz M., The Professional Soldier: A Social and Political Portrait, Free Press, New York, 1960.
- Janowitz M., *Military Organisation* in Little, R.W. ed., Handbook of Military Institutions, Sage Publ., California 1971.
- Lang K.Military Organisations in March, J.G. (ed) Handbook of Organisations, Rand McNally and Co., Chicago, 1965.
- Little W. (ed) Handbook of Military Institutions, Sage Publications California, 1971.
- Pugh D.S., Hickson, D.J., and Kinings, C.R., Writers on Organisation 'third edition) Penguin, Suffolk, 1983.

CHAPLAINS AND THE MORALITY OF MILITARY SERVICE

by Bishop G.F. Mayne AM, DD

From time to time various concerned people query the role of Chaplains in the Defence Force and the support of the Catholic Church for their role. On the 21 July 1986 Pope John Paul II issued an Apostolic Constitution on the spiritual care of Defence Force personnel, and their families, around the world. The outstanding feature of this decree is to establish a Church for the Forces, equivalent to a Diocese.

The reasons for this are best expressed by the Pope himself:

'The Church has always desired to provide with praiseworthy concern, and in a manner suited to the various needs, for the spiritual care of Military people.

They constitute, as a matter of fact, a particular social body, and because of the special conditions of their way of life, whether they belong permanently to the Armed Forces by virtue of voluntary enrolment, or are called up temporarily by law, they have need of a concrete and specific form of pastoral assistance.

Now, however, it must be said that the time has come to revise past structures and norms so that they may have greater impetus and efficacy. Leading to this above all is the Second Vatican Council, which opened the way to bringing about most suitable particular pastoral initiatives, and gave close attention to the role of the Church in the world today, especially in all that regards the promotion of peace throughout the whole world. In this context those who give Military service must be considered "ministers of the security and freedom of peoples" and indeed "if they carry out their duties properly, they also truly contribute to stabilising peace".

This new step forward is also made advisable by the major changes which have come about, not alone as regards the Military profession and way of life, but also in the popular understanding in society today of the nature and duties of the Armed Forces in relation to the reality of human living.'

Earlier, in a homily at a Military Pilgrimage in Rome in 1984, the Pope said: 'The morality of your protession, dear members of the Military, is linked to the idea of service for peace, in the individual National communities, and even more in the universal context. The logic of service, that is, the commitment to others, is fundamental to the Christian view of life. To go back to this source means to discover the profound justification for your situation, which includes readiness, sacrifice, a spirit of solidarity beyond even legitimate personal and family interests.'

To look at history is to find that Chaplains are almost as old as Christianity itself - not perhaps in the organised form we know them today, but their necessity was realised from early times, e.g., Crusades, early explorers. In our society when young men and women join the Services. they do not lose their rights as citizens. These rights include the freedom to worship God in the manner one chooses. The facility to do this is recognised and provided, as far as possible, by the Services. The Catholic Church, together with other Churches, provides Service Chaplains to help personnel fulfil their religious duties, to witness to their Christian faith, and to develop the moral and ethical principles necessary to carry out their duties properly. The Church commends the Service person's special vocation to preserve the freedom and integrity of his own country and of his fellow citizens as one of the highest forms of citizenship. This vocation is not always popular in time of peace. Maybe it was well expressed by an old English veteran in the 18th century:

God and the soldier we adore In times of danger, not before; The danger passed, and all things righted, God is forgotten and the soldier slighted.

The foundation of all our duties towards God, our neighbour and ourselves lies in the fact that we are God's creatures and are given stewardship over our lives. Human beings do not have absolute mastery over life — life belongs to God, the Author of life. Catholic morality obliges us positively to be grateful for the gift of life — to respect the right of our fellow-man and woman to live in peace and happiness. Many complex problems arise in human relationships and Catholic morality recognises examples where there

can be justifiable homicide, e.g., to preserve one's own life (self-defence) or to preserve the lives of others against unjust aggression. A person can choose to use or not to use this right.

The right of the serviceman or woman to go to war is based on the principle of self-defence, on the presumption that the war is against unjust aggression. They are entitled to learn the means and methods of self-defence to enable them to effectively defend their country if all forms of negotiation and diplomacy fail. To protect the rights of other nationals against unjust aggression requires that there be a just and proportionate cause.

We all want to live in peace. Chaplains and Service personnel are no exception to this wish. But I don't think we help the cause of true peace by denying the possibility that we may have a duty to defend it. I believe that 'peace at any price' is a false peace, because it involves a compromise of moral principles, a willingness to go along with evil - and for the Christian, with evil there can be no compromise, no treaty, no peace - no matter what the cost to ourselves personally. In the letter to the Hebrews, we are told: 'In your fight against sin, you have not resisted to the point of shedding blood'. This implies for Christians the need for willingness to shed our blood in the struggle against evil. That certainly isn't peace - it's all-out war.

The major hope for peace lies with each one of us as individuals — to strive to eliminate from our world and society greed, lust, self-interest, disregard for the basic rights of men and women the root causes of war. Those who want, and are willing to fight and work for peace and true freedom and justice, are fighting against superhuman forces. We must discover the moral forces necessary to influence the hearts and wills of all men and women to accept, and try to live the basic tenet 'everyone, without exception, is my brother and sister.'

This again, in my opinion, is a very important reason for the presence of Chaplains in the Services. As long as the majority of people in the Defence Force are motivated by Christian principles, there is a greater safeguard for peace in our time. I shudder to think of the possibility of people who have no moral principles handling the modern destructive weapons. The presence of Chaplains helps to minimise that possibility.

So I believe there is a necessity for Christians to assume a leadership role in the work for peace. However, in so doing, we must strive to keep in touch with reality. In everything concerning human relationships, we will be faced always with those who, disregarding the basic rights of man, are power-hungry, lustful, cruel and greedy, and who will propagate philosophies which pander to their distorted outlook. These

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philosophies will be scattered through with some truths and half-truths which will beguile and deceive the undiscerning. The anti-human travesty of atheistic Communism and the greedy exploitation and selfishness of the excesses of Capitalism are obvious examples.

The effects of Godlessness and sin in our world are only too evident. This is why the Bishops of the Catholic Church, in reflecting on the griefs and anxieties of today's world, among so many things, dealt with our yearnings for peace and the horrifying reality of war. In the midst of these deliberations, they stated that governments cannot be denied the right to legitimate defence and have the duty to protect the welfare of the people entrusted to their care.

As that great apostle of true peace, Pope Paul VI said: 'Military disarmament, if it is not to constitute an unforgiveable error of impossible optimism, of blind naivete, of a tempting opportunity for others' oppression, has to be common and general. Disarmament is either for everyone, or it is a crime of neglecting to defend oneself'. In these words, he was reinforcing the statements of the Vatican Council.

Pope John Paul II, in 1982, warned against 'ideologies that hold out the prospect of a totally and permanently peaceful human society as easily attainable - such deceptive hopes lead straight to the false peace of totalitarian regimes.'

People may hold different ideas of how the common good is to be defended effectively. Individuals may choose to forego their fundamental right of defence, but they may not renounce their obligation to others. Governments must defend against armed aggression.

A genuine contribution to the establishment of peace is being made today by those men and women of the Australian Defence Force who are pledged to the service of their country and their fellow-citizens. The Church recognises this fact by appointing a Bishop and Chaplains for the spiritual, religious and pastoral care of these men and women and their families who are deserving of special consideration.

The Chaplains and I look upon it as an immense and overwhelming privilege to be able to love and serve those who are prepared to die, if necessary, so that we may continue to live in freedom and peace, however fragile it may be. We love and respect them because theirs is not just the carrying out of a job but the fulfilment of a very important vocation for which there is need in our time. Patriotism, loyalty and mutual concern are integral parts of our Christian tradition and are in true accord with a desire for genuine peace and justice. Should they disappear from our land then we may well have surrendered our capacity to survive.

OF SHIPS AND THE SEA

RIDING A DINOSAUR

At a time when the Peace Flotilla and antinuclearists can command and demand television coverage for their every utterance while the massive arms build-up of the Soviet forces escapes their condemnation, it was exciting to see the welcome afforded those ships of the various navies who were in Port Jackson for the RAN's 75th anniversary. A few activists paraded their bodies and their cliches before the press but an estimated 200,000 people struggled to Garden Island to view the ships. It is now history that public authorities and RAN fell far short in estimations of crowd and transport needs. Be that as it may, it seems the silent majority made its point about 'nuclear' warships.

Nowhere was this more in evidence than on and around the veteran battleship USS Missouri where an estimated 80,000 people tried to just get aboard the ship on which the final major surrender of World War II was signed.

Like millions of others I watched the fleet review on TV but, unlike millions of others, I was aboard *Missouri* when she left Sydney heading for Hobart. How that came about still boggles my mind but for 56 hours I became what the US Navy calls a 'rider', sleeping in a two-berth wardroom cabin and eating in the wardroom (total cost of meals US\$12).

USS Missouri was the third ship of her class commissioned, the last US battleships built. There were four completed — *Iowa, New Jersey, Missouri* and *Wisconsin*. Two others were commenced but not completed. The class was designed for Pacific service as fast battleships, a combination of all the features of the battleship and the battlecruiser with none of the disadvantages of either. All ships reached or exceeded their design speed of 33 knots, making them the World War II equivalent of the Royal Navy's World War I Queen Elizabeth 'fast battleship division'.

The very long and fine bow which was to give them speed in the Pacific was soon found to be a drawback in the Atlantic and the new class did not perform well in that ocean, particularly when compared with the RN *HMS Vanguard* in Nato exercises post World War II. However, it was in the Pacific that this class shone both as close-in anti-aircraft defence for carriers and as a high speed interdiction force should the remains of the Imperial Japanese Navy be brought to bay. Many articles have been written exploring the possible results of a match between an *lowa* and one of the bigger and more powerful Japanese giants of the *Yamato* class. Some American admirals were keen to bring such an action into being but other wiser heads prevailled and the giants were taken out by air power, thus saving many American lives.

One could spend many pages detailling the superlatives of this classically beautiful ship but suffice to state that her fully-loaded displacement is now stated to be 58,000 tons (not metric tonnes.) She is 270.2m by 33m by 11.6m (draft). Her armament now comprises the much-photographed 9×406 mm(16in.) main battery, 12×127 mm(5in.) DP guns, 4 CIWS Vulcan Phalanx, 32 tomahawk SSM and 16 Harpoon launchers.

Missouri now carries a complement of more than 1500 men, about two thirds the number carried when she was festooned with light antiaircraft guns for the Pacific war. Most of her men are volunteers from other ships, all wanting to serve on a piece of floating history and the condition of the vessel, its systems and living spaces shows this pride. I was a little depressed to compare the maintenance standards of this old ship with some of the cost-cutting maintenance (lack of man power) I have seen on RAN ships of late. It is an interesting exercise to compare the longevity of many USN ships with equivalents in the RN and RAN.

Missouri's officers and men were universally keen to talk about the press articles on the class, particularly some in Time and Newsweek which purported to discuss the inaccuracy of *New Jersey's* batteries off Lebanon. They claimed this was a media beat-up of a chance remark by an officer who was not involved and claimed the accuracy of BB63's main battery was as good as it was in World War II and that was 'very good indeed'. The big guns can range out to more than 40 km with an accuracy of plus/minus 100m at 20,000m. Trained crews can fire each 125 tonne gun twice a minute but BB63 was on a worldranging shakedown cruise and one a minute was considered to be good-so far.

Getting these massive 2200 tonne turrets and their gear working as designed created special problems for the USN. These were solved by inviting retired Master Chiefs and Chiefs of

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various classifications to come back to the USN. Thus we have the fascinating situation of seeing Master Chief Davidson in charge of the Focsle. Master Chief Davidson first joined *Missouri* in 1944. Other old sailors jumped at the chance to return to show a new generation how to work analogue control clocks for the batteries (very similar to the Admiralty Fire Control Clock on which I trained — Battles/Tribals/Darings etc), the (now) dieseline fired boilers and steam turbines and the thousands of other massive, labour-intensive items aboard.

After leaving Port Jackson, *Missouri* slowly swung south and steamed at an easy 14-15 knots towards rendezvous with *RFA Bayleaf* about mid-afternoon. *Bayleaf* is a big ship but looked small alongside *Missouri*. *Bayleaf* provided one rig forward while *Missouri* provided one aft. By my memories of serving on *Supply*, rig hook-up was very slow but this was probably one of the first times it had been done as the battleship commissioned only in May 1986. After fuelling and absorbing about 10,000 tonnes (I'm glad that's not on *my* Visa card'bridge officer at 1900) *Missouri* broke away from Hobart.

Travelling aboard ship was a team of marine engineers, hired to iron out some of the bugs involved in recommissioning a ship that has been in reserve for more than 30 years. As part of these adjustments, *Missouri* worked up to more than 27 knots into a 4m sea and a 45 knot headwind. Standing more than 45 m above the waterline with wind across the deck equal to that of putting one's head out of a car window at 130 plus k/mh was quite an experience — great for cleaning out the sinus! I was told that the ship was rolling three degrees — the most since she came back into service.

With a smaller-than-intended ship's complement, *Missouri* is a very roomy ship for both officers and men. She is a rabbit-warren of spaces and compartments and my cabin-mate, on board a month, was still very cautious as to his various destinations. At sea at night as the wind and sea began to build, all upper and weather decks were out of bounds. I had worked out the geography of the *Missouri*, based on going out onto the 'uppers' at one location and re-entering near my destination. Once the 'weathers' were banned I had a whole new problem — it provided some good excuses to explore odd places. When I asked what my limits of movements were I was told 'none, use your own common sense'. I could photograph what I liked except where classified signs were erected — the result was a film and processing bill for more than \$200.

As we entered the wintery Derwent River, Reserve-manned Attack class patrol boat *HMAS Ardent* came to meet and escort us, to be later joined by a small flotilla of private craft, tugs, ferries and police boats. The Anti-nuclear ship demonstrators were there in small number while on the wharf a number of signs spoilt other people's view. One sign complained that 'US sailor's sperm is radioactive' I tried to put myself back into the shoes of a 20 year old matelot visiting a 'friendly' port, wondering how a youthful sailor must feel looking at that. One young black put my mind at ease when he said 'After they've put the sign back in the car they'll be down here trying to get our money off us.....'

As I left the wharf, first person to go ashore, I had to pass through a small gate and into the crowd. Some person, obviously trying to demonstrate a great committment to peace and nonviolence punched me heavily from behind. Perhaps some sort of a moral could be drawn from that?

Having served aboard RAN carriers, frigates, destroyers, patrol craft and service and support craft from 1955 to 1968 and as guest and Reservist at times since, I had though I had 'seen it all'. *Missouri* provided me with indelible memories to add to them and I am very grateful. The US Consul tells me the ship will be back in 1988 for our Bi-centenary. Perhaps she'll also return in 2001 for an even more important centenary—she's good enough to do it.

Graeme Andrews

IRON PACIFIC — PRIDE OF THE BHP FLEET

With a deadweight of 231, 850 tonnes, *Iron Pacific* is the pride of the BHP fleet and the largest vessel ever to sail under the Australian flag. She was built by the Samsung Shipbuilding and Heavy Industries Co. Ltd., of Korea and their Koje Island Shipyard. Samsung was selected because they offered the most competitive price and although a small shipbuilding company, one which proved to be the technical equal of other shipyards world wide.

Iron Pacific was delivered, on schedule, on 30 May 1986. Subsequent trials proved that the vessel's performance was up to specification in all areas and in some, namely manoeuverability, fuel consumption and speed, exceeded requirements.

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The ship began service for the company in June 1986, joining the recently commissioned 148,000 deadweight vessels *Iron Newcastle* and *Iron Kembla* in BHPT's unique traingulation voyage pattern. These vessels carry iron ore cargoes from Port Hedland on Australia's west coast to the east coast steelmills at Port Kembla and Newcastle. They then load coal at New South Wales or Queensland coal ports for Japan and Korea before they return in ballast to Australia to load ore again. This reduces unprofitable ballast passages by 20 per cent.

Many innovations had to be adopted in the design of the giant Iron Pacific to enable the ship to enter ports in Australia and Korea. At maximum draft she can load 210,000 tonnes of coal. However, vessels trading in Australia coastal iron ore and coal trades are restricted to operating at a maximum of 15.25m draft (the allowance depth at Port Kembla). At this draft Iron Pacific's shallow draft design allows 175,000 tonnes of cargo (approximately 35,000 tonnes more than any previous ore/coal cargo to be taken into or out of Port Kembla). Her resultant beam of 55 metres needed manoeuvering characteristics equal to a single screw vessel of much smaller size in order to negotiate the harbour at Port Kembla. Simulation studies of the vessel entering and leaving Newcastle and Port Kembla harbours were conducted at the

Maritime Research Institute of the Netherlands. These studies confirmed that the proposed twin screw/rudder and hull configuration gave the required manoeuverability characteristics.

Sultzer RTA superlong stroke diesel engines were chosen for *Iron Pacific*. The engines have four cylinders with slow rotating, highly efficient controllable pitch propell propellers and low fuel consumption.

A self-polishing paint was used on the underwater section of the vessel's hull. When in contact with sea water this paint slowly dissolves allowing a progressively fresh surface to be continually exposed. This paint reduces water resistance to the moving vessel and allows the interval between dry-docking for underwater hull cleaning to be extended from two to five years.

The computer integrated ship monitoring and information system on board allows for centralised surveillance and control of main machinery and fluid handling (water ballast and fuel oil). The system enables ships' personnel to establish the current condition of the ship, and to exercise control over a number of operations from terminals located in the bridge, machinery and ballast central rooms and the administration office.

Iron Pacific has a crew of 26 compared to 33 on other vessels in the BHP fleet with much smaller deadweights. She is one of the first



Bulk carrier Iron Pacific

Photo courtesy BHP Transport.

vessels in the Australian merchant fleet to implement the reduced manning levels suggested in the Crawford Report. Therefore, throughout the design phase, particular attention was paid to the installation of facilities to minimise laborious and routine workloads for the crew. Further reductions in manning on future tonnage is expected for the Australian fleet to be cost competitive with vessels from many foreign countries.

With the introduction of Iron Pacific, the average age of the BHP Transport large vessel fleet is under 3.5 years. These six vessels make up the youngest fleet serving any major steel company in the world.

BHP Transport has won a 1986 Austrade Export Award, presented for achieving dramatic growth in freight returns in the international shipping market. BHP Transport has also won the Chartered Institute of Transport 1986 Australian Transport Industry Award for introducing the technically advanced *Iron Pacific* into these highly competitive international trades.

BHP Transport

A FORTUNE OF WAR

For several centuries the ship of the line which evolved in its final form into the massive armoured battleship of the mid 20th century was the ultimate symbol of seapower and despite the rise of the aircraft carrier to the position of queen of sea engagements in World War II, the battleship nevertheless retained an overwhelming emotional grip on the public mind. Indeed, 40 years on, the enduring strength of this image was clearly demonstrated by the astonishing enthusiasm generated by the recent visit to these waters by the reactivated USS Missouri. It seems that a battleship projects an image of invincible power withal a beauty of line which can be matched by no other man-made artifact. In consequence, right up to the end of World War II. the sinking of a battleship remained one of the most significant single blows which could be struck against an enemy. Such a sinking could have occurred in Australian waters towards the end of the war.

The story opens at 0218 on the morning of Christmas Day 1944 when the United States liberty ship Robert J. Walker, en route from Fremantle to Sydney, was torpedoed some 40 miles south east of Narooma on the south coast of New South Wales. The explosion tore off the rudder and immobilised the propeller. The ship took little water but was stopped and unmanoeuvrable. A distress message was broadcast and the services of a tug requested. Just before 0600 another torpedo struck amidships causing mortal damage and the crew, with the exception of two men lost in the first attack, abandoned ship. Vessels were despatched from Sydney and Melbourne to search for survivors who were, in the event, rescued within 24 hours; and to try to locate the enemy, an endeavour which proved to be unsuccessful.

The Robert J. Walker was destined to be the final victim of submarine attack off the east coast of Australia. In the previous three years, 18 ships

totalling nearly 70 thousand tons had been sunk in this area by Japanese submarines, with the loss of 465 lives. However, in addition to being the last of a long line the *Walker* was unique for another reason: her assailant was *U-862*, a German U-boat, commanded by Korvettan Kapitan Heinrich Timm who, with this sinking, achieved the furthest-from-home success of any U-boat in the whole course of the war. On reflection it is quite astonishing and a glowing tribute to the initiative and tenacity of the U-boat arm of the German navy that, at this stage of the war and with the homeland on the verge of defeat, a blow could be struck at such a remarkable distance.

Captain Timm had departed his forward base in Batavia on 9 November and having operated for a time off the west coast of Australia with no success, finally proceeded to the east coast for his rendezvous with the Robert J. Walker. At the very time of his traversing the Great Australian Bight, Timm, unbeknownst to either party, was running on a similar track to that of the modern battleship HMS Howe, with an escort of four 'Q' class destroyers, proceeding to the east coast as the initial element of the substantial British Pacific Fleet soon to be deployed against the Japanese mainland. In the absence of detailed track charts, the juxtapositions of the vessels will always remain a matter of conjecture but the chances of actual contact at some stage of the passage must have been reasonably high.

In this event, had Timm sighted and engaged the Howe, the battleship's powerful and experienced escort may well have proved to be the nemesis of his boat. None-the-less one can almost feel sympathy that such a narow margin denied him a golden opportunity to strike a last shattering blow for his failing Fatherland.

WOC.

Timm and his crew survived the war.

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EXCHANGE POSTINGS — ANOTHER BORING STORY?

By Commander G.G. Rogers RAN

When asked to write an article for the ANI on my recent USN exchange, I initially thought no one would be interested. Exchange postings tend to produce the same effect in people — a professional adventure and personal experience difficult to relate to anyone other than another 'exchanger'. Reminiscence about one's experiences overseas is invariably met with polite interest that rapidly deteriorates to polite disinterest. So, why should another essay on the subject be any different?

But then again, on the positive side, why not re-emphasize — or at least tell the readers of this august magazine — that an exchange job is so good! It is fun, challenging, an adventure, personally rewarding — and of course hard work. To do a course overseas is an interesting interlude interlaced with a brief insight into that country. To work, live in, explore — and exist in a host country for two or three years is another ball game altogether.

I was fortunate enough to be the first incumbent of a new USN/RAN Personnel Exchange Programme (PEP) - the surface warfare officers exchange. An Australian Principal Warfare Officer (PWO), subspecialised in gunnery, exchanges with a similarly qualified USN officer, with each spending 18 months at sea in a guided missile frigate (FFG) and then shore instructing in one of their Navy schools. USS Flatley (FFG 21) was a recipient for the Australian; HMAS Canberra (FFG 02) welcomed aboard the American. Then the fun began!

I can only speak for myself, but I feel comfortable when I say I believe Leut. Ely Kincaid USN most likely enjoyed similar confusion, amusement and adventures to me. And knowing Ely, he too will invariably recall elements of his exchange, and then smile to himself at one incident or another — just as I do.

Flatley is based at the Mayport Naval Station, Jacksonville, Florida. She is one of some fourteen FFGs of the Oliver Hazard Perry Class which comprise Destroyer Squadron Eight

(DESRON 8). DESRON 8 ships are part of the US Second (Atlantic) Fleet, and provide units on a regular basis for both Caribbean and Mediterranean operations. Whilst in Flatley I saw duty with the Sixth Fleet, in the Mediterranean, the Seventh Fleet (Western Pacific) in the Arabian Sea and Persian Gulf, as well as more mundane operations in the Atlantic and Caribbean. Mayport itself is a flourishing, if small, naval base. In addition to the FFG Squadron, two aircraft carrier groups and a Cruiser-Destroyer Group (CRUDESGRU) also are homebased in this northern Florida Naval Station. On one quiet day in summer I counted 28 major warships (FFG or larger) moored in the basin. This was a higher number than normal, but indicative of the capacity of Mayport.

Flatley herself was 10 months old when I joined on 31 May 1982. The ship had literally just returned from post-delivery maintenance at Bath, Maine, and was now eager to commence work-up and fully fledged operations. Within three days of joining I was on my way to Guantanamo Bay, Cuba and work-up USN style. GTMO (the favoured abbreviation for this exotic treasure in the south-east corner of Cuba) is the USN Atlantic training base. Suffice to say my wife and two young sons were still living in a motel — and trying to decipher 'you all' — when I left! For my part, I was trying to digest the fact that US had a naval base on Cuban soil.

The Author

Commander Graeme Rogers joined the RAN in 1968. He has had considerable sea experience in DEs, DDGs and FFGs. An advance warfare officer, sub-specialised in gunnery. Commander Rogers' career highlights include command of *HMAS Betano*, his recent 3 year exchange with the USN and Executive Officer of *HMAS* Canberra. He is presently Deputy Director, New Surface Combatant Project. Excellence in

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Those who have worked with Americans will support me when I say our US allies are workaholics. Their Navy is no different. Combine this trait with a new frigate's crew eager to prove their ship and themselves, add one fresh Australian and mix gently. The result is a full six weeks of operational work-up, with only Sunday the day of rest. Every USN acronym invented is used and all hands are exercised at every conceivable drill you can imagine! We worked hard and well. I learnt the ins and outs of Flatley in those weeks, gained a very respectable insight into the USN - and set the manoverboard ship recovery record for the US Second Fleet. Thankfully, I was also able to demonstrate RAN PWOs are adaptable, professional and equipped with a thick skin and a good sense of humour. By work-ups end, Flatley was operationally qualified, the wardroom well versed in Liar's Dice - and I was as vankified as I was ever going to be! All this in the first six weeks of a 3 year exchange!

Then tollowed probably the most professionally rewarding and exhilarating 18 months of my Naval career. Emotive, American sop? No way! Flatley operated virtually continuously from mid-July 1982 until the end of March 1984. With the exception of a two week maintenance period in that first September and a similar one again mid-deployment 1983, that ship was operational throughout the entire period. Perhaps I am a little biased now, but I give the USN full dues - those men work hard and long hours. In 20 months onboard, we were in Mayport for less than three months all up.

The spectrum of operations covered weekly running on the US East Coast exercise areas to seven month deployment a to the Mediterranean. Flatley was escort commander for the then ex-battleship lowa whilst the ship was towed through the Straits of Florida enroute to Texas. (Whether the Cubans really would have sunk her and so blocked the Straits I never did really find out). Aircraft carriers, cruisers, battle group operations - even a Christmas sortie to shadow a Soviet ASW group in and around the Caribbean - all became common companions or tasks. One evening in the Southern Atlantic, halfway through a four Aircraft Carrier Battle Group exercise, I went up on the bridge to get 'the surface picture' before closing up as Tactical Action Officer (TAO - USN equivalent of PWO) on watch. I could not accurately count the ships around the horizon there were literally dozens of warships. (I didn't dare look up!) I had no doubt that I was serving with a powerful maritime nation.

Against this backdrop, one wondered how all this was orchestrated so well. The USN is so

different in its training philosophies and management of assets. For example, there are no qualified engineering officers at sea. By qualified. mean purpose-trained L and professionally gualified marine or weapons electrical engineers. Mid-ranking officers (senior lieutenant / junior lieutenant - commanders) perform the duty of chief engineering officer of their FFGs and DDGs - even CGs. (Nuclear powered ships do have specialist engineers so relax Green Peace!) Flatley had three Department Head Officers - the Engineer, the Combat Systems Officer and the Ship Control Officer. The Combat Systems Officer was Weapons Electrical Engineer, Gunnery Officer, ASW Officer and Communications Officer all rolled up into one. All three were gualified TAOs and, in a new ship, perhaps the only qualified officers of the Watch (OOW) as well. So how do the US ships maintain professionalism and efficiency? By delegation. Chief Warrant Officers (CWOs) and Chief Petty Officers are invariably well experienced, responsible technicians to whom the responsibility for 'getting it done' is delegated. And they get it done. A different philosophy to the RAN tradition of leadership by example? Perhaps. My experience was that the Department Heads worked hard and well. Thin on professional knowledge - and especially sea experience - but good managers and watchkeepers, USN ships do work well at sea. In a six hundred ship Navy (give or take a score) some ships are obviously better - or worse than others. Cruisers, aircraft carriers and submarines are commanded by experienced veterans — the rest (FFs, FFGs and DDGs) are really cannon fodder, so to speak! The organisation and execution of that huge exercise I mentioned in the Atlantic was faultless. So, despite different methods and perceived levels of proficiency, that Navy functions most impressively.

Sailors navigate USN ships - they are quartermasters. Sailors also control F-14s and F-18s, as well as helicopters and other fleet aircraft. As Navigator of Flatley my right hand man was a Senior Chief Petty Officer - and he was good! Mind you I was also Gunnery Officer and Operations Officer - and 1 in 2 in the operations room more often than not. So you need a few good sailors - delegation is the only practical method of meeting your watchkeeping and ship duties. I firmly believe, after the practical examples observed in the USN, the RAN can take a leaf out of the US Navy's book and we should use our senior sailors far more fully. RAN Chief and Petty Officer are an asset whose full worth is not tapped nearly enough.

My sea time sojourn really climaxed with

Flatley's deployment to the Sixth Fleet from April to November 1983. We joined up with the USS Eisenhower Carrier Battle Group off Norfolk, Virginia, and the 23 ship group transmitted to the Mediterranean. Flatley was briefly detached to the NATO On-call Force, Mediterranean (NAVOCFORMED), before rejoining Eisenhower and the bulk of Battle Group off Beirut. We were plane guard and intermediate missile defence ship to Eisenhower for three months. Lebanon was in terrible self-conflict and Libya and the Gulf of Sidra were to our south-southwest. Difficult and uneasy times at sea. Yet there were moments of levity, too. Nuclear aircraft carriers, when they need to launch a strike on a windless. flat sea, get up and go (to make wind). On one such occasion, Eisenhower did just that - got up and went! I was OOW. We had the Deputy Deployment Commander onboard for lunch, and as he and I had had a previous tactical discussion which hadn't concluded as amicably as I had preferred, I was banned to the bridge. We attempted to maintain station - FFGs with their gas turbines are nimble, too. But Flatley was not nimble enough! We trailed behind the carrier - at full ahead - until the strike had been launched and the Eisenhower had regained station on us - then lunch resumed!

The back half of the deployment was no less dramatic nor exciting. Perhaps a little less dynamic. Flatley was seconded to the Seventh Fleet and operated in the Persian Gulf for nine weeks. Initially our duty was as surface-to-air missile (SAM) escort for the USAF AWACs aircraft monitoring the Iran/Irag War. The aim of the game was to provide cover for the ungainly surveillance aircraft should the protagonists have decided to seek alternate game. Then in early October 1983, Iran declared all US ships targets and threatened to close the Straits of Hormuz. Flatley then rose to this challenge, (sort of) and acted as escort for shipping through these very open and vulnerable straits. Demonstrating US political will is one thing; contending with the uncertainty of an oftthreatened Harpoon missile attack against us was entirely another! Life, in those weeks, was akin to the digger in the trenches at Flanders waiting for that fellow to blow his whistle and say 'dash it all, chaps, over we go!'.

My time in *Flatley* was long, with difficult separations and several operations into troubled waters. That ship was friendly, hospitable and full of professional and humble men. But, in all honesty, I must also admit I was grateful to detach and head north to Rhode Island and the



Attack carrier John F. Kennedy in Mayport Florida

Photo courtesy of US Naval Institute.

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US Navy's Surface Warfare Officers School (SWOS), at Newport. I joined SWOS in January 1984 and was immediately posted as antisurface warfare (ASUW) section hand in the Department Head School, within SWOS.

Life at SWOS was an experience in complete contrast to Flatley. Gone were watchkeeping, sea time and operational commitments which reflected actual political events or protracted interplay between two nations confronting each other on the high seas. Yet the responsibility of teaching officers who would replace the Departments Heads on ships like Flatley seemed no less daunting. The difference in each Navy's training philosophies I have already mentioned. How does one prepare such officers, with an average of three years sea experience, to meet the responsibilities of such positions in warships at sea in a six month course? With difficulty is the honest answer! But that is how the USN does business. They have an almost-600ship Navy to man, and to do that the schools tend to appear to be sausage-factory-like. They aren't that bad. But the pressure is intense on both the student and the teacher. The gravity of this responsibility is no less because you are an Exchange Officer. I felt professionally comfortable within SWOS and next to the USN instructors. The main difference was that one was still a foreign officer teaching USN students. So the challenge here was to relate your RAN and USN experience to your job - and translate that into practical, beneficial teaching output. Your job is real - in a real world. Not that the RAN is any less dramatic or challenging, not at all. The difference remains being in a foreign Navy, performing to high standards, and high expectation by the USN that your ability matches this situation. And it does. Not mine - but the RAN's. To really appreciate the quality and depth of RAN training and the sea experience gained in our system, you need to be thrust into a position where you must rely on your training and your background. This exchange does that, both at sea and ashore.

The time in *Flatley*, as a Department Head, gave me instant USN credibility before I opened my mouth. RAN SWO course students should observe their USN counterparts. The Americans I instructed worked seven days a week for virtually the whole six months on course. No exaggeration. They realised the backlog of knowledge they needed to acquire, and set to redress that imbalance. This enthusiasm placed a considerable load on the instructors. My staff of seven officers and senior sailors rose to the challenge magnificently! (So did i!) Twelve hour days, not uncommonly six days a week at times, lays further evidence in the case of workaholism! Noting SWOS graduates six-seven courses per annum, with class size averaging sixty-five to seventy, that is a lot of fodder!.

You are infected by their dedication and enthusiasm. The USN, at sea or at school, take their business seriously. Your USN sea experience extends to cover half the world, your professional and technical knowledge expands to heights even humble Australians grudgingly acknowledge. This is the beauty and the challenge of working for the USN. It was for me.

So this is my view of exchange. I didn't describe my exploration of the US of A, nor the friendships set in concrete, nor the wonderful hospitality of Yankees and Southerners alike. As I wrote these lines, particularly about SWOS at Newport, I somehow felt that to boast of sights seen or countries visited wasn't appropriate. Fond memories flooded back. I could see the look of fear in the eyes of one of my young Quartermasters off Beirut, or feel the tears as I stepped off Flatley to embrace my family after seven long, long months at sea. I can clearly see my students laughing at one of my ridiculous jokes in class or asking how they could remember all the tactical and equipment knowledge being thrust down their throats. These are other sides of exchange - in any Navy, in any other country.

I could rattle off a dozen different adjectives describing experience gained, exposure enjoyed or improved professionalism. I probably have rambled on too much already. But I will say that I, for one, was impressed with *my* lessons learnt. Respect for another way of doing business, confirmation that politeness and thoughtfulness are common keys to mutual understanding and respect and the RAN's level of professionalism is both high and internationally respected. Perhaps these summarise best the value of exchange.

So, these are my views on exchange. To those officers or sailors pondering the question of 'risking' an exchange posting, my advise is swift and honest. Apply for it. You will never regret the opportunity of working and living in another Navy, in another land. It was the pleasure of a life time

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THE ROYAL AUSTRALIAN NAVY — THE FIRST SEVENTY FIVE YEARS with artwork by Phil Belbin and text by Ross Gillett. Published by Child and Henry, 296 pages, 56 illustrations. Cost \$950.

In 1982 the Royal Australian Navy invited Child and Henry to submit ideas for a publishing venture to mark the Navy's 75th Anniversary. After considering various possibilities the company proposed that a book of very high quality containing a set of new and thoroughly researched paintings would be the most appropriate venture to mark such an historic occasion. It was also proposed that the book should contain a detailed history.

By late 1983 the publishers had begun talks with Phil Belbin who agreed to produce some trial sketches of naval subjects. These demonstrated his ability to undertake the artwork. Navy had by this stage produced a list of ships they considered should be included in a work of this nature. A special research unit was also set up under Lieutenant Ross Gillett to provide the reference material for the artwork and to write the text.

The resulting book is a worthy momento of the Royal Australian Navy's 75th anniversary.

A total of 400 books were printed of which 350 numbered copies are offered for sale. Each volume is personally signed by the artist, the author and the present Chief of Naval Staff.

On the production side the book is truly first rate. It is some $17^{1}4^{11} \times 14^{11}$ (470mm $\times 345$ mm) in size and is hand bound in Australian leather and buckram. Text pages are printed on high quality 160 gram Archive Cartridge while the 26 full colour reproductions of Phil Belbin's oil paintings are printed on 118 gram embossed art paper.

The book is divided into two distinct sections. The first details the history of the Navy in Australia, starting from the earliest voyages of discovery, and covering the Royal Navy in Australasian waters, Colonial Navies, and the Royal Australian Navy from 1911 to the present day. This section is illustrated by 30 pen sketches depicting naval life.

The second section consists of Phil Belbin's oil paintings of famous ships and major naval events in the Royal Australian Navy's history. Each painting is supported by a detailed description of the event. Paintings are generally of a high quality and provide a good cross section of ships which have served in Australia's maritime service since 1901. While there is a preponderance of major vessels of destroyer size and larger, other classes such as patrol craft, auxillaries and submarines are also represented. The text is enhanced by personal recollections of those who were there at special moments. The coverage is essentially chronological which is appropriate for a project of the nature sought by Navy. Some exposure is also given to the policy background to Navy's development.

A central featre to emerge is the importance of history and the lessons that can be derived for present and future considerations. All too often in the development of defence policy there has been a tendency to forget the lessons of history and to seek to start afresh from first principles. This is not to suggest that historical precedents should dominate considerations, but rather heed should be paid to earlier relevant examinations and the reasons why certain issues were either favoured or rejected.

There is much from the development of naval strategic and tactical thought from the 1901–1914 period that is particularly relevant today. In this period Australian naval thought focussed specifically on maritime defence forces appropriate to the protection of Australia's direct interests, a situation which after some six decades is in vogue again.

Australia's principal military and naval advisers at the turn of the century agreed that the primary threat to Australia was one of small-scale raids by enemy cruisers rather than large scale invasion. The influence of Australia's geographic environment was also highlighted by Captain Creswell in 1906. When commenting on a proposal for a coastal destroyer he said: 'high speed had been traded — off to provide for increased hull strength, radius of action, armament and ammunition storage. Radius of action and good sea-keeping characteristics were seen to be particularly important because of the large distances involved and because all of the Australian ports.'

These factors clearly demonstrate that in assessing maritime force structure needs, at least as early as the first decade in the twentieth century, Australia's naval advisers focussed their attention on: the likely threat, geographic factors, and strategically relevant tasks for naval vessels flowing from these considerations. These factors remain relevant today and are basic to the characteristics and capabilities sought in new submarines, surface vessels and their related aviation support.

The British Admiralty remained a dominant force, until at least the 1960s, in terms of Australia's maritime force structure development and strategic and tactical thought. Its pre-eminence was firmly established at the Imperial Conference of 1909 when the Admiralty

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suggested the Australian Government acquire a fleet unit based on a battle-cruiser. Prior to this Australian naval thinking was centred upon destroyers and torpedo craft (including submarines) as being the best means of protecting local seaborne trade and ports.

Whilst reliance on the Royal Navy brought several benefits, particularly in terms of training, personnel support, and in gift ships, it also led to the Royal Australian Navy being developed more for its contribution to Imperial Defence than the defence of Australia. Indeed during the 1920s Royal Navy advice led to the Roval Australian Navy being based on cruisers and submarines - the deficiencies of which shortly became evident. Australia was advised not to acquire destroyers because of their limited range, nor aircraft carriers because they were unproven. By 1930, however, the Admiralty was forced to acknowledge that this advice was not sound and that cruisers required destroyer support. The Australian Government's acceptance of a defence policy based upon deployment of Royal Navy units to Singapore also had a stifling influence on Australian maritime force development.

The dangers of reliance upon the Royal Navy for Australia's security were quickly appreciated as the prospects of war in Europe approached. It was soon apparent that the Royal Navy would not be in a position to provide effective naval support for the defence of Australia if Japan was to enter the war. Australia was increasingly forced to look elsewhere for assistance.

Hopefully the dangers of reliance upon Allies for security, strategic perceptions and force structure development are now well recognised. It remains therefore for Australia to develop its own strategic philosophy and doctrine relevant to the defence of Australia and to generate the necessary forces and infrastructure to support policy objectives.

The Royal Australian Navy began to distance itself, to a limited extent during the Second World War, from the Royal Navy and operated as part of United States Navy Task Groups. After the war, however, the bonds with The Royal Navy remained firm as Australia continued to acquire British ship designs. The post war fleet was based on a concept of a two carrier force of HMA Ships *Melbourne* and *Sydney* — both of which were acquired from the Royal Navy.

It was not until the early 1960s, when three guided missile destroyers were acquired from the United States, that the Royal Australian Navy started to sever its ties with the Royal Navy. The ties were further loosened with the British decision to withdraw east of Suez.

Through the 1970s and early 1980s links with the United States developed with most major naval combatants, weapon systems and armaments being sourced in the United States. More recently, however the Royal Australian Navy has begun to adopt a more independent approach looking to the Federal Republic of Germany and Sweden for its new submarine design and possibly Europe for the new surface combatant. Similarly a more independent posture has evolved on strategic perceptions and force structure development.

The most striking feature of the book is the colour reproductions of Phil Belbin's paintings. There are some truly memorable prints. Those of: *HMAS Pioneer* in Action off German East Africa in July 1915; HMA

Ships Parramatta, Vendetta and Waterhen picking up survivors from HMS Auckland; and HMAS Hobart during the Battle of the Coral Sea are particularly favourites of this reviewer.

At \$950 this book is not cheap, but one has to consider what is obtained for the price. If the prints alone were purchased then this might result in a cost in the order of that for the total work. The book warrants consideration on several grounds but particularly for its artistic merit, the quality of production, and for its history of Australia's naval heritage. In summary its a definite candidate for the naval enthusiast with an adequate bank balance.

John Mortimer

SUBMARINES OF THE IMPERIAL JAPANESE NAVY 1904–1945. Conway Maritime Press, London. Available in Australia from Princeton Books Pty. Ltd., Cnr Mills and Herald Streets, Cheltenham, Victoria \$59.95 rrp.

I believe this to be the first reference to scrutinise every aspect of the Japanese submarine force design and technical' details, strategic and tactical doctrine, development, operational success and failures. It covers every submarine from the first five *Holland* type boats of 1905 to the *Kaiten* human torpedoes and midget submarines of 1945. Army supply submarines are also included.

When Japan entered World War II it had the largest and most capable submarine force in the Pacific region. Their crews were well trained, submarines modern, and their torpedoes were the best in the world.

There can be no doubt that the Imperial Japanese Navy built some of the most interesting and oddest submarines seen this century. The Pacific War saw the Japanese develop submersibles such as the I-400 underwater aircraft carriers which were designed to carry three floatplane bombers for attacks on US cities. Displacing 6,560 tons submerged they were the largest submarines ever constructed prior to the advent of nuclear propulsion.

Another interesting development was the high speed I-201 class of attack submarines. Capable of 19 knots submerged, they were, in February 1945, the fastest in the world. Only three commissioned before the Japanese surrender and no operational patrols were made by these submarines.

The traditional application of submarines in the Japanese Navy was operating in fleet warfare, this showing in their size, lengthy cruising range and heavy armament. Smaller, medium submarines were basically designed for coastal defence.

Containing 16 chapters, this 176 page book contains highly detailed data tables of each submarine class and is supported by 174 black and white photographs, some discovered recently and never before published. Also included are twelve sets of line drawings and eight maps to further support the highly researched text.

Fascinating reading, this book fills a void in naval history.

Vic Jeffery

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