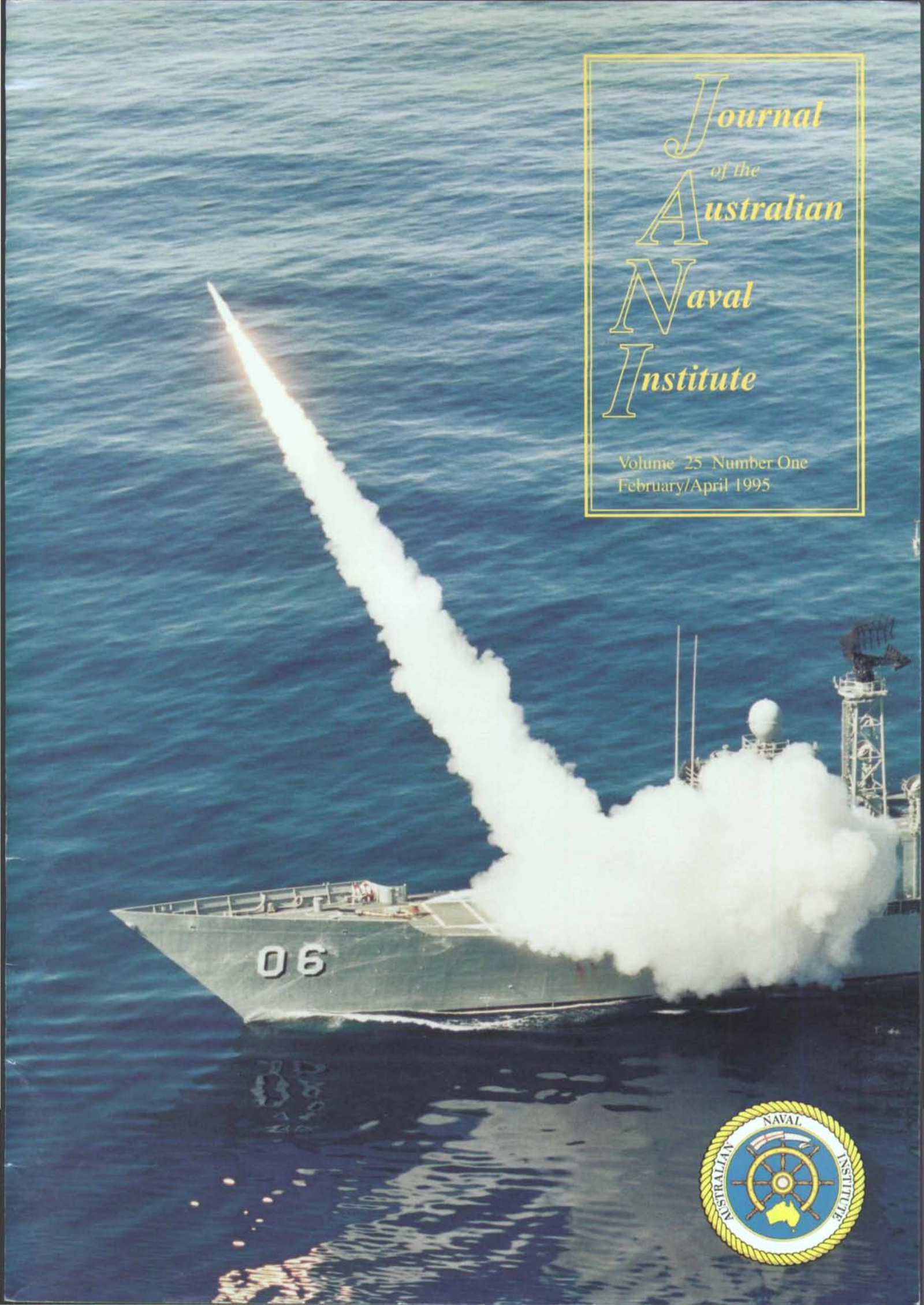

Journal of the Australian Naval Institute

Volume 25 Number One
February/April 1995

AUSTRALIAN NAVAL INSTITUTE INC

The Australian Naval Institute was formed and incorporated in the Australian Capital Territory in 1975. The main objects of the Institute are:

- 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
- to publish a journal.

The Institute is self-supporting and non-profit-making. All publications of the Institute will stress that the authors express their own views and opinions are not necessarily those of the Department of Defence, the Chief of Naval Staff or the Institute. The aim is to encourage discussion, dissemination of information, comment and opinion and the advancement of professional knowledge concerning naval and maritime matters.

The membership of the Institute is open to:

- *Regular Members*. Regular membership is open to members of the RAN, RANR, RNZN or RNZNVR and persons who having qualified for regular membership, subsequently leave the service.
- *Associate Members*. Associate membership is open to all other persons not qualified to be Regular Members, who profess an interest in the aims of the Institute.
- *Honorary Members*. Honorary membership is open to persons who have made a distinguished contribution to the Navy or the maritime profession, or by past service to the institute.

ACKNOWLEDGEMENTS

The Australian Naval Institute is grateful for the assistance provided by the corporations listed below. They are demonstrating their support for the aim of the Institute by being members of the "Friends of the Australian Naval Institute" coterie.

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Journal of the Australian Naval Institute

Volume 21 Number 1 January 1995/April 1995

SPECIAL 20th ANNIVERSARY ISSUE

This issue celebrates the founding of the Australian Naval Institute and its journal. In addition to our usual wide variety of articles, we revisit the origins of the Institute with Vernon Parker, and Rick Leahy starts a series looking at the major issues addressed in the journal over the past two decades. We also kick off the year with a 'no holds barred' column called 'Illumination Rounds'.

INSIDE

Cover Photograph: Fireball forward! A Standard missile launch

Feature Articles

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From the President.

an edited version of the President's address to the Annual General Meeting

Last year it was reported that 1993 had been a year of some considerable housekeeping on the part of the council of the institute and that we could look forward to a year of consolidation during 1994. I think we have made considerable ground in this regard. Our strategy for further developing the Institute is based on production of a high quality journal, the promotion and sponsoring of seminars in pursuit of the institute's objectives and expanding our membership. 1994 has been very successful in all these regards.

I am sure you will agree we have seen a significant step up in the quality of the journal in both presentation and content. I am confident that our flagship is not only the equal of any professional journal in this country but would stand in good stead on the international scene.

I would therefore take this opportunity on behalf of all the members of the institute to thank Alan Hinge for an excellent job during this past year as Editor of our journal. Alan has spent the year building on the very strong footing that our former Editor Dick Sherwood established for the journal, and in this process he has made considerable savings in costs.

With respect to seminars, you will recall that we endorsed at the last AGM a plan for the ANI to form a strategic alliance with the Navy's maritime studies program. I hope some of you were able to attend the very popular seminar at *Watson* in March last year — it was a good example of this partnership. Furthermore, we are jointly hosting the Naval History Conference, entitled the RAN in World War II, at the Maritime Museum in Sydney in May this year and are negotiating participation in the major maritime conference, called Seapower in the New Century which is to be held at the Brighton le Sands Conference Centre in November.

The 1994 Vernon Parker Oration was delivered by Rear Admiral Fred Crickard, a retired Canadian naval officer and produced a lively debate. Together all these activities are encouraging and promoting knowledge of the Navy and maritime profession and providing a forum for the exchange of ideas — in other words we are achieving the institute's objectives.

Our Chapter Convener will report in some detail of the activities of the vibrant New Zealand Chapter. Without doubt our trans Tasman brothers have taken up the aims of the institute in a most enthusiastic manner and have been most successful in spreading the maritime word. They have also been most creditable contributors to the journal. I congratulate and thank them for their efforts. While on the topic of spreading the word Council have implemented some recent initiatives which in my opinion will stand us in good stead for the future. As you are aware the ANI sponsors the RAN Staff College Silver Medal award, a most prestigious prize. The ANI has agreed to sponsor a prize for the Naval History chair which is expected to be established shortly at the Defence Force Academy. In addition, the Junior Officer's Staff Course and the residential phase of each Senior Sailor's Staff Skills and Administration Course will be given a prize from the ANI. The prize for these latter courses will consist of a book award and membership of the Institute for a period of twelve months. In addition last years Defence Academy graduates have all been given personal issues of our most recent journal and twelve months' membership of the Institute. I hope you will agree with me that the future of the Institute lies in the younger members of our Navies and their propensity to ask the hard questions in the maritime debate.

Talking of the future — our prospects are good. Through our corporate sponsorship we are in a healthy financial position and this should allow us to pursue further initiatives during 1995. One proposal that the Council is examining is the provision of part-time secretarial support to assist the handling of the Institute's administration and give the ANI a more professional appearance. It is early days in developing this proposition but I consider it has merit.

Finally I would like to express my thanks to the Vice-Presidents and other council members for the support they have provided throughout the year. There is a healthy mix of youth and experience on the Council and I am particularly encouraged by the very active

and valuable contribution made by the more junior officers. I would like to thank Simon Woolrych and Gerry Gogan in particular for their contributions. They have both had to resign at the end of last year. Simon has provided a wide range of services over a number of years. Gerry has performed the thankless task of treasurer. Both have served the Institute very well.

The Australian Naval Institute has not experienced the rate of change that our navies have in recent years but the consolidation process in a part-time organisation such as ours has been almost as dramatic. When Council membership is declared vacant later this evening I ask each of you who have not yet nominated for a position to give it serious consideration. I can promise you a period of challenge combined with a great deal of personal satisfaction.

Regards,
Chris Oxenbould

From the Editor

This first issue JANI for 1995 marks twenty years of journal production. Perhaps this does not sound like an extra ordinary achievement, but given a *total* production and distribution budget of $A 30,000 per annum and no employed staff, consider what we get for our money - eight hundred copies of this colour journal distributed every quarter to members in eight countries. This is not only a credit to your current Council but also to those councillors who came before; who saw what needed doing, took the decisions and did the work. Previous editors and councillors, with the help of their wives and kids have, for two decades, produced and distributed this professional journal in their own time at what I know to be considerable personal cost. To individually list the many councillors involved over the last 20 years would be too long a task, but all ex ANI Councillors can be assured that the Institute in general and JANI in particular would not be enjoying today's success had it not been for their contributions.

This 20th anniversary issue kicks off with a rather risque column called 'IIIumination Rounds'. In it readers have a chance to comment about issues concerning the navy and the objectives of our Institute. The column is put together by 'Odd Ball' who tells me we need a little constructive controversy. On reading the draft of 'IIIumination Rounds' I was delighted to see the Institute's old friend 'Cyclops' make a sudden, dynamic reappearance. In fact, we are reproducing the 'Shiphandling Corner' column of the first JANI where 'Cyclops' appears as a 'professional ship wrecker'. And on the subject of old friends I thank Vic Jeffery and his fine team of 'Phots' from WA for a steady flow of outstanding colour shots and stories, several of which appear in this journal. Keep the good stuff coming Vic.

Lieutenant Rick Leahy takes us on a short trip down memory lane and provides an overview of JANI over the last few years - including major issues it has tackled and characters who have emerged. We look forward to more of his '20 Years of JANI' instalments through this year.

Other interesting features in this issue include an article from Commander Alan Du Toit; he considers the impact of technological trends on surface ship vulnerability. Also, on the technical side of naval strategy and operations, Part 2 of our seven part *Fighting Smarter* series looks at the sea mines we need and how we should use them.

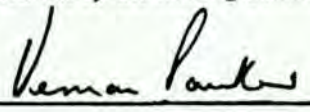
News and views from our thriving NZ Chapter abound in this issue, and include another informative 'Letter from Wellington' by the fearless 'Jacko'. On other matters 'kiwi', Athol Forrest looks at the good, bad and ugly aspects of business management principles as they are applied in the New Zealand Defence Force.

Geoffrey Bewley and Lieutenant Alistair Cooper round the issue off with excellent historical pieces. Geoffrey tells us about the origins of 'ram bows' and Alistair gives some views on tactical aspects of the Battle of Jutland. So, all in all we have an exciting issue with which to start this Celebration Year for our Institute. Enjoy the read.

Alan Hinge
Editor

From the President

It gives me great pleasure to write this first message to members of the Australian Naval Institute. In the years to come many people will write for the Journal and so it is with this certainty and also the belief that the Institute will grow and go from strength to strength, that prompts me to say that at last, we people devoted to the advancement of professional knowledge with respect to maritime affairs from an Australian stand point, have a forum dedicated to expressing such views. We should be proud to belong to the Institute and having got off to such an auspicious start we can be quite confident about the future. I would like to express my appreciation of the hard work carried out by the steering Committee and others associated with our beginning and also to thank you for the honour of electing me the first president.



THE AUSTRALIAN NAVAL INSTITUTE – HOW IT BEGAN

In October 1973, late one night, when usually the most eloquent arguments are propounded, the clearest statements made, and the Navy is put to rights V. Parker and J. Robertson came to the not original conclusion that what is needed is a Naval Society. During the following few months the idea was discussed with various people to gain some indication of support. Thus it was on 12 July 1974, 16 officers met in the Conference Room of Navy Building 2, Russell Offices, Canberra to more formally discuss the proposal. At this meeting the formation of a Naval Society, with the broad aims of encouraging and promoting the advancement of knowledge related to the Navy and the maritime profession and to provide a forum for an exchange of ideas related to the Naval profession, received encouraging support. A Steering Committee was formed consisting of V. Parker, J. Robertson, L.G. Fox, W.B. Loftus, A.M.F. Summers, N.E. McDonald and K.W. Grierson. Several Meetings of the Steering Committee then followed, under the Chairmanship of W.B. Loftus and drafted a constitution for consideration by the Registrar of Companies for Incorporation in the ACT. It was decided that the Society should be called the Australian Naval Institute and on 2 October 1974 a letter was forwarded to the Minister of Defence requesting approval to use the word "Naval" this being a specified word for the purposes of the Defence (Prohibited Words and Letters) Regulations. The proposal received out of session Naval Board support. Notwithstanding, it was not until 15 January 1975 that the Minister's approval dated 7 January 1975 was received. Meanwhile membership was slowly increasing and reached 30 by 21 January 1975.

With Ministerial approval to use the word Naval our Honorary Solicitors were instructed on 21 January 1975 to formally seek incorporation. A most extraordinary series of events then followed. At first the Registrar did not like our objectives. Then he thought the use of the word Naval should be referred to the Attorney-General. When it was pointed out that the Minister of Defence had approved this the Registrar then demanded to see the original of the approval and not to receive this through the Officers of the Institute but direct from the Department of Defence. You may draw your own conclusions from this stipulation. In any event the Registrar referred the whole question of incorporation to the Attorney-General in early March 1975. In early April the Attorney-General queried whether the Australian Naval Institute was associated with the Navy League or Naval Association, which at the time, you may recall, were issuing statements to the press on Naval policy. The Attorney-General was informed that we had no association with these two bodies and for that matter with any other organisation. Frustrated by these delays and in expectation of an earlier consent to our application a Special General Meeting had been set down for 4 April 1975. This was duly held and an interim Council elected, an Auditor appointed and a paper "Law of the Sea-Defence Implication" was delivered by Commodore K.D. Gray DFC ADC RAN, an historic first. On the books on that date were 57 foundation members.

The Attorney-General gave his consent in April 1975. The Registrar approved the publication of an advertisement in the Canberra Times on 24 April 1975 giving notice of the intention to form the Australian Naval Institute. The ANI was formally incorporated on 10 June 1975 at which time the membership stood at 68. In all, twenty months from conception to realisation.

ILLUMINATION ROUNDS!

with 'ODD BALL'

Perception, Reality and Navy PR

We live in an age of images. The famous are famous for being famous and assidu ously nurture their legends. Advertising agencies flourish, creating favourable images for their clients. Accordingly those who seek their own way go about establishing images of themselves which are favourable, and, at the same time, they often try to create images which diminish their competitors. None of this is very new and it may seem like overkill to restate it. But it is vital to understand that perceptions are more important than realities when it comes to getting results, and if the Navy is ever to be allocated the resources it needs to fulfil its strategic missions, it should develop a public image which politicians want to be seen to support. Unfortunately, and as a wholly subjective opinion, the current public image of the navy conjures up adjectives such as 'reactionary', 'conservative', 'expensive' and 'slow'. Yet, of course, this image is contradicted by the facts and technologically the Navy is streets ahead of the other services.

In the business of image and myth making, there is little doubt that the Army is far and away the best at it. The Air Force runs a good second as the supposedly high technology wave of the future, and the Navy runs a bad last. For example, the twentieth anniversary of Cyclone Tracy reinforces many of the misleading images and mythology of the time. No doubt General Stretton did quite a good job in his six days in Darwin, but he was elevated by the media at the time to be the single handed saviour of the city. And the media, which claims to be so hard headed, never took the trouble to find out who actually took decisive actions and set in train all the efforts to provide for the relief of the city. As a result we are left with a media image of Darwin saved by General Stretton single handed. An alternative, eye witness view of Stretton's performance was recently given by Mr Michael Barker QC, who suggested that,'...One cannot deny General Stretton's dedication, but his six-day reign must rank in Australian history as one of the most bizarre administrative intrusions into the life of the citizenry. He did not leave at the end of a mission accomplished. He was quietly flown out, very suddenly. We were given no official reason...' (*The Australian*, Letters to the Editor, 9 Jan 95). And Stretton, departing Darwin, had the ill grace to say to some Darwin men, and to record in his book that he had said so, that the arrival of the Fleet next day would probably compensate for the absence of women there. As for the huge clean up task by the Fleet in 1975, all that was mentioned in the Press in 1994 was that HMAS *Melbourne* was there.

Whatever else General Stretton may be, he clearly understood the image and myth making business.

Today, the public image being carefully cultivated is that Army is being starved of resources to pay for capital equipment projects for the Navy. It is curious that no one publicly questions why it is that an army of 28,000 has difficulty in fielding a ready reaction force of any size, while a Navy of 16,000 has about 3,000 people at near immediate notice for combat, or any other task demanded of it.

There are things the Navy should and must do to give itself a more attractive public image. It is simply not enough, for example, to just react to the sexual harassment problem, or to any other adverse publicity as it arises. It is appreciated that a centralised public relations organisation in defence makes it difficult for the Navy to establish and run its own unique image making program, but that is not the same as making it impossible. There must be people serving who are smart enough to develop an active public relations program: they must be found and set to work. And, this activity needs to be a central element in the Navy's strategic planning.

'Cyclops'

(Ed. Good to have you back on board Cy)

Bureaucracy at its best!

I genuinely believe in the last five years or so the RAN has made real advances in trying to make jobs better through increased delegation and cutting down on red tape, so it is disappointing to see the odd Navy Office directorate still upholding the tried and true principles of obstructionism, production of needless paper work and sheer bloody mindedness - all aimed at making the serviceman's life more difficult. The navy can still be its own worst enemy, as the following extract from a letter concerning a request for Civil Schooling reimbursement shows:

References:

A. HMAS HARMAN minute .....

B. DI(N) PERS 20-4

1. Further to reference A, the above named member's request for reimbursement of transit fees has been received at... *(Directorate's name not included to protect the ignorant).*

2. Members(sic) attention is drawn to paragraph 14(g) of Reference B where by(sic) member should refrain if possible from making separate claims for minor increases(?) (less than $30.00). In cases of minor changes (sic) members are requested to wait until the next occasion they submit a request for reimbursement and seek approval for them together.

3. Original receipt of $20.00 for transit fees is returned at the enclosure.

Stop the bullshit! If real workers incur expenses, then pay up. Allow us to get on with our real jobs. Don't quote rules you dreamed up to make your own lives easier — and do a bloody staff course! There are no more berths for fat gutted, illiterate bureaucrats in uniform in my navy.

POPO

(Ed. POPO, baby! What's with all the negative waves! Why can't you say something righteous and hopeful? This story does have a happy ending. The receipt was handed to an Air Force pay clerk and POPO got paid the next day. Apparently, at the sight of the 'letter' the blue suited professional had a good belly laugh in the confidence of knowing he had joined the right service. All's well that ends well!)

A modern day *Marie Celeste* ?

The RAN is at a watershed in its development. Changing social pressures and expectations are impacting on what is, in essence, a service deeply rooted in the traditional past. These pressures are eliciting institutional change, but is this change managed and controlled properly, or is it merely forced?

These are only a few of the many issues that the RAN must seriously address if it is to progress and prosper:

1. Society demands equal opportunity and non discriminatory practices. Equal opportunity at the recruiting level, and increases in the overall female to male ratio should be matched by similar increases in the sea going female/male ratio. Otherwise serving male members will be forced to undertake more sea time, and consequently will spend less time with their families: a discriminatory outcome!
2. Society now sees two income families and two career paths as the 'norm'. Does 'normal' naval life sit comfortably with these developments?
3. Society also demands higher academic qualifications as the professional norm. Recruitment, remuneration and advancement are increasingly seen as being linked to higher qualifications. Is the traditional RAN 'reward' system up to this task ?

History is replete with examples of military institutions which time simply passed by: the Praetorian Guard, the Templar Knights and the Japanese Samurai. Will the RAN follow suit? Today the service is like a modern day *Marie Celeste*, gliding peacefully and emptily forward; with signs of life all around, but none in existence. What the navy has to do is build a future rich in dynamic achievement that past and present naval personnel and their country can be proud of...'boldly going where no one has gone before'.

Yours faithfully
Mr Spock

(Ed. Beam the navy up, Spock!)

Controversy Corner — Wrens, abandon ship

Few readers will have been surprised by revelations in yesterday's Daily Telegraph about the problems besetting the Royal Navy's women at sea. In 1990, when the policy of putting women in ships was initiated, we predicted that it would run into trouble. The Lords of the Admiralty must have been the only people in the country who failed to foresee that if a small number of young women are confined on ships for long periods with a large number of young men, bitter tensions and sexual complications will ensue.

The 1990 decision was prompted chiefly by concern about falling male recruitment. Beyond this, the services and their traditional commitment to fairness over promotion and job allotment, energetically embraced the 'equal opportunity' philosophy, and the navy went further in this than its sister services. The Sea Lords decided that there were many sea borne trades and appointments which women could successfully fill. The old WRNS had been far and away the most suc-

cessful of the women's branches of the armed forces. It attracted people of high quality, and did its job impeccably. Why should not Wren's do as well at sea?

Old sailors could have told them. Providing separate quarters for women diminishes a ship's fighting efficiency. Many women are not physically strong enough to perform essential ship board tasks. More important still, a ship is an intensely intimate society. Long periods of isolation, in a company of perhaps 200 people often create tensions. Much of a captain's task involves sustaining an emotional balance between competitive and virile young men, officers and sailors alike. As sailors seem to have decided as long ago as the quinqueremes of Nineveh (sic), casting the opposite sex into the potent, emotional mix of male crew at sea invites trouble. Friendships become love affairs, hatreds become sexual jealousies, women are hurt, men are slighted, the efficiency of the ship is threatened by quite unnecessary complications. The policy of sending women to sea was ill considered and should be abandoned. (UK *Telegraph*, 25 October 25, 1994)

(Ed. Comments please)

Across the Tasman—another successful year

NEW ZEALAND CHAPTER REPORT TO AGM

By Commander B.M. Coffey, RNZN, Convener

1994 was another successful year for the New Zealand Chapter with a high level of participation and activity being conducted in both the Auckland and Wellington regions.

Throughout 1994 the membership increased from 78 to 91, a net increase of 13, made up of two resignations, one failure to remain financial and 16 new members. A number of recruiting initiatives were invoked throughout 1994 which provided a steady flow of membership applications and raised the level of awareness of the purposes of the ANI amongst a good many other personnel.

An important and very welcome development in 1994 was the approval of Council to the change to Regular Membership status of New Zealand Regular and Volunteer Force personnel in lieu of Associate status.

The quality and range of speakers and activities provided for New Zealand Chapter functions at both ends of the North Island have remained at a high calibre. These have included Grant Howard, noted author, historian and journalist; Vice Admiral Sir Somerford Teagle KBE, Chief of New Zealand Defence Force and Rear Admiral John Welch, Chief of Naval Staff (AGM, Auckland).

In addition other activities included a visit to HMNZ Ships *Wellington* and *Monowai* to view the NAUTIS Command and Control system and the HADLAPS data plotting systems on the respective ships. The Wellington Chapter was addressed by the Secretary of Transport on the Maritime Transport Safety Act, by Captain Peter McHaffie on his time at Canadian National Defence College and the Chapter conducted a maritime international law forum.

The New Zealand Chapter sponsored two prizes for junior officers completing initial officer training - one in each of the Regular and Reserve Forces. The prizes of a pair of binoculars and a one year subscription to the ANI were well received.

The Committee continued to meet regularly at a variety of novel venues, including the Captains Flat HMNZS *Philomel*, on board HMNZS *Endeavour* and MV *Aquelle*, the Kauri Point Armament Depot and Museum, and The Northern Club. The addition of another junior officer to the Committee has proved to be beneficial in increasing the profile of the ANI amongst junior officers.

The administration of the matters of the New Zealand Chapter of the ANI have been greatly facilitated by the good offices of the New Zealand Chapter Councillor on Council. The patience of the outgoing Chapter Councillor, Commander Liz Coles, in assisting in the birth of the NZ Chapter is willingly and gratefully acknowledged. Similarly the ongoing assistance of her replacement, Captain Ian Noble is also appreciated by the New Zealand Chapter Committee.

The New Zealand Chapter members have been very impressed by the standard of the ANI Journal and would commend the extensive efforts of the incumbent Editor in achieving this. The New Zealand Chapter has been well represented in the Journal including both written and photographic material.

Intentions for 1995 include another broad range of activities and meetings in both the Auckland and Wellington regions. It is planned that ship visits to HMS *Monmouth* and HMCS *Vancouver* will take place later in 1995 as well as a contingent of NZ Chapter Members attending the launch of the ANZAC Class HMNZS *Te kaha*. A number of dinner evenings are planned along with a Cocktail Party at the end of the year. Additionally, the viability of forming a Public Relations Sub-Committee will be investigated as well as the possibility of offering free one year ANI memberships to a number of junior officers completing initial training.

The New Zealand Chapter continues to provide very visible support to the aims and goals of the Institute and the Committee is committed to seeing the Chapter continue to grow throughout 1995.

'The Penetrating Insight of Hindsight'

— A brief look at Twenty Years of JANI

by Lieutenant R.C.A. Leahy

"We people devoted to the advancement of professional knowledge with respect to maritime affairs from an Australian standpoint, have a forum dedicated to expressing such views"

With these words, the founding President of the Australian Naval Institute, Commodore Vernon Parker, launched the ANI's flagship — the *Journal of the Australian Naval Institute* (*JANI*) in August 1975. The purpose of this paper is to provide a brief overview of *JANI* over the last 20 years. I cannot promise a comprehensive coverage. This would be impossible in the space available. However, I hope that by focusing on some of the key issues that concerned some of the contributors, we might draw out the role that *JANI* has played in the naval community since its establishment. Clearly with the 'penetrating insight of hindsight' we can look at the predictions that came true, the issues that remain current and those contributions best left as part of history.

The Objectives of the Institute

In 1975, the establishment of the ANI and the publication of *JANI* had the potential to be the antipodean answer to the United Kingdom's *Naval Review* and the United States Naval Institute's *Proceedings*. The ANI encouraged freedom of debate and contributions would be judged on content, not authorship. The Institute was determined to promote open discussion of any matters relating to the navy and to the maritime profession. The use of pseudonyms, although not always encouraged, still remains the author's privilege.

Maritime Strategy - The One Constant

Just as military historians and theorists debate the constants of strategy, so too has *JANI*. If there is one common thread woven through the Journal, then it is the vociferous and wide-ranging debate on maritime strategy that has occurred in its pages. Quality articles such as Commodore J.A. Robertson's 'Fundamentals of Maritime Strategy' and Vice Admiral J.J. Hayward's (USN) 'Impact of Technology on Strategy' have been commonplace in the pages of the Journal over the years.

Interestingly, but not surprisingly, many contributions in the late 1970s and early 1980s concentrated on the threat to Australia and the Region posed by communism. Various Cold War scenarios were debated in the Journal. The Soviet submarine threat was tangible, as was the expansion of forces and capabilities in the Region. China was also a concern. 'Gig' penned a series of wide-ranging articles on China, warning that:

> "We may expect firm moves by China to establish satellite transitional socialist states within the next decade in Taiwan, Thailand and Malaysia."

The unification of Germany and the collapse of the Soviet Union have resigned many of these concerns to the pages of history. Perhaps of more interest is the manner in which some contributors to the Journal have succeeded in their 'crystal ball gazing'. For instance, a paper delivered at the 1976 Naval Symposium by four officers - dubbed the 'Young Turks' and including the then Commander I.D.G. MacDougall - was entitled 'The Needs of the RAN 1985 to 2000' It is fascinating to compare their hypothesis with today's Navy. The 'Young Turks' were right on the following:

- Australia will face no direct threat.
- EEZs will be activated.
- Australia will face problems with foreign fishing fleets.
- World economies will become increasingly interdependent, especially on sea trade.
- Smart weapons will assume greater importance.
- Self-reliant defence will be critical, especially in shipbuilding.
- Most officers will need to be tertiary educated.
- Australia will have lost her 'technological edge' in the region.

Their stated role for the Navy is also very close to our current objective - "The conduct of operations at AND OVER [their emphasis] the sea for the defence of Australia and Australian interests". Of course, where their hypothesis is different is a result of the Navy's unsuccessful bid for an aircraft carrier. The lack of an aircraft carrier and our diminished capability for power projection was the major area where their 'soothsaying' let them down, but other missed predictions included:

- The Navy would be operating and controlling maritime patrol aircraft.

- Soviet submarines would pose a major threat to Australia.
- Surveillance satellites would be operated by the Navy.

Where they went furthest off the path, was in their prediction that Australia would join the 'nuclear club':

> "We would like to develop a nuclear deterrent on our own...If the threat level we intend to combat includes nuclear weapons in limited numbers then it follows we should have them too."

It is difficult to know to what degree articles in *JANI* and ANI debate actually influenced defence decision making. What is clear is that the Journal covered all the important debates and often succeeded in predicting the outcome. As just one example, the RAN has always been heavily committed to developing relations with countries in the region. Many articles in *JANI* demonstrate this. In the case of Indonesia, 'Ourselves as Others See Us' by Major A.A. Kustia of the Indonesian Navy and 'Indonesia's Perception of SLOC is S.E. Asia' by Major General Subijakto illustrate this point. In 1980 a fascinating article appeared by Lieutenant Kerry Clancy, entitled 'The RAN and the JMSDF - Pacific Partners'. Clancy argued that:

> "The interests of the RAN and the JMSDF coincide in many ways...At present trade between the two countries is worth nearly A$8,000 million per annum, and 35% of Australia's exports are carried in Japanese ships...The protection of this trade is an immense task...Accordingly Australia must investigate ways of involving Japan in the forward defence of that part of its own shipping which is on the Southern Asian sea lanes."

Many *JANI* articles in the mid 1980s were devoted to debating the assumptions and conclusions of Paul Dibb and the 1987 White Paper. The current President, then a Captain, wrote that the Dibb Report:

> "...has stimulated considerable comment and debate within the media...it is a major step forward in its contribution to the public discussion of important defence issues; and in some areas it addresses matters not previously raised in the public forum."

Rear Admiral J.R. Hill (RN) agreed with many of Dibb's recommendations during a 1988 visit to Australia, adding that more work needed to be done on force structure:

> 'Australia has unique problems. The basic ones are that it is very big, and therefore difficult to defend. But also, it is very big and therefore difficult to attack...But an outsider, looking in on your great country, sees your new policies as based on cool self-appraisal and sound forward thinking...I have to congratulate you on a notable strategic coming of age."

Indeed, it was the late 1980s and early 1990s that *JANI* began to attract some influential international strategists to its pages. Eric Grove submitted an article 'Sea Power and the Gulf War' while Ken Booth's 'The "New World Order" and the Future of Naval Power' outlined the new roles of navies which have concerned strategists in this decade.

Professional Issues

Although debating maritime strategy is almost the raison d'être *JANI*, clearly there are many other subjects of professional interest to its readers. Over the last 20 years, issues of professionalism have varied from the serious subjects of defence budgets, to whether officers should carry silk handkerchiefs in their breast pockets! For example, it is edifying to note that the current Chief of Defence Force had this to say in 1977, taking an author to task in a letter to the editor:

> "Australia's exisiting military structure is a product of our history (to call it an 'accident of history' would be less than charitable to our predecessors)...I do not accept [the writer's] assertion that 'the cost of providing equipment for one of the three Services affects the ability of the other two to meet their objectives.' This assumes that the objectives of the Services will always conflict and that the conflict cannot be resolved or the objectives integrated."

The division of the defence budget pie will always be a serious matter, but what about dress and bearing? 'Vang' undoubtedly upset his Tri-Service brethren in 1979 when he exclaimed:

> The wearing of a full beard and moustache stamps the wearer as a man of sound common sense ...the wearing of a moustache without a beard is faintly ridiculous. The deliberate cultivation of a patch of hair on the upper lip serves no useful purpose at all and stamps the wearer as a man of vanity and pretension."

In the light of the current uniform review, it is interesting to see that rigs have always been a hot issue. The unrepentant H.G. Julian had this to say:

> "It's okay for the oldies and the staunch traditionalists, but officers' No. 5 uniform is really an 1870 blue serge suit, given brass buttons and (very expensive) gold rank badges. The sailors' equivalent is strictly HMS *Pinafore* stuff and utterly impractical."

Captain J. A. Robertson provided sound advice to all in 1976 in a two part piece entitled 'The Battleship Mentality'. So provocative are these articles that they warrant reprinting in full in a later edition of the Journal.

However, the best professional advice (for me at least) was provided by the then Sub Lieutenant J.V.P. Goldrick in his 1981 article - 'How to succeed in the Navy without appearing to try'. As well as counselling young men not to become Observers - "Life's passengers", Goldrick provides sage advice on marriage to a WRAN:

> "Marriage is out of the question, since half are much smarter than the average A.Y.O. [Aspiring Young Officer], will insist on staying in the Navy, and will have four stripes while guess who is still eyeing that brass hat in the outfitter's window."

Lest the reader thinks that the early 1980s marked *JANI*'s slide toward satire, nothing could be further from the truth. The few years either side of 1980 marked a watershed in the RAN's history. The key issues were covered in detail in *JANI*. I would like to look at two that caused the most hurt to the Navy - the Carrier Debate and the establishment of ADFA.

The Carrier Debate

Support for a replacement carrier for *Melbourne* was universal in the RAN. To speak against it was heretical. Commodore Donohue summed up the role of the carrier stating:

> "The Aircraft Carrier is the most complete projection of maritime power yet devised. It has an excellent strategic value and as well as reconnaissance, early warning and fighter defence, it can provide a flexible anti-submarine force; it also has the capability to support land forces.

It seemed as if the aircraft carrier could be 'all things to all men'. In February 1982, in an article entitled 'The Navy's New Aircraft Carrier' the then Chief of Naval Staff, Vice Admiral Sir James Willis, explained why the RAN would purchase the ex HMS *Invincible* when this type of carrier had earlier been described as not suitable. Although criticism from the Press, Politicians and the RAAF was commonplace at the time, it was only the brave or foolhardy member of the Navy who would even contemplate the RAN without a carrier. To the ANI's credit, it fostered wide debate on this matter, and an article 'What if No Carrier' by Lieutenant Commander Allica suggested an alternative force structure if the unthinkable happened. Remarkably, his suggested naval force bears a striking resemblance to our current force structure.

Of course the unthinkable did happen. By 1985 it appears it was 'safe' to talk about this other 'peacetime disaster', and *JANI* ran an excellent article by Lieutenant Commander Francis called 'Ashes to Ashes - The Rise and Fall of the RAN Aircraft Carrier Project'. In this article Francis outlines the project's history and why we failed.

ADFA

Another key issue for debate in the pages of *JANI* was the establishment of the Australian Defence Force Academy. The furore in the years leading up to the establishment of ADFA was quite remarkable. Sir Leslie Martin had concluded in his report in the late 1960s that:

> " ...there is a genuine and increasing need in the Services for officers who have followed appropriate courses of tertiary education...officers of the future must be more than leaders of men schooled in the techniques unique to their professions...They must be articulate and able to communicate and collaborate with specialists in fields such as foreign affairs, economics, and industry."

The Navy accepted these conclusions; the issue was how best to implement the tertiary education of officers.

The proposed tri-Service Academy was criticised on many grounds, including:

- Its Canberra location.
- Its military focus.
- Its academic focus.
- That it would foster, not negate, single Service rivalry.

'Master Ned', *JANI*'s most notorious anonymous contributor, described ADFA as "the biggest confidence trick ever perpetrated upon the Australian public." He argued persuasively that an officer's education - not his training - would be better fostered in the more liberal environment of a normal university. Supporting the Navy's arrangements with UNSW at the time, 'Master Ned' suggested:

> "...naval officers were exposed to all streams of political opinion and background that are to be found at the average university; they were forced to justify their existence and choice of professions and they discovered the strengths and weaknesses of other beliefs and doctrines."

The Reverend M.A. Head agreed, reminded readers that:

> "20 years ago, various religious orders began to send students to secular universities, instead of running their own institutions, as they had done for the previous thousand years or so. It seems that some in the Defence Department are determined to do the reverse, to create some sort of military, monastic elite, instead of a Defence Service whose members can easily take their place as part of Australian Society."

Political reality is...reality. ADFA happened and the Navy had to make it work. Interestingly, for those who

criticised the quality of the early graduates, Rear Admiral MacDonald, when Chief of Staff to the Flag Officer Commanding Australian Fleet, signalled his dissatisfaction with the quality of junior officers in 1970:

> "The main professional shortcomings appear to be in General Service knowledge, leadership, Fleetwork and Midshipman's sea training."

Some things never change!

Conclusion

ANI has had a distinguished history over its first 20 years. Unfortunately this brief article has only scratched the surface. There were many worthy topics that could have, should have, been covered, including:

- *JANI*'s coverage of naval history.
- Past Presidents, Editors and Councils of the ANI.
- The wide variety of personnel-related papers that were published - some of which retain validity.
- Membership demography of the ANI.
- The 'filler' pieces - 'Shiphandling Corner', 'Classic Signals'.
- Activities of the Chapters.

Perhaps these can be covered in later issues of the Journal through this year.

Has *JANI* been a success? My view is yes. Before 1975, before the ANI, before *JANI* there was no forum for debate on maritime issues in Australia. In this respect the ANI has achieved its objectives. No issues were dodged, anything was open to debate, so long as it was conducted in a balanced and rational manner.

Where are we now? The Journal continues to build upon its achievements, but we lack the wider debate and synergy encouraged by Chapter meetings across the Country. We need to be wary of becoming a "retirement home for the brass hats" as previous editor, Commander Cutts put it. The future success of the Institute lies in our ability to attract new and vibrant members. ADFA cadets are now being targeted for membership. This is a step in the right direction. As the Reverend Head suggested:

> "These young men [and women] should be encouraged to publish, publish, publish...It doesn't matter if writers make fools of themselves, tread on sacred cows or sacred feet...Every decade has to produce its own generation of 'Young Turks'.

There is much to celebrate on the ANI's twentieth birthday. But this is not a time to rest on our laurels - there is much work to be done if we are to live up to the expectations created in 1975. The words of the USNI's Clay Barrow may put the last 20 years into perspective:

> "Both USNI and ANI began with a President, a Vice President, and a governing body totally committed to freedom of speech - particularly for the junior officers. The officers have endured, but the commitment has not always been steadfast in the face of overt or covert pressure from Navy officialdom. Knees have been known to buckle and eyes to water in Annapolis and Canberra when the head of either Navy wrote something like, 'Overall, you are doing a good job, but you should strive for more balance. You should at all costs avoid controversy-for-the-sake-of-controversy (by which he meant any controversy) and ad hominem attacks, particularly with regard to official policies.'"

IS TECHNOLOGY MAKING SURFACE WARSHIPS OBSOLETE?

By
Commander Alan du Toit, RAN

Missiles, data processing and helicopters have restored standard surface ships to their rightful place in combat at sea - something that would have seemed unlikely some years ago.

Admiral Hubert Moineville
French Navy [1]

Few will doubt the potential for technology to revolutionise warfare. Since 1945 - which was without doubt a great watershed in both tactical and technical naval development - advances in technology have brought about fundamental changes in naval strategy. Many observers have deduced from such things as the sinking of the Israeli destroyer *Eilat* in 1967 by Egyptian fast attack craft firing Styx anti-ship missiles, or by the losses suffered by the British Task Force in the Falklands conflict [2], that surface naval power has been significantly eroded by accelerating technological developments. Furthermore, they are showing increasing concern about the future vulnerability of surface platforms. They contend that the surface ship is large, visible, slow moving and expensive in terms of what it can offer, when compared to submarines and aircraft, and that the offensive power of the surface ship is constrained by the increasing need to devote a large proportion of its displacement tonnage to simply staying afloat in an increasingly hostile environment. As a result, they argue that it has more difficulty in surviving and less capacity to do the enemy harm than previously, and consequently, that the role of the surface warship is limited to low-risk tasks, for situations requiring no more than the limited application of force, for flag-showing, training cruises and for holding cocktail parties in foreign ports. [3]

This discussion on the present and future validity of the surface ship, will be considered under three headings, namely the role of the modern surface warship in sea control operations and naval warfare generally, the weapons and sensors carried by surface combatants and finally the vexed question of surface ship survivability. This paper argues that despite the technological revolution in the naval environment, the modern surface warship is not prohibitively vulnerable, that its place in combat at sea remains firmly secure and that the surface ship of the future will remain the basic unit of naval power.

The Role of the Surface Warship

Looking at the steady flow of new surface warships being built around the world, it is hard to believe that a generation ago the need for surface warships of any sort was in question. Surface ships have many functions and their vulnerabilities as well as their potencies are as much above the surface as beneath it. The most unique and arguably the most important function of surface ships is the command and control of forces at sea. Straddling the interface as they do, equipped with a comprehensive range of communication equipment and full of data processing and display equipment, they are best placed to have a full grasp of the situation. [4]

There is a long-running controversy in most navies concerning the relative merits of surface ships and submarines as anti-submarine platforms, and there can be little doubt that there are, indeed, certain aspects of the art in which submarines are superior. Nevertheless, surface ships can perform certain functions for which a submarine is far less effective, including protecting a task group or convoy against surface and air threats. Moreover, surface warships can give a visible indication of a 'naval presence'.

France's Admiral Moineville has aptly described the surface ship as the foot soldier of the sea. Moineville argues that being at once under the surface of the sea, on it and above it, the surface ship can receive all kinds of data, and can make the best possible assessment of any given situation and so participate in all types of action. Certainly, a look at attack envelopes of a modern major surface combatant demonstrates just how flexible a surface ship with a wide range of

onboard weapon systems and sensors can be. The surface ship's versatility means that it can act effectively in a whole range of possible actions at sea. It can carry sensors and weaponry appropriate to all four types of activity related to the contest for sea control, namely:

- Anti-surface warfare, where it uses its onboard or helicopter borne missiles, its guns and torpedoes to attack other surface warships.
- Anti-submarine warfare, where surface ships have particular advantages in deploying anti-submarine sensors for long periods of time. Ships can also attack submarines directly with a whole variety of anti-submarine weapons launched either from the ship itself, or from its organic helicopter.
- Anti-air warfare, where the ship is not just a potential victim of the air battle but also a factor in the struggle for air superiority. In its capacity to maintain air surveillance, and shoot aircraft down, the surface ship can make an important contribution to the air defence of naval formations.
- Operations against the shore. The arrival of long range naval cruise missiles, such as Tomahawk, intended for the attack of land targets is a significant accretion of power for the surface ship.

In short, by its capacity to act in these four spheres of sea control related operations, the surface ship offers significant offensive and defensive capabilities and has unique advantages to offer in the area of command and control. [5]

Surface Ship Weapons and Sensors

The capacity of the surface warship to do the enemy harm is a function of the offensive power of the weapons it carries. Naval weapons and the surface combatants that deploy them have been fundamentally changed by the advent of guided missiles, organic shipborne helicopters and the development of modern naval electronics, which buys both increased weapon effectiveness and much increased weapon range. [6]

For centuries the standard method of engagement between surface ships was by means of the gun. A fundamental change shared by all navies is the rise of self-propelled missiles, which provide quite small ships with the firepower equivalent of the capital ships of the past. When the development of missiles started the concentration of effort was on engaging aircraft. It was, however, some time before it was realised that similar methods could be applied to engaging surface craft and shore targets. In fact it was the sinking of the Israeli destroyer *Eilat* in 1967 by a Russian made Styx missile fired from an Egyptian Osa class patrol boat that really illustrated the impact of the missile on naval operations. [7]

Long-range guided-weapon systems, backed up by light-calibre guns and short range missiles for close-in or last-ditch actions, are now vital for the defence of ships against anti-ship missile and air attacks. Furthermore, the advent of the cruise missile, which was extensively used during the recent Gulf War, has enabled surface warships to gain the ability to attack any point with precision and we will continue to see improvements in the range, accuracy, lethality and stealth of these weapons in the future.

For underwater actions there are passive and active homing torpedoes capable of responding to acoustic and magnetic influences, although sonar is more limited in its applications than radar, simply because water is an unpredictable medium for transmitting sound. The Falklands conflict demonstrated the relative ease with which submarines are able to remain hidden. Submarines can make effective use of temperature layers and bottom contours to go undetected for long periods and evade surface and airborne anti-submarine forces. In anti-submarine warfare most progress in technology and hardware is made by inchstones rather than milestones. Steady improvements are being made in magnetic anomaly detectors (MAD), radar, sonars, sonobuoys, acoustic processors, towed arrays, lasers and weapons. [8] The colossal power of a nuclear submarine is offset by the fact that although the surface ship may not be able to keep pace with them, the ship-launched helicopter has no difficulty in outpacing the target, and for that reason the surface warship has not been driven from the seven seas. [9]

Almost from its inception, the possibility of using the helicopter at sea was in the minds of designers and naval staffs alike. Although primarily utilised as an ASW platform, modern naval helicopters play an increasingly important surface surveillance, over the horizon targeting and indeed surface attack role.

The increasing awareness of the merits of electronic warfare, both for self-protection of a warship and as a major force multiplier in any type of naval conflict, has spurred the development of a variety of equipment ranging widely in complexity and sophistication. While awareness of the usefulness of electronic warfare has always been high among western navies, there is no doubt that recent conflicts have helped accelerate many developments in this field. [10]

Surface Ship Survivability

Survival of the surface ship has never been an end in itself. Keeping the ship tied-up alongside would accomplish that. The real issue is how to survive whilst still accomplishing the ship's mission. Survivability is partly a function of the surface ship's capacity to inflict damage and partly to dodge or absorb it, whilst at the same time achieving their primary purpose. Surface warships must have built-in strength, tough-

ness and staying power to survive in a hostile environment, and they must be designed and constructed to take hits. [11]

Above water damage to surface ships is generally due to shellfire, to bombs or to anti-ship missiles fired by other surface vessels, aircraft or even submarines. Probably the greatest danger is that the magazine might be hit and the ship blown up, or that the fuel remaining in anti-ship missiles may cause uncontrollable fires. Even though these weapons might not actually hit the ship, the effects of near-misses which shower the ship with splinters can be considerable, particularly to the antennas and waveguides of sensitive electronic equipment, without which a modern surface combatant cannot effectively operate. A further category against which a modern warship may be protected is underwater attack, either under the keel or contact with the ship's side, the former being a far more effective use of explosive.[12]

Some sceptics argue that modern warships are soft and that the size and weight of a surface warship's defensive systems is such that while it may, or may not, survive, its usefulness has markedly declined and that a much higher percentage of its effort is now devoted to the simple business of staying afloat.[13]

Many experts dispute this view. They start by observing that the whole question of whether the surface ship is vulnerable to destruction is fundamentally a relative matter not an absolute one. Till argues that all weapons systems, be they ships, submarines, aircraft or tanks are vulnerable to destruction in certain sets of circumstances. In this sense, the surface ship is vulnerable, but the real question is whether it is so vulnerable that it can no longer perform its tasks. [14]

While few would deny that keeping the surface ship sufficiently survivable will remain a problem for the foreseeable future, it is a generally held view that the availability of modern defensive weapons and sensors, various electronic deception measures and the latest anti-submarine devices, maintains the surface ship's capacity to dodge damage, and that continuously evolving constructional advances preserve its ability to absorb damage, while maintaining its stability and capacity to continue to perform its tasks. [15]

Conclusion

Maritime warfare is essentially a struggle for control of the sea so that its resources may be exploited, and use made of it for the transport of personnel and materials or the projection of power ashore. Unless the day comes when supplies can all be carried by submarine, or military assaults conducted exclusively by air, surface ships are plainly necessary for positive sea use. Despite Defence pundits who argue that the future lies with submarines, the realities of maritime power dictate that tomorrow's surface ship will remain the basic unit of naval power and an effective instrument of national policy.

In the past, as every new technological development or combination of developments has come along and affected naval operations, there has always been those who doubted whether the 'traditional' surface warship would survive, yet the surface warship is still here and more powerful than ever before. What has happened is that as always, an overwhelming threat produces a countermeasure. Technology has kept pace with the development of weapons that can be employed against surface ships and there is no sign that this continuous chain of technical challenge and response is about to be broken. [16]

ABOUT THE AUTHOR

Commander Alan du Toit entered the South African Navy as a midshipman in 1975 and after graduation and initial sea training, attended the tri-service Military Academy at Saldanha Bay from where he graduated with a Bachelor of Military Science degreee from the University of Stellenbosch in 1979.

He subsequently qualified as a mine warfare sub-specialist and principal warfare officer and served mainly in mine countermeasures vessels before moving to Australia in 1987 where he accepted a commission in the Royal Australian Navy.

His postings since joining the RAN have included Officer-in-Charge of the Minewarfare School, Deputy Commander Australian Minewarfare Forces, Executive Officer of HMAS *Tobruk*, Director of Minewarfare and Clearance Diving and Director of Minor Project Development. He currently lives in Canberra, with his wife Tessa and young sons Tristan and Rowan, where he is serving as Operations Director of the RAN Minehunter Coastal Project.

Allan, who is studying part-time for a Master of Defence Studies degree at the Australian Defence Force Academy, is a keen naval historian and an avid student of international naval developments. His first book, written at the age of fifteen, was published in 1976 whilst he was serving as a midshipman, and his most recent work, *South Africa's Fighting Ships*, was released in late 1992 after more than fifteen years of research. He has also published a number of articles of current and historical naval interest and is a regular contributor to various naval journals, including the United States Naval Institute *Proceedings*.

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[2] The 1982 Falklands War was the first truly naval confrontation since the Pacific conflict in World War II.

[3] ibid, p.77.

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[5] Till, op.cit., pp.84-86.

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[11] William D. O'Neil, 'Don't Give Up on the Ship', *USNI Proceedings*, Jan 1991, p.46.

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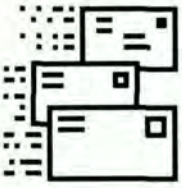

LETTERS TO THE EDITOR

A Special Visit

Thank you for noting in a recent JANI edition that one aspect of my article, published earlier in 1994, needed correction. The information relating to TOBRUK's visit to Saigon, the second such visit by an RAN vessel, can be obtained from her December 1957 Report of Proceedings - AWM 78, 343/5; located at the Australian War Memorial. Again, this visit was also reported in the (English Language) " Times of Vietnam" of 14 December 1957 - a copy of which is held at the National Library of Australia, also in Canberra.

Clearly, this visit was a marked success and left many favourable impressions - on the people of Saigon, foreign diplomats and the men of TOBRUK. While all visits are programmed well in advance with traditional activities: including sport and tourism, official calls and public inspections, this visit was special. So much so that the then President of the Republic insisted that the Commanding Officer, with some officers and ship's company, be flown in his private aircraft over Vietnam on a DC3 in order to get a better appreciation of Cam Ranh Bay and the hill country. In all, a most memorable visit.

Yours sincerely,
Michael Fogarty

Historical Hiccup

I believe that a mistake was made in the article about the Spratly's by Captain Lee G. Cordner AM RAN (JANI Vol 20 No 2). In the article, he said that (the) Chinese government defined its southernmost boundary as the Paracels, not the Spratlys, in a government report in 1928. According to my study, this is (an) often quoted mistake. Captain Cordner quoted this from R. Haller-Trost, who in turn quoted from Samuels. In fact, this report was done by a construction bureau under Guangdong Province after its expedition to survey the Paracels in 1928. According to the report, the 'southernmost point" of this expedition (please note *not* the boundary of the country) was the Paracels. This was later misquoted by these scholars as the "southernmost point of China's territory" is the Paracels. What is more, a bureau under Provincial level does not have any right to determine or proclaim the boundaries of a nation. This report is still available in China for study.

Best Regards
Sincerely yours
(Dr) Sheng Lijun
Research Fellow
Institute of Southeast Asian Studies
Singapore

A note from the Editor

Renew your membership for 1995 and enjoy more first class reading and entertainment. QUICK! Send $ 65 to the ANI, PO Box 80, Campbell ACT 2601 for our three year membership 'special'. If you're short, send $25 for the year, or $ 48 for two years (tax deductable). And please don't forget to mention who you are and where you live. It really does help !!!!

CHEERS.
Alan Hinge,
Editor

A reprint from the first issue of *JANI*, August 1975: Perhaps we should 'crank' this column up again... —Ed

SHIPHANDLING CORNER

What Happened?

This incident occurred at Victoria Basin, Hong Kong. The ship was a Daring Class Destroyer and it had been given a berth on East Wall, bows south. The geometry of this problem is worth looking at on the chart. Having entered the basin, the ship had to turn through about 70°, from memory, in about 1½ ship's lengths. It was possible, but much would depend on conditions and the wind in particular. Once inside the basin, the flood which would be running strongly at the time would of course have no effect.

As the ship passed North Point a reasonably stiff easterly was blowing, and this was welcomed. It was considered it would allow the necessary steep approach and help blow the bows around.

At the basin, FEARLESS was outside on the North Arm, but inside appeared quite empty.

A normal approach was made with a good wide sweep through the Star ferries' tracks and, as the run to the entrance was made, it was seen that an R.N. Frigate was berthed inside on North Wall. This further reduced the room to turn and added to the problems. Worse still, the easterly had shifted to become a light westerly. As the Bull's Nose came nearer the Navigator remarked "We should now be out of the flood". No sooner had it been said than the tide moved the ship rapidly towards the all too solid sea wall in front of Tamar. A few quick corrections sorted that out, but it had altered the line of approach and had been, to say the least, unsettling. The turn to starboard was hampered by the R.N. Frigate reducing the area to port for the stern to swing and as the westerly breeze started to catch the ship, the starboard anchor was let go. By then the bows were getting too close to the wall to go any further ahead and there was very little room astern. So the two tugs standing by were secured, and the ship was berthed using them.

What Self Criticism is Offered?

It would have been much better handled with a more realistic plan. It had been decided that the worst possible position to get into was to be at an angle between East and North Wall with the bows near the former and the stern near the latter. Ironically it was just this worst case which developed. In hindsight, there were two, or maybe three, important mistakes. Firstly it was unwise to enter the basin with so much tide running. It would have been better to wait, anchoring in Junk Bay if necessary, until conditions were better. Secondly, it would have been simple enough to ask COM Hong Kong if there were any ships in the basin, and adjust the berthing plan accordingly. Finally and most importantly, two tugs were available, so why try to prove that it could be done without them?The best plan, I believe, would have been to get safely into the basin, stop, button on the tugs, and make a cold move of it. Very simple, no fuss and quite seamanlike; much more so than taking on a difficult task with engines, rudder and anchor. The tugs were available and had to be used anyway, as it turned out.

Lessons Learnt

Always make it easy for yourself. The hard ones develop all on their own; save your strength for them.

A Professional Wrecker's Comment

Berthing on the East Wall of Victoria Basin is not an easy evolution. The points mentioned under "Self Criticism" – State of Tide, Local information and Use of Tugs – need no further amplification.

Entering Hong Kong through Sulphur Channel and approaching from West may have been preferable in this case. The advantages are:-

1. slow steady approach to the basin
2. basin entrance and berth is visible to the command earlier
3. approach track cuts across Star ferries track at right angles which is preferable to making a wide sweep through the tracks.

CYCLOPS

SHIPHANDLING CORNER

Contributors are invited to relate their reactions when coping with difficult or awkward shiphandling problems and how the situation was retrieved (and if it wasn't – why not). Contributors may remain anonymous if they wish and also leave out ship names and places if desired. Articles should be between 300 and 500 words. Comments from members will be printed in succeeding editions.

The business orientation of the New Zealand Defence Force

by
Squadron Leader A J Forrest. RNZAF

Strategy, Objective and Target were familiar military terms long before they were borrowed by the business world, which is now returning them to us, albeit in somewhat mutated form.[1]

In 1932, Aldous Huxley's *Brave New World* warned of the predominance of the methodical, stereotyped, planned institution over the emotional, disorganised and dignified character of the individual. Huxley presented the 'modern' institution as faceless, vulgar and desensitised, driving relentlessly to standardise the practices of government, education, psychology and economics. Advances in science and technology were dehumanising factors, but a more significant influence was the transporting of business methodology into social institutions. The source of Huxley's concern was clear in his selection of **Ford** as the founder of the World State and as a Christ surrogate. Time was reckoned according to Ford (the setting is AF 632) and it was his teachings that were the basis for truth and inspiration in the brave new world.

Sixty years on, Western bureaucratic institutions are not merely influenced by business methodology; they are virtually indistinguishable from business operations. In the brave new world of Roger Douglas and Ruth Richardson[2], state components of the transport, communications, scientific research and energy sectors, in addition to many departments of the Public Service, have been restructured as self-sustaining business enterprises. Restructuring of health and education has lent those a commodity status, and policing for law and order has similarly been examined for efficiency and user-pays implications. To what extent, then, should Defence be affected by the business ethic that has been foisted onto other sectors of state funding? And what is the impact on two first-principle elements of an armed service, esprit de corps and loyalty, should the business focus of the NZDF be sharpened.

THE BUSINESS APPROACH

Woodrow Wilson stated that '...business underlies everything in our national life.'[3] Not surprisingly, the business mode of operation that has been able to dominate such a span of human activity is plural in its meaning and ambiguous in its interpretation. The confusion about what business and its methodologies consist of is not eased by reference to customary sources of 'wisdom' - poets, politicians, presidents and professors. Sir Francis Bacon noted that business was a condition to which great men are servile[4]; the Duke of Wellington stated that business concerned guesswork in the absence of verifiable knowledge[5]; President Calvin Coolidge observed with a hint of tautology that 'The business of America is business'[6] and Professor J.K. Galbraith came close to deifying business when he advised:

> 'Their (technocrats) religion is business success; their test of virtue is growth and profit. Their bible is the computer print out; (and) their communion bench is the committee room."[7]

Business, apparently, may also be the activity of prophets, extending beyond the base concerns of everyday existence. Wilson added that business penetrates our spiritual life[8] and St Luke described it as the prerogative of the fifth dimension:

> "Wist ye not that I must be about my father's business."[9]

In a more contemporary and conventional sense, business is customarily linked to the pecuniary concerns of enterprises ranging from individual ownership to conglomerate. However, 'business-like' does not mean to offer a product or a service for advantage or for maximum profit, although it **may** involve these things. Similarly, 'business-like' does not necessarily imply an owner-customer relationship, although once again, it may involve such a relationship. What 'business-like' invariably involves is a single-minded focus based on defined goals, a body of knowledge and a system of information, analytical approaches to decision making, and above all, rationality.

A business-like approach unerringly aims at meeting the expressed goals of the institution. The nature of the goals depends obviously on the nature of the institution, although in general they will be stated in fiscal terms or in terms of the continuity of the organisation. The term 'mission statement', borrowed

from the armed forces, hints at the uncompromising way in which a business-like institution will approach its goals. The entire resolve of the institution is rigidly applied to the mission statement, which gives way to nothing except a revised mission statement and another mandatory set of goals. To accomplish the mission, the business method invariably requires the establishment of a strategic or corporate plan. The style of business is to lay down what is to be done rather than to leave it to a professional's judgement. Because the emphasis in business is on the logical matter of fact, specialist data and the analytical tools to process data are essential to the business planning function. Business managers have become reliant on specialists with sophisticated management services or operational research tools involving modelling, simulation and computer processing. The transfer of information must be on demand - institutions that cannot keep up with the 'velocity of business' seldom meet their mission statements. Implementing the business strategic plan involves decision making that is ***logical*** in its approach and ***efficient*** in its targeting of resources:

> "The business man is ...a rational being who ...carefully weighs the costs of one action against another and is preoccupied with marginal costs and marginal utility. Managers...will probably stress the rational element in their decisions — although they may allow that the decisions made by others are often not as objective as they should be."[10]

Implicit in this fundamental view of business characteristics is the reality that the rational exercise of a reasonable will is the dominant basis of behaviour admitted by business. In principle, the descriptor 'business-like' implies the operation of an efficiency regime. The mentality that it forms is based on the expedience of situational ethics. It is functional, and it lacks charm. It implies a social Darwinist approach to the effects of competition and market forces, which, if left to their own devices favour the strong and discriminate against the weak, creating few winners and many losers. It is, furthermore, austere and impersonal; it is frigid, insensitive and detached:

> "With each fresh elaboration of business, the individual finds himself further degraded toward the mere embodiment of an economic function."[11]

To some degree the severity of a business-like operation can be softened by the application of new-age management techniques. Worker participation in decisions, management implementation of continuous improvement principles, informal lines of communication to CEOs, adherence to Total Quality Management (TQM) philosophies and independent ISO 9000 series recognition of quality processes collectively provide a human face to business and increase the satisfaction and co-operation of staff. However, an elementary caveat applies to the level of these measures, and indeed to their continuance - they must not conflict with or compromise business goals; they must be complementary. If a business can be sensitive to non-market factors (ethical, moral, social) ***as well as*** deliver the specified performance, then it may do both. If it comes to a trade-off, the specified performance will take precedence.

In order to determine whether the NZDF needs to be more business-like in the sense in which it is described, the level to which business practices are currently utilised by the NZDF needs to be clear. The outline that follows deals primarily with the business orientation of the NZDF as a whole, and is based on the assumption that the business practices listed are distributed relatively evenly across the three services.

THE BUSINESS ORIENTATION OF THE NZDF

In the late 1980's the Lange Government initially capped and then cut vote defence, forcing Defence to investigate ways of operating with greater efficiency. Over the last four years, a range of business-style reforms have been set in place within Defence, designed to deliver the requisite economies. The funding problem has not been unique to the NZDF; no longer are defence forces anywhere in the democratic world blessed with funding at the levels annually appropriated during the previous decade.

The NZDF has adopted single Service mission statements based on an expression of defence outputs, issued by the Government as an extension of defence policy. In effect, defence outputs delivered to Government mirror the business return to the shareholder on the capital invested, ie. previous funding represented by items on the fixed asset register plus the current annual allocation. The Ministry of Defence has devised a Defence Planning System, approved by Treasury, which enables defence requirements to be more effectively presented to the Minister of Defence and subsequently understood by his Cabinet colleagues. The planning system enables a 10 year 'look ahead' period of anticipated expenditure, plus a further 10 years of projected estimates. The current plan draws attention to the problem of funding major capital items toward the end of the decade, assuming the required defence outputs remain static. To devolve financial control so that it can be more flexibly employed at the user level, the NZDF has redeveloped its budgeting from incremental to zero-based, and subsequently to a priority-based system. The Audit and Assessment Division of the Ministry has been established to provide scrutiny of unit performance from a resource consumption viewpoint. Asset rationalisation, perhaps the outcome of defence resource auditing, has become a euphemism for the relinquishing of real estate. Rationalisation or 'restructuring' has become a contemporary business practice, often involving the retiring of personnel as well as capital

assets. The NZDF has followed the business trend toward staff reductions, but has managed the process more gently than most. The Armed Forces Pay Review (AFPR) completed some time ago has introduced a less incremental structure for remuneration, based more justifiably on market equivalents and on highly valued skills. Innovation in the arrangements for defence contracts have enabled offsets to be negotiated as an integral element of overseas tenders, and New Zealand Industry Participation (NZIP) for overseas contracts at the higher end of the scale.

Within the Royal New Zealand Air Force (RNZAF), additional business-style processes have been introduced. Civilian staff, less costly in overall support terms, have been employed in some areas where occupational roles are non-operational and narrow in scope. A range of information systems for pay, administration, supply and engineering have been introduced, and moves are under way to integrate these isolated programs into a single data base. A semi-voluntary posting system has been introduced, more in line with the structures for job-rotation in the public service and in industry.

The umbrella for these business oriented changes to the Ministry and the individual Services has been three relatively recent pieces of legislation - the State Sector Act (personnel), the Public Finance Act (finance) and the Defence Act (organisation). The summative effect of the changes which this legislation has enabled include more flexible resource allocation, expenditure better matched to specific activities, a better definition of performance indicators, improved staff participation in resource decisions, and improved flow of information. These changes, however, have not been accomplished without corresponding changes to the personality of Defence and single Service management. The parameters of Defence management have become much more rigid, curtailing the freedom of action hitherto applied by intuitive and imaginative Service chiefs and senior staff officers. Leaders have been compelled to manage with much tighter rules and obliged to accept further limitations to their authority. Their task has become business-like - mechanistic, objective and analytical. The basis of RNZAF management, for example, has become less the empiricism and long-established experience of the General Duties officer and more the theoretical and procedural influence of accountant and logistics officers, civilian finance advisers, and auditors. The personality of single Service management has become 'left-side' dominant, tending toward 'sequence and logic rather than depth and colour'.[12] There is little doubt that the approach is efficient. The more valid concern for a modern defence force is whether it is effective.

NON-RATIONAL ASPECTS OF THE ARMED SERVICES

The appropriateness of rational business-style reform within the NZDF rests on whether the resultant changes enhance the operational effectiveness of the three services. Expressed in the contemporary vernacular of commerce, is defence better positioned to optimise the sustained delivery of outputs demanded by the providers of capital? Two fundamental and essential qualities of a defence force mark the NZDF as distinct from commerce, industry, the Public Service, and virtually any other form of bureaucratic institution. These inter-related, non-rational, and non-market factors are esprit de corps and loyalty. Their presence as integral and pervasive service emotions is as critical in operational preparedness (in peace) as in operations per se, because they arise from inculcation rather than training and cannot be routinely escalated as contingencies occur. Because neither factor is cost-free, their effects are qualitative, and their return is maximised only in conflict, these qualities tend to be diminished by business-like measures applied for the sake of peace-time efficiency.

Esprit de corps relies on the distinctiveness of the Services which business-style measures and Public Service standardisation set out to erode. Within the NZDF, esprit de corps originates in tradition, which is neither static nor dynamic, but evolving almost imperceptibly in an otherwise rapidly changing environment. Esprit de corps is rooted in a common Service background and in a particular value system. It is manifested in a particular way of life, in a Service language, in a sense of mutual trust and in morale. Morale is founded on pride and belief. Where that is diminished by factors that, within the NZDF, include the strict cash consciousness and efficiency mindedness of managers, the fighting capacity of the defence force, especially when under duress, will soon be negated. For the NZDF and for any defence force, the emotional, non-rational, and costly factor of esprit de corps is elementary and sacrosanct. It provides the service culture and the sense of belonging that are the preconditions before the members of the service can be expected to reciprocate with loyalty.

Loyalty in any context can be defined as ' ...the acceptance of duty or obligation. It is a personal commitment that will at times subjugate the rights or self-interests of the individual.'[13] In the armed forces, the application of loyalty requires a serviceman to:

> "Put first the honour and interest of your king and your country...and that last, and last all the time, you will put your own interest, your own safety, and your own comfort."[14]

Loyalty functions in the armed service as a non-rational factor that postpones the more rational option of 'exit' when conditions are either unsatisfactory or

threatening[15]. It is most effective when ***least*** rational, ie. in hostility, where conditions may be parlous or even hopeless. In such cases it may lead to inspiration, creativity, valour, and in the extreme, to self sacrifice.

Loyalty operates in the same way in peacetime, engendering commitment beyond the call of duty, albeit without the degrees of heroism and sacrifice that arise during the course of war. From time to time, all organisations, including defence forces, fall short of the expectations of members, or impose upon members conditions that seem inequitable, unpalatable, or negative in some way. Assuming the availability of an alternative organisation offering more equity, superior hygiene factors, or improved remuneration to compensate for prevailing conditions, the rational behaviour for a member is to exit to the alternative. The threat to the NZDF from the rational application of a straight economic choice (to move to a competitor/alternative) is that it is the members who are most quality conscious who will be the first to depart at the initial signs of deterioration. Thus, the NZDF risks losing its best members; those who would otherwise be the most active, creative, and effective agents in managing the necessary processes of organisational restoration. Institutional and business-like barriers such as returns of service and critical manning can be applied, although these have a temporary efficacy, and are ultimately self-defeating. Far more functional is the informal, emotional and cultural barrier of loyalty. Within the NZDF, loyalty holds exit at bay. As a result of loyalty, quality-conscious members remain longer than could ***reasonably*** be expected, in the expectation that recuperation can be achieved from within. Not rational, but hardly irrational, loyalty serves the essential organisational purpose of limiting departure from the NZDF and preventing any deterioration from becoming cumulative. Loyalty is not a brake on progress. On the contrary, it is a dynamic factor of quality that is fundamental to the effectiveness and survival of the NZDF and of any defence force that at times requires its members to act in a non-rational, selfless and wholly committed way.

For two reasons, loyalty is excluded from the portfolios which the business-style reformers have brought to the NZDF. Firstly, it is rejected because it is not a business essential. In the standard competitive model of business, organisational recovery is not necessary. As the organisation or operation loses out in the competitive struggle, its market share, its role, and its factors such as personnel are taken up by its competitors. Consequently, a new equilibrium evolves. In the Darwinist environment of competitive business, non-market factors are irrelevant and loyalty is dismissed as redundant sentimentality. Secondly, loyalty requires the investment of increasingly scarce resources. Within the defence force, it would be foolish to assume that loyalty is guaranteed by the oath of allegiance. The oath commits members to serve loyally, but the only meaningful 'contract' of loyalty is the internal, emotional one that the individual continuously and sub-consciously makes with himself. Clearly, the loyalty contract is conditional. The presumption that member loyalty can be claimed 'right or wrong, thick or thin' is erroneous. Although customarily viewed as an individual virtue, loyalty is, in practice within the armed forces, a mutual serviceman-service responsibility:

> "Loyalty is earned, not commanded. It is incumbent upon the leader, company, religion, or country to present some characteristic worth being loyal to...For loyalty is certainly not an absolute."[16]

If the NZDF must impose upon its unique function and way of life a regulated, vapid, public service culture, then it must accept that a reduced level of member bonding is also inevitable. Alternatively, the cost of ensuring loyalty, as pointed out earlier, is the cost of maintaining esprit de corps. That is a price that the businessmen, the rationalists, and the specialists at the policy levels within the NZDF are becoming less able or less willing to pay.

CONCLUSION

In recent years, the NZDF has embraced a range of business-styled practices modelled on the commercial, industrial, and restructured public service efficiency paradigm. The reforms have been applied to stretch limited public funding, utilising theoretical and analytical skills of strategic planning, resource allocation, rationalisation, and auditing. While infrastructure and operating economies have certainly been achieved, the science of business threatens to negate the essential, non-rational aspects of a robust defence force. Two aspects in particular, esprit de corps and loyalty, have significant implications for the effectiveness of the NZDF if their diminution is the outcome of the further encroachment of commercial methodologies.

Esprit de corps is a factor of loyalty. It is the elan or joie de vivre of service life. It is a motivating factor that accounts in part for the 'privilege' of putting up with military service when that service requires unrewarded personal commitment. Unless military service is to be regarded as a routine job or business task, esprit de corps is an intrinsic element of service morale and service loyalty. Member loyalty offers the NZDF a reserve; a surplus above the normal levels of input required of the individual. In war it is the quality that yields heroism and sacrifice. In peace it sustains highly competitive and creative personnel when the defence force fails to meet expectations and member exodus is the rational option that would certainly apply in business. Because the business influence within the NZDF is rational and goal oriented, it is

oblivious to the need for resources to nurture loyalty and the distinctive service way of life upon which loyalty is based. Rejection of the total business philosophy is not a yearning for impulsiveness or nostalgia. Rather, it is a recognition that:

> "The validity, relevance and utility of the commercial ethic and model, which is being embraced in a wholesale fashion...can be broadly questioned...Defence is not a commercial or industrial enterprise. Its bottom line is not profits and products, but an insurance service which needs to have a sufficiency of capability to respond effectively when a claim is made."[17]

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1. Corp COL P. Correspondence to *British Army Review*. April 1989. p 73.
2. The reformist Ministers of Finance within the Lange and Bolger Governments respectively.
3. Wilson W. From Speech delivered in New York, 1912. Cited in *Dictionary of Modern Quotes*. Penguin Books, London, 1984. p 359.
4. 'Men of great places are thrice servants: servants of the sovereign or state; servants of fame; and servants of business.' Bacon Sir F. Essay 11 - Great Place.
5. 'All the business of war, and indeed all the business of life is to endeavour to find out what you don't know from what you do; that's what I call "guessing what was at the other side of the hill".'
6. Coolidge C. Speech. 17 January 1925. *Cited in Dictionary of Modern Quotations*.
7. Galbraith J. The Age of Uncertainty. Cited in *Dictionary of Modern Quotations*.
8. Wilson, op cit.
9. St Luke 2:49
10. Stewart R. *The Reality of Management*. Pan Books Ltd, London, 1973. p 89.
11. Gannon P. *Aldous Huxley's Brave New World*. Monarch Press Inc., New York, 1965. p 14.
12. Doughty MAJ W. Intuition and Decision Making. *British Army Review*. December 1989. p 19.
13. Goodwin Capt A. Ethics and the Officer Corp. *The New Zealand Army Journal*. No 4. July 1987. p 15.
14. Slim Field Marshall. Cited by Col D. Shaw. Officers - But no longer Committed. *British Army Review*. April 1991. p 48.
15. Loyalty depends, of course, on the **availability** of an exit option. In instances where exit is not a genuine option (where there is nowhere else to go, or where exit is labelled desertion or treason) loyalty is not required.
16. Colt M. On Loyalty. *Naval Reserve Association News*. February 1986. p 9.
17. Downs C. To Grasp the Wheel of Providence: The Officer Development - Challenge of Managing Change. *The New Zealand Army Journal*. January 1990. p 15.

A Letter from Wellington

A NEW YEAR OF CHANGE FOR THE NEW ZEALAND DEFENCE FORCE

This letter is written at a time of change - the NZDF leadership changes as Vice Admiral Teagle steps down and Lt General Birks takes over. Coincidentally David Lange, former PM, Labour spokesman on Foreign affairs and "ANZUS vandal" has also announced he will retire from politics at the next election. (Of course that won't be the last we hear from him!)

But out in New Zealand society there is also a sense of reaching a watershed — the national day celebrations at Waitangi on February 6 (at which the RNZN plays a major role) were totally disrupted by radical Maori protesters and the outlook for race relations seems to me to have perceptibly shifted.

The protest at Waitangi was about government proposals to recognise and solve Maori land grievances from last century — a current plan to recompense the various tribes, estimated to be worth about a billion dollars, was the focus of the protest. But the form of the protest offended many, with spitting and jostling of the VIPs and one individual trampling the national flag in front of the Governor General; the protest group completely disrupted the traditional format and prevented the naval Ceremonial Sunset.

In the days following it seemed that some pakeha (ie non-Maori) New Zealanders were starting to think that perhaps emmigration was inevitable, if the protesters were genuinely representative of the Maori reaction to a generous and practical attempt by the Crown to atone for injustices during and after the land wars of the 19th century.

A flavour of the weekend events may be gauged from the reaction of one young female Maori lawyer to the parading of the King's Silk Flag presented to the mainly Maori pioneer battalion of WWI: "Military wankers" she called out (in front of the newsmedia), thus offending not only the troops but the many Maori veterans of 28 (Maori) Battalion from WWII, who take a particular guardianship role for this special flag. Her comment illustrates the enormous gulf between the elderly (her own ancestors) who remember times of conflict and the "gimme" generation who have a shallow, knee-jerk reaction to anything military. The media of course gave her reaction prominence, but it was soon overshadowed on Waitangi Day proper by the protest and occupation of the Treaty grounds in front of the VIPs.

Ironically the NZDF has been at some pains to further incorporate Maori tradition into our ceremonial — many readers will know how the ships all have a Cultural Group who proudly perform at many flight deck cocktail parties. A Maori challenge and haka was incorporated into the Kiwi version of Ceremonial Sunset as part of the RNZN display at Brisbane's Expo 88, but the awareness goes back much further — HMS *New Zealand* had a "haka party" during her post-war cruise in 1920, while the Captain wore a ceremonial cloak during the Battle of Jutland - it's credited with protecting the ship when other battlecruisers were blowing up under German gunfire. (The Summer NZ Defence Quarterly magazine has an outline of *New Zealand*'s career, along with the diary of an Aussie midshipman of WWI who subsequently fathered two Kiwi naval officers!)

So, for the retiring CDF, it's been a torrid final year — the scandal of the Ohakea base commander's house, the breathless "revelations" of the newsmedia and then the shambles of his last Waitangi day parade. Fortunately there has been a lot more positive in Admiral Teagle's time in office and the recent decision of government to approve four key projects is perhaps the most tangible achievement of Sir Somerford's time in command.

The purchase of a military sea lift ship, defensive systems for Hercules air transports and a plan to purchase new naval helicopters were all announced by the New Zealand Government during December 1994. Then in January the decision to re-wing the six Orions of the RNZAF was confirmed. Our Minister of Defence stated that this new equipment will enhance the NZDF's ability to meet New Zealand's commitments to security, both regionally and on an international basis.

Readers will recall in my letter in the August/October 94 issue that a five point priority list for capital purchases had been agreed. Last November a paper was

prepared for government that addressed several of these priorities; the government considered the paper in early December and subsequently announced approval for four new projects: The purchase of a military sea lift ship, self-protection equipment for C-130 Hercules, seeking registrations of interest for supplying replacement naval helicopters, and rewinging the P-3 Orions .

The Military Sealift Ship

The military sea lift ship is a 7,000 ton roll-on/roll-off ship with 1000 metres of vehicle lanes on its two freight decks. Now named HMNZS *Charles Upham*, the ship is intended for the transport of the Army's heavy vehicles and stores. A lengthy period of study of all options, including investigation of the commercial market and the option of HMAS *Tobruk*, had led to the identification of a particular class of freighter that could meet New Zealand's needs. The actual ship was purchased from a Danish firm for 14 million dollars soon after the government's approval was given. The new ship first had to have its hull repainted to conform with New Zealand's anti-pollution standards for ships' anti-fouling paint, and came south with a civilian crew, when it was handed over to the RNZN during March.

A related consequence was that the Ikara Leander-class frigate HMNZS *Southland* was formally decommissioned on 1 March this year, to release crew and operating funds for the new sealift ship.

C-130 Protection

In response to the growth in peacekeeping operations, and the need for the RNZAF to maintain its capability to operate in risk areas — where gunfire and anti aircraft missiles are a threat — the RNZAF will equip three of its five C-130s with flight deck armour, missile approach warning systems and countermeasures dispensers (radar and infra red missile decoys). Having three aircraft so equipped should ensure that at least two are available at short notice and so is consistent with the credible minimum policy. About 15 million dollars is budgeted for this project.

Last August the No.40 Sqn aircraft that went to Rwanda for humanitarian duties, stopped in RAAF Base Richmond so that temporary cockpit armour, loaned by the RAAF, could be fitted.

Replacement Naval Helicopters

The RNZN currently has six Wasp helicopters in service, which can operate from the four frigates, *Endeavour* and *Monowai*. In Auckland the Wasps are based at and maintained at Hobsonville as part of No 3 Sqn RNZAF. These helicopters are 28 years old, being designed in the late 1950s and — for New Zealand — first entering service when HMNZS *Waikato* commissioned in 1966.

New naval helicopters are needed to operate from the modernised frigates *Wellington* and *Canterbury*, as well as the two Anzac-class frigates due in 1998. You will all be very familiar with the value of ship borne helicopters; they are an integral part of a modern naval force, carrying surveillance and detection systems and weapons that can extend the capabilities of the ships. As well, naval helicopters improve ships' ability to conduct search and rescue, EEZ surveillance, cargo carrying or disaster relief.

Registrations of interest have been sought, industry briefed, and the responses are now being assessed before the project goes to the next step of seeking government approval for purchase. It is anticipated that the project will cost over 200 million dollars. There are implications for the RAN in this project as a smaller helo than the Seahawk is needed for the future offshore Patrol Vessels.

Life Extension for the P-3 Orions.

The RNZAF's long range maritime patrol force of Lockheed P-3 Orions is to have its life extended by rebuilding the wing and tail structures of the aircraft. Fatigue governs the designed life of modern aircraft, and the six P-3s, purchased in 1966, are among the oldest still in service. Sophisticated fatigue management by the RNZAF in conjunction with New Zealand's Defence Scientific Establishment, has ensured that the RNZAF has operated these aircraft safely and reliably in a tough environment, but inevitably the aircraft are reaching their limits. The re-winging project (Project Kestrel) is intended to extend the life of the airframes for another 20 years. Over $100 million has been budgetted for Project Kestrel.

Interestingly the P-3 Orion has been so successful (built in greater numbers than any other comparable aircraft) that there is no obvious replacement. Some eight nations operate this aircraft and it remains in production after 30 years.

The Minister of Defence summed the new programme up: "The recent approvals are the outcome of three years of careful review of our equipment needs. They are designed to ensure that our armed forces have the capacity to carry out the tasks identified by the 1991 Defence White Paper" Mr Cooper said.

Other equipment projects.

As well as the four new projects other equipment procurement is already underway. At Ohakea and Whenuapai the RNZAF has installed new airfield arrestor gear and instrument landing systems. The Army is taking delivery of a new relocateable field hospital,

while field generators and a power distribution system for the Engineers, night observation equipment (see the Summer 1994 Defence Quarterly) and low-level air defence missiles are being purchased. For the future the Army continues to study options for fire support vehicles to replace the Scorpions. Despite all this activity some in the Army think they haven't done well and expect an Army CDF to redress the balance.

Admiral Teagle did not, in fact, favour the RNZN when he was CDF. His strategy, it appears to me (with the clarity of hindsight), was that he initiated a determined and genuine period of cost cutting and budget mindedness within the RNZN while he was CNS, so that when he became CDF he could enforce the same disciplines on the other two services, knowing that Navy was already well screwed down and therefore less vulnerable to external (and so probably ill advised) cuts. That prospect of external interference was the greatest danger of the Ohakea house affair, that the NZDF as a whole would have its financial management authority removed and outsiders attempt to impose economies without any understanding of the organisation.

So a remarkable man retires, but his legacy of implementing effective self-financial management within the Defence Force is one that will be appreciated by future commanders over the next couple of decades.

—*"Jacko"*

The ubiquitous P3 Orion LRMP aircraft used by the RNZAF and the RAAF


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SHIPS SAIL FOR THE TOP END

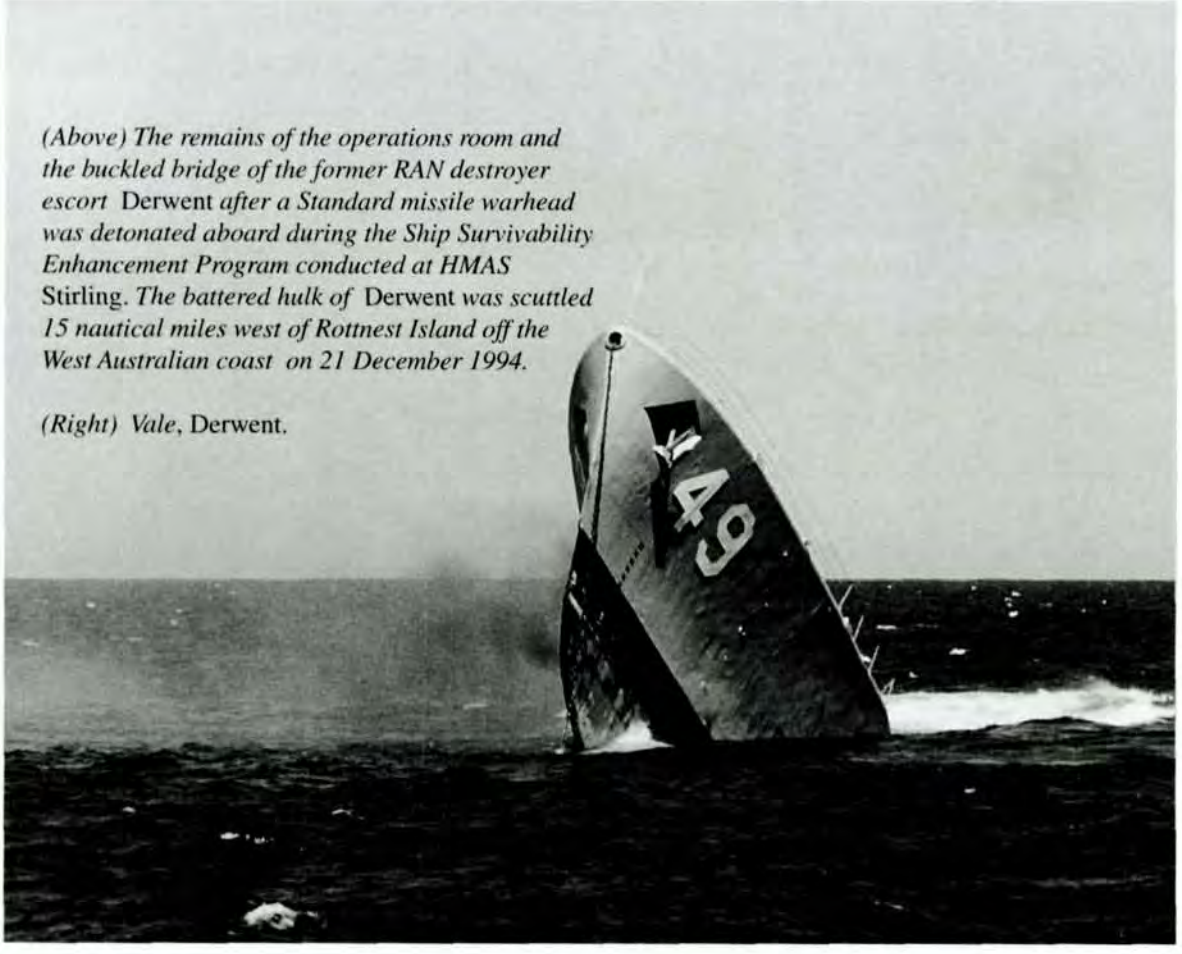
HMA Ships HOBART (guided missile destroyer), CANBERRA, SYDNEY, NEWCASTLE (guided missile frigates) and SUCCESS (replenishment ship) leave the Fleet Base at Woolloomooloo.

The vessels headed north to take part in Exercise Kakadu 2, which involved 22 ships, two submarines, more than 50 aircraft and over 5000 personnel from seven countries including Australia, New Zealand, Indonesia, Malaysia, Singapore, Thailand and Hong Kong (United Kingdom).

Centred on Darwin, this Fleet Concentration period provides an opportunity for bilateral activities between Australia's maritime forces and those of our South East Asian neighbours. It is another example of increasing defence co-operation in our region.

(Above) The remains of the operations room and the buckled bridge of the former RAN destroyer escort Derwent *after a Standard missile warhead was detonated aboard during the Ship Survivability Enhancement Program conducted at HMAS* Stirling. *The battered hulk of* Derwent *was scuttled 15 nautical miles west of Rottnest Island off the West Australian coast on 21 December 1994.*

(Right) Vale, Derwent.



The Ship Survivability Enhancement Program

Courtesy of Vic Jeffery and DSTO Corporate Communications

The Ship Survuvability Enhancement Program (SSEP) is a joint RAN and DSTO (Defence Science and Technology Organisation) project made up of a series of fire, smoke, weapons effects and electromagnetic radiation experiments which were conducted on the decommissioned River Class frigate *Derwent*.. The program has generated a number of benefits for Australian defence and the wider community, its major aim being to enhance the combat survivability of modern ships and their crews against a wide range of weapons and their effects. These threats include: electronic interference, explosive projectiles, anti ship missiles and limpet mines.

The 10 week experimental period involved 100 RAN and DSTO personnel working side by side. Many former members of *Derwent*'s crew assisted in the SSEP which was conducted at Fleet Base West, HMAS *Stirling* and trials were divided into four broad areas: limpet mine, fire and smoke, blast and fragmentation and electronic warfare.

Limpet mines are well known devices used to blast holes in a ship's hull below the waterline. The properties and effects of limpet mine explosions were investigated and several devices for removing limpets without damaging the ship were assessed. This knowledge is being used to develop ways of minimising damage to ships, and one device is centred around a computer package which, having received data on the mine's position, predicts damage levels and advises on the best course of action.

The fire and smoke series of experiments gave a better understanding of how fires behave on board ships. Fires were generated on board using simulated missile impacts and then intensity and spread characteristics were recorded, particularly those features associated with combustion of unspent rocket fuel. Consequently, enhanced fire protection provided by glass and plastic insulating materials and coatings is now being compared to protection afforded by existing steel bulkheads. The smoke series of tests involved generating smoke from fires of varying intensity in a compartment and recording the behaviour of the smoke. This data is being used to predict likely hazards to crew in real shipboard fires and to improve crew fire fighting training.

The next series of experiments involved analysing the blast and fragmentation effects of missile strikes, with a range of missile simulation explosions used to test ways of predicting damage levels and to more accurately identify safety hazards for the crew. Finally, the electronic warfare series was designed to extend knowledge of the transmission of electromagnetic radiation across sea water. Results emerging from this series are being used to test theoretical propagation models.

For more information on the SSEP contact DSTO Corporate Communications (Melbourne Office) by telephone on 03 626 8105.

HMAS *Derwent* was built at what was then known as Williamstown Naval Dockyard. She was launched in 1961, commissioned into the RAN in 1964 and was paid off 30 years later to release 220 billets for manning the first ANZAC frigate.

The decision to scuttle the old warhorse was praised by offshore angling clubs who believe it will result in a flourishing game fishing attraction. Previous plans to sink the ship as a recreational diving wreck were cancelled after the SSEP rendered the hulk too dangerous for this purpose and, after strict government environmental standards were met, the ship was towed to her final resting place by the navy tugs QUOKKA and TAMMAR.

Derwent sank in two minutes and 46 seconds; after on board detonation of internal explosive charges set by divers of Clearance Diving Team Four.

Today, sunk as an artificial marine reef and as a fish attracting 'device', *Derwent* is expected to draw marlin and blue fin tuna to the area.

It beats being turned into razor blades and beer cans!... Derwent cops a hiding during the ship survivability enhancement program.

The Western half of the RAN...

From HMAS *Stirling*'s "Welcome Aboard" pamphlet, published by Navy Public Affairs, Western Australia.

The first record of Garden Island appeared on a Dutch map of 1700 after William Vlamingh's three-ship flotilla visited nearby Rottnest Island some four years before. A French scientific expedition of 1801 to 1802 under the command of Captain Nicholas Baudin named the island "Isle of Buache" after the then hydrographer of the French Navy. The island was renamed by Captain Stirling in March, 1827.

The idea of a naval facility in Cockburn Sound is not new. In 1911, after the completion of a report by Admiral Henderson, RN, construction began on a naval base on the mainland near Woodman Point. The project was abandoned after World War I.

Garden Island has long had a military presence, with the Australian Army occupying the island during World War I and again in World War II when numerous coastal gun batteries were deployed around the island as part of the fixed defences for the Port of Fremantle. During the second world conflict the island was also the home of the seaborne arm of Z-Force where top secret submersibles and midget submarines carried out training.

Between 1945-56, Careening Bay, today the site of HMAS *Stirling*, was the home of the Fremantle Detachment of the Royal Australian Navy's Reserve Fleet. As many as eleven warships and their support vessels were laid-up in the bay.

Garden Island was for many years a popular holiday destination with cottages and shacks scattered along its shores, the main area being around Careening Bay.

Fleet Base West

The planning of HMAS *Stirling* began in 1969 after the tabling of a feasibility study into the use of Garden Island as a naval base. The 4.2 kilometre causeway linking the island with the mainland was completed in June, 1973. Construction of HMAS Stirling's wharves and workshops began in early 1973 and accommodation in 1975 with HMAS Stirling being formally commissioned on July 28, 1978.

The fragility of Garden Island and its environment had been recognised and some 50,000 indigenous trees and shrubs were planted to stabilise the soil and enhance the wildlife's habitat.

Since its commissioning HMAS Stirling has expanded enormously within its existing boundaries and has seen buildings such as the Submarine Escape Training Facility —one of only six in the world and the only one in the southern hemisphere constructed.

The new 310 metre long two-level fleet pier (Page 34) and the redevelopment of the small craft harbour have vastly increased the wharf and berthing space available to surface ships and submarines at HMAS Stirling.

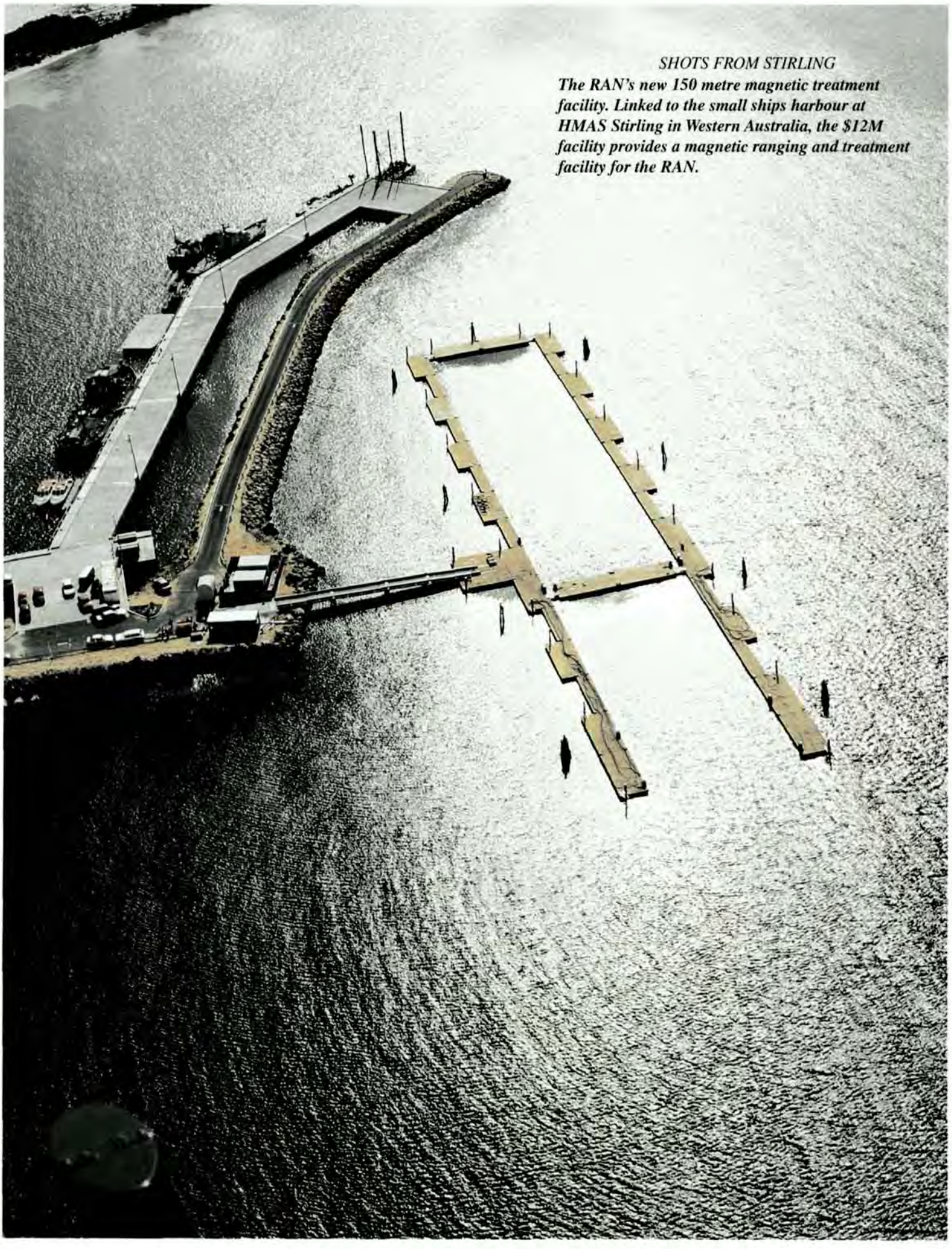
Another major addition has been the RAN Submarine Training and Systems Centre, purpose-built to train personnel for the new Collins-class submarines which will be entering service over the next few years.

HMAS *Stirling's* workshops and stores complexes have the facilities to maintain the wide range of equipment on modern naval vessels from electronics, optics and precision machining to heavy steelplate work for hull repairs. The base's supply system is fully computerised.

By the year 2000 half of the Australian Fleet will be homeported at Fleet Base West, including all six of the new Collins-class submarines.

HMAS *Stirling* was named in honour of Captain James Stirling, Royal Navy, who landed on Garden Island in 1827 and returned in June, 1829 to found not only the first European settlement in Western Australia, but also the first free colony anywhere in Australia. Stirling's makeshift camp was set-up on the craggy rock outcrop on the eastern side of the island which today is known as Cliff Head and is the site of a memorial. HMAS Stirling's crest is based on the Stirling family coat-of-arms.

Story and photographs courtesy of Vic Jeffrey and the Navy Public Affairs (WA) team.



SHOTS FROM STIRLING

The RAN's new 150 metre magnetic treatment facility. Linked to the small ships harbour at HMAS Stirling in Western Australia, the $12M facility provides a magnetic ranging and treatment facility for the RAN.

Two Sea Kings from the Navy's HS 817 Squadron hover in front of the Royal Australian Navy Submarine Escape Training Facility at HMAS Stirling.

FIGHTING SMARTER Part 2

Part 1 of this series (Vol 20, No 3) demonstrated that naval minefields can be used to exercise some control over the actions of a determined adversary by adjusting their areas, intensities, timings, targets and durations of effect. It also suggested that naval minefields should be among the first; not the last options considered in modern strategies of graduated response. This article explores the use of sea mines as 'robot policemen' in Australia's defence and develops a model describing the mines we need, how to use them and when to use them.

WIELDING THE WEAPON THAT *WAITS*:

AUSTRALIA's USE OF SEA MINES IN THE 21st CENTURY

by LCDR Alan Hinge MA(Strategic Studies) BSc psc RAN
Navy Visiting Fellow, Australian Defence Studies Centre
Australian Defence Force Academy

Managing International Conflict

Conflict between nations is a continuing aspect of human experience and managing conflict, at least in its early stages, involves both parties manipulating 'risk'. Each side tries to establish some degree of control over the other's actions by introducing the chance of experiencing unacceptable danger, injury or loss. For governments, manipulating risk sometimes means the threat to use military force, but specifying the nature and extent of force depends on deciding just what level of military 'expenditure' matches the value of one's political objectives. The essence of 'risk management' here is for government to avoid over reacting or under reacting militarily, because either mistake can draw a high price. Under reaction can contribute to the rival feeling more confident in a 'war of risk', while over reaction could tempt him to panic and escalate. Either way, a vicious cycle of violence can begin, and prospects for settlement will probably deteriorate as the conflict escalates.

As a 'good international citizen', Australia demonstrates a high threshold against risk taking and is unlikely to initiate unilateral military action that could escalate an international dispute. However, while high thresholds for military action are excellent in principle, democracies are sometimes disadvantaged by them in practice. This is because they may be 'pushed' so far by over confident adversaries that ,ultimately, there is little alternative but to regain the initiative with a high level military response. High costs in terms of 'blood and treasure', which the democratic government tried to avoid for so long, are then drawn.

Rather than drift into such 'all or nothing' response dilemmas, 'good international citizens' need relatively low risk, 'high leverage' political-military tools to signal resolve in the early stages of threat development. These 'sobering' tools should help defuse potential conflict by giving the opposition far less reason for confidence at the outset. In short, they should provide options for graduated military response aimed at making the other side 'blink', so that new conditions for favourable settlement are developed.

What is Graduated Response?

A system of graduated response provides options to deliver proportional responses to a wide variety of threats and, when developing graduated options, Navy planners should base recommendations on SAFE criteria. That is, a graduated response must satisfy the conditions of Suitability, Acceptability and FEasibility.

'Suitability' of a military option is measured by how far its accomplishment achieves the desired political-military effect. Desired effects may be forcing meaningful dialogue, drawing third party intervention, or obtaining concessions, a withdrawal or even surrender. Most importantly, when checking the suitability of a proposal the question,'.... What is our objective, and *exactly* how will this option help us achieve it' should be asked throughout the evaluation and implementation process.

'Acceptability' involves judgment on whether the desired result is worth the risks and costs, and whether the action sits well with Australia's 'public conscience' and international law. Public conscience stems from the sense of right and wrong that governs a particular

nation's perceptions of justice and behaviour. Right or wrong actions in the eyes of neighbours, allies and the world community depends on meeting the twin tests of reasonableness and proportionality . Acceptable actions must also be seen to minimise unnecessary suffering and guarantee protection to non combatants. Furthermore, commonly accepted actions are those stemming from the inherent right of self defence, either collectively or individually (Art 51. UN Charter). Acceptability of response is also reinforced by presenting clear evidence of provocation and demonstrating that attempts to peacefully resolve issues have been made. Moreover, having the support of regional groups and exhibiting a genuine willingness to work with the UN and other agencies to settle the dispute, are important ingredients of acceptability in the eyes of the international community.

'Feasibility' is simply concerned with whether the suggested military option can really be accomplished with available means. However, the fact that a military option is feasible does not necessarily mean that it is suitable and/or acceptable.

Importantly, if navy's planners develop and articulate SAFE options in the early stages of threat development, our Government is likely to feel confident in justifying its actions before the electorate, our allies and the international community. We will now look in detail at where the sea mine fits in as a SAFE tool of conflict management and limitation.

The Sea Mine as a tool of Graduated Response

Assume that the point is reached where Australia's political leaders believe they must do 'something' tangible and decisive about a situation with potential for military escalation. Initially, options involving *directed weapons* such as bullets, bombs and missiles increase prospects for escalation, and a high threshold against their early use is likely to exist. Directed weapons are simply active weapons 'launched' with the intent of destroying a target shortly after release from human control. They are high profile weapons almost invariably carried by highly visible, crewed platforms such as combat aircraft and warships.

If a 'show of force' by an active platform such as an ANZAC ship or an FA/18 fails to deter, the human directors of these weapons eventually face an 'All or Nothing response' dilemma that ultimately involves 'pulling the trigger' or 'backing down'. Pulling the trigger involves an inherently high chance of escalation, while backing down may be interpreted by the opponent, the region and the Australian electorate as weakness or even surrender of sovereign right. In short, directed weapons inject the main ingredient of 'hot' war; this being the likelihood of escalatory 'eyeball to eyeball' confrontation.

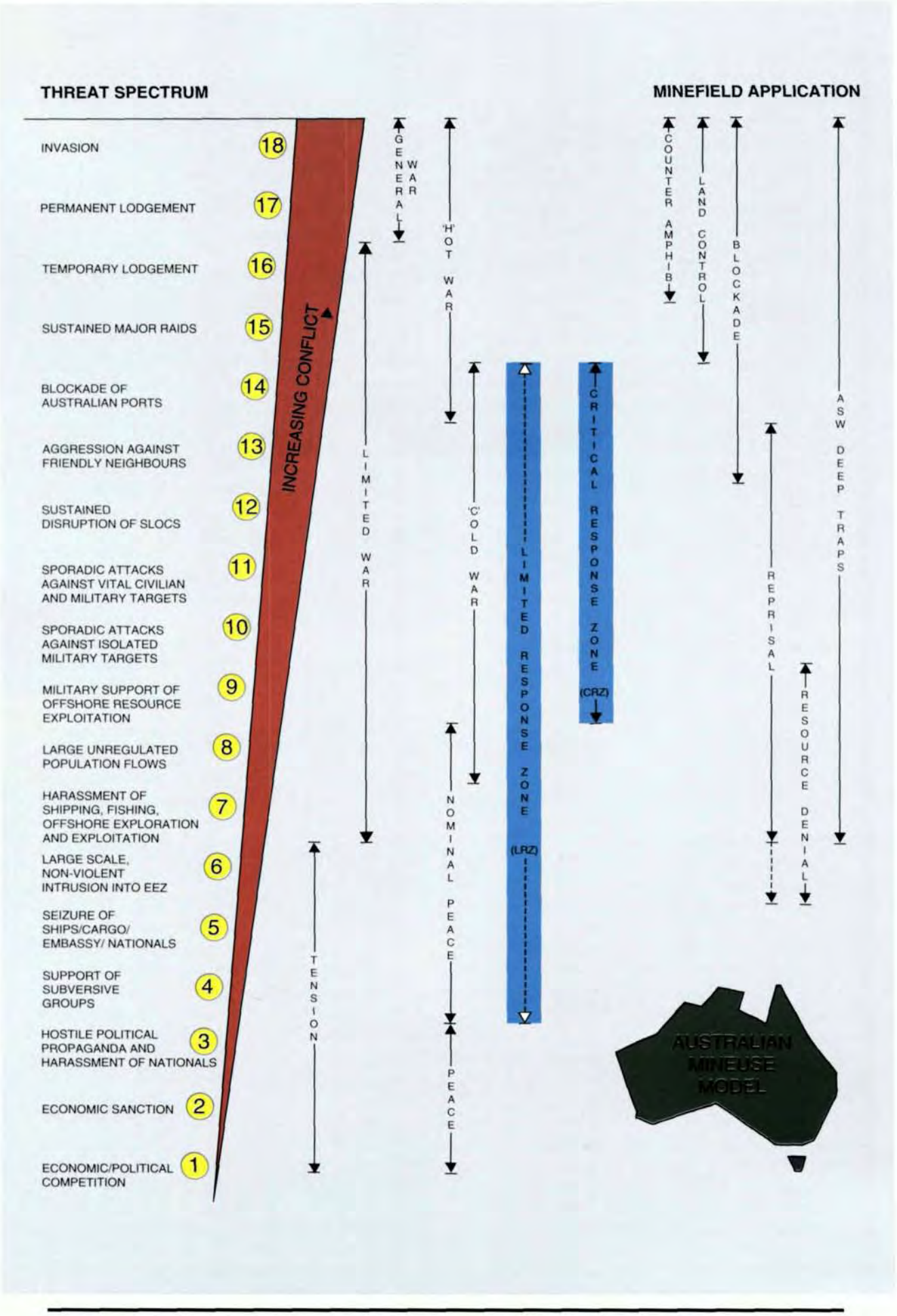
Risk of 'eyeball to eyeball' combat, at least initially, should be avoided, and the Australian Government is likely to show commendable reserve before authorising first use of directed weapons systems. But, as discussed, lack of firm, prompt action in the early stages of threat development could well draw severe penalties, by contributing to an opponent's confidence and willingness to take risks.

In some circumstances deployment of naval minefields may give Australia's political leaders valuable options not provided by any other weapon system. Minefields give decision makers an instrument of firm, yet non escalatory military response, because minefield deployments do not immediately sow the seeds of a 'hot war'. They avoid committing active platforms, their directed weapons and their crews to 'eyeball to eyeball' contact. Nevertheless, minefields are unambiguous and project psychological 'warheads' capable of near infinite patience and instantaneous attack (see Pt 1, pp.38-9). Also, because of the impersonal nature of minefields less 'face' is lost in refusing to challenge them as opposed to the situation of withdrawal from directed weapons. In fact, naval minefields lie at the critical interface between military and police action in that they can yield precisely measured pressure aimed at minimising violence through adjustment of their areas, targets, intensities, timings and durations of effect. In many instances, the minimum response required to achieve a political-military objective can be selected using naval minefields.

The Australian Mine Use Model (AMUM) is now presented. It suggests a systematic approach to using naval minefields as components of suitable, acceptable and feasible graduated response against a wide variety of threats.

THE AUSTRALIAN MINE USE MODEL (AMUM)

The AMUM is depicted on page 40. It is a weapons use framework that matches ways to use mines against kinds of threat. The framework is for general guidance only and is not meant to be too 'scenario sensitive'. It should be flexible enough to be applied in situations not exactly envisaged during peace time planning because, if history is any guide, the conflict actually faced is likely to be quite different to that which was anticipated. Consequently, the Threat Spectrum on the left margin of the AMUM merely 'signposts' various degrees of threat ranging from a minimal threat to national security (Level One), to a maximum threat to national survival (Level Eighteen). Specific ordering of contingencies in between these extremes is open to debate, but exact ordering is *not important* because a threat which may eventuate can be fitted into a level equivalent to, or between, the levels set on the model. Once a judgement on threat


THREAT SPECTRUM
MINEFIELD APPLICATION
INVASION
18
PERMANENT LODGEMENT
17
TEMPORARY LODGEMENT
16
SUSTAINED MAJOR RAIDS
15
BLOCKADE OF AUSTRALIAN PORTS
14
AGGRESSION AGAINST FRIENDLY NEIGHBOURS
13
SUSTAINED DISRUPTION OF SLOCS
12
SPORADIC ATTACKS AGAINST VITAL CIVILIAN AND MILITARY TARGETS
11
SPORADIC ATTACKS AGAINST ISOLATED MILITARY TARGETS
10
MILITARY SUPPORT OF OFFSHORE RESOURCE EXPLOITATION
9
LARGE UNREGULATED POPULATION FLOWS
8
HARASSMENT OF SHIPPING, FISHING, OFFSHORE EXPLORATION AND EXPLOITATION
7
LARGE SCALE, NON-VIOLENT INTRUSION INTO EEZ
6
SEIZURE OF SHIPS/CARGO/ EMBASSY/ NATIONALS
5
SUPPORT OF SUBVERSIVE GROUPS
4
HOSTILE POLITICAL PROPAGANDA AND HARASSMENT OF NATIONALS
3
ECONOMIC SANCTION
2
ECONOMIC/POLITICAL COMPETITION
1
INCREASING CONFLICT
GENERAL WAR
'HOT WAR
'COLD WAR
LIMITED WAR
TENSION
NOMINAL PEACE
PEACE
LIMITED RESPONSE ZONE (LRZ)
CRITICAL RESPONSE ZONE (CRZ)
COUNTER AMPHIB
LAND CONTROL
BLOCKADE
REPRISAL
RESOURCE DENIAL
ASW DEEP TRAPS
AUSTRALIAN MINEUSE MODEL

level - however approximate - has been made, the user traces across to the right to see what kinds of minefields could assist in dealing with the threat.

Note that likelihood of threat deteriorates markedly as we proceed 'up' the threat spectrum from very plausible political/economic competition to highly implausible invasion. The probability of the listed threat (or something like it) arising is not at issue; this model is used to demonstrate an approach to *thinking* about the graduated use of a weapon to manipulate risk.

We will now work through the model, starting with the nature of each threat in the spectrum and then discuss the fields that can be used to help counter them.

THE THREAT SPECTRUM

The Tension Zone (Threat levels 1 to 6).

A number of minor contingencies exist at the lower levels of the threat spectrum, with Levels 1 to 3 included simply because they affect the social and economic progress of the Australian people. Threat Level 1 (Competition) involves economic/political competition that could generate international tension.

Level 2 represents deterioration in relations to the point where one party imposes some sort of sanction (diplomatic, trade or travel) on the other. Trade sanctions can range from banning certain types of commodities to full trade embargoes. This level of threat could also involve manipulation of currency, cutting import quotas and raising tariffs, thus bringing pressure to bear on Australian decision makers to make concessions. Threat Level 3 involves consistent, hostile political propaganda and perhaps harassment of Australian nationals overseas.

Three more types of threat exist in the Tension Zone. Level 4 may include material support for subversive groups within Australia; Level 5 includes seizure of Australian cargoes, embassies, ships, aircraft, other assets and perhaps even nationals overseas. While these acts develop considerable tension they would generally be dealt with using exclusively diplomatic means and international pressure.

Threat level 6 marks a significant increase in tension, with large scale, non violent intrusions into Australia's EEZ occurring with another government's tacit approval or even active encouragement. Civilian and military surveillance and arrest forces could be used to deal with this contingency in the first instance, however, an extremely disproportionate cost is likely to be exacted and intrusions could be large enough to indicate that Australia's government cannot regulate its own EEZ. Indeed, causing this kind of embarrassment - perhaps aimed at an eventual resource 'grab' - could be the motive behind such intrusions.

The next threat level (7) takes us into the 'grey' area of limited conflict. Potential for escalation to general war, which involves full mobilisation of national resources, increases as we move up from threat level 7.

LIMITED CONFLICT (handling Threat Levels 7-16)

Limited conflicts are 'wars of risk' where minefield deployments may prove especially advantageous. This kind of conflict involves limited objectives and falls short of general conflict in that the essential (continental) sovereignty of one party is not under direct, long term threat.

Limited conflicts may be 'cold' or 'hot'. Levels 7 to 14 fall into the 'Cold War' category and may involve increased states of alert, threatening manoeuvre and limited contact between rival military forces. Levels 15 and 16 take us into the 'hot war' part of the spectrum. 'Hot wars' involve overt conflict between major regular units and large scale damage to property, together with the likelihood of significant civilian and military casualties. Note that some Hot/Cold war overlap exists at Threat level 14 because, if blockade were attempted against Australia using only mines, overt combat between military forces would be absent and the conflict would likely remain 'cold'. However, if air, surface and/or sub surface units were used during a blockade the conflict would become 'hot' because of the certainty of overt combat between armed forces.

Threat Level 7

Harassment of shipping, fishing and off shore exploration/exploitation assets could involve the sustained presence of rival military forces within or in close proximity to the Australian EEZ. Motives for interference with Australian offshore activities may be to exert political pressure on the Australian Government or to claim resource rich areas.

Threat Level 8

Injection of large numbers of illegal immigrants with or without the sanction of a rival government may be associated with creating a precedent for subsequent migration. It could also become a relatively safe, indirect way of pressing a resource claim using the precept that 'possession is nine tenths of the law'. Moreover, using unregulated population flows (UPFs) to provide 'cover from view' and 'cover from fire' for lodgement forces is a handy way of compromising Australia's strategy of defence in depth, which largely relies on identification and destruction of conventional forces in the sea air gap. In any case, sustained landings by large numbers of illegal immigrants, whether supported by a rival government or not, would be a threat to Australian sovereignty.

Threat Level 9

Military support for off shore resource exploitation could involve permanent dployment of rival maritime forces in Australia's EEZ. Motives for these activities could be to support a major resource grab or provide 'leverage' in disputes over fishing, oil, mineral and gas fields.

Threat Level 10

Sporadic attacks against isolated military assets in Australia and the EEZ pose direct military challenges to the Australian Government. This has an inherently high potential for escalation, and motives for attack could be to embarrass Australia's political leadership by drawing a disproportionate response, or simply to affect the government's capacity to make independent judgements on certain issues.

Threat Level 11

Sporadic attacks against vital civilian and military assets in Australia and its EEZ are serious attempts to intimidate the Australian Government and its citizens through violence. The variety and importance of targets would be significantly greater than at threat level 10. While these acts are essentially demonstrative in nature, Australian civilian and military casualties are likely to occur.

Threat Level 12.

Sustained disruption of SLOCs may involve anything from closing archipelagic straits and deterring neutral shipping from approaching Australia, to seizure of Australian flagged ships at sea. Once again, this could be undertaken to obtain 'leverage' in dealing with the Australian Government over some issue. Striking at the margins of Australia's 'reach' is likely to be very attractive to a rival endeavouring to extract political or economic concessions; these tactics could draw an extremely disproportionate response from Australia in the long term.

Threat Level 13.

Aggression against friendly neighbours is a serious threat to Australia's security because of the likelihood of requests for, and expectation of, ADF assistance. For example, strong historical, political and moral ties to the governments of New Zealand, PNG and several other nations in the South Pacific could lead to Australian military involvement. Similarly, obligations to consult under the FPDA and ANZUS could lead to Australian military support in some circumstances.

Threat Level 14

Blockade of some Australian ports could be attempted with submarines, mines or a combination of both. Substantial damage could be done by temporary blockade of even a handful of ports and, once again, this kind of threat may be used to intimidate the Australian Government by causing substantial economic damage, not to mention loss of 'face'. Coastal shipping is particularly vulnerable to disruption and accounts for 40% of the domestic transport task. This is larger than any other transport mode and comprises about 50 million tonnes with a cif (cost insurance freight) of nearly 20 billion dollars.

Threat Level 15

Sustained major raids against Australia bring the situation into the 'hot' war category. Unlike scenarios considered at levels 10 and 11, the objectives of major raids are punitive and probably acquisitive rather than demonstrative. This fundamental change in the nature of political-military objectives represents a serious escalation.

Threat Level 16

Temporary lodgement of enemy forces on Australian soil is a potent form of applying political pressure against Australia's government, possibly to gain concessions on resource sharing. Such a direct threat to territorial sovereignty represents a 'quantum' leap in escalation which could easily lead to general conflict.

Threat levels 15 and 16 require strong and direct military responses from the Australian Government. However, responses may involve some constraints such as refraining from direct attack on the rival's home territory. Nevertheless, most restraints are likely to be eliminated as conflict becomes general, and military victory becomes the key objective.

General Conflict

General Conflict characterises threat levels seventeen (permanent lodgement) and eighteen (invasion) which involve full mobilisation of Australia's civil and military resources, because the nation's long term territorial integrity and perhaps even survival are threatened. Military response would be pitched at the maximum level with little debate.

Looking at the Response Zones

The Limited Response Zone (**LRZ**) indicated in the centre of the AMUM encompasses Threat levels 4 to 14. These threats demand judiciously selected responses because fear of escalation, coupled with un-

certainty concerning the rival's objectives, affects the scope of reaction. Prompt government decisions on just what constitutes a reasonable and proportional response are difficult here, and military responses in the LRZ are likely to be augmented by extensive diplomacy and attempts to focus international pressure on the rival.

Threat levels 4 to 8 of the LRZ may be met with diplomatic and economic means. However, levels 9 to 14 embrace the Critical Response Zone (**CRZ**). Here, Australian decision makers would seriously consider using unilateral force to develop more favourable conditions of settlement. Nevertheless, fear of escalation to a hot war would be a major constraint on the nature and extent of military response. In the CRZ Australian leaders would be faced with a major national security problem, and could ask in effect:

> '.....What do we do about this situation? If we use aircraft or ships the whole thing could blow up in our faces and escalate into a major conflict. If we don't do something, then we lose face in front of the opponent, the public, our allies and the international community'.

Appropriate options during the early stages of conflict in the CRZ depend on the unique and often unpredictable circumstances of the situation. However, the six minefield types depicted on the right side of the AMUM may contribute to successful security solutions and yield options not provided by other weapons systems.

MINEFIELD APPLICATIONS

Resource Denial Fields (handling Threat levels 6 to 9)

It can be argued that Australians lay claim to a disproportionate share of the earth's resource wealth. By 2025 less than one quarter of 1% of the world's population is likely to be living in Australia (23 million of a world population of 10 Billion). Yet, among other things, Australians claim more than one quarter of the earth's known uranium reserves together with huge gas, mineral, oil and fishing reserves existing within continental Australia and its EEZ - an area comprising some 10% of the earth's surface. Also, since 1933 Australia has claimed almost half (43%) of Antarctica (Australian Antarctic Territory) on the ground that it is important to Australia's security.

Australia exists in a region comprising many developing nations with rapidly growing demand for energy, foodstuffs and mineral resources to sustain the increasing economic and social expectations of their populations. Under increased regional population pressure, Australia's disproportionate share of the planet's wealth could be questioned and perhaps even challenged. The EEZ, AAT and perhaps even parts of the continent itself *may* , in the long term, become attractive targets for 'sharing'. If serious challenges do come, Australia's government would be under pressure to deny rival exploitation of its EEZ, and minefields could be used to assist in the following ways:

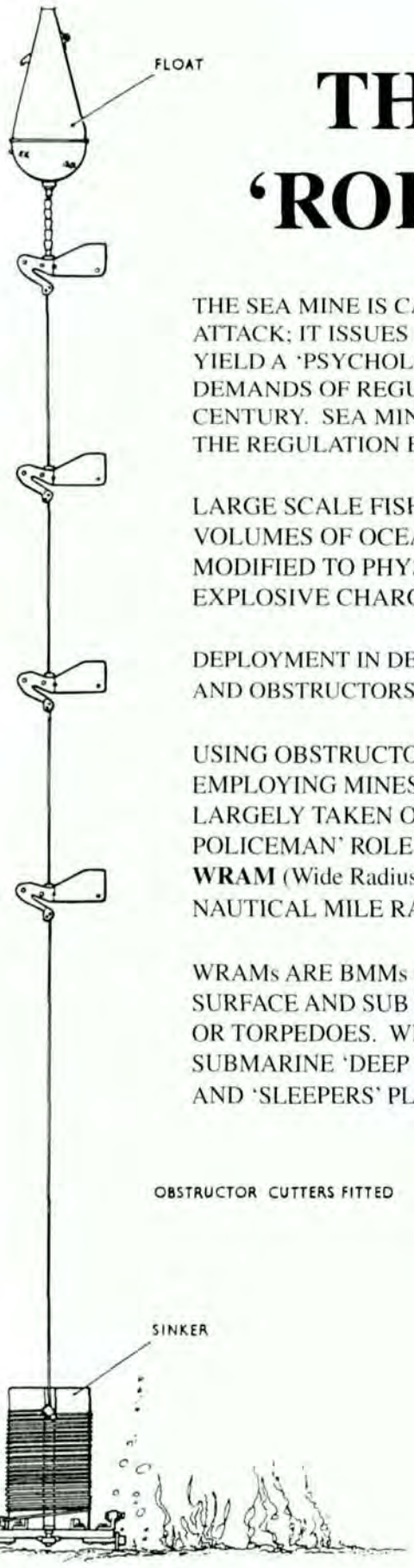
Fishery Denial Fields: A certain amount of petty pilfering in terms of fishing within the EEZ is expected, and completely eliminating it through vastly increased surveillance would yield a small marginal increase in effectiveness at huge cost. However, large scale illegal intrusions by foreign fishing fleets – with or without the support of their governments – create dangerous precedents and must be deterred. Of course, if it proved physically impossible to arrest most intruders, the Australian Government could dispatch warships and fighter aircraft to demonstrate its resolve, but if threats presented by active, manned Australian units were ignored, these units would eventually be forced to either attack or back down. Attacking unarmed, non violent craft is likely to be seen as inappropriate by the international community, but something tangible would need to be done to maintain the credibility of the Australian Government.

Large scale fishing operations require enormous rigs of nets that carpet considerable volumes of ocean. These operations can be hamstrung and deterred by obstructor mines designed to physically wreck and sever fishing nets with blades and/or explosive charges (see p.44). These mines are described below and could be covertly deployed in the courses of the rival's fishing fleets, or be quickly delivered by air once information on rival activities had been acquired.

Obstructors perform a 'robot policeman' role. This kind of role, where the 'human' element is largely taken out of policing and punishment, may become increasingly important in the 21st Century.

Oil, Gas, Mineral Denial Fields: Rival attempts to exploit increasingly valuable seabed resources would involve substantial exploitation rigs and platforms. The main area of challenge is likely to be the vast, poorly regulated area in the waters to Australia's north and north west, from Cape York to Dampier. Fortunately about 80% of the EEZ in this area is less than 200 metres deep and hence 'mineable'.

Rival rig construction and emplacement areas could be cordoned off with mine fields deployed by Australian aircraft, surface vessels and submarines. The onus is then placed on the rival to either back down, 'run' the minefields or make the escalatory move of deploying mine counter measures vessels (MCMVs) in Australian waters. These vessels are naval warships, and orchestrating deployment of rival counter meas-



THE SEA MINE AS A 'ROBOT POLICEMAN'

THE SEA MINE IS CAPABLE OF NEAR INFINITE PATIENCE AND INSTANTANEOUS ATTACK; IT ISSUES NO COMMUNIQUES AND NEVER SURRENDERS. THESE FEATURES YIELD A 'PSYCHOLOGICAL WARHEAD' THAT CAN BE USED TO HELP MEET THE DEMANDS OF REGULATING ALMOST 10% OF THE EARTH'S SURFACE IN THE 21ST CENTURY. SEA MINES COULD SERVE AS 'ROBOT POLICEMEN' CAPABLE OF EASING THE REGULATION BURDEN ON AUSTRALIA'S POLICE AND DEFENCE FORCES

LARGE SCALE FISHING OPERATIONS INVOLVE RIGS OF NETS THAT CARPET HUGE VOLUMES OF OCEAN. THE BASIC MINE SWEEP **OBSTRUCTOR** (pictured) CAN BE MODIFIED TO PHYSICALLY WRECK AND SEVER FISHING RIGS AND NETS USING EXPLOSIVE CHARGES AND SPECIAL KINDS OF BLADE AND GRAPNEL

DEPLOYMENT IN DEPTHS TO 500 METRES IS POSSIBLE USING MODERN MATERIALS, AND OBSTRUCTORS 'COLLAPSE' AFTER A PREDETERMINED TIME

USING OBSTRUCTORS IN A FISHERIES PROTECTION ROLE IS A SIMPLE EXAMPLE OF EMPLOYING MINES AS 'ROBOT POLICEMEN'; WHERE THE HUMAN ELEMENT IS LARGELY TAKEN OUT OF DETERRENCE, 'ARREST' AND PUNISHMENT. THE 'ROBOT POLICEMAN' ROLE COULD BE GREATLY ENHANCED WITH THE DEVELOPMENT OF A **WRAM** (Wide Radius of Action Mine) THAT CONTROLS AN AREA OF THREE TO FIVE NAUTICAL MILE RADIUS

WRAMs ARE BMMs or BOTTOM MOUNTED MINES THAT INTERCEPT UNCLEARED SURFACE AND SUB SURFACE CONTACTS BY AUTOMATICALLY LAUNCHING ROCKETS OR TORPEDOES. WRAMs ALSO HAVE WAR FIGHTING ROLES, INCLUDING USE IN SUBMARINE 'DEEP TRAPS', REPRISAL/QUARANTINE FIELDS AND AS MCMV 'KILLERS' AND 'SLEEPERS' PLACED IN ENEMY HARBOURS.

ures forces takes the non violent 'card' out of the rival's strategy. The onus to escalate is then placed on him and any effort to sweep Australian mines in Australian waters could be stopped using Australian combat ships and aircraft. This constitutes a reasonable and proportional response to sustained, illegal intrusion into the Australian EEZ.

UPF Denial Fields: (Threat Level 8) Unregulated Population Flows (UPFs) are causing increased concern world wide, but Australia's problems to date have been sporadic, relatively small and manageable. Successful means used to deal with UPFs have relied on police and judicial methods supported by diplomacy, however, UN authorities believe that the problem will get far bigger.

We live in a region where the rich are getting richer and the poor are getting poorer at an increasing rate, and unmet social expectations, coupled with growth in poverty and hunger, could lead to much larger migrations of the poor to richer areas. The UN estimates that the world's population will almost double to 9-10 Billion by the year 2025, with Asia's population expected to increase by 60% from 3.1 billion to 4.9 billion. Interdependent problems in sustaining this increase abound. For example, according to Dr Klaus Lampe, Director General of the Philippines based International Rice Research Institute (IRRI), struggling farmers in South East Asia seriously threaten environmental stability,'...while the growing masses of urban poor are a menace to urban stability'. He also warned that global rice production has to increase by 70% by 2025, and this goal' ...must be achieved on less land than is now in production..'. Effectively, to meet future food needs, grain yields per hectare must double by 2025.

Of course, it is impossible to accurately estimate the nature and extent of the UPF problem for Australia in thirty years time; numerous, often 'thin' assumptions have to be made, and technology's potential to ameliorate problems that appear overwhelming today should not be underestimated. Nevertheless, estimates of the possible dimensions of the UPF problem for Australia do exist. For example, during the ANZAAS Conference of September 1994, one speaker from the CSIRO estimated that unregulated population flows to Australia could reach 500,000 per annum by 2020. Certainly, this appears to be a worst case scenario, but even at one fifth of this level Australia's surveillance, arrest, processing and absorption capabilities are likely to be inundated, and resort to more extreme deterrent and control measures would almost certainly be considered by an Australian government. Strong calls from the Australian electorate for decisive action would be likely, but manned military platforms are then faced with the 'shoot or back down' dilemma on a huge scale.

Humanitarian obligations preclude destruction of non combatant vessels at sea, and Australia's surveillance, police, arrest, processing and absorption capacities would remain in danger of being overwhelmed. In such circumstances *declared* , protective minefields may be deployed in territorial waters as means of deterrence and 'channelling'.

Minefield deployments could ease the burden on conventional law enforcement forces by cordoning off large areas of coastline so that the bulk of UPFs are shunted into designated quarantine zones. These deployments are akin to setting up anti burglar defences in a neighbourhood facing a breakdown in law and order, and could ease pressure on Australia's limited surveillance and arrest assets by allowing them to focus on particular entry paths and holding areas. However, to be of practical, cost effective assistance in the UPF denial role several technological problems would have to be ironed out. For example, using conventional mines is unlikely to be cost effective, and a WRAM (Wide Radius of Action Mine) with an effective radius of at least three nautical miles would need to be developed (see p.52). Also, effectively marking fields and reliably communicating 'no go' zones to UPFs also poses some difficulty.

Letting it be known widely that protective minefields have been planted in Australia's territorial waters could be presented as a justified Australian response in *extreme* UPF situations. Nevertheless, any suggestion of using minefields to directly stem unregulated population flows in situations not posing direct, substantial and permanent threats to Australian sovereignty and economic viability are unreasonable and disproportionate - not to mention inhumane.

It is stressed that deployment of any kind of minefield to control UPFs would be part of a last resort deterrent, and implemented only after sustained failure to remedy huge, unregulated population flows by peaceful means.

Rival Force denial (Threat level 9)

Any sustained, coercive presence of rival naval or air forces within the Australian EEZ would escalate tension substantially. These forces may harass Australian workers engaged in resource exploration and exploitation, or interfere with fishing and surveillance activities. They may even support rival resource exploitation attempts.

Australian surface and air platforms could be used to contain operations of rival vessels, but 'temporary' mine fields could deter the foreign naval presence in certain waters, particularly in resource rich or disputed zones of shallow depth (under 200m). However, if rival military support for resource grabs became more

wide spread and aggressive, thus making mining of disputed areas prohibitively expensive, Australia's political leaders could choose to inflict a proportional inconvenience on the rival by 'fouling his own backyard', rather than engaging him in Australian waters.

Reprisal Fields

Reprisal fields are used as means of economic warfare and can be applied in threat situations from levels 6 to 13, but especially at levels 9 to 13.

In cases of sporadic attacks against Australia (levels 10 and 11) and disruption of SLOCs (level 12), Australian forces may well find themselves spread very thinly against raiders with high mobility who work at the margins of Australian 'strategic reach'. It is impossible to effectively guard all civilian and military targets and SLOCs with limited Australian interdiction and escort forces likely to be available in time of conflict. Consequently, the Australian Government could be placed in the embarrassing position of simply not being able to 'lay hands' on elusive raiders determined to elicit a disproportionate response and bring coercive pressure to bear on Government decision making. Australian response in kind could be operationally difficult and unacceptably escalatory in the early stages of dealing with these kinds of attack. However, minefields could prove to be a subtle and more expeditious means of affecting the rival's cost/benefit perceptions.

Reprisal fields use mines to close selected rival ports for specified periods to exact a proportionate (or disproportionate) price for irritating activities against Australia. Such fields are *assertive* and differ from *offensive* minefields in that they are declared prior to becoming dangerous and have strictly limited life spans and locations. They are usually applied against two or three ports, because full blockade is not the objective.

Holding up essential cargoes and shipping, and interrupting important supplies draws an economic cost. Every ship delayed represents a net cargo loss because, if the right ports and cargoes are chosen, at the conclusion of the conflict the rival is left with a negative balance of ship days that often cannot be recovered without significant expense. Every week of delay dislocates a rival's industry to a measurable extent, because many key industries rely on steady flows of material. Other indirect consequences of deploying reprisal fields include increased marine insurance rates, refusal of neutral crews to sail and withdrawal of tonnage from trade with a nation whose main ports are effectively mined.

If the rival attempts to challenge the minefields, he does so at his own risk and must accept a probability of ship damage or loss. Sinking and salvage of vessels significantly contributes to cost, and the repair of damaged merchantmen and counter measures vessels also has a disturbing and cumulative effect.

Advantages of reprisal minefields, and their potential use by an Australian Government anxious to be seen as decisive in response to threats at levels 9 to 12, can be summarised as:

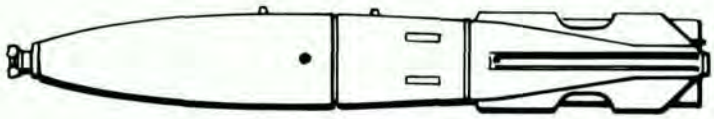
- Reprisal fields satisfy an immediate political requirement for tangible, proportional and effective action against an elusive rival bent on embarrassing the Australian Government, or unlawfully gaining political leverage by coercion. Boldly deploying mines in the rival's territory unambiguously signals Australian determination not to be 'pushed around'. Ultimately, reprisal fields could provide Australia's government with increased political leverage over the rival at marginal cost, given the safe and extensive deployment options currently on inventory (see Pt 1, JANI Vol 20 No3, p.43)
- The Australian Government could justify deploying reprisal fields to the electorate, regional groups and the United Nations as an appropriate and reasonable use of force, in terms of being a low key response to provocative activity. Certainly, reprisal fields are effective forms of retaliation in the rival's 'back yard' that offer a persistent threat, yet they have the advantage of being responses set at the minimum level of overt conflict. 'Eyeball to Eyeball' violence is eliminated; only warned maritime targets are attacked; populations are 'targeted' with shortages and reduced standards of living rather than with bullets, bombs and missiles.
- Reprisal fields draw a precisely measured and specifiable cost from the rival. For example, the following declaration might be made by the Australian government after reprisal fields are deployed:

  "...The Australian Government is concerned by recent provocative acts perpetrated by ... This situation is unacceptable and Australian forces mined harbours A, B and C as part of a reasonable and proportional response to provocation. These minefields will activate in 36 hours and have an active life of more than 100 days. A notice to mariners has been issued to ensure safety of neutral shipping in accordance with Article 8 of the Haig Convention of 1907.

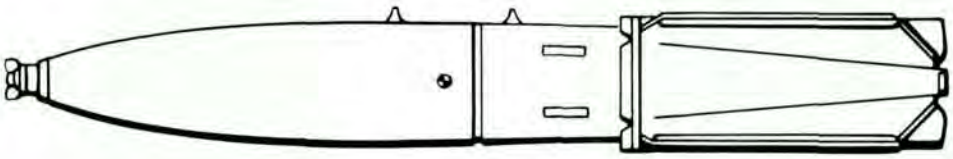
  "Closure of harbours A, B, and C for this period of time draws an economic penalty commensurate with the economic damage and costs incurred by the Australian Commonwealth in dealing with belligerent acts to date. Attempts to challenge the fields are likely to bring about sinkings and damage exceeding this cost.

  "Deployment of these minefields is an assertive act of self defence in accordance with Article 51

DESTRUCTOR DESCRIPTIONS



DESTRUCTOR (DST) MARK 36



DESTRUCTOR (DST) MARK 40

The conflict in Southeast Asia saw the introduction of a completely different mine concept. By installing the Mk 75 DST Modification Kit in GP Low Drag bombs, the weapons became Destructors (DST), or bomb mines. The DST's, created by marrying the Mk 75 kit to the bomb, mark a major advance in the mine ready-round concept because the maintenance time for the kits in storage and the time required to prepare the weapon for planting are very significantly reduced over those required for standard sea mines such as the Mk 52 and Mk 55 series.

With the Mk 75 DST Modification Kit installed, a 500-pound Mk 82 bomb becomes a Mk 36 destructor and the 1000-pound Mk 83 bomb becomes a Mk 40 destructor. The figures above show both the Mk 36 and Mk 40 DST's. (The Air Force incorporates the kit into its 750-pound Mk 117A bomb, which then becomes the DST Mk 117D.) The DST Mk 36 can be equipped with a Mk 15 (Snakeye retardation) or a standard conical fin. The Mk 40 DST uses either a standard conical fin or a retardation fin assembly (MAU 91) with the adapter ADU 320/B. When used over water, the DST Mk 36 and Mk 40 must be retarded.

The heart of these bomb mine destructors is the Mk 42 magnetically actuated firing mechanism with its several associated components and features. The Mk 42 uses a thin-film magnetometer as its sensing device. The various options available in sensitivity, PAC (Probability Actuator Circuit), arming delay, and self-destruct times are obtained by merely breaking or not breaking tabs in the circuits. This feature makes the preparation for planting a much easier and more rapid operation than that on standard sea mines. Another important feature of the later mods of the Mk 42 firing mechanism is the PAC which blocks the mechanism from firing actuations at regular intervals and acts, in effect, somewhat as the ship counter mechanism does on standard mines to reduce the weapon's vulnerability to minesweeping.

DST's became the first mines to be useful as both land mines and sea mines. When buried in the ground after impact, they would actuate on motor vehicles, personnel carrying metal objects, etc. When dropped in rivers, canals, channels, estuaries, harbors, they would actuate on freighters, coastal junks, small craft, etc—any metal-carrying or metal craft.

of the UN Charter and customary international law. The fields have been deployed to minimise violence and limit conflict. The UN Security Council has been informed of the Commonwealth's actions, and the Australian Government has expressed its desire to act in accordance with the decisions of the Council.

"Negotiations for the neutralisation of the reprisal fields can commence when provocative acts have ceased and an undertaking is made that no further acts will be perpetrated against Australia".

Other advantages provided by reprisal fields are:

- The incentive to have the fields neutralised puts increased pressure on the rival to negotiate. Agreements to ensure safety of mined areas could be handy bargaining chips for Australian negotiators, especially if rival counter measures are practically non existent.

- Reprisal minefields could buy time for Australian decision makers and encourage serious third party mediation. Third parties, including the UN and allies could be encouraged to intervene on Australia's behalf if minefield deployments indicated serious and legitimate responses to unlawful provocation.

Blockade and Quarantine Fields (Threat levels 13-18)

As discussed, foreign aggression against friendly neighbours (level 13) is a potentially escalatory threat because strong pressure for ADF involvement is likely. The Australian Government may be placed in the situation of having to convincingly demonstrate tangible commitment to its friend, but at the same time be reluctant to directly involve Australian forces.

Levels of Australian commitment would largely depend on the degree of aggression, as well as the importance and proximity of the friend to Australia. Logistics support, coupled with a naval/air presence may sufficiently demonstrate Australian resolve, however, if the conflict continued to escalate and a hot war situation was likely to develop, a way of limiting conflict and saving 'face' would be sought. In this situation naval minefields could assist by helping to contain the aggressor's ability to project violence; thus keeping the two 'barking dogs' apart.

Given the archipelagic nature of the region to the north, ports and harbours belonging to the aggressor would be providing substantial logistic support for any sustained deployments. Key ports and harbours can be heavily mined to limit the aggressor's ability to perpetrate violence. These actions would demonstrate Australia's resolve to tangibly support its friend by presenting the aggressor with a persistent, unambiguous and uncompromising physical threat. Using minefields in this way will not leave the Australian Government open to charges of fence sitting from the friendly state, the international community or the 'mainstream' of the Australian electorate. Mining is a decisive military act with a relatively low potential for escalation (see Pt 1,p.42) and, after minefields were deployed and declared, the onus would be on the aggressor to take the next step. It is even possible that the physical demonstration of Australian resolve inherent in deploying minefields could make the aggressor 'blink' and avoid further escalation. If escalation did continue, subsequent Australian military operations would be assisted by the fields. For example, combining mines and submarines as the next step in a graduated Australian response (that is, setting up naval 'Quarantines' and Exclusion Zones) could affect any offensive operations of substantial nature.

Having mined the aggressor's key ports, the Australian Government would be morally obliged to explain its actions and intentions. Australia's case to the international community would need to establish that:

- Australia's security and that of the region is seriously affected by aggression against a friendly and peaceful Government.
- Australia is unsure of the aggressor's intentions and has taken assertive action to limit violence in the region. Assertive action involves mining conflict sustaining ports to limit conflict and signal that conflict termination is an important Australian strategic interest.
- Australia's conflict limitation strategy is aimed at inhibiting the flow of conflict sustaining supplies through the aggressor's ports. The minefield deployments are relatively restrained military actions aimed at stabilising or de escalating the situation by limiting the aggressor's war sustaining capability. Therefore, the fields are aimed at de escalation, encouragement of serious dialogue and eventual disengagement of forces.
- 'Quarantine' of conflict sustaining ports is a legitimate act of collective self defence under Article 51 of the UN Charter. The purpose of the quarantine is to prevent the 'disease' of war in the region. Deployments are therefore not acts of war, but attempts to impose a quarantine where a level of logistical isolation and limitation of offensive power is achieved.

Note that having the minefield deployments endorsed by regional groups such as the South Pacific Forum or ASEAN would be especially advantageous.

Blockade of Australian Ports (Level 14)

Among other things, the economic impact of port closure depends on period of closure, cargo value, viability of alternative supply sources, availability of other transport modes and interdependency of industries. When a port is closed for an extended period,

production which is dependent on that port will, over time deteriorate. While no regional Navy has the capability to inflict a sustained blockade of most Australian ports, success in closing a handful of ports can draw a highly disproportionate response. For example, choking the narrow, 10 mile long Port Hedland Tidal Races with a mined ore carrier could halve Australian steel production for three to six months, as well as drastically cut exports. Estimated cost of a three month closure of this kind is of the order of $100 million. Similarly, the Weipa to Gladstone Alumina 'run' is very susceptible to mine attack in the approaches to Gladstone. Consequently, mine deployments could be attractive, low risk options to rivals intent on embarrassing or intimidating the Australian Government.

In addition to directly countering enemy blockade minefields in Australian waters with limited counter measures assets, the Australian Government may consider imposing a reciprocal blockade as a reasonable and proportional response. This involves deploying fields on a much larger scale than reprisal or quarantine fields. Blockade deployments are unquestionably acts of war, because the aim is not merely to impose an economic penalty but to affect entry to all major harbours of a country. The bulk of shipping must be deterred from entering or leaving the rival's main ports

Blockade fields can be laid outside and inside ports in the same way as reprisal fields, however, they can be laid anywhere within territorial waters *and* rivers; they need not be declared and are set to be less discriminating in terms of target. They should be covered by some sort of 'fire' from submarines, naval surface combatants if possible or by a periodic air presence (see Pt.1,p.43). Obligations to neutral shipping are broadly satisfied by declaring that all territorial waters of the enemy should be considered unsafe for shipping.

Counter Amphibious and Land Control Fields (handling Threat Levels 15 to 18)

Major Raids (Level 15): Minefields can contribute to countering sustained major raids and lodgements in the following ways:

- Counter Amphibious Fields (CAFs). These fields mainly comprise rapidly deployable DST type devices which are air laid in shallow water and landing zones. They are set to trigger on detection of landing craft, barges and other vehicles.
- Land Control Fields (LCFs). Again, rapidly deployable DST fields could be deployed to foul landing strips, protect installations and disrupt lines of enemy advance at very short notice. Such fields may even be employed in defence of Australia's Antarctic Territorial claims, because DSTs can be aerially deployed into ice and snow. (see Page 47)
- Blockade Fields (BFs). These fields are used as punitive responses against a nation responsible for a major raid or lodgement. Their purpose is to limit delivery of war sustaining material and reduce the capability to sustain major assaults against Australia.

Australia's geographic depth presents a lodgement force with many problems. An enemy lodgement commander, after having gained a foot hold on Australian territory with some sort of 'cover from fire' - perhaps using Australian civilians or his own civilians - would be extremely concerned about his 'back'. Being far from home in a desolate, low support infrastructure region with tenuous logistic links, would pose severe constraints on his operational capability. Most, if not all initial war sustaining logistics would have to come from home or a forward support base of some kind.

The larger and more capable the enemy lodgement force the more disproportionate are the adverse effects of logistics deprivation. Australian forces could aim at dislocating enemy dispositions by separating forces, threatening supplies and blocking escape routes. This aims to inspire feelings of being 'trapped', and developing this 'state of mind' in the lodgement force may enhance chances of a favourable settlement for Australia in negotiations with the rival government. In short, the objective of the ADF could well be to ensure lodgement forces 'wither on the vine' by fragmenting the enemy war effort, and loosening the lodgement grip to an extent where enemy strength can only deteriorate further and never recover.

Minefields can be of value in disrupting operations and fragmenting the support of a lodgement force. Mine blockade of forward bases, home ports and choke points hinders resupply of operational units. Counter amphibious minefields can be delivered by air at short notice to foul landing places and harbours. Air deployed land control fields adversely affect enemy air operations and mechanised movement. Mines also add to the effectiveness of other ADF weapon systems such as warships, combat aircraft and army units. Therefore, in lodgement scenarios and invasion contingencies the mine fulfils its traditional role as a weapon of attrition that poses a persistent menace.

ASW 'Deep Traps'

These small, accurately placed fields comprise bottom mines in depths between 100-300 metres. Deep traps attack submarines that are illegally or aggressively operating in Australian territorial waters and submarines caught in deep traps incur serious shock damage and rupturing, depending on the 'coarseness' of mine settings. Relatively minor explosive effects are experienced at the surface because of the laying depth, and charge weights can be scaled down in accordance with deployment depth to ensure safety of

surface shipping. Mines in the 'traps' would not need large charge weights because they are not required to attack surface targets. For example, being caught by the 'gas bubble' and shock waves (see Pt 1, p.39) from a 1000 kg charge detonated at 200 metres would be devastating for a conventional submarine patrolling above at a depth of 100 metres. Moreover, development and deployment of single and multiple warhead WRAMs (discussed below) would multiply deep trap lethality. Nevertheless, regardless of the mine types used in deep traps, reliable self destruct mechanisms need to guarantee charge detonation at about 30 metres below the surface to ensure safety of surface shipping.

Deep Traps make use of the mine's 'psychological warhead'. Mine fields reveal themselves only in violent spasms with no possibility of warning, and pose a considerable constraint on the operational freedom of hostile submarine commanders and their crews. These fields may be considered automatic means of 'surveillance by fire' and, depending on the extent of the submarine threat, can be deployed in the following kinds of locations, with the obvious requirement that their positions be accurately known by Australian submarine commanders:

- approaches to Australian shipping focal areas;
- submarine transit routes and choke points, and
- outside the rival's naval harbours.

Deployment of deep traps in Australian territorial waters at any time is a legitimate defensive act which warns a potential opponent that Australia is taking the likelihood of conflict very seriously. Deployment of deep traps can be done covertly by submarine and fields are unlikely to ever be detected. Also, there will usually be a strong element of uncertainty as to whether the loss of a submarine was due to a field or to misadventure.

R&D CONSIDERATIONS

If Australian decision makers want options offered by the sea mine, then a family of mines could be developed to satisfy the requirements of the Australian Mine Use model. The appropriate mine types are:

OBSTRUCTOR MINE	(OBSM)
SUBMARINE LAUNCHED MOBILE MINE	(SLMM)
AIR DEPLOYED COMBAT MINE	(ADCM)
DESTRUCTOR	(DST)
SHORT TETHERED RISING MINE	(STRM)
WIDE RADIUS OF ACTION MINE	(WRAM)

The general features of each mine type in this family are as follows.

OBSM

As discussed, the Obstructor mine is used in resource denial deployments to destroy fishing rigs and compromise a rival's mine sweeping efforts. When the mine is engaged by a sweep wire or a fishing net, a relatively small 3-5 kg high explosive charge will badly hole a net or cut a sweep wire. Production of this mine is relatively simple, and each would weigh only a few hundred pounds. These moored mines should be capable of launch from the surface and even from civilian aircraft so that deployments can legitimately be represented as police actions. A few hundred of these mines should be available to surveillance forces.

SLMM

The Submarine Launched Mobile Mine, which may be a converted torpedo, is fired from a torpedo tube and guided to a position on a harbour floor. It should be capable of being fired from standard 533 mm torpedo tubes and have a range of 5 - 10 nautical miles. Charge weight should be in the order of 300 kg, which is very effective on most targets to a depth up to 30-40 metres, depending on the nature of the sea bed.

The TDD (Target Detection Device) in this weapon has to be very selective and 'smart' enough to resist substantial counter measures. The SLMM's main use is in establishing and 'topping up' reprisal or blockade fields. The real significance of the SLMM is that any harbour within mission range of an Australian patrol submarine (3000+ miles) is able to be mined at minimal risk to the deployment platform. Because of the utility of the SLMM in a very wide range of situations, and the difficulty of producing it rapidly, a minimum of 150 of these weapons should be maintained in peace time as 'ready rounds'.

ADCM

Air Deployed Combat Mines should be capable of deployment from any Australian air platform able to carry 1000 or 2000 pound bombs.

Given advances in modern materials technology an ADCM could have a charge fraction (of total weight) of up to 80%, despite the requirement to use flight gear. Therefore a 2000 pound ADCM should carry a 1500+ pound charge capable of effectively attacking surface and submarine targets. This model would be capable of seriously damaging large vessels of 1000 tons or more at depths up to 80 metres, depending on the bottom and 'coarseness' of mine settings.

An ADCM should combine the four major influence type mechanisms, acoustic/seismic, pressure, magnetic and ELPHI (Electric Potential Field effect), and any desired mix of influence actuations should be

***HMAS* Collins**: *Her five (perhaps seven) sisters will also be based in Western Australia by early next century. All are capable of accurate and covert deployment of a variety of mines at ranges exceeding 3000 nautical miles (more than 5200 kilometres)*
Planting reprisal and blockade fields should be primary missions. Submarines are also needed for 'reseeding' operations and laying 'deep traps'.

achievable. Self destruct settings and variable actuation times are essential features of this mine. Moreover, the facility for surface and sub surface laying would add to its flexibility and, because this mine would act as the 'big hitter' in mixed bag minefields laid within reach of Australian air and sub surface units, several hundred ADCM 'ready rounds' should be available for opportunity use.

DST (Destructor/Bomb Mine)

This very handy and cheap 'bomb mine' can and should be available in large numbers. Continued use can be made of the Mk 80 bomb series, which is still cheaply produced in Australia. (see Page 47) However, the shift to plastic cases may limit utility in some applications. Another limitation is that charge fraction only ranges from 40-60% depending on the model, so effectiveness is limited to depths of 20-50 metres.

Given the DST's capability to cost effectively 'top up' most minefields, and also its utility as a land control weapon, several thousand updated conversion kits should be available for practically immediate use.

STRM

The Short Tethered Rising Mine is deployed in depths outside the effective range of bottom mines, that is, in the 80 to 200 metre depth range. It would be equipped to detect a surface target, detach from its sinker and rise to the vicinity of a target under net positive buoyancy. The STRM could see wide application in resource denial fields as a 'robot policeman' with a limited life when used to help establish exclusion zones or cordon off unwelcome installations within the EEZ.

Several hundred STRM should be available to deter would be 'burglars' or large scale, systematic intrusions into the EEZ. The main area of research applicable to the STRM is sensor and signal processing technology.

WRAM

Drastically widening the radius of mine action and improving target selectivity with better 'finger printing' techniques requires particular emphasis, if the sea mine's emerging role as a 'robot policeman' is to be fully realised. A WRAM is a BMM or bottom mounted mine which, instead of having a simple explosive charge, is equipped to launch a torpedo or rocket at a target. Effective radius of action should be at least one nautical mile against military targets and, ideally, three nautical miles against non military targets.

For assertive deployments in foreign waters, some WRAMs could be configured as 'sleepers' capable of remote activation in situ and reprogramming by coded sonar signal. A number of 'specials' could concentrate in the counter MCMV role with magnetic, acoustic and ELPHI sensors supported by an extensive collection of MCMV 'signatures' located in the WRAM's TSL (Target Signature Library).

Deployment considerations

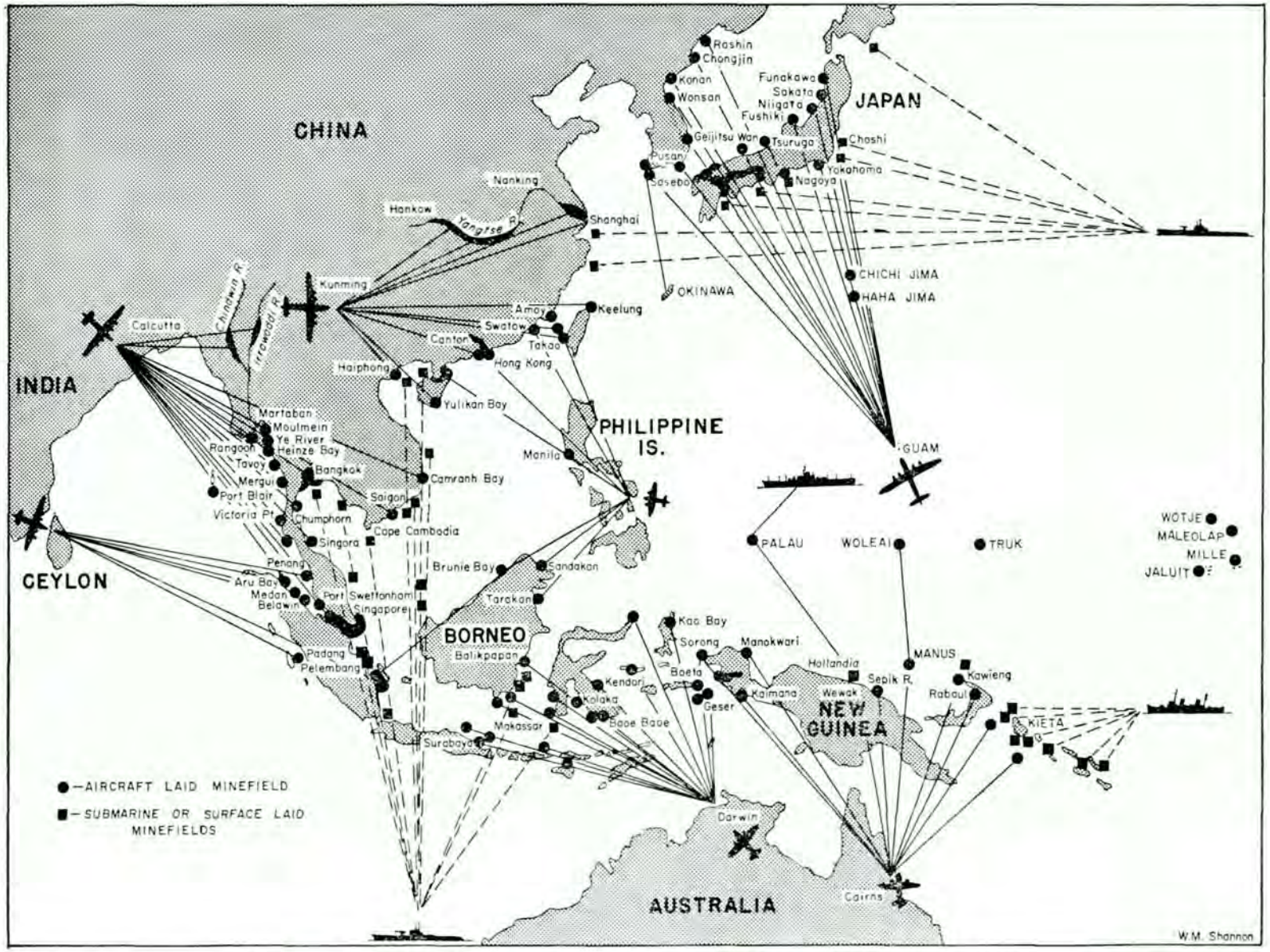
Some key aspects of minefield deployment and tactics were considered in Part One of this series, but special emphasis is given here to submarine laid fields. These fields are extremely valuable in blockade and reprisal applications, as well as in reseeding operations. The great accuracy with which submarines can covertly lay mines as ambush devices in and around harbours guarantees 'demonstration effects' (see Pt 1, p.43). For example, during WW2 the sea mine had no greater success than in the waters of South East Asia when, in October 1943, a handful of Fremantle based submarines started laying mines as a secondary mission because of a shortage of torpedos existing at that time. These operations deployed 160 bottom mines in the approaches to Bangkok, Haiphong and Cape Paderan. The Hainan Strait was also mined. Consequently, these fields threatened the heavily used route around Indo China to Siam, as well as all traffic transiting the Hainan Strait. They immediately produced casualties as ships totalling 22,000 tons were sunk and six ships totalling 18,000 tons were damaged.

Success continued with deployments along the coasts of Malaysia, Singapore, Borneo and the Celebes. As a result of 421 submarine laid mines deployed in 21 small fields, 27 vessels were sunk and the same number was damaged. Consequently, an outstanding success rate of one ship attacked for every eight mines deployed was achieved (this rate could hypothetically be improved on using SLMMs and WRAMs). Furthermore, no submarines were lost during mine laying operations during the entire war in the Pacific.

The mine is still an 'orphan'

Modern sea mines are special weapons that require considerable training of support personnel if they are going to work. Effective mine laying operations to enhance Australia's bargaining position during conflict are simply not feasible unless enough of the right mine types can be quickly prepared and accurately deployed. Nevertheless, mine R&D, production and training remain low priorities in most navies, and the RAN is no exception to this rule.

The main reason for general lack of mine awareness and readiness is the traditionally low status accorded



OFFENSIVE MINELAYING CAMPAIGN AGAINST JAPAN FROM OCTOBER 1942 TO AUGUST 1945.

to the mine as a weapon of war among the military. Fighter pilots and Principal Warfare Officers who are not properly educated in using mines have an understandable preference for the more visible, more glamorous weapons of warfare. These weapons are much 'sexier' than the mine - they move fast, make loud bangs and give the user quick feed back on results. In fact, a former US CNO, Admiral Elmo Zumwalt, pinpointed the core of this attitude problem when he suggested that navies are made up of 'unions' consisting of the surface warfare, submarine and aviation arms. Members of the three unions are educated to be extremely platform oriented and the mine has tended to become an 'orphan' because it did not seem to greatly enhance the value of a platform relative to other weapons. Also, the mine is less dependent on particular vehicular delivery systems than other weapons.

These factors are exacerbated by the mine's traditional image as the weapon of the maritime 'underdog', and all this has led to lack of mine awareness - especially in western navies - and a general feeling that mine warfare service does not enhance prospects for career advancement. Lack of mine awareness within our navy leads to a lack of appreciation by politicians of the unique advantages of using mines. Ironically, the sea mine suffers institutionalised neglect because of the same 'unglamourous', low profile image which is the essence of its ultimate political value!

CONCLUSIONS

Fighting smarter depends on having an insight into when and how to best use the political and psychological 'warheads' of various weapons and tactics. The naval minefield is a unique tool of conflict management, and Parts One and Two of this series describe how decision makers can use it in a decisive manner, while minimising risk of escalation in a wide variety of contingencies. Minefields are especially handy at lower levels of threat development and conflict because they satisfy the three fundamental requirements of graduated response; that is, Suitability, Acceptability and Feasibility. Also, proportionality of response is possible because a field's threat is politically adjustable in terms of area, intensity, timing, target and duration of effect. Therefore, properly managed mine deployments can be made acceptable to the domestic and international 'public conscience'.

A comprehensive Australian Mine Use Model (AMUM) has been developed to practically demonstrate that, in a wide range of scenarios, minefields provide suitable, acceptable and a feasible options for Australian decision makers. Specifically, the AMUM provides options capable of *contributing* to EEZ regulation, defence of friendly neighbours and dealing with harassment and lodgement operations. Tomorrow, sea mines may be called on to undertake 'robot policeman' tasks where the 'human' element is increasingly taken out of policing, deterrence and punishment. This role may become very important in the 21st Century if large scale resource 'grabs' and unregulated population flows begin to inundate Australia's conventional regulation and enforcement capabilities. The development of a family of WRAMs (Wide Radius of Action Mines) should become a research and development priority in these circumstances.

The naval minefield is not a panacea that will magically meet all the challenges and demands of Australian defence; minefields work best when they are supported by other systems or act in support of these systems. However, minefields could give Australian decision makers political-military leverage out of all proportion to mine costs, as well as multiply the effectiveness of other military and diplomatic action. Furthermore, a well planned and diversified approach to mine laying operations provides the very best form of mine counter measure in terms of deterrence. Yet, despite these conspicuous advantages the *weapon that waits* remains the unglamourous, neglected 'orphan' in our naval inventory.

About the author

Lieutenant Commander Alan Hinge holds a Masters degree in Strategic Studies (ANU), and in 1993 was awarded the inaugural Rockwell Scholarship in Strategic Studies. In 1984 he became the first junior officer in the ADF to be awarded a Defence Fellowship, and since then has had thirty five articles published in professional military journals in Australia and overseas. He has also written one book; is a contributing author to the Australian Dictionary of Biography and recently won his 9th major prize in the Commonwealth Navies Peter Mitchell Essay Competition (Open Prizeman 1994). Lieutenant Commander Hinge has edited this journal during 1987-88 and 1994-1995. He is married to Meryl (nee Avent) and they have five children.

Author's note:

My thanks go to the Director and Staff of the Australian Defence Studies Centre, Australian Defence Force Academy for their wholehearted support during the production of this paper.

Ramming speed!

Sydney writer, history buff and man of parts GEOFFERY BEWLEY sent us this fascinating insight on a nearly-forgotten 19th century trend in naval architecture.

The steam ironclad ram entered history on St. Valentine's Day, 1859, when the French iron clad *Couronne* was laid down at Lorient. She was a full-rigged broadside ship, but her hull was iron and her bow was formed into a jutting underwater beak. She started a fashion in ship design that lasted more than half a century.

In this period, almost all major fighting ships were completed with ram bows. Some were even designed as rams, with their gun armament counted as less important, or not important at all. A handful of historic steam warships survive today, mostly preserved as museum ships.

Warrior at Portsmouth is the last surviving Victorian first class ironclad, but three of the ironclad rams are still around, one in Chile, the other two in Holland.

Buffel and *Schorpioen* were launched for the Dutch Navy in 1868, and they served in Dutch home waters until late in the century. Then they were stripped and converted to floating barracks, and they survived as hulks until after 1970. Ship lovers saved them from scrapping, and now both have been rebuilt as museum ships, replicas of themselves in their early life.

Holland was a major sea power in the Seventeenth and Eighteenth Centuries, but a minor sea power after 1815. In the age of steam and iron, the Dutch settled for a navy of cruisers for the eastern empire and coast defence ships for home waters. The first Dutch ironclad was a small broadside ship, converted from a wooden frigate. Next was a smallish barque-rigged turret ship. Next came four ironclad rams, *Stier* and *Schorpioen*, *Guinea* and *Buffel*.

Purpose-built rams were generally small ships. They carried only a few big guns, mounted to fire forward while the ram was bearing down on a victim. They were built short and low, to be handy at manoeuvre and hard to hit. They made their speed through engine power, rather than fine lines. They were cheap to build, cheap to run, and they didn't need big crews.

All this suited the Dutch. Their home coastline was on the short side, with shallow water offshore. They decided to get along without big, heavily armed seagoing battleships, and they produced a fleet of small turret ships, rams and monitors. Actually, to start with, the Dutch shipbuilding industry hadn't yet made much progress with iron construction, and most of the early ships of this program were ordered abroad.

The four ironclad rams were built in two classes, in three countries, in four different yards. Only *Guinea* was laid down at Amsterdam. Her sister, *Buffel*, was ordered from Napier at Glasgow. *Stier's* contract went to Laird of Birkenhead, *Schorpioen's* to La Seyne in France.

They were the first purpose-built rams to carry their heavy guns in revolving armoured turrets. The few rams already in existence carried their guns behind fixed armour. The rams *Stonewall* and *Cheops*, built for the Confederate States of America, had guns on turntables inside fixed turrets. Many naval experts thought the shock of a successful ramming attack would probably jolt a revolving turret's machinery adrift.

Most of the turret ships then afloat were American monitors left over from the Civil War. Their turrets were the clumsy Ericson model. Their deck freeboard was best measured in inches. They were slow, clumsy, and liable to sink in bad weather. The Royal Navy had two primitive coast defence turret ships. The Russians, the Italians and the Danes had others.

The value of turrets was widely debated. On the one hand, they mounted bigger guns more easily, they gave wider fields of fire, they cut down a ship's silhouette, they cut down the armoured area so that less or thicker armour might be used.

On the other hand, because of their weight they couldn't be carried very high above the waterline. Low freeboard meant low speed in a seaway, as waves broke over the deck. Masts and rigging interfered with turret guns' bearing, so designers had to settle for either reduced sail power or reduced fields of fire — or both, most likely.

This debate was reflected in the designs of the Dutch rams. One pair were built with medium freeboard, a flush upper deck and no sailing rig. The other pair

had a low freeboard, with the turret mounted a deck lower and the form of the ship cut away round it, and a brig rig on two tall tripod masts. One ship of each pair has survived.

The design of *Guinea* and *Buffel* leaned toward seaworthiness. They came out looking like derivatives of the USS *Monitor*, but a deck higher out of the water all along. *Buffel* has been restored to this appearance, and today you can visit her in her dock basin at Rotterdam, 20 minutes' walk from the main railway station, and inspect her in detail.

When Napier of Glasgow took the order for *Buffel*, they were already perhaps the most experienced builders of ironclads in the world. They'd already produced *Black Prince, Hector* and the Danish turret ship *Rolf Krake*, all with iron hulls. The Dutch Navy wanted the benefit of the latest British practice.

Buffel was launched after about a year and a half on the stocks. She turned out just over 200 feet long, with a beam of 40 feet and a maximum draught of 16 feet 3 inches. She displaced just under 2300 tons. Her Dutch built sister, *Guinea*, was 100 tons heavier and drew 6 inches more.

She was too small and high in the water to carry thick armour all over. But she had a 6-inch belt along the waterline, with 8 inches on the turret and on the turret trunk inside the hull. This was generous for a ship her size, by the standards of the day. The British second-class ironclad *Penelope*, twice *Buffel's* size, had 6 inches on her belt and 6 inches over her broadside battery guns.

Buffel's turret mounted two 9-inch 12-ton Armstrong muzzle-loading rifles, firing 254-pound shells theoretically capable of penetrating more than 11 inches of wrought iron at close range. On the main deck amidships, she carried two short 4.7-inch Krupp breech-loaders, presumably just because there was room. They were too close to the waterline to be useful in anything but calm seas, and they were too small to hurt an armoured enemy. Nor would they bear ahead, where a ram's enemy was likely to be found.

She had twin engines and twin screws, with 2000 indicated hp for 11.5 knots. This was hardly fast enough to keep up with most contemporary ironclads, let alone to outmanoeuvre them and ram them. Her bunkers took just 150 tons of coal, giving enough range for coastal service.

Lack of speed was a common failing among ironclad rams. Their designers built them short for handiness, then tried to make them faster by improving the ratio of horsepower to displacement. This didn't actually work. Only long hulls could easily be driven fast.

Buffel's performance wasn't exciting even by these low standards. Her hull lines didn't look awfully bad, as ironclad rams went, but the French Belier class ships, larger and tubbier than *Buffel*, were claimed to do more than 12 knots on less power.

Nor was *Buffel* a very good sea-boat, apparently. She got into some trouble on her delivery voyage from Scotland, in heavy weather on the North Sea. Her officers considered she was dangerously unstable, thanks to the weight of the turret so high in the ship. This may have just been because they weren't so used to ships of her type. Anyway, apparently she never had to face this sort of test again.

In fleet service she had a crew of 117 officers and men. This was made up of a captain, 6 officers, 2 cadets, 22 petty officers, 37 seamen, 9 boys, 5 engineers, 2 assistant engineers, 17 stokers, a petty officer of marines, 13 marines, a piper and a drummer. It was a first class ship's complement in miniature. It looks as if the Dutch Navy believed in keeping up a division between deck officers and engineers.

After some years of service, Buffell's gun armament was updated. The 9-inch muzzle-loaders were replaced in the turret by a single Krupp 22 calibre 11-inch breech-loader. The 4.7-inch guns were taken out, and four 1-pounder quick-firers and two 1-pounder revolvers were mounted on her upper deck. Apparently torpedoes were never fitted.

Buffel was never really fast enough to be a useful ram, and she drew a bit too much water to be a suitable coast defender. In 1896, she was taken off the effective list and converted into a floating barracks. Her guns and turret were removed, her engines and boilers were lifted out, the 8-inch armour belt was stripped from her sides. This took several feet off her draught. Then an extra deck was built along the top of her hull, pent-roofed, so that she looked like a giant houseboat.

Accommodation for a couple of hundred seamen was fitted inside. Only the original officers' cabins, right aft, were left unchanged. Between 1896 and 1974, she was towed round to various moorings in Dutch ports. Then the Navy found no more use for her, she was put up for sale to scrappers.

But by then, ship lovers had become interested in saving floating relics. Dutch ship lovers, many in number, rallied and protested. Then the City of Rotterdam took her over, and charged the Prins Hendrik Maritime Museum with her reconstruction. She couldn't be returned to her exact original condition, but she was returned to the right external appearance, with a light dummy turret, a dummy funnel and a replica conning tower and bridge.

Now she's tied up in a basin off Rotterdam's Churchillplein, a mile from the central railway station. She looks just as she must have when she was tidied up after her delivery voyage, black hull, buff funnel, gold leaf around her ports. Only her waterline has changed. Free of the weight of armour, guns and machinery, she shows 6 feet more of her sides now.

Below decks she's a museum. The officers' cabins are in their original order. The forecastle holds a big washroom from her barracks days. Elsewhere there are model ships, guns and marine engines, pictures, plans, maps, a small video theatre and a snack bar.

On the upper deck, the exposed steering looks like another weak point in the design. Actually it's just the auxiliary steering position. The real wheel was below decks, amidships. But that disappeared in 1896, the plans were lost, and the original linkage is now unknown. There's a hand capstan on the forecastle to lift the anchors. In *Buffel's* day, steam power hadn't yet travelled far from the engine room.

Schorpioen, the other restored Dutch ram, was launched at Toulon in January 1868, and a crew sent from Holland commissioned her there in October. She was slightly smaller than *Buffel*, about the same length but a foot less in beam and a few inches lighter in draught. She displaced 2140 tons, a bit more than her British-built sister, *Stier*. She was a little faster than *Buffel*, with 2225 indicated hp giving 13 knots, and she carried about 100 tons more coal. She was armoured on the same generous scale, 6 inches on the belt, 8 inches on the turret, but her turret face was thickened to 11 inches around the gun ports.

In appearance, at a glance, she was nothing like *Buffel*. She was a low freeboard ship, with her upper deck at the height of *Buffel's* main deck, only three feet above the waterline. Nonetheless, she carried a fairly heavy square rig on two tripod masts. The sails were worked from a narrow superstructure deck running the length of the ship.

Schorpioen's turret sat a deck lower than *Buffel's*, breaking the line of the superstructure. This was tapered toward the turret, fore and aft of it, so that the twin 9-inch guns could aim through the widest arcs possible. They couldn't fire dead ahead, as Buffel's could, but the sides of the forecastle were cut away so that the blind angle was only about 30 degrees.

Buffel was a pretty straightforward design. *Schorpioen* wasn't. It's not easy to tell what her designers actually thought they were doing. They made a lot of sacrifices for the sake of the sailing rig. What gave them the idea that the sails were really worth having?

Steam power had been around a fair while by 1868. Ironclads were all expected to fight under steam, with much of their rigging sent down out of the way. A single-screw ironclad needed sail power in reserve in case of a mechanical breakdown, but *Schorpioen* had twin engines and twin screws. A cruiser of the time still needed sail to spin out its endurance and range, but *Schorpioen* was never likely to have to fight more than a day or two's steaming from her home port.

If she'd been designed without the tripod brig rig, the weight saved might have gone to improve her coal supply or her armour. She'd have needed a much smaller crew. She might have been built with less superstructure, for a smaller target and a better field of fire for her guns. Without a sailing rig, she'd certainly have been a much safer ship.

Rigged low-freeboard turret ships came into fashion briefly in the middle sixties, and went swiftly out of fashion a few years later. This was a reaction from the loss of the 7700-ton battleship HMS *Captain*. She was a rigged turret ship with a low freeboard, 8 feet as designed, 6 feet as she was completed, 800 tons overweight.

The Royal Navy was happy with *Captain's* trials performance, and she joined the Channel Fleet in 1870. On 7 September 1870, with the fleet in a severe gale off Cape Finisterre, she heeled the edge of her deck under water, under the pressure of a heavy gust of wind in her reefed topsails. This put her past the point of recovery, and she fell on her side and sank bottom up. She took 472 men with her, including her designer.

Before this, rigged turret ships had appeared to offer the best of both worlds, a good long cruising range combined with the thickest armour and the best system of mounting the big guns. After *Captain's* accident, saving on coal suddenly didn't look nearly so important. Existing ships of the type generally had their rig reduced or removed. Not many more of the type were ordered.

Schorpioen looked as if she were one of *Captain's* pups. She had a turret, the same type of tripod masts, even less freeboard. She did have a long iron bulwark down each side, which unbolted and lowered out of the way when the turret guns had to fire. This increased her visible freeboard from less than 4 feet to nearly 8, better than nothing, but not much better. Her tall masts were lifted out fairly soon, and light pole-masts fitted.

She had a slightly more exciting life than *Buffel*. Once she actually sank a ship with her ram, in what was perhaps the least exciting ramming incident in history. She was at anchor at Brouwershaven, when the Dutch barque *Maria Adriana*, home from the Indies, drifted foul of her and tore her side on the jutting stem. Later, the Dutch merchant navy got its own back, when

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A TACTICAL APPRECIATION OF THE BATTLE OF JUTLAND 31 MAY 1916

BY Lieutenant Alistair Cooper, RAN

The Battle of Jutland was the largest naval battle of the First World War, and also the largest engagement between dreadnought battleships.[1] It came after a period of rapid technological innovation and was a mainstay of tactical consideration in the period between the First and Second World Wars. This paper will consider the Battle of Jutland with particular reference to the utilisation of technologies and organisations not thoroughly tested in war prior to the First World War.

WHAT HAPPENED?

The First World War at sea can be divided into two areas: the contest to control the sea lanes of communication, and the standoff between the British and German capital ship fleets. The standoff was the result of German unwillingness to join battle under any but the most advantageous circumstances. Such opportunities were few and far between because of German numerical inferiority. Though the British also avoided unfavourable situations if possible, they were far more willing to take some risks. When encounters did occur between opposing capital ships, they were almost always broken off by the Germans. Jutland was the largest example of this.

The Royal Navy's Grand Fleet, commanded by Admiral Sir John Jellicoe, left its various bases in northern Britain and concentrated the day before the battle based on intelligence reports that the German High Seas Fleet would be sailing. The German Fleet, commanded by Admiral Richard Scheer, was proceeding to sea as part of a combined operation which was designed to engage the British fleet or a part thereof after its numerical superiority had been reduced by U-boat attacks. The Germans did not intend to engage the full Grand Fleet, however bad weather denied them both the attrition by the U-boats and the aerial surveillance from the Zeppelins that they had hoped for. Both fleets were divided in two sections: the main fleet comprised of the slower but more powerfully armed dreadnoughts, and the scouting forces based on the battlecruisers.

The two fleets almost never made contact, but in the early afternoon destroyers from the opposing scouting forces turned to investigate a vessel which turned out to be a neutral Danish tramp steamer, and in doing so they sighted each other. The commanders of both scouting forces, realising that they had encountered the opposing battlecruisers, thought that they had encountered what both sides wished for — an inferior portion of the enemy's fleet. Neither realised that the other was supported by their main battle fleet and so turned to engage.

The engagement between the two battlecruiser forces occurred on a southerly course at high speed. The German ships had the better of the action which highlighted several points. The first was the inadequacy of the fire control systems in use at the times. The British ships had various systems in use, most of which were based around the Dreyer Fire Control Tables which did not cope well with high speeds and rapidly manoeuvring ships. Though the rates of change in range did not expose the deficiencies of the Fire Control Tables, the conditions made spotting the fall of shot difficult. While both the Germans and the British had their faults in this area, the German stereoscopic rangefinders tended to find the range more quickly than the British.

The superior initial gunnery by the German ships led to the destruction of two British battlecruisers, the *Queen Mary* and *Indefatigable*. Much has been made of the slender armour protection these ships possessed, suggesting that it was mainly responsible for the loss of the ships. Though it was undoubtedly a contributing factor, more crucial was the lack of flash tight integrity in the British gun turrets, brought about by the ad hoc modernisation of flash tight doors in the search for an increased rate of fire. The *Queen Mary*'s near sister ship the *Lion* survived considerable damage at both this battle and at the previous battlecruiser battle at Dogger Bank, which suggests that the ships had a greater ability to resist damage than is usually credited them. It was examination of the damage the *Lion* suffered at Jutland which led to the identification of the cause of the magazine explosions which destroyed the other ships. The Germans had learned this lesson from an earlier action when the battlecruiser *Seydlitz* was almost blown up after a hit on a turret initiated a chain of explosions passing down the ammunition handling system, nearly igniting the main magazines.

The British began the engagement without their most powerful ships, the fast battleships of the Fifth Battle Squadron. These four *Queen Elizabeth* class battleships were the most powerful ships of the war and perhaps the most successful battleship design ever. That they were not in range at the outset was the result of inadequate tactical communications and less than ideal handling by the British commander. The absence of their contribution was most evident once they were able to get within range, with the rear German ships suffering considerable damage while unable to return fire with their smaller weapons. The superior gunnery of the Fifth Battle Squadron, in comparison to the British battlecruisers, was due to the combination of a longer based rangefinder, a superior gun, better visual conditions and more recent practice.

Shortly after the fast battleships were able to engage, two more lessons became evident: inadequacies in the use of radio communications and tactical surveillance. Tactical surveillance was carried out mainly by light cruisers, although the Germans did use Zeppelin airships, unsuccessfully on this occasion. Without radio, this restricted surveillance to the distance to which a reliable visual signalling relay could be set up. With this limited ability it was difficult to develop a tactical picture on which commanders could base their decisions. The British received the first surprise when some of their scouting forces encountered the whole of the High Seas Fleet directly in the path of the battlecruiser action, almost exactly as the Germans had planned. The British in their turn saw an opportunity they desired, and the British battlecruisers turned to the north to lead all the German forces into the arms of the Grand Fleet.

The British did make considerable use of radio to pass on sighting reports this was not as successful as might have been hoped: Apart from inadequate content, errors in estimating position (before the days of satellite or even radio navigation) often made sighting reports quite misleading. As a result Jellicoe knew the High Seas Fleet was in his vicinity, but not with sufficient accuracy to allow him to make a decision on the deployment of his forces. This was compounded by the insufficient emphasis that many of Jellicoe's subordinate commanders placed on reporting the enemy by any method.

Admiral Scheer, the German commander, was as ignorant of the presence of the full British battle fleet as Jellicoe had been of him. His lack of information led him to continue north in pursuit of the British battlecruisers. The first and only battle between the two fleets was the result of Scheer's incomplete tactical picture because he had not intended to fight the full British fleet. This was demonstrated by Scheer's action of reversing course when he discovered that the British Grand Fleet deployed across bows of the leading German divisions. Scheer's following moves were all driven by the desire to disengage and return to port. Jellicoe, while keen to continue the battle, was not so keen to risk his battleships to a massed torpedo attack by German destroyers or in a night action for which his fleet was not prepared. He thus attempted to place the Grand Fleet in a position where it could block the High Seas Fleet from heading towards its bases during the night, and so that the action could be continued the next day. The reporting failures that were so evident during the day were just as evident during the night and contributed greatly to the German success in evading the British and escaping what would have been a very difficult situation for them the following day.

The British had failings in their compilation of tactical information which went beyond the ships in the vicinity of the action. The Royal Navy's intelligence organisation was quite successful in intercepting much of the German signal traffic, but confusion in the interpretation of this information led to the Admiralty passing very inaccurate information to Jellicoe on and before 31 May. Jellicoe therefore did not give much consideration to the information passed to him by the Admiralty about the High Seas Fleet's movements during the night, when in fact that information was accurate and could have helped Jellicoe achieve his aim.

The Battle of Jutland is probably the most closely studied naval action. It has been the source of much controversy, as much because of the later tensions between the two senior British commanders, Jellicoe and Beatty, and their supporters, as because of its equivocal result. There is no doubt that the battle was a strategic victory for the British. The High Seas Fleet did not pose any serious challenge to the Grand Fleet's supremacy; only the U-boats mounted such a challenge. It was also a tactical victory for the British, though this is not obvious as they also suffered greater losses than the Germans. Despite their greater losses there is little doubt that the Germans refused to continue the action because they believed that they were about to suffer greater damage than could be justified by any advantage gained. This is reinforced by the fact that the Grand Fleet had a much larger proportion of its ships available for service in the months after the battle than the High Seas Fleet did.

WHY STUDY THE BATTLE OF JUTLAND?

History is not always regarded as seriously as it might be; it is usually qualitative and not quantitative which may discourage widespread study. This is unfortunate, for although history does not provide the answers to present or future questions, it does show how similar questions were answered in the past. In this way history constitutes distilled institutional and personal

experience, a commodity which should always be prized by the military profession which spends most of its time training for rather than engaging in warfare.

Though Jutland occurred almost 80 years ago, and was fought with weapons unlike those in use today, it has significant lessons for current military organisations. The failures in tactical surveillance, communications, fire control, force organisation, picture compilation and integration of intelligence information are obvious and have been considered in great detail by Arthur Marder, Jon Sumida, N. J. M. Campbell and others. All of the failures mentioned above are linked by one common thread: they were all the result of the inadequate use of new technology: weapons and systems which had not been adequately tested and exercised, or whose potentials were not fully exploited. Such a situation can arise whenever new organisations or technologies are brought into service, because it is difficult to predict exactly how organisations and weapons will work under the conditions found in a real war. In addition, the cost of such simulation is not small.

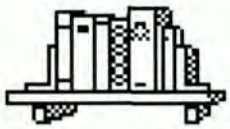
There were few precedents for the conditions under which the battle of Jutland was fought. Radio communications, near real time intelligence information (although not in large amounts), high ship speeds, long engagement ranges, and the use of centralised fire control were all First World War innovations. Though it is perhaps understandable that the use and implications of these new developments were not fully appreciated, such an appreciation is required if an armed service is to prepare itself for future combat.

At least on the British side there are several areas where a combination of lack of foresight and vested interests leading to inaccurate analyses of how the latest developments in technology could best be utilised existed. The controversy over fire control systems, in which an inferior design by a naval officer was adopted, is the best but not the only example. Others included the conditions under which gunnery practises were conducted prior to the war. They did not always reflect the potential of the weapons or fire control systems that were available, nor did they include practice under the more difficult conditions possible in battle. Finally the inadequate integration of the Royal Navy's signals intelligence organisation led to misinterpretation and hence distrust of what was accurate information.

Specific answers to how a particular development can be tested and its full potential appreciated in simulated battle cannot be copied directly from a study of the Battle of Jutland. Some general suggestions can however be made. Firstly, that military exercises tend towards what is known from the past rather than what is anticipated for the future, which is not always the best balance. Related to this is the tendency to ignore an element of Murphy's Law, Clausewitz's friction, which can upset the best laid plans. Secondly, that peacetime pressures are different from those of even a low intensity war, and that these will not help produce realistic training. Finally, military organisations can be insular and mistrustful of outsiders, which does not lead to an objective analysis of a situation. The RAN (and the ADF as a whole) today does not have exactly the same problems as the Royal Navy did prior to the First World War. But it is in the analogous situation of having equipment and organisations whose performance in war has not been fully tested, and it may benefit from analysing actions such as the Battle of Jutland.

Lieutenant Alastair Cooper graduated from the Australian Defence Force Academy in 1991 and is currently posted to HMAS CANBERRA as an Officer of the Watch.

[1] The author is grateful to CMDR James Goldrick, RAN for his comments on the paper.



BOOK REVIEWS

***Traders Under Sail, The Cutters, Ketches and Schooners of South Australia.* Captain James Gillespie, Self published. Hardback with many photographs, and comprehensive index. $35.00.**

This book occupies a place in the maritime history of Australia in general and South Australia in particular. It lists in great detail the smaller, locally owned vessels that traded on and around the South Australian coast between 1839 and 1982, when the auxiliary sailing vessel *Nelcebee* was withdrawn from the Kangaroo Island service.

Whilst Captain Gillespie's seatime took him to many places, he retained a love and understanding of the "mosquito fleet" that once filled Spencer's and St Vincent's gulfs and in others that traded interstate. This is reflected in the detail and wealth of knowledge provided in his book.

Although his first interest in ketches began in about 1926, it wasn't until 1932 that he started his seagoing career in the schooner *Leillateah*, transferring to the interstate trading ketch *Leeta May* about five months later. To obtain his certificates he transferred to larger ships both sail and steam, serving on the coast until 1947 when he joined the Harbours Board as a Pilot in the outports, later becoming the Harbourmaster at Port Adelaide. Prior to his retirement from DMH he was Director of Ports and Marine Operations for South Australia.

Because of the wealth of information on the small commercial sailing vessels of South Australia contained in this book, *Traders Under Sail* fills a vacuum in the maritime history of Australia that has existed for many years. Like other parts of this continent the farmers, traders and the populace in general relied heavily on the intrastate and interstate seagoing trade. the advent of rail and later road transport brought about the end, but to many of us those scenes of the trading ketches sailing in the Gulf is a treasured memory.

It can truthfully be said that these vessels played an important role in the development of South Australia. They also had roles in later years in taking grain cargoes from jetties and landings to the anchorages where it was transferred to the larger ships for passage to Europe.

I would suggest that this lighterage was unique in Australia as most, if not all, of the (sailing vessel) grain trade originated from this state. I have yet to read of a Grain Race that started in any but a South Australian port! They also transported fuel, spare parts and other items to the outports thus hastening their own demise.

There are some five hundred plus vessels listed, not all of which are cutters, ketches and schooners. Other vessels are listed when and where they form an integral part of the story. The amount of information is enormous, each vessel being listed in minute detail including not only the dimensions, but builders name and location, masters, owners, the subsequent fate and more often than not some anecdotes of the life of the vessel. Interestingly enough, the art of lengthening ships appeared to start with these vessels too. It poses the question "is anything at sea really new?".

After retirement Captain James Gillespie was Honorary Curator of the Port Adelaide Nautical Museum, remaining until the collection was transferred on loan to the SA Maritime Museum. In 1991 he was awarded the St Malo Medal by the International Association of Cape Horners for his contributions to maritime history. He is also Patron of the Port Adelaide Sailing Club.

Traders Under Sail is a must for all bookcases whether at home or aboard. Also a 'must' for students who wish to read the complete maritime history of their country. It is available from the SA Maritime Museum, a limited number of bookshops in and around Adelaide or direct from the author at 39 Devon Street, Largs Bay 5016. If ordering direct please add $5.00 for packing and postage.

—Robin Pennock

***Machwi: Mining, War and Insurgency in Burma*, L A. Crozier, Australians in Asia No. 11, Centre for the Study of Australia Asia Relations, Griffith University, March 1994, 113 pages.**

This is Crozier's second book in the series - following on from "The Golden Land", which described his professional career in Indo-China as an aid expert. His follow up book covers his employment managing a tin mine in Burma during the fifties amid a chronic insurgent problem. It was

not his first time in Burma as he gained similar work in the country just before the Japanese invasion which he details in harrowing terms; witnessed as an evacuee.

Crozier appears to be a man of considerable resources as he bounced from one setback to another but largely surviving by his wits and keeping in gainful labour despite many personal disasters. As an expatriate, he had to make the best of what he could. In the end he remained a survivor and those experiences made him the man he is. For this reason, the book is of obvious interest to any one who has worked on technical projects in Asia.

—Mike Fogarty

The Shadow of the Durian, Indonesia Observed, R.W.L. Austin, Australians in Asia No. 10, Centre for the study of Australia Asia Relations, Griffith University, August 1993, 80 pages.

Dick Austin is a former Australian diplomat who has served as a political officer in Ja pan and Indonesia. He is more widely known for his later business interests and a cultivated knowledge of Asian arts. As a POW, during World War II, he acquired Japanese language proficiency. This is his second book, following up on "The Narrow Road to a Far Country", also published in this series.

As part of an autobiographical series, the earlier work is the better of the two - perhaps more interesting in its historical sense for his vivid portrayal of fighting and subsequent capture and imprisonment at the fall of Singapore in 1942, where he served as a young AIF lieutenant. He accurately describes events evoking strong memories of that city. Being able to return and live in Asia after the war may have exorcised many ghosts carried over from Changi.

Australian-Indonesian relations have always been an important plank in Australian foreign policy and it is to his credit that Austin has attempted to make sense of his experience in Jakarta as a diplomat. Clearly, he has done his homework reading up on many standard texts. He acknowledges the importance of Kartini's *Letters of a Javanese Princess*, wryly observing those modern ideological imperatives which reconstructed her as a feminist.

Jakarta was not then a comfortable post and considerable resilience was required to cope with the many challenges a foreigner faced in living and working in such a country. Still, he was able to take the good with the bad and endure, if not profit, nevertheless. It was both professionally rewarding and personally stimulating to be immersed in such a culture unlike our own. Even previous service in Asia could not have fully prepared him for it.

In Singapore, Dick Austin held special memories of the famous Cathay Building, for a time the largest tower in Singapore and headquarters for SEAC after the war. There it was possible to look down on the YMCA opposite where many allied servicemen met a different reception. However, he was not the first Australian (or Asian) to be haunted by memories of hospitality during famed "Cathay Nights". The entertainment and cuisine there still ranks that complex as one of the premier night spots in Asia — in peace and war.

The author draws from letters to his father at once giving his work the legitimacy diaries and correspondence render. He offers brief vignettes of some other embassy staffers he served with - including Rogers, Lawrey, Campbell and Fogg. While he correctly noted that Alan Fogg became High Commissioner to Nauru, he did not list his other senior ambassadorial appointment to Peru.

Much attention is giving to household husbandry and the demands that a foreigner faced — including general protocol and the nature of entertaining in Indonesian society. The author formed abiding friendships with many nationals - some of whom still enjoy prominence in that country. As far as his embassy duties were concerned, Austin describes the agenda of the time as it directed his reporting requirements. That also included West New Guinea/Irian Jaya.

In December 1959 the then Prime Minister Menzies paid a formal visit and the background to it is instructive for an assessment of President Sukarno. On another plane, he also tells us much about Menzies and his disposition towards the region. Consular duties are given equal prominence and a useful consular report is included - something which would not be out of place in a Somerset Maugham novel. They also served. While it is obviously dated, it also is a reflection on behaviour in the floating world in which a clash of cultures often invites.

As his posting ended in December 1960 he attempted to take stock of the many friendships formed and broken if not erased by time and movement. People marry, unmarry, move and die and otherwise fall off personal radar screens into the lost contact zone. As he put it "...all that remains is a leather bound book full of occasions without names and of names without faces". More than thirty years later his memory surrendered only those who were of lasting significance to him.

Lastly, the inclusion of a chapter on "Australian Investment in Indonesia" is curious in its obvious juxtaposition with the earlier consular report. At first

glance, it does not cleave to any symmetry. However, if it represented part of his personal experience this book must be as good a place as any to repeat this seminar paper given in 1982. In the end, the economic opportunities are managed within the wider political framework, now as before.

In all, a useful book of value to those interested in Indonesia and its place in the region and Australia-Indonesian relations overall. That is, seen from residency in Jakarta in the late fifties and through later business contacts in future decades. The hallmark of this book is his description of the many delights available within Indonesia which only extensive internal travel to remote areas can present. We can only hope that any later work expands on his knowledge of Asian Art and his appreciation for it.

—Mike Fogarty

Stealth at Sea: the History of the Submarine, Dan Van Der Vat: Allen & Unwin, $49.95

Van Der Vat has produced a very readable treatise covering submarines and submarine history; from its earliest days, when they were no more than fanciful ideas in the minds of the theorists of the day, to the most modern nuclear and conventional submarines of the twentieth century.

The chapter dealing with the history of submarine development was enlightening, but the highlight of the book, for me, was the exploits of submarine services in the First World War — arguably the most successful period in the existence of the submarine. A close second is the chapter dealing with submarine operations in the Atlantic during the Second World War. Sadly, the war in the Pacific lacks depth and is rather disappointing as is the section on the development of nuclear-powered submarines.

The author provides us with a good understanding of the personalties of the submarine commanders and an accurate reflection of the difficulties facing those charged with stopping the submarine menace. Tales of ineptitude and total disregard for the power of the submarine are scattered throughout the book. What becomes obvious from the outset is that much of the success of the submarine during both wars was due to the attitudes of people such as Mr Hugh Oakley Arnold Foster, Parliamentary Secretary at the Admiralty, who declared in 1900 "The Admiralty are not prepared to take any steps in regard to submarines because this vessel is only the weapon of the weaker nation".

The author's understanding of submarine operations is impressive and the book is generally a delight to read — not normally one for indulging in books such as this I was pleasantly surprised at the entertainment this book provided.

Lieutenant James McCormack

By Sea, Air, and Land: An Illustrated History of the US Navy and the War in South-East Asia, Edward J. Marolda; US Naval Historical Center.

The Vietnam War is largely characterised in books, films and television shows as an army war. *By Sea, Air, and Land*, the US Naval Historical Centre's latest work, serves to redress this imbalance by examining the USN's involvement over 25 years in Vietnam. For example, few people may realise that Vietnam's coastline is 1200 miles long, the Mekong Delta has over 3000 miles of rivers and canals flowing through it, and that more than 2.6 million US Naval personnel served in Vietnam — 2,551 lost their lives.

By Sea, Air, and Land, is an ambitious but largely successful undertaking. Although it has a 'coffee table book' look about it, the text, maps and illustrations that accompany the wide variety of photographs — many of them by official photographers — help to tell of the enormous contribution the USN made to the war in Vietnam. Marolda adopts a chronological approach to this work, beginning with the advisory and logistics support role the USN played in the early 1950s in Vietnam. The many problems the US advisers faced in establishing and training the South Vietnamese Navy are documented here, and it may be possible to draw parallels with the current difficulties we are experiencing with the fledgling Cambodian Navy. Interestingly, because Vietnam was in the American Pacific Command, the responsibility for logistics support rested firmly on the Navy's shoulders. Consequently, much of the early medical, stores, and financial support was provided by Navy personnel.

As the US presence in Vietnam increased in the 1960s, so too did the Navy's — peaking at 38,000 men in 1968. Marolda provides us with some stunning action photographs of the various naval operations designed to disrupt the North Vietnamese and Viet Kong forces by interdicting their resupply routes and bombarding their positions on land. The photographs detail the operations of the US carriers launching their strikes over North Vietnam, the ships providing naval gunfire support (from battleship to river monitor), and the SEALs, divers and riverine forces operating throughout the Delta area of South Vietnam. The coverage of operations such as LINEBACKER, SEA

LORDS, MARKET TIME, ROLLING THUNDER and SEA DRAGON is good, and most RAN DDG sailors would enjoy the flattering caption on page 76 that refers to them as 'Australian cruisers' bombarding coastal defences and resupply routes during Operation SEA DRAGON!

Significantly, this illustrated history does not concentrate solely on the combat elements of the USN. It highlights the critical role that the Navy played in providing logistic support for the war in Vietnam. For instance, the Naval Support Activity: Danang was huge, handling 350,000 tonnes of cargo each month — at the time the largest naval logistics complex in the world — it had to be, because 99% of the ammunition and fuel, and 95% of the vehicles required in Vietnam came by sea. Interestingly, in terms of logistics support at sea, Marolda details how the war years greatly improved this facet of USN operations. VERTREP was pioneered during the war and underway replenishment greatly improved. Indeed 70-97% of the fleet's requirements for fuel, ammunition and provisions were satisfied underway.

In summary, *By Sea, Air, and Land* is a valuable addition to our understanding of naval operations in general and a much-needed counter balance to the plethora of Army-focused histories on the same subject. But at $US53.75, you might like to look it up in the library.

—Lieutenant R.C.A. Leahy

Ramming Speed! *(from page 57)*

a tugboat ran into her in the docks at Willemsoord, holing her under her belt. She sank in shallow water, and she was easily raised and repaired.

Her later career was like *Buffel's*. She swapped her 9-inch muzzle loaders for an 11-inch Krupp gun. She was listed in the active fleet until 1903, and then she lay in reserve until 1908, when she was rebuilt as another accommodation ship. During the Second World War the Germans took her to Hamburg, but in 1947 she was towed back to Holland. She was sold in 1971, then used as a merchant navy training ship for another decade.

She was in poor shape by then, but a committee of ship-lovers took her over to rebuild her and preserve her. She was also taken back to her original appearance, with new tripod masts stepped in. Since the late Eighties, she's been on show to the public at Flushing.

She's not easy to miss. Step out of the train at the dockside railway station, and when the train pulls away, there she is across the water. Like *Buffel*, she floats about 3 feet higher in the water than she did, because of the missing weight of engines, guns and armour. Her hull and funnel are black, her turret and upper works are yellowish buff. Camouflage was hardly thought of in those days.

Like *Buffel*, Schorpioen kept her officers' cabins aft, and they've all been restored. Dummies of her turret trunk and machinery have been built in. There's a coffee shop in the superstructure amidships. On the outside, the tip of her ram now juts just above the waterline forward, and the long sunken spaces in her sides where her armour and backing were removed have been plated over.

Apart from the matter of rig, there are a few other points of contrast between the ships. *Schorpioen's* design left no room for any 4.7-inch secondary guns, but this probably wasn't much loss. *Schorpioen* was also finished without any conning tower. Her first captain pointed out that it might be useful to have armour protecting the officers and the helmsman in a ramming attack, and one was later fitted just in front of the funnel.

With both ships so high in the water, now, you can see the form of each ram bow. *Buffel's* is rounded outward in a big curve, *Schorpioen's* is a sharp jutting spur. Most ramming enthusiasts favoured the sharp bow over the blunt. On the other hand, the blunt bow was less likely to twist and fracture, or to get stuck inside the victim. Presumably the tugboat at Willemsoord had no ram at all, but a blow from her straight stem was enough to put Schorpioen temporarily on the bottom.

One interesting relic in *Buffel's* display is a builder's model of *Buffel* or her sister, looking just as *Buffel* is now, but with a towering brig rig on two tripod masts like *Schorpioen's* . Apparently, even before the loss of HMS *Captain*, the Dutch had second thoughts about this dangerous extravagance. With that topweight added to the weight of her high turret, it's likely *Buffel* wouldn't even have made it across from Scotland. Early photos show she only wore a light fore-and-aft rig on her pole masts sometimes, to steady her.

Neither ship is in much danger now. Their present guardians think they're wonderful. Actually, it's true, they are wonderful. *Schorpioen* is perhaps just a bit more so, because her design is that much more bizarre. But both ships are rare treasures. Ironclad rams are in short supply, these days. It's clever of the Dutch to have cornered the market in this way.

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