JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE

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AUSTRALIAN NAVAL INSTITUTE

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

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

c. to publish a journal.

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

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CONTRIBUTIONS

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

DISCLAIMER

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

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JOURNAL OF THE AUSTRALIAN NAVAL INSTITUTE (INC)

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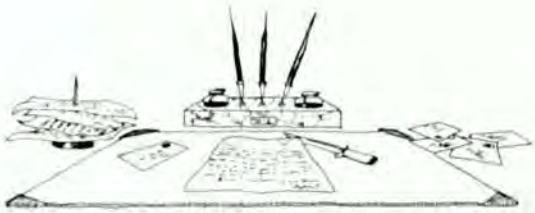
The front cover features a photograph of Garden Island Dockyard looking south
— by courtesy of Defence Public Relations



CANBERRA

On Tuesday 7 November, 1978 the Canberra Chapter met and heard Professor Ulrich Gabler's presentation on *Trends in Modern Conventional Submarines*. About 18 members were present.

Professor Gabler's life long interest in submarines was evident, particularly during the question time when he expertly answered a wide range of inquiries.

Canberra members are advised that there will be a screening of films at the National Library of Australia on Tuesday 27 March at 1930. This is being held in conjunction with the Naval Historical Society and the films are:

Feature — *Rise of the Red Navy*
Support — *Gold on Blue*
The Commander
Mine Channel Reef

All members are welcome.

MELBOURNE

12 people attended the Melbourne Chapter Meeting held at the RSL Club, Toorak on 21 November 1978. Amongst those present was Commodore J.A. Robertson the Immediate Past President of the Institute. A Panel Discussion was led by Commander Mike Dowsett of *CERBERUS* the subject being 'Trends in Training in Australia. Is the Navy in step, out of step, or marching to the wrong music?' A lively debate followed the presentation with almost as many views as people present being expressed. An interesting sidelight was the showing of the latest RAN College recruiting film 'Blue & Gold'.

The **next meeting** of the Melbourne Chapter will be held *on* **Tuesday 20 March** *commencing* at 8 p.m. A paper on 'The River Class DE Modernisation Programme' will be presented by Commander D. York of the Williamstown Naval Dockyard. The venue as before will be the **RSL Club Toorak, 72 Clendon Road, Toorak.**

Correspondence

Dear Sir,

Is there a case for admitting RANR Officers as full members of the Institute? I think so.

The Reserve has within its ranks some exceptionally dedicated Officers of all branches who could be relied upon to make a significant contribution to ANI affairs.

Whilst these Officers obviously cannot be expected to reach the same level of professional expertise as their RAN counterparts, they are, within their own areas of activity, experienced, competent and exceptionally interested in promoting the well being of the Navy as a whole. They are great ambassadors in the community.

The current trend is to employ the Reservist, once trained, on operational duties in peacetime. He is no longer someone you "call up" in an emergency. It should be the aim of us all to integrate the Reservist into the total force by every means possible.

The Institute could help and foster this trend by offering full membership to Reserve Officers thus giving one more indication that they really belong to the Navy.

Yours faithfully,

F.G. SWINDELLS
Captain RANR

Dear Sir,

In his excellent paper "Surveillance of Australian Coastal Waters" in the August issue, Commodore Gray listed required characteristics for both aircraft and ships for use in the civil surveillance role. It is interesting to note that airships would satisfy all criteria, except that of airborne transit and loiter needs (200 and 130 to 170 knots respectively). I believe that neither of these would loom as important should a suitable vehicle, capable of speeds of 70 knots plus and an endurance measured in days and weeks rather than hours, be available. In addition an airship could be both a surveillance platform and an enforcement platform with all that implies in terms of resources.

In an article on airships I made reference to the British firm, Aerospace Developments, and its projected blimp, the AD600. I understand that the first flight of a smaller version, the AD500, was scheduled in October but was delayed due to construction problems. Meanwhile the Venezuelans (early reports had them buying several of the blimps for coastal work) have a representative in London to monitor events. It is reported that the RN is going to "wet" lease the airship for trials and evaluation and that the USN will do the same at a later date. It will be interesting to see what eventuates.

I was lucky enough to ride and drive the Goodyear blimp, America, just recently; it is certainly different and definitely a great way to see the country.

L.M. SULMAN

Dear Sir,

The November issue of the Journal of the ANI contained an article by Master Ned which critized the training current for the GL officer. Whilst the article begged a learned reply the alternative option was to maintain the muteness traditional to the Silent Service. This latter course has been rejected on the grounds of principle.

To argue with the bald facts as outlined would be an exercise of dubious value as the author has argued from the obvious position of knowledge and sentience. He has however failed to research his subject in terms of direct costs in manpower and dollars.

Certain points are well taken and are currently under close scrutiny or are being actively pursued at Navy Office. These include the Junior-versus-Senior Entry into RANC, the acquisition of small training vessels to complement the training afforded at *CRESSWELL* and on board *JERVIS BAY*, and the training of technical officers and in particular the pros and cons of Manadon.

Currently the Junior Entry into RANC costs the Navy dearly in terms of manpower which is ineffective and remains so for some 5-7 years. The simple elimination of this entry in favour of a Senior Entry only would save some 60 man-years/year. However, the equation does not rest at this point. The two factors which inhibit the move are:

a. a lack of numbers applying for Senior Entry; which leads to

b. the average quality, in terms of intellect and dedication, of young gentlemen applying for the Junior Entry tending to be at a slightly higher level.

Given an adequate basis for selection, b. could well cease to be an argument and the JE could be phased out.

As an inducement for young men to complete their secondary education outside the Navy and enter as Senior Entry having matriculated, Navy offers appropriate scholarships, the numbers of which are planned to increase to twenty each year. Past experience has shown that these scholarships do not necessarily provide the shortfall required to ensure a satisfactory level, in terms of numbers and quality, for Senior Entry selection.

With reference to the acquisition of small training vessels, a Naval Staff Requirement is well developed to acquire two such vessels of about 30 metres in length for the College. The vessels would be a follow-on build of the Survey Motor Launches and would be provided with equipment specifically designed to train in all aspects of seamanship, ship handling and navigation that are possible within the limitations of the vessels' size.

Master Ned has advocated a return to Manadon as the venue for Engineer Officer training. This has many supporters both within and without the Training Directorate. Manadon trains technical officers specially to operate and maintain warship systems. RNEC Manadon, unlike all civil universities, ensures appropriate employment of its output upon graduation.

Thus the training and education afforded can, within limits, be directed towards specific goals. Again within limitations, ADFA could be capable of a similar training pattern.

Perhaps the biggest factor against any continuation of training at Manadon is the cost, which at present stands a little short of $40,000 per year per man.

Current tertiary training at the University of NSW and RMIT is providing graduates of good quality although the success rate at the former is disappointing when the latent quality of the student is taken into account. Being civilian-orientated training institutions, both offer courses which do not meet the peculiar needs of the Navy Technical Officer and as Navy's weapons, communications, and ship propulsion systems advance in technology, the required background of an electrical systems engineer and a mechanical systems engineer each with a fair degree of knowledge of the other's discipline becomes difficult to obtain via a straight degree course. This matter is being pursued with the university authorities.

The attack on the RANC Arts course cannot go unchallenged, as neither can the reference to the *CRESWELL* course's being inferior.

Compared with either the B or BSc courses the BA is a soft option. Whilst in no way denigrating an Arts discipline (and indeed the humanities form an essential part of the total make up of a Naval Officer), we are in the business of training Naval Officers who are to command at all levels in an environment of increasingly higher technology wherein mathematics and physics play a major role.

Later in their careers, these officers will be required at least to comprehend (and more likely to use) analytical techniques in decision making which call for a good grasp of mathematics. They will use equipment and systems involving levels of technology which employ scientific and physical principles of which they must have a grasp of the essentials. As the ocean will be their professional working environment, surely oceanography is an appropriate subject of study?

Whilst many officers undertake the *CRESWELL* course, it must be appreciated that the subjects are studied at tertiary level and indeed negotiations are well in hand to have this training recognised by the Australian Council on Awards in Advanced Education. The use of the term inferior alone begs the question "to what?". Perhaps the *CRESWELL* graduate is the better prepared for his Stage II training than the BSc. Perhaps, like Captain Roskill, he is a late starter and his *CRESWELL* course becomes the motivator towards acquiring wider education.

Master Ned's article has been timely and one trusts thought provoking. Never will the trainers be able to please everybody all the time but it is hoped that some aspects of officer training which Master Ned has criticised have been addressed to his and others' satisfaction.

DGNTE

Dear Sir,

As a past Secretary of the Australian Naval Institute I have followed the progress of our journal from the frustrating days of the initial volumes to the now professionally produced Volume 4 series. It is encouraging to note the continuing dedication of all Institute officers mentioned in the 1978 President's Report, not forgetting the staunch support of our regular journal contributors, in particular 'Master Ned' and his colleagues.

Being an ex-PNF officer I find that our journal is an excellent means to bridge the information gap between serving Reserve List personnel and the RAN, as well as other national and international maritime organisations.

My congratulations to the Editorial Staff for a highly informative November issue of the Journal.

Yours faithfully,

A.G. BORWICK

Dear Sir,

The wearing of a full beard and moustache stamps the wearer as a man of sound common sense. One doesn't have to shave. The saving in sleeping time is great when taken over a long period. Beards are cool in summer and warm in winter.

It has always seemed to me that 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.

Moustaches for the Navy?

Please — no — never.

Yours sincerely,

VANG

Dear Sir,

The dichotomy of thought exposed by the two items published in the 'Nobody Asked Me, But...' section of the November 1978 edition of the Journal raises an interesting point or two.

Whilst both articles denigrate long established customs of our Service, the first, attacking the 'full set'-only rule, pales into comparative insignificance when the second subject addressed attacks the mesing arrangements of our shore establishments. An interesting point is that J Cutts conforms to the beard tradition of sporting a full set, and red at that!

The classless society referred to by J Cutts, as being his preconceived notion of Australian society as viewed from afar (the UK), is a myth both within and without the Services. A comprehensive study of this subject by Encel has been published under the title of 'Equality and Authority — a Study of Class Status and Power in Australia'.

A quote from a letter written by a UK migrant in 1966 to the Canberra Times and reproduced by Encel sums up the Cutts' dilemma succinctly. For brevity's sake it has been paraphrased.

> *'When I wanted to migrate to Australia, I was told that Australia was a country without social classes. I found large differences between people, although there was a deep-rooted attitude of equalitarianism.*
>
> *This attitude has been changing due perhaps to the influx of many migrants. The learned and the rich, and also others, today expect to be treated according to their rank and status.*
>
> *On balance, the return to a more realistic attitude as regards differences seems a healthy development. After all, differences are there and cannot be eliminated by ignoring them.'*

I suggest that therein lies the answer to the query raised by J Cutts, whose proposal after all is based upon differences in status which reflect the responsibilities and privileges that status entails.

I commend Encel to Cutts.

LTS

BY CUTTS (G not J please!)

Students of logic, and in particular OETC graduates, will recognise in this letter a classic case of the fallacy known as 'appeal to revered authority'. However, the revered authority is merely a UK migrant — no more an authority than Cutts, let alone LTS or even Encel. To quote from Encel himself, page 462:

> *"The profession of arms . . . . is becoming subject to the processes of specialisation and professionalistion which have affected many other occupations . . . . . The growth of a professional military establishment means the introduction of new kinds of hierarchical relationships which ae not part of the traditional social structure, and have often been regarded as alien or repellent."*

I now feel obliged to quote from one of my own revered, authorities, Norman F. Dixon, who, in his book 'On the Psychology of Military Incompetence' has this to say, page 201/2:

> *'. . . . some military organisations even to the present day actually cultivate the psychology of snobbishness as a substitute for merit. Higher ranks are encouraged to regard lower ranks as socially inferior . . . . . As a general rule, snobbish behaviour betokens some underlying feeling of inferiority. It is a common characteristic of the social climber, of the individual with low self-esteem, of the person who feels threatened or persecuted because of some real or imagined inadequacy . . . . . But why should the military be snobbish? . . . . . military status became spuriously equated with social status . . . . . .*

I commend Dixon to LTS and all our readers.

In passing, I suggest to the editor that there is no place for pseudonyms or initials in a reputable, professional journal — not for letters, articles nor even book reviews.

G. CUTTS

Dear Sir,

I refer to the articles on Casey University by Lieutenant Commander Daw and 'Master Ned' in the August 1978 issue of the Journal of the Institute. As a former Seaman Officer who was keen to undertake some university education, and who was only able to do so after he had resigned from the Service, I support the thrust of those proponents of an outlet to satisfy what is, in my opinion, an urgent need for the tertiary education of Naval Officers.

I venture to comment that the need is as equally urgent for career officers who are well passed their tender years, as for those younger ones who are just completing their secondary education. Although the steps in recent years to provide tertiary education for graduates of the Royal Australian Naval College is commendable, it should be remembered that it will be well into the 21st Century before those graduates are in the highest positions of command. It is persons who have had no opportunity in the past to expand their intellectual abilities to whom care and consideration must also be shown, as from these persons will come those who are to occupy the positions of highest command for the next two decades.

A saying which now seems to have been accepted into our contemporary literature is 'the pen is mightier than the sword', and no doubt this is correct. However, the corollary to this saying is that though there are situations in which sword play is the predominant desirable skill there are others in which it lies in skilful penmanship. I am sure it is well accepted that it does not necessarily follow that the development of skills in the martial arts will assist in the development of literarcy.

My remarks must be tempered by the fact that my service experience is now almost a decade out of date, but when I served in Navy Office in 1969 for a short period I did notice that those public servants who had a sound literary education were thereby assisted in winning the paper war against the Naval Officers. The latter gave the impression of being intelligent but under-educated for the administrative task into which they were thrust. I formed the clear impression that those same officers, who were splendid in their seagoing capacity, were ill equipped for the complexities of policy formation and administration. In my estimation this failure was due to the Naval educational system failing to give them the requisite tertiary education. Lest there be misunderstanding let me hasten to add that included in my premise is a distinction between technical training and the educative process, the former of which I do not concede as being of great assistance in the latter. Hence, for example, a technical weapon or tactical course can be informative and challenging but it may make no contribution to those educative skills to which this discussion is directed.

In the intervening decade since I left the Service my mental processes, no doubt, have been much effected by the legal training which I have undergone. Hence, where I have no doubt as to the desirability of a proper tertiary level of education for Naval Officers, I freely admit that I am not in any position to comment on the best means to achieve it. To the debate I can only add that it is my observation that such an education would be beneficial not only to the Service generally but also add to the personal satisfaction of the persons who serve in it.

Yours sincerely

M.W.D. WHITE

FROM THE EDITOR

In this edition we have five interesting articles including two written by eminent professors and one by an Army officer. Perhaps the discussion of maritime affairs is widening beyond the normal confines of those directly involved?

Professor Gabler's article, based on a presentation to the Canberra Chapter, presents some interesting details of submarine development; Professor West's paper, which was presented as the Keynote Address at the 15th Biennial Congress of the Royal Australian Planning Institute and is printed by kind permission of the author, poses some interesting questions concerning the national way ahead for Australia; Commodore Robertson's article highlights the fact that by studying history we can still learn from other peoples' mistakes; Major Cambridge argues for a strong maritime force for Australia; and Captain Fox presents a very good brief on the projected modernisation of Garden Island Dockyard and Fleet-Base.

A most encouraging aspect since the last edition is the number of letters received by the Editor and which are printed in this edition. In his reply to the letter by LTS, Geoff Cutts raises the subject of the use of pseudonyms or initials. There are quite a number of factors involved in this matter, some for and some against. The current policy is that pseudonyms or initials may be used, providing the author informs the Editor of his true identity, which is kept in the sttictest confidence by the Editor. A study of all items received by the Editor, since the inception of the Journal, has revealed that just over 25% have involved the use of a pseudonym or initials. Is this too much for a professional journal? The Editor would be pleased to hear members' views as current policy can be reviewed.

The increase in the number of letters has been somewhat counteracted by the lack of items for regular features. We are completely 'dry' on 'I was there when . . . .'; 'Nobody asked me, but . . . .'; 'Technical Topics'; 'Ship Handling Corner'; 'Classic signals'; and 'Book Reviews'. With the number of members we now have, this should not occur. Now that the traditional Christmas and New Year holiday period is over we feel sure that members should be in the position to put pen to paper. We look forward to hearing from you.

Finally, the Seminar was a great success and production of the proceedings is in hand. Those who attended will receive a copy as part of their seminar subscription; those who did not attend may acquire a copy for ten dollars. Details are contained on page 12.

THE GARDEN ISLAND MODERNISATION

by Captain L.G. Fox, RAN

This article is based on a paper presented to the Canberra Chapter in October 1978.

Oh it's a snug little island!
A right little, tight little island.
Thomas Dibdin 1771-1841

Garden Island, the location of the RAN's main fleet base and principal refitting dockyard, has been synonymous with Naval activities since the name was recorded in February, 1788, in the log book of *HMS SIRIUS*, a ship of the First Fleet. A kitchen garden was cultivated on the island to supplement the diet of the ship's company; hence the name, Garden Island.

As with many other parts of NSW, the first colonial inhabitants of Garden Island were convicts, who were temporarily accommodated there. Garden Island was the territory of the first 'bushranger', the term used by Governor Phillip to describe a convict who escaped and fled into the bush.

Garden Island was dedicated as a Royal Navy depot in 1866 and it remained so until control was retransferred to the Royal Australian Navy in 1913.

During the period 1923 to 1945, the ownership of the island was a matter of some legal dispute between the NSW and Commonwealth Governments. In 1945, the Navy's occupancy was secured by a settlement of $638,000.

Between the two World Wars the waters surrounding Garden Island were the traditional focus of the RAN and venue of many a Naval occasion.

The construction of Captain Cook Dock, the dockyard's major asset, commenced in 1941 and was officially opened by HRH The Duke of Gloucester on 24 March, 1945. The reclamation of 13 hectares of seabed necessary to complete this facility effectively transformed Garden Island from an island to a peninsula. The total cost in 1945 equivalent dollars was eighteen million but the value of the installation today is estimated to be in excess of one hundred million dollars. Because of an emergency situation, the docking of the first ship, *HMS ILLUSTRIOUS*, a 22,000 ton aircraft carrier, occurred 10 days before the official opening of the dock.

Garden Island Dockyard contains a number of buildings of historical significance of which the following have been listed by the National Trust.

- **Barracks and Hospital.** Construction of this building was commenced in 1887. Two of the floors were originally used to accommodate marines with the third floor being used for officers' apartments and as a hospital.

- **Sail Loft and Rigging Ship.** Construction on this building was completed in 1887 — currently used for flag making and life raft repairs. The chapel is also located in this building. A unique feature is that it is a consecrated church in a factory building.

THE AUTHOR

The author joined the RAN as an Ordinary Seaman Radio Mechanic in 1946. He was selected for Upper Yardman training as a Petty Officer and subsequently promoted to Sub Lieutenant in January 1954. He served on HMA Ships *CULGOA, SHOALHAVEN, SYDNEY (2), QUICKMATCH, VAMPIRE* and *PARRAMATTA*.

Shore postings have included staffs of FOCEA and FOCAF, *COONAWARRA* and Navy Office (3 times).

Captain Fox, who is a Weapons Electrical Engineer, was made an Actuing Captain in April 1974 and confirmed in December 1975. He took over the duties of NPDGI in February 1978.

- **Battery Shop.** This building was constructed in 1887 and its primary use today is to house and maintain a spare submarine battery.

- **Factory Building.** This building was erected in 1887 and currently is used as a machine shop and foundry.

- **Administration Building.** The original structure was completed in 1893 but has been extended since that date with different types of architecture.

- **Naval Stores.** This building was completed in 1893 as a store and is currently used as such.

In addition to these old buildings, Garden Island also has a number of historical artefacts such as ships' figure heads, cannon and bells, together with some rock carvings carried out by sailors of the First Fleet.

The retention or otherwise of old buildings during modernisation will be subject to negotiation with the appropriate authorities. It is planned that the exteriors of the retained buildings be restored and the interiors be upgraded to house one or more of the functions required in the modernised fleet base or dockyard.

The redevelopment of Garden Island has been under departmental consideration for the past twenty years or so. In the absence of an approved master plan, only a very limited amount of construction has occurred. During the past few years, there has been a general acceptance that the condition of buildings, wharves and services has fallen to an unsatisfactory standard in most respects.

In late 1975, a Garden Island Master Planning Committee comprising representatives from the Departments of Defence and Construction was established. As a result of this committee's work, it was agreed by both Departments to participate in the preparation of a development plan for Garden Island.

In November, 1976, the White Paper on Australian Defence stated, inter alia, *The Government intends that the major Naval base at Garden Island, NSW, should remain, but be modernised and developed in a way which pays careful attention to environmental considerations and improved aesthetics. Efficiency of the Fleet as well as of the dockyard is presently hampered by the poor condition of the wharves and other facilities. A start will be made in the coming years to refurbish the wharves and to commence modernising the facilities.*'

On 30 March, 1977, the Minister of Defence announced the formation of a Design Team (subsequently called the Garden Island Modernisation Planning Team, GIMPT). This team, composed of Public Service architects, engineers of several disciplines, Defence representatives and administrative support staff, is still in being and is located at Westfield Towers, Sydney. Also consultant architects and engineers have been commissioned for specific studies from time to time.

The work of the GIMPT has now progressed to a stage where a modernisation development plan can be expected to be ready for Departmental consideration in a few months time. Subject to a favourable reception, it is hoped to place submissions before the Government in mid-1979.

THE PROJECT MANAGEMENT SYSTEM

At the start of the development planning phase, a steering committee composed of senior officers representing the Departments of Defence (including Navy) and Construction was formed. The Chairman is the First Assistant Secretary Defence Facilities and the Naval Project Director Garden Island is the Executive Officer.

The main roles of the steering committee are to review the work of the GIMPT, interpret policy, provide direction on the planning study and resolve matters which the Project Director and Project Manager GIMPT cannot bring to a satisfactory conclusion.

A large number of Defence authorities is involved as well as other Commonwealth Departments. These include Construction, Finance, Environment, Housing and Community Development and Administrative Services. It is expected that State Government and local municipal authorities will also play an active part of the management scene as further progress is made.

Aside from the actual architectural and engineering design planning processes, management interest includes the environment, industrial relations, car parking, service conditions, public relations and public participation, machinery, plant and equipment matters.

Judged by any standards, the Garden Island modernisation is a project of some complexity.

PLANNING METHODOLOGY

The development plan is founded on a Navy statement of user requirements (SUR). The SUR was derived from a functional breakdown analy-

sis of all of the GI Dockyard and Fleet Base activities required to support the RAN into the twenty first century. Some amendments have been made to the SUR as the planning has proceeded and, no doubt, more changes will be introduced as operational and technical requirements alter.

In the early stages of the development planning (about May/June 1977), the GIMPT expended considerable effort on data collection and in developing a modus operandi. Extensive photography recorded GI and its buildings from almost every angle and a complementary survey of every structure was commenced by the architects.

Concurrently, the planning engineers commenced the preparation of berth development layouts. This task involved a thorough study of hydrographic and weather information in conjunction with the available records of ship movements. This data was used in mathematical simulations to verify judgements of the required wharf space.

Industrial planners were occupied in qualifying the SUR in terms of floor space per function/activity whilst the service engineers surveyed the existing mechanical/electrical utilities to provide a foundation for future development.

The approach taken by the GIMPT was not to settle on any particular modernisation scheme at too early a stage in the study. Indeed, two of Australia's leading architectural consultants were commissioned to prepare two basic options, one highlighting the advantages of building additional berths on the eastern side of Garden Island, the other emphasising a possible acquisition of the wharfage in Woolloomooloo Bay.

During the second part of 1977, the GIMPT was also engaged in value engineering assessments, economic evaluations, soil investigations, etc, and had commissioned consultant engineers to carry out hydraulic pollution, air emission, wind analysis, town planning and a number of other studies necessary for the preparation of an overall development plan.

Another important activity, started by Construction and Defence officers, was the preparation of a draft environmental impact statement (EIS). When completed, this paper will describe the impact of Garden Island, as it exists, on the environment today and assess the effect of the various options projected for future development. The EIS, which will be released for official and public perusal is being prepared in accordance with the Commonwealth Environment Protection Act 1974-75.

By December 1977, the GIMPT had produced an interim report that canvassed the pros and cons of 17 cases for development of which 4 were short listed for further departmental consideration, guidance and further development. More will be said on the actual form of the proposed development later.

Two of the broad aspects of the Navy's specification tested the planners' capabilities. These were to:

a. within practical, and economic constraints, separate the Dockyard and Fleet Base facilities; and

b. fit all of the specified Dockyard and Fleet Base functions needed in the modernised facility within the GI area.

Satisfaction of the first mentioned aspect is important as it is desirable that the Fleet Base be independent of the Dockyard in its operation. However, inevitably, economic grounds and the geographical circumstances of Garden Island may predicate some compromise.

It will not be possible, nor is it planned, to re-establish all of the present Dockyard functions in the modernised dockyard. Space is at a premium because of more demanding industrial standards, therefore, some of the activities which have a lower priority for retention on GI will be re-located in a Dockyard Annex, maybe in a building at Zetland. Also, a separate waterfront annex is under consideration for the repair of support craft.

GARDEN ISLAND TODAY AND SOME PLANNING PROBLEMS

Garden Island has a dual role as the Navy's major fleet base and as the principal dockyard for refitting, repairing and modernising RAN ships and the associated complex shipborne equipments and machinery.

Among the facilities required of Garden Island are:

a. berthing and overside services for ships;

b. administration building for the Dockyard and Fleet;

c. Storage;

d. Workshops, laboratories, etc, for the repair, calibration and testing of machinery and equipment; and

e. Amenities for Dockyard, Construction and Service personnel.

Currently the average Garden Island daily population is about 6,000 people. The Dockyard workforce numbers about 3,500 (2,300 wages and 1,200 salaried staff). There are over 150 classifications within the 24 skilled and 16 semi skilled occupations comprising the wages personnel which are represented by 21 unions. Currently 36 nationalities are represented in the workforce.

The annual expenditure by the dockyard on the repair and refit of ships and equipment has been in excess of $40m.

Garden Island occupies a prominent and central position in Sydney Harbour and its potential for creating sociological, industrial, operational and environmental problems has played a significant role in the planning team's considerations.

For example, the area of Garden Island is only 26 hectares with few feasible options for expansion. Within GI and its environs, there are over 300 registered structural assets of which many are small, inefficient temporary/portable type buildings. These structures occupy 5 hectares, parkland occupies another 3.4 hectares and the balance of Garden Island consists of wharf space, roads and parking areas. Traffic flow is severely congested, on the northern end of the island particularly, by the layout and the numbers of cars entering the island.

With an average daily Service and civilian population of 6,000, only 1120 private commuter cars can be accommodated on the limited, widely dispersed groundspace. An equivalent number of GI commuter cars, perforce, must be parked in the Woolloomooloo/Potts Point area; with all of the risks that unattended and/or illegal car parking entails.

In the medium to long term, both 'on' and 'off' the island, ground level car parking will be severly reduced; the former by the demands of the modernisation works and the latter by the Sydney City Council. The council plans to close off local streets and to introduce 'residents only' priority parking.

The narrow entrance to the island, the congested layout and the fact that classified historical buildings may have to be retained in their inconvenient locations coupled with the overriding need to maintain refitting and Fleet Base activities at an acceptable level, throughout any reconstruction activities, pose special problems for the planners. How much building activity with its associated workforce, machinery and transport can be tolerated by the fleet support system and the local civilian residents?

Garden Island in its present form has some adverse effects on the environment. Ships alongside occasionally cause smoke and noise pollution and there is the continual discharge of raw sewage into the harbour. Also, harbour contamination by fuel, paint or solvents is not an uncom-

Garden Island Dockyard circa 2,000?

— by courtesy of Project Director

mon event. Some of these matters can be rectified by a conscious and disciplined approach but others may require the expenditure of considerable sums on special facilities during the modernisation.

The photograph also shows that the present conglomeration of structures is rather unsightly, particularly in juxtaposition with residential areas, Lady Macquarie's Chair and Benelong Point. The architectural coherency of buildings that are planned to be constructed over a twenty year period will be an important factor in the aesthetic appearance of Garden Island; considered by many to be a significant factor in the public's acceptance of Navy's continued occupancy of Garden Island.

The fact that some of these buildings occupy large site areas and, though inefficient in terms of site utilisation, they still have a reasonable economic life, makes a case for demolition difficult to justify.

Nevertheless optimum site utilisation is an important factor, as industrial engineering studies have shown that future needs and improved safety and industrial standards dictate a planned increase of 48% in workshop floor area.

DEVELOPMENT PLAN OPTIONS

The GIMPT has developed three alternative planning options from the previously mentioned short list of 4 cases. These options have taken into account the need to maintain maximum separation of Fleet Base and Dockyard activities and the user's requirement for berthing space, though these aspects have not been completely satisfied by all of the options.

The first and preferred development plan option envisages that the commercial berths, Woolloomooloo 2, 3 and 4, can be permanently acquired from the NSW Maritime Services Board. These berths, in conjunction with the present Fitting Out Wharf (FOW) will form the proposed fleet base area with a capability to provide alongside berths for one large ship and 4 DDG/DE. Up to 4 additional DDG/DE can be secured by double berthing.

In this option, it is proposed that the dockyard control the Cruiser Wharf, East and West Dock Walls and that the present Oil Wharf will be demolished. Two boat pounds will be provided on the eastern side of GI. Minor reclamation work will be necessary to allow the construction of a perimeter road around the island.

Besides the construction of new buildings the plan involves the provision of increased electrical power, steam, compressed air, fuel and chilled water together with the reticulation of these utilities to, and control at, each berth. Facilities to discharge ships sewage are also planned.

It is also planned to retain the EMS Berth for *STALWART* so as to provide sufficient flexibility to cater for the increased berthing demand created by ships of visiting navies.

The importance of the commuter car in the modernisation planning has been highlighted. The preferred plan includes a need to construct a multi-storey car parking facility, with a capacity to store 1,300 cars alongside the Cowper Wharf Road cliff face. The planning concept also envisages a roof top lawn and garden on this facility and this should make it more acceptable to local residents.

The second planning option is based on the provision of constructing the additional wharf space on the eastern shore of Garden Island. This could involve substantially more reclamation of the eastern side sea bed than is involved in the preferred option. However it does not involve the Woolloomooloo wharves. The Fleet Base is essentially located on the eastern side of GI. This option would also require an agreement with the NSW Maritime Services Board since this authority controls the sea bed.

In this option a car parking facility could also be located at the Cowper Wharf Road cliff face but some additional car parking space might need to be constructed in a multi-floor basement under the planned GI buildings.

Both of the options have many advantages/disadvantages of which some can be objectively analysed on a cost-benefit basis and others assessed rather subjectively on a platform of qualitative opinion. Needless to say, GIMPT's final report which, in being submitted, firstly, for consideration by the Departments of Construction and Defence and then, secondly, by the Government and Parliamentary processes, will aim to canvass all of the arguments necessary to produce both a technically feasible and a convincing case.

To conclude, the modernisation of Garden Island should be seen in perspective. It is the most significant peacetime Defence Works project in terms of finance, physical resources and technical complexity, ever to be seriously contemplated by the Australian Government. Further, if approved, the probability is that the Development Plan will involve an ever-changing scene on Garden Island for the next twenty years or so.

Garden Island Dockyard looking north.

— by courtesy of Defence Public Relations

Seapower '79

— . . . must be accounted one of the most important discussions ever mounted in this country.

The Canberra Times,
7th February, 1979

The Proceedings of Seapower '79 are available from the Institute at $10 a copy. (Those who attended the Seminar receive a copy automatically, the cost being included in the registration fee.) The Proceedings contain the papers presented at the Seminar.

Send your cheque, payable to Seapower '79, to the Treasurer, Australian Naval Institute, P.O. Box 18, Deakin, ACT 2600.

BRITISH STRATEGIC AND TACTICAL MISCALCULATIONS IN THE 1930S AND THEIR SIGNIFICANCE FOR BRITAIN'S PREPAREDNESS IN 1939.

by Commodore J.A. Robertson RAN (R'td)

Resources

'The Air Estimates of March 1934 totalled only twenty million, and contained provision for four new squadrons, or an increase of our first line air strength from 850 to 890. The financial cost involved in the first year was £130,000.'

Churchill *The Gathering Storm'*

'That a Prime Minister should avow that he had not done his duty in regard to national safety because he was afraid of losing an election was an incident without parallel in our history.'

Churchill ibid

'It was a national disaster that the effort needed to win the war was incalculably greater and more costly than that needed to prevent war between 1933 and 1939.'

Barnett *'Britain and her Army'*

'(Britain) tended to have trouble spending adequately on defence in years of peace, for other calls on revenue were more persuasive.'

Blainey *'The Causes of War'*

'in a representative government any military expenditure must have a strongly represented interest behind it convinced of its necessity.'

Mahan *'The Influence of Seapower upon History'*

Strategy

'The absence of a generally accepted and coherent national strategic doctrine forced all three Services into an internecine struggle in which the object, apart from mere survival, was never very clear.'

Hunt *'Smaller Navies and Disarmament'*

'. . . (in 1938) the twin obligations of Home Defence and Imperial Defence appeared so overriding that no forces could be spared to fulfil the third traditional aim of British Defence Policy, the maintenance of the European Balance of Power . . . .'

Howard *'The Continental Commitment'*

Tactics

'. . . . the submarine should never again be able to present us with the problem we were faced with in 1917 . . . .'

Official Admiralty report 1937

'the most astonishing thing about British naval aviation (in World War II) is not that it occasionally failed to meet the heavy demands made on it, but that the carriers and crews accomplished so much with the inadequate types of aircraft which they had to use.'

Roskill *'The Navy at War 1939 - 1945'*

'(The British Expeditionary Force of 1939) had no modern arms. Its artillery was still practically the artillery of 1918. Its light weapons were only relatively improved. It had achieved no real degree of air co-operation and its armoured component was ludicrous.'

Divine *'The Blunted Sword'*

'The bomber will always get through.'

Baldwin

'The Air Ministry was . . . . told that in no circumstances would any technical member of the Air Ministry be consulted or allowed to interfere with the design (of the Spitfire).'

Sir Robert McLean (Vickers)

'There never was an Air Ministry requirement for Radar.'

Divine *'The Blunted Sword'*

'(the Amphibious warfare development centre) was . . . . closed on the outbreak of war — on the grounds that there would be no combined operations in this war.'

Roskill 'The Strategy of Seapower'

SYNOPSIS

It has often been suggested that the failure of successive British Governments to provide sufficient resources for Defence in the 1930s was a principal cause of Britain's unpreparedness for war in 1939. Yet examination of the facts and the very considerable sums of money actually made available to the Services in the 1930s indicates rather that resources made available were misapplied for a variety of reasons. The principal reason was the failure by Governments to determine a coherent central strategic policy, and from this failure flowed many of the failures of the British Services to develop appropriate tactics and weapon systems; without coherent strategic guidance the three arms became mesmerised by unproven doctrines, isolated from each other, and, for the most part, they also neglected to appreciate the importance of developments in weapons technologies and tactics.

INTRODUCTION

While it is often popularly believed that successive British Governments' unwillingness to spend money on Defence in the 20s and 30s was the main cause of the country's military weaknesses on the outbreak of World War II, other critics have drawn attention to the failure of the British military Estabishment to take account of technological developments, and their tactical possibilities, which had been occurring over the twenty years from 1919. The truth, of course, is never quite so simple as these two contrasting propositions suggest. There is some measure of truth in both of them, but even taken together they do not explain the almost complete failure of British Forces to be ready for the war to which they were committed in 1939.

SOME RANDOM EXAMPLES OF UNPREPAREDNESS

Britain had invented the tank and Fuller and Liddell Hart had suggested the possibilities of armoured warfare. But it was Germany which exploited both the weapon and the operational concept. The British Army in 1929 spent much more money on fodder for its horses than it did on petroleum.[1] Up to 1939 the Royal Navy had not advanced its anti-submarine warfare capability to any significant extent; there had been minor improvements in detection equipment, of which the Admiralty at the time was inordinately proud, but anti-submarine weapons remained no further advanced than they had been in 1919. Not one slow mercantile convoy exercise had taken place in the twenty years up to 1939.[2] Coastal Command had never exercised with a submarine and the weapons in its 1939 inventory proved ineffective, even when submarines were found on the surface.[3] The Admiralty built some excellent aircraft carriers in the 30s but began the war with its main operational aircraft, the Swordfish, a biplane relic of the 1920s.[4] Tactics to exploit organic naval avaiation were almost totally undeveloped. The Spitfire and the Hurricane were developed by commercial interests as private ventures, virtually in defiance of the Air Ministry,[5] radar, the necessary complement to a successive air defence system, was Watson Watt's response to a request for a "low brow Death Ray".[6] In fairness, a relatively small group in the RAF, with external political backing, saw the possibilities and put the aircraft and the command and control system together with enthusiasm, just in the nick of time. But this was contrary to the mainstream of RAF strategic and tactical thought which remained unrepentantly convinced of the supremacy of strategic bombing even to the war's end.[7] "It was with us . . . a matter of faith", one Air Marshal later[8] wrote but it was an unproven faith and it failed when put to the test of war.

THE AUTHOR

Commodore John Alan Robertson was born at Melbourne in 1926. He graduated from the RAN College in 1943 and saw service in the Royal Navy on the East Indies Station and in the English Channel. After the war he took part in the mine clearances of the Barrier Reef and New Guinea Islands area. He specialised in Communications in 1952 and after RN exchange, joined *HMAS MELBOURNE* (CVS-21) for her commissioning in 1955. As a communicator, he has also been, variously, Fleet Communications Officer, Officer-in-Charge *NAVCOMSTA* Darwin, and Director of Naval Communications. After passing the RN Staff Course in 1963 he had a further two years exchange service in Singapore as a Joint Planner on the staff of the C-in-C Far East. Subsequently he was posted as Executive Officer *HMAS MELBOURNE*. He has commanded *HMAS DUCHESS* (DD-154) 1967-69, *HMAS HOBART* (DDG-39) 1970-72, and *HMAS STALWART* (AD-215) 1975-76. He was serving in Navy Office as Director-General of Naval Policy and Plans before his retirement from the RAN on 1st February, 1979.

Commodore Robertson is a co-founder of the Australian Naval Institute and was its President 1977-78.

BRITAIN REPRIEVED — BY MISCALCULATION

The examples given above are far from exhaustive and the whole range of British miscalculations in the 1930s about the nature of a future war is so extensive and appalling that it would seem only a miracle could have saved the nation from a well-deserved defeat. There is, therefore, some irony in the fact that it was almost certainly the decision to go to war in 1939 which probably saved the country. Strategically the decision was illogical in any military sense. How could Britain, a maritime power, assist Poland, a continental power, located as it was the other side of the continental enemy Germany?[9] Nor could the small, ill-equipped, and ill-prepared British Army effectively assist France, whose own strategy had been severely damaged with the sacrifice of Czeckoslovakia and the Russo-German pact. But, with the British Army defeated, due in part to its tactical weaknesses, the nation was released from the continental strategy it had adopted in response to French pressure in 1939, and it was forced back on its traditional maritime posture; but it was not by deliberate choice.

It was the militarily illogical plunge into war with Germany some five years ahead of Hitler's most likely timetable,[10] and the subsequent rout of the unprepared British Army which at last allowed a breathing space for the nation to face the realities of the war to which it had been committed. Luckily, Hitler, too, had made, and continued to make, his own strategic and tactical miscalculations but with almost the sole exception of the Home air defence system, Britain's reprieve owed virtually nothing to her strategic deliberations and tactical planning in all the years since World War I.

How was it that it could all have been so disastrously wrong? Lack of resources for defence? Failure to keep pace with combat technologies? Or an inability to decide on an appropriate strategy? Was it any one, or any combination of all three reasons?

THE CAUSES OF UNPREPAREDNESS

Resources

The introductory quotes reflect the popular view that successive British Governments failed to provide adequate resources for defence between the wars. And certainly Governments behaved very capriciously at times, such as forcing pay cuts on servicemen, even driving some men to mutiny.[11] Additionally, British statesmen continued to maintain perceived obligations, promising armed assistance to the scattered Empire, and trying to behave in international affairs much as their Victorian and Edwardian predecessors had done, apparently ignoring the nation's relative economic and industrial decline since 1919.[12] On the one hand, at home they sought to prevent increases in expenditure on defence; on the other, they continued to promise to honour defence commitments all round the globe. Despite the politicians' something-for-nothing attitude, continued commitments with no commensurate increase in resources, it can hardly be denied that very large sums were, in fact, made available for the armed forces.[13] Whether taken as a percentage of the Budgets of the day, or considered in absolute terms and adjusted to today's equivalent prices, Defence allocations were far from niggardly. Over one hundred million uninflated pre-war pounds a year, even during the worst years of the Depression, or never less than about 11% of total Government expenditure, annually, was no pittance (See Tables 1 and 2). By any standard these were resources on a scale to gladden the hearts of today's Australian Chiefs of Staff. The question is therefore not so much the resources made available but, rather, how wisely those resources were applied to meet the defence obligations which the nation considered it had to meet.

Politics and Pacificism

Before turning to British strategy and tactics it would be an omission not to mention the pacifistic leanings within the British electorate. Revulsion against the slaughter of World War I, optimistic belief in the League of Nations and the value of disarmament and collective security, persuaded politicians of all sorts, notably Baldwin,[14] that it would be politically suicidal to increase the Defence vote, despite the alarms which began to be sounded by Churchill in the 30s. But while these considerations had their effect on public discussion of Defence resources there is an indisputable consistency in the remarkably high level of funding provided for Defence right through the 20s and 30s; and in any case, even if resources had been increased, there could be no confidence that the additional money would have been spent with any more wisdom than was shown at the time. The real heart of the problem lay elsewhere.

Strategy

Strategy is a much abused, overworked and misunderstood word. At least eight different definitions given by reputable authorities can be found without much exertion. In popular mythology military strategy is an arcane art practised by senior military officers, a few academics, failed

TABLE 1

BRITISH DEFENCE EXPENDITURES BETWEEN THE WARS

From Montgomery Hyde *'British Air Policy Between the Wars 1918-1939'*

Comparative Table of Service Estimates 1920-38

	Navy	*Army*	*Air*
1920	£90,872,300	£125,000,000	£22,992,230
1921	£83,444,000	£ 93,714,000	£18,411,000
1922	£64,883,700	£ 62,300,000	£10,895,000
1923	£58,000,000	£ 52,000,000	£12,011,000
1924	55,800,000	45,000,000	14,861,000
1925	60,500,100	44,500,000	15,513,000
1926	58,100,000	42,500,000	16,000,000
1927	58,000,000	41,565,000	15,550,000
1928	57,300,000	41,050,000	16,250,000
1929	55,865,000	40,545,000	16,960,000
1930	51,947,200	40,500,000	17,850,000
1931	51,605,000	39,930,000	18,100,000
1932	50,476,300	36,488,000	17,400,000
1933	53,700,000	37,950,000	17,426,000
1934	56,550,000	39,600,000	17,561,000
1935	60,050,000	43,550,000	27,596,000
1936	81,289,000	55,881,000	50,700,000
1937	78,065,000	63,120,000	56,500,000
1938	96,117,500	85,357,000	73,501,000
	£1,222,435,100	£1,030,550,000	£456,077,230
Annual average	£64.3 million	£54.2 million	£24 million

Proportion of total allocated to the Royal Air Force = 17 per cent.

TABLE 2

BRITISH DEFENCE EXPENDITURES BETWEEN THE WARS

From Montgomery Hyde *'British Air Policy Between the Wars 1918-1939'*

Fiscal Year	Unemployment Fund	Financial Year	Army	Navy
		1913/14	£ 35,208,842	£ 50,819m150
		1914/15	£255,298,143	£105,858,129
		1915/16	543,187,549	211,421,914
		1916/17	629,863,458	224,972,939
		1917/18	802,992,962	246,924,336
		1918/19	974,033,762	356,044,688
		1919/20	521,479,983	188,254,064
		1920/21	216,825,469	112,793,809
1921/22	£ 58,453,000	1921	95,110,000	80,770,000
1922	47,880,000	1922	45,400,000	56,200,000
1923	41,188,000	1923	43,600,000	52,600,000
1924	51,551,000	1924	44,765,000	55,625,000
1925 [a]	49,291,000	1925	44,250,000	59,657,000
1926	42,753,000	1926	43,600,000	57,600,000
	42,777,000	1927	44,150,000	58,140,000
	53,693,000	1928	40,500,000	59,920,000
	53,397,000	1929	40,500,000	55,750,000
	101,332,000	1930/31	40,150,000	52,574,000
	122,833,000	1931	38,520,000	51,000,000
	117,808,000	1932	35,880,000	50,010,000
	101,609,000	1933	37,592,000	53,500,000
	98,786,000	1934	39,660,000	56,580,000
	97,727,000	1935	44,647,000	64,806,000
	85,470,000	1936	54,846,000	81,092,000
	66,567,000	1937	63,010,000 [b]	77,950,000 [b]
			14,867,000	24,000,000
	67,768,000	1938	86,661,000 [b]	95,945,000 [b]
			35,700,000	31,350,000
		1939	88,296,928	97,296,928
		1940/41	450,647,549	384,162,379
		1941	617,396,917	510,853,677
		1942	799,267,718	593,092,578
		1943	954,304,031	690,563,761
		1944		
		1945		
		1946		

a. *July 1925 - 31 March 1929, thereafter the standard financial year was used.*

b. *Issues under the Defence Loans Act of 1937.*

TABLE 2 (continued)

BRITISH DEFENCE EXPENDITURES BETWEEN THE WARS

Air Force	Total Defence Expenditure	Ministry of Munitions	Total Government Expenditure
£	£ 86,027,992	£	£ 197,492,969
	361,156,272		560,473,533
	754,609,463	246,720,787	1,559,158,377
4,434	854,840,831	559,439,949	2,198,112,710
2,531,974	1,052,449,272	715,101,222	2,696,221,405
85,445,084	1,415,523,534	562,227,196	2,579,301,188
56,614,616	766,348,663	192,843,559	23,949,370
353,568,648	32,922,770	1,195,427,877	
13,560,000	180,440,000		1,079,186,627
9,400,000	111,000,000		812,496,604
9,600,000	105,800,000		788,840,211
14,310,000	114,710,000		795,776,711
15,470,000	129,380,000		826,699,778
15,530,000	116,730,000		842,395,027
15,150,000	117,440,000		838,585,341
16,050,000	116,470,000		818,040,525
16,750,000	113,000,000		829,493,543
17,800,000	110,530,000		881,036,905
17,700,000	107,280,000		851,117,944
17,100,000	102,990,000		859,310,173
16,780,000	107,870,000		778,231,289
17,630,000	113,870,000		797,067,170
27,496,000	136,960,000		841,834,442
50,134,000	185,080,000		902,193,385
56,290,000 [b]	197,300,000		919,874,287
26,000,000	254,400,000		1,018,948,905
72,800,000 [b]	626,400,000		1,408,200,000
61,000,000	3,220,000,000		3,970,700,000
105,702,490	4,085,000,000		4,876,300,000
269,464,039	4,840,000,000		5,739,900,000
360,868,065	4,950,000,000	Defence	5,909,500,000
463,443,580	5,125,000,000	Supplies	6,179,500,000
499,535,028	4,410,000,000	4,999,100,000	5,601,100,000
	1,653,400,000	3,332,500,000	4,191,900,000
	853,900,000	2,652,000,000	3,376,000,000
	753,200,000	2,633,800,000	3,337,000,000

Sources: Cmd 1665 (1922), 4-5; Cmd 3465 (1930) 116-117; Cmd 6232 (1940) 177; Cmd 3465 (1930) 111, 114-117; Statistical Digest of the War (1955), 254; Whitaker's Almanac.

diplomats, and some democratic politicians. There are four recognised classic schools of strategic doctrine,[15] and there are variations, sequential, cumulative, indirect, deterrent[16] and so on. All this word engineering tends to obscure one simple fact; strategy is concerned with winning, or, at least, not losing.[17] Two important factors in this century have tended to blind men to this simple truth; one is unquestioning allegiance to some doctrinaire school of strategic thought, and the other is awe at the combat technologies by which war is to be, or might be, waged. There has been, and still is, one other important misconception. It is this: in order to have a sound military strategy it is considered necessary to define The Threat. So, self-styled strategists scan the horizon seeking to find an enemy, real or potential, assess his capabilities and divine his intentions, for, without a Threat, it is believed, there can be no real basis for one's own military strategy. This might be described as the 'Platoon Commander's Outlook'; in the absence of an evident threat, it is believed, there can be no Situation, and hence, no beginning for the Appreciation, which, as everyone knows, concludes with the Proposed Course of Action.

British military history from the 1920s demonstrates virtually all of these misconceptions about the nature of strategy. After the unpleasantness of the Irish Troubles the world had apparently finally settled down. Germany was weakened economically and bound by the Treaty of Versailles to a limited rearmament. Europe generally had had enough of war; the only small cloud on the horizon was the growing number of aircraft coming into military service in France, and some French abruptness in her international dealings. War with the USA was unthinkable even if there was resentment at her economic strength; there was, too, some pique at America's naval ambitions but these were being argued out in the round of Naval Conferences.[18] Russian and British agents had resumed "the Great Game throughout Asia which had been temporarily interrupted since 1907"[19] but the new Bolshevik nation had too much internal reconstruction to do to present a real threat, despite the Foreign Office's fears for India's safety.[20] Japan had emerged from World War I as one of the world's richest nations and as a major naval power. Furthermore, the Anglo-Japanese Alliance had not been renewed in 1921 for the sake of amity with America, and to meet the wishes of some of the Dominions.[21] Nevertheless it was assessed by the Committee of Imperial Defence in 1925 that Japan "could not undertake aggressive action against the British Empire within the next ten years".[22] In these benign circumstances and in the light of the naval limitations imposed by the conferences, the efforts of the League towards disarmament and collective security, the pacifist mood of the country, and the impoverished economy, Churchill as Treasurer, was able to persuade the Committee of Imperial Defence in 1928 to institute the self perpetuating Ten Year Rule.[23] It was official, no threat for ten years, or so it could be interpreted. And if there was no threat, and one adopted the 'Platoon Commander's Outlook', how could there be a strategy? But the Services needed a strategy, or at least a threat on which to base their force development plans, so they each selected their own and, moreover, ones which suited the various doctrines of warfare they found attractive.

THE ROYAL AIR FORCE

The recently formed Independent Air Force had seen most of its assets disposed of in the heady days following Versailles[24] and, not without some reason, it believed that the two older Services wished to return to the pre-1916 arrangement of a Royal Naval Air Service and a Royal Flying Corps.[25] Despite the fact that the most important reason for its existence at all as a separate service was home air defence,[26] it discovered its raison d'etre in the 20s and 30s in the theories of strategic bombing which had been enunciated by Guilo Douhet in 1921.[27] Trenchard, the RAF's paranoid leader, had found a Cause, and he took it up with evangelical zeal. France had a large air arm, it was within range of his aircraft and vice versa; the RAF's potential enemy became France,[28] and the RAF's strategic doctrine came from the newest of the classic schools of strategic theory, the Aerospace School. "The bomber", the Aerospace School said "it will always get through", and politicians believed them and quoted them in these words for the next twenty years.

THE BRITISH ARMY

After World War I Britain had no intention of repeating that searing experience by taking part in continental warfare in Europe ever again. There was no threat of invasion, and after being withdrawn from Ireland in 1922 the Army seemed to have little purpose. There was a spate of books attacking Army leaders in World War I for stupidity and callousness, reinforcing the pacifist tide of public opinion noted earlier; under these circumstances the Army sought its place outside Britain and became "a colonial gendarmerie with no major role to play or plan for".[29] Yet it too tried to find an enemy, and by the late 20s had decided its prime strategic function was to fight Russia in Afghanistan in defence of India.[30] The plan would require "only some 11 divisions, or a quarter of a million men" which "could probably be raised on a volunteer basis".[31] After all, where else could the Army fight a large land battle? Who needed tanks for that sort of warfare?

RESULTS OF MISAPPLIED RESOURCES — TWO EXAMPLES

Fairey Battle. Over 3,100 of these largely unwanted aircraft were produced. There were high losses at the beginning of World War II and it was withdrawn from the front line and used as trainer and target tug.

— by courtesy of Defence Public Relations

HMS Hood. Survivor of World War I. Sunk by the Bismarck.

— by courtesy of Australian War Memorial (Negative No. 6078)

THE ROYAL NAVY

The Navy had been the first off the mark to find an enemy. By as early as 1921 it had selected Japan and, with the encouragement of Australia and New Zealand had begun to develop the Singapore base[32] which progressed sporadically over the next twenty years till it fell, uncompleted, and unsupported by the sort of Main Fleet on which the strategy was supposed to be based.[33] Quite apart from adopting the Platoon Commander's Outlook on strategy, the evidence also indicates that, in its strategic thinking, the Admiralty misread the classic school of maritime strategy enunciated by Mahan and refined by Corbett, and instead took Clausewitz to sea and to its heart. It had become enamoured of the idea of the Big Battle to decide who was to command the sea;[34] it seemed to forget that the essence of maritime strategy was concerned with controlling that part of the sea the nation needed for its purpose at the time, and this did not necessarily require it to refight a more decisive Battle of Jutland.[35]

As the 20s rolled into the 30s Britain thus had three different strategies being pursued by each of the three fighting arms. Habits of thought became entrenched and reinforced by the force structures which derived from the original strategic concepts. The essentially conservative nature of the Services made them into juggernauts unable or unwilling to reshape themselves to the growing awareness of Hitler's adventurism on the Continent. In broad terms they thought it was merely a matter of using what they had been developing already. Compounding this ossification was their chronic internecine squabble for funds to maintain their separate objectives. In fairness to the Chiefs of Staff they reported by 1935 that "Britain could not fight Japan in the East, Germany in the West, and any power on the main line of communications between the two" (Italy);[36] and they repeated this warning in December 1937. Desirably Britain should make a démarche with Japan, and perhaps Italy, so that they could concentrate on the menace from Germany, even if this meant abandoning their earlier commitment to the Empire in favour of dangers nearer home. But Britain's leaders still vacillated over the strategy to be adopted. The Navy was resolutely opposed to a replay of World War I with a large army on the continent, and was supported by much public opinion, as exemplified by Liddell Hart, for the "British Way of Warfare" — a return to the maritime strategy of the Napoleonic Wars.[37] The Air Ministry championed an Aerospace Strategy — to bomb Germany into submission, and, as a secondary issue, and if necessary, to increase home air defence capabilities.[38] The Army still appeared to have little purpose, or say, and as late as 1938 was being organized to provide two infantry and one mobile division equipped "for an Eastern theatre";[39] these forces could, however, be diverted to assist in Europe if the situation at the time permitted.

Finally the initial war strategy was decided principally by international politics. The abandonment of Czechoslavakia in 1938 had deprived the democracies of 35 well-equipped Czech divisions which, together with France, her Maginot Line and her Army might have made a continental war feasible. France, now alone in Europe against Germany and Italy turned to Britain, not for maritime and air support alone, but for ground forces. It was more than just the military need; it was emotional, too. French public opinion demanded from the British "un effort du sang".[40] If French blood was to be spilt others had to share the pain and loss. Britain responded much as she had done in 1914, but the strategy finally adopted owed nothing to longstanding logical development over the years — it was simple expediency in circumstances out of Britain's control, and not surprisingly, it failed. The Services had developed tactics to suit their individual strategies and with them their weapons and tactical concepts; with one important exception they were simply not ready for the war they had to fight.

If strategy had such an effect on tactics, as has been asserted, it is necessary to examine the British Services tactical miscalculation in the 30s.

Tactics

It can be said that military tactics derive from concepts of operations, which in turn derive from military strategy. Since, as has been suggested, British strategies were diverse and inappropriate, it is not remarkable that tactics and their development suffered accordingly, and these miscalculations were compounded by political misjudgements, and an almost unbelievably complex range of defence committees and sub-committees in the decision-making process.[41]

THE ARMY

As indicated earlier, between the wars the Army reverted to its 19th century role as a Colonial gendarmerie, and, while in Britain reverted to regimental life, sport, smartness on parade, ceremonial and etiquette. It was a gentleman's life.[42] Its two main military intellectuals, Fuller and Liddell Hart were shunted out, became critics of the Army, and were heartily disliked by the military Establishment. Without any real sense of purpose, no clear objectives and, uncertain of its

means, the Army followed no coherent fighting doctrine other than the minutiae of staff tables and procedures. The weapons of 1919 sufficed, for the most part; RAF co-operation was virtually non-existent. Even as war came nearer in 1938 and '39 the Army's belated entry into tank warfare was beset with indecision as to the sort of tank it might use, landcruiser or battle tanks, and in what ratio?[43] In almost every aspect, other than disciplined men, it was deficient. Ironside on becoming C.I.G.S. in 1939 remarked with some heat that his two predecessors should be taken out and shot.[44] It was as bad as that. The Army's main tactical assets in 1939 were discipline and gallantry — a poor match for Hitler's panzers and stukas.

THE NAVY

As indicated earlier the Navy's long-standing obsession with Japan and a Clausewitzian strategy at sea dominated its tactical thinking. The failure at Jutland rankled on, and it rehashed and pored over the reasons for that failure, determined not to repeat them. Many of its senior officers holding important postings between the wars were Jutland men.[45] Like the Army it would not brook original thinkers such as Richmond, who was forced into retirment for what amounted to insubordination, driven to writing anonymously to newspapers. So it concentrated, for the most part, on the tactics of the major Fleet action — shades of Jutland and Trafalgar — the tactics of the battleship and the battle line. In this it had been encouraged by Churchill in the 1920s[46] (there is no evidence that Churchill ever, at any time, understood the real nature of maritime strategy, being content with superficial enthusiasms for weapons systems). Compounding this sort of thinking and reinforcing it was the political decision, on trade union lines, to have all aircraft flown and operated by the RAF. Although the RN had in service by 1921 the only purpose-built aircraft carrier in the world and Beatty in 1923 had publicly stated that he foresaw sea warfare in the future commanded from carriers,[47] the Navy's efforts to regain control of its Air Arm met with no success until 1937. The Beatty-Trenchard feuds of the 1920s poisoned relations between the two Services, and find their echoes in Australia today. The Navy's attitude to air could be likened to the lady's rueful comment about sex. "You're damned if you do, and damned if you don't". Even the decision to return organic aviation to the RN in 1937 was half-hearted. The RAF retained Coastal Command, for no good military reason, and in the Service it remained the 'runt of the litter'[48] A cumbrous system of joint control

Avro Anson. Coastal Command's principal aircraft in 1939. It was replaced as soon as possible with American Hudsons which had five times the bomb load and twice the range.

— by courtesy of Defence Public Relations

had to be established on the outbreak of war and this duplicated, wasteful method survives to the present day in Britain and consequently in most of the former British Colonies and Dominions. The sins of the fathers . . . .! Unlike the USN and the Japanese Navy (coached by former RNAS mercenaries), the RN's ideas of the tactical use of carriers remained elementary — aircraft were required mostly for reconnaissance. Rigid Fighting Instructions to conduct battle-fleet operations were dominant.[49] It was not until actual air attacks were experienced in the war that the RN was released from the dead hand of Jutland. Since its strategic attention was not in home waters and on home defence, anti-submarine warfare tactics merely survived. ASDIC, as sonar was called then, was a prized secret, but tactics were limited to rigid screening diagrams — to protect the battlefleet more than anything else.[50] By 1937 memories of 1917 prompted the Admiralty to consider the security of the Atlantic lifeline and it set up its world-wide naval control of shipping system. But the Air Ministry delivered itself of the opinion that convoys would make such juicy targets for aircraft that they would not be practicable. However a compromise was reached; only if Germany began unrestricted submarine warfare would convoys be introduced. Luckily for Britain, *ATHENIA* was torpedoed, the day the war began, in spite of Hitler's orders, and the tactics of trade protection were begun in earnest. Even then a half-hearted and unproven belief in hunting groups employing the few aircraft carriers was tried, until a carrier was sunk. The lessons of 1917 had to be relearned.[51] It would be possible to go on and exhaustively list a much greater range of tactical miscalculations in mine-warfare, torpedoes, anti-aircraft gunnery,[52] submarines, communications and cryptography, the slow adoption of radar, and so on, but the central problem stemmed from the RN's deviant view of the maritime strategy it so publicly proclaimed. As a result it wasted its efforts and the vast resources made available to it in tactical developments which soon proved to be inappropriate.

THE RAF

One may, in this brief account, ignore side issues such as Trenchard's policies of hiding the RAF in the Middle East and the effect that had on tactics and aircraft. It is sufficient to observe that the RAF's tactical concepts sprang from its almost religious devotion to the theories of Douhet and Billy Mitchell. Bombing was to be the strategic weapon to win the war on its own.[53] This was not, however, backed up with any form of testing to prove the assertion, or to provide adequate tactics, bomb sights, navigation systems, and all that this concept implied.[54] Quantity was the apparent yardstick for airpower and this was echoed by politicians, notably Churchill again — numbers of squadrons was the criterion, never mind what they were.[55] And, since the bomber was supposedly unstoppable, air defence tactics and weapons were neglected. RAF staff requirements bewildered aircraft manufacturers and designers who, as a result, produced some of the worst military aircraft in the short history of aviation.[56] It took Inskip, the not very highly regarded Minister for Defence Co-ordination in the mid 30s, to force the RAF into a great proportion of fighters to bombers.[57] As noted earlier, the fighter aircraft and the command and control system to make a total system sprang from a variety of external, mostly civilian, sources, and these with a handful of RAF enthusiasts, got together the one outstanding tactical combination of the 1930s. But this successful development was in no way a matter for which the RAF Establishment could congratulate itself as it did after the Battle of Britain. Although the RAF was not prepared to allocate more than token resources to Army and Navy co-operation roles it clung tenaciously to its trade union rights to fly them. Its attitude "if it flies we'll fly it", also finds echoes in Australia today. So the RAF would neither give up its claim to these roles, nor would it develop the aircraft and tactics to make sure it could perform them. Bombers, and a deathbed conversion to fighters dominated all. The Billy Mitchell assertion about sinking ships was accepted unquestioningly into the RAF's theology, but tactics and weapons to support the claim were not developed. One example will suffice; as late as 1941 it used 1,875 aircraft over four months to drop 1,962 tons of bombs on two ships (Scharnhost and Gneisnau) immobile in a French port. Ten hits were obtained, two of them failed to explode.[58] Army co-operation as noted earlier was practically non-existent. The record is an almost completed indictment of the pre-1939 Royal Air Force, and those who were blinded by the unfounded and extravagant claims of its leaders, to be the principal military aim of the nation.

This sorry tale of confusion probably needs to be balanced by some of the other few important and outstanding successes, such as the development of machine cryptography and cryptanalysis;[59] it is also appreciated that the snug wisdom of hindsight often neglects to recall any tactical virtues at all, or to appreciate what it must have been like trying to find time, under the pressure of events, to think clearly about the important issues of those days. Notwithstanding this admitted lack of balance, it is contended that there is a overwhelming weight of evidence that Britain's tactical miscalculations in the 1930s extended into virtually every facet of her Defence

organisation, and it was not from lack of resources, but rather an unquestioning acceptance of Service dogma. There was no single or simple reason for this lack of intellectual analysis; the many different reasons combined to produce a condition of tactical unpreparedness for war which was nothing short of scandalous. More than one modern writer on military strategy had urged that military services should nurture their rebels,[60] and Britain's painful and unnecessary experience provides an abundance of examples of the folly of blind adherence to a party line.

CONCLUSIONS

It is a matter of recorded fact that Britain was not ready for the war into which she was plunged in 1939. It remains, therefore, to consider the significance of the strategic and tactical miscalculations outlined briefly above. Since it is also a matter of record that, despite her constant economic difficulties, Britain did allot a remarkably high, and consistently high, proportion of her annual budgets to defence, it follows that the failure to settle on a central strategic policy must be accounted the single most important reason for the misapplication of those resources. The inevitable consequences which flowed were the development of unsound tactical doctrines and the acquisition of inappropriate weapon systems. The blame for this state of affairs lies with successive Governments, is shared by the Services themselves, and ultimately rests with a supine electorate, too little concerned with this important matter to challenge its appointed servants. The chain of strategic miscalculation which began in the 1920s effectively perpetuated itself through the changing circumstances of the 30s. Service doctrines and administration (particularly the staff requirements process) played their parts too; but their contributions pale in comparison with the effect of the failure to determine a 'central strategic' policy.

Yet, from this remove, it appears all too easy to see that a British strategy could have been developed in the 1920s, despite the absence of a discernible threat. It could have been based on the need, first of all, to ensure the security of the Island's vital interests, for, without survival, as they were at last forced to realise when France fell, there could be no British intervention in Europe, nor could there be any possibility of assistance to the Empire. On the past experience of World War I, and taking account of technological developments, it would not have been too difficult to define two vital interests at least; one was the maintenance of the Atlantic life line, the national jugular vein; without food the nation would be starved into submission; without oil no aircraft could fly. The other was security of the population and industry from assault from the air. With these two interests secured, as a minimum, it would then have been possible to assess how much more of the national purse needed to be expended on the possible need to assist Continental allies, and to allay the Empire's fears. This approach to a national military strategy would have provided a bedrock minimum on which to guide the Services' development. It would not necessarily have eliminated the ramshackle, interlocking and constipated defence decision making machinery, or got rid of outmoded political decisions, but, at least the debate to define vital national interests might have encouraged a spirit of freer inquiry into what Britain's strategic objectives should have been. But, instead, they began with the 'Platoon Commander's Outlook', and compounded it with unproven opinion and outright fear generated by polemicists and propagandists; from that first cause the rest followed.

In all this expensively bought experience there are, I suggest, some important lessons to be learned by contemporary Australia, if we take the trouble to find them.

FOOTNOTES

1 Divine *The Blunted Sword* quotes the Army's fodder bill in 1929 as £607,000 and, for petrol, £72,000. As late as 1936 Duff Cooper, War Minister defended 'the importance of cavalry in modern warfare'.
2 Roskill *Naval Policy Between the Wars, Vols I and II* and The Navy at War 1939-1945.
3 Roskill *The Strategy of Seapower* and Divine ibid.
4 Divine op cit.
5 Divine op cit.
6 Watson Watt, quoted by Divine, op cit.
7 Boyle *Trenchard* and a variety of sources.
8 Slessor memoirs, quoted by Howard *The Continental Commitment*. Most bombing raids up to 1941 at least were disasters. See Divine *The Broken Wing* and Official RAF histories.
9 Wylie *Military Strategy*. The best book so far on this misunderstood subject.
10 Various sources, based on the *Fuehrer Naval Conferences giving rise to the German Navy's 'Z' Plan. Divine again, (Hitler) gave the assurance that war with Britain would not be initiated before 1944-45* op cit p.164.
11 Higham *Armed Forces in Peacetime, Britain 1918-40* and others.
12 McCarthy *Australia and Imperial Defence 1918-39*. Factually good, but polemical in comment. The author appears to have no clear idea of what seapower is, and does not define it beyond 'the doctrines of Admiral Mahan'.
13 Extracted from Higham op cit. and Montgomery Hyde *British Air Policy Between the Wars 1918-1939*.
14 Churchill *The Gathering Storm*.
15 Collins *Principles and Practices of Grand Strategy* an excellent book — quotes the four as 'Continental, Maritime, Aerospace and Revolutionary Warfare'.
16 See also Wylie op cit. and Kahn *On Escalation*.
17 Collins, op cit, 'to win it may be enough simply not to lose'. Confrontation and the Vietnam War are good examples.
18 Roskill *Naval Policy Between the Wars Vol I*.
19 Howard *The Continental Commitment*.
20 Howard op cit.

21 Roskill op cit.
22 Howard op cit.
23 Howard op cit. It was Churchill who had introduced the 10 years rule concept originally in 1919, as War Secretary.
24 Divine op cit.
25 Boyle, op cit, Chalmers *David Beatty* and others.
26 Divine *The Broken Wing* and Ropp *War in the Modern World* (invaluable).
27 Ropp, op cit, Boyle op cit.
28 Howard op cit.
29 Barnett *Britain and Her Army*.
30 Howard op cit.
31 Howard op cit.
32 Roskill *Naval Policy Between the Wars*.
33 Grenfell *Main Fleet to Singapore*.
34 Hunt *Smaller Navies and Disarmament* address to seapower seminar 'From Dreadnought to Polaris', and Roskill in several works.
35 Roskill and Hunt op cit.
36 Quoted by Howard, op cit.
37 Ropp op cit.
38 Montgomery Hyde *Air Policy Between the Wars*.
39 Quoted by Howard, op cit.
40 Quoted by Howard, op cit.
41 Rothermere, *My fight to Rearm Britain*.
42 Barnett, op cit.
43 Divine, op cit, and Ropp, op cit.
44 Liddell Hart *Why Don't We Learn from History?*.
45 Hunt, op cit, and Roskill *Navy Policy Between the Wars*.
46 Hunt, ibid.
47 Chalmers *Beatty* address to Lord Mayor's dinner.
48 Divine *The Blunted Sword*.
49 Roskill *The Strategy of Seapower*.
50 Roskill *Navy Policy Between the Wars*.
51 Roskill *The Strategy of Seapower*.
52 Roskill, article *Anti Aircraft Gunnery between the Wars*.
53 Montgomery Hyde *Air Policy Between the Wars* suggests that this was not the RAF's attitude; this apologia contrasts with Trenchard's assertions about making war on the enemy nation, not its armed forces.
54 Divine *The Broken Wing* and RAF official histories.
55 See the introductory quote and Baldwin's promises to the House quoted by Howard, op cit.
56 See Annex B.
57 Montgomery Hyde op cit, and others.
58 Divine *The Broken Wing*.
59 Winterbottom *The Ultra Secret*.
60 Liddell Hart, op cit and Collins, op cit.

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CONVENTIONAL SUBMARINES

WITH PARTICULAR ATTENTION TO GERMAN DEVELOPMENTS SINCE WORLD WAR II

by Professor U. Gabler

This paper was presented to the Canberra Chapter in November 1978

HISTORY

Up to the middle of World War II, the so-called submersibles, generally designed for long surface cruise, represented the mainsream of development. For most of the mission period, these submersibles operated on the surface; they only dived to attack the enemy or to evade enemy attacks. They were constructed so as to offer both a high maximum speed as well as a wide cruising range during surface operation. However, their cruising range and maximum speed in the submerged condition were comparatively small. In order to reduce their wave-making resistance on the surface, they were designed as long as possible (to reduce the Froude's Number). They were provided with twin screws to which the rather high diesel engine output was transmitted on the surface. The cruising range on the surface was rather large; they had to carry a relatively large amount of fuel. A high percentage of main ballast tank capacity was necessary to obtain favourable sea-going qualities particularly for bad weather conditions. A double hull construction for these boats was normal (with the exception of the German type 7C boat which was an intermediate version between the single-hull and the double-hull types). The outer hull was not pressure-proof. The space between inner and outer hulls was mainly used for main ballast tanks and fuel tanks. The submerged performance of these submersibles was poor. They reached a submerged speed of 7 to 8 knots only, for a period of up to one hour. In order to obtain sufficient submerged static stability, they had to carry stability ballast amounting to 5 to 10% of the surface displacement.

In the middle of World War II, initial designs were made for true submarines, i.e. boats making their entire trip in the submerged condition and surfacing only during approaches to their own naval base. Propulsion of these submarines was effected by very heavy lead batteries. In order to reach a high speed in the submerged condition, a powerful electric motor of large capacity was provided (Figure 1 illustrates one of this type of submarine). Due to the fact that, in submerged condition, no wave-making resistance exists, the Froude's number was no longer important. Of decisive importance in this concept is the resistance of the friction surface of the outer hull. Consequently, these submarines had to be designed as short as possible and as thick as necessary. The total output could be transmitted via a shaft to a single propeller, the size of which was practically unlimited, thus allowing a higher percentage of

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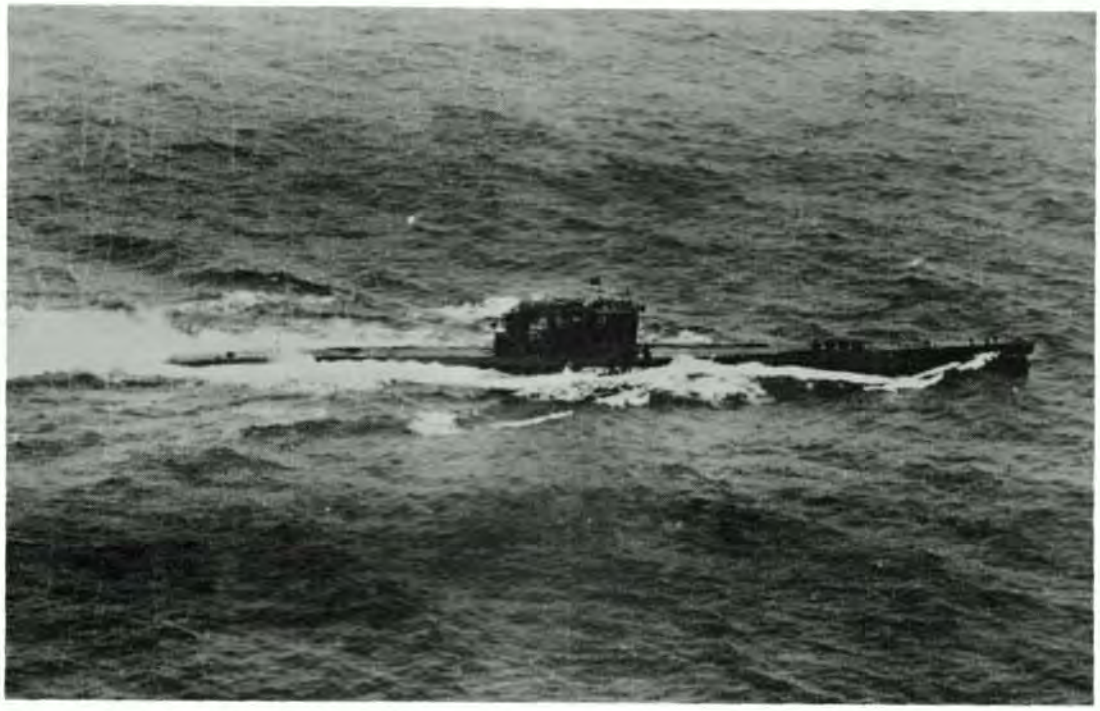
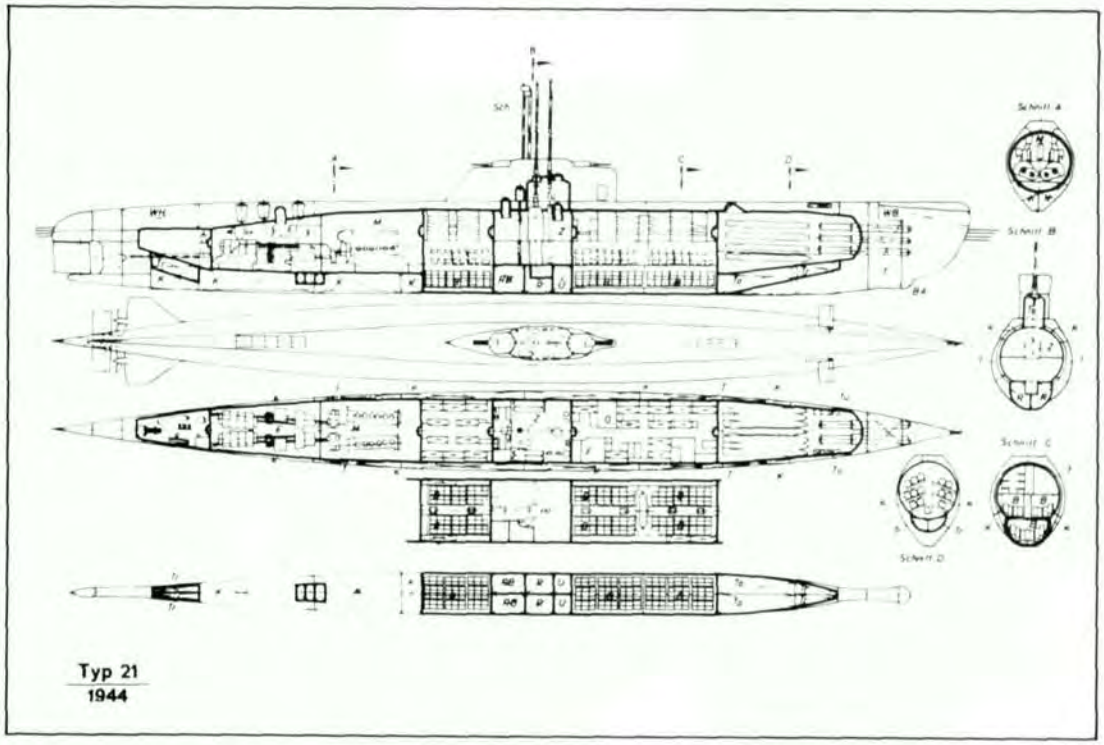
Professor Gabler was born in 1913 and, on completion of schooling, studied Naval Architecture at Technische Hochschule of Berlin — Charlottenberg from 1932 to 1938, during which time he served in the German Navy as a Technical Officer in the period 1934/5. He was a Design Engineer with Ingenieurkontor Fuer Schiffbau GmbH, Suebeck in 1938/39 prior to serving with the German Navy during World War II. From 1939-45, Professor Gabler served in Supreme Naval Command, Berlin; as chief Engineer and Diving Officer in various submarines, completing 6 missions in the Atlantic; as Head of Design Office of Hellmuth Walter GmbH, Kiel and, finally, as their Department Head of the Central Submarine Design Office. In 1946 he was founder of the company Ingenieurkonto Gusbeck (KL) and in 1954/55 was concerned with Italian submarine design in Rome. Since 1958 he has been a lecturer in Naval Architecture (Warships) at the Institut Fuer Schiffbau Der Universitaet Hampburg and became a Professor in 1963. During this period he formed the company Maschinenbau Gabler GmbH.



German U-Boat in World War II

— by courtesy of Australian War Memorial (Negative No. 128377)

FIGURE 1



German Submarine Type 21

propulsion efficiency. The large batteries now were charged by separate diesel generator sets. The new submarines consequently required a very much smaller percentage of fuel supply and a smaller percentage of water ballast tanks. Single hull types without any stability ballast often were the result. This design of a single hull offers a greater static stability in the submerged condition than on the surface. If single hull vessels having the smallest possible length are envisaged, an adequately increased pressure hull diameter is the result, at the bottom of which the heavy lead battery may be arranged and fuel tanks may be fitted in the spaces at the sides as well as forward and aft, so that such submarines do not require any stability ballast. The snorkel system is integrated in the design enabling the submarines to re-charge their batteries practically under all weather conditions at periscope depth.

THE HULL

The cylinder pressure hull with transverse frames manufactured from high-tensile steel is normal. However, the German submarine hulls of non-magnetic construction are being made of austenitic steel. The pressure hulls are dimensioned for the predicted collapse depth (i.e. the so-called calculation depth) by means of modern mathematical methods. The service diving depth which is the maximum diving depth for a submarine under normal service conditions is related to the above mentioned calculation depth by means of a safety factor which normally is of the order of 2.0.

In addition to the diving pressure, the pressure hull (just as the other parts of the ship) may also be subjected to shock loads by explosions in the vicinity of the vessel. The modern submarine design aims at all parts of the submarine (including machinery, equipment, outfit and accommodation) withstanding shock loads somewhat larger than the strong pressure hull itself. In the Federal Republic of Germany, a considerable number of underwater shock trials have been performed with 1/1 scaled models.

OVERALL SHAPE

Single hull submarines often take a cigar-shaped outer contour resulting from the space arrangement in their interior. A comparatively stout bow turns out to be favourable for the arrangement of armament and combined sensors in the ship's forward end. By the arrangement of stabilizing fins, it is possible without any considerable expenditure to establish hydrodynamic stability for practically all submarine shapes so that depth keeping does not offer any difficulties even at maximum speed.

FIGURE 2

U1 collapse test in pressure dock

Whereas submarines are dependent only on the effects of their stern hydroplanes for medium and high speeds, they require both the bow and stern planes for low speeds (particularly in the vicinity of the water surface at periscope depth). On the German submarines, a "mussel"-shaped outline is used for the bow planes, and always one plane only is rigged out creating either a positive or a negative lifting force (see Figure 3). Such a design offers the advantage of both the planes being rigged in at higher speeds; however, at the lower speeds during which the planes are active, they will also be in the rigged-in position at zero lift, thus reducing the ship's resistance. If, on the other hand, bow planes are of non-rigging-in-type, they require — due to their destabilizing effect at higher speeds — increased stabilizing fins on the stern, which, in turn create increased resistance. As to the stern plane/rudder assembly, the cross arrangement is generally prevailing now. In this connection, the steering rudders are vertically situated forward of the propeller, and the stern planes are also arranged there in extension of the stabilizing fin. Such an arrangement contributes significantly to high manoeuvrability.

Fore-and-aft location of the bridge fin principally depends on the subdivision of space in the interior of the submarine. From the hydrodynamic viewpoint, a midship arrangement would be favourable as the submarine is turning on the middle at low speeds and when using the periscope, the periscope is not subjected to any changes in depth in case of trim angles. Furthermore, the bridge fin arranged amidships causes the submarine moving in a turning circle to trim by the stern, which should be counteracted by putting the stern plane to below if it is intended to run the ship in a turning circle at constant depth. Such a trim by the stern may be a safety measure against unintentional trim by the bow in case of stern plane jam.

Submarines of single hull construction provided with the smallest possible overall length offer a comparatively small sonar echo area, and their behaviour is clearly more favourable than that of double hull submarines.

ARMAMENT

Main armament of modern submarines is the wire-guided torpedo. The torpedo tubes usually are arranged in the forward end. The tubes on the German submarines are of the swim-out type, i.e. tubes from which the torpedo leaves under its own power after flooding. The sensors are part of the submarine weapon system. The main sensor is the passive sonar which, today, allows target contacts at great distrances. Classification and identification of detected targets are also possible.

As against that, the active sonar is of lesser importance, as the use of active sound propagation always includes the danger of revealing the submarine's own position. The passive senor should most favourably be arranged in the forward end of the submarine providing the best omnidirectional characteristics and smallest possible disturbing influence of the propeller.

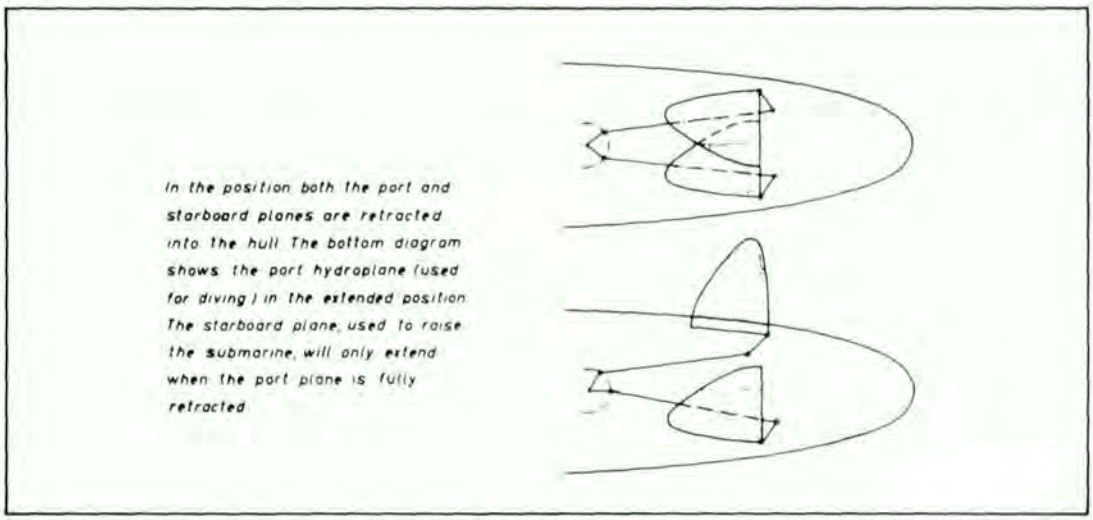
PROPULSION

Modern submarines are driven by electric motors fed from large lead-acid batteries during submerged operation. These batteries, in turn, are supplied with energy by diesel generator sets to be operated during snorkling and during surface cruise as well.

Two new developments concerning batteries have recently been made known, one of which is the so-called 'Double Decker' plate structure in the cell. This arrangement provides for parallel extraction of power on top of the cells as well as at mid-height of cells in a special lead-coated bus-bar made of copper. The other new development provides for copper strips laid into the negative grid plates, which results in a decisive reduction of the internal resistance of the battery.

The generators are driven by high-speed four-stroke V-type diesel engines which are remarkable for their particular insensibility to counterpressures at the exhaust and to underpressures at the inlet end.

FIGURE 3



Schematic diagram of missel-shaped forward hydroplanes

The unmanned machinery room is remotely controlled and supervised from outside the room.

The smaller the number of crew, the easier it is to provide comfortable living conditions for them.

SAFETY AND RESCUE

A comparatively advanced stage has nowadays been reached concerning safety and rescue equipment on submarines. In this connection, safety precautions comprise all measures allowing the submarine to be brought to the surface in the case of emergency and, possibly, to her naval base. Rescue measures comprise crew recovery out of the damaged submarine laying on the seabed. Two new developments are worth mentioning:

In the Federal Republic of Germany, a device for quick blowing of main ballast tanks, i.e. the so-called gas generator, has been developed, which is arranged in the main ballast tanks. The gas generator is operated on the basis of hydrazine (N_2H_4) which is forced through a catalyzer by means of nitrogen as a power gas and is spontaneously decomposed into hydrogen (H_2), nitrogen (N_2), and ammonia (NH_3).

By using such gas generators, it is possible within a very short period to completely blow out the forward ballast tanks of a submarine cruising at the greatest possible depth; by this measure, a submarine trimming heavily by the stern and developing high speed may then be brought to the surface (see figure 4).

FIGURE 4

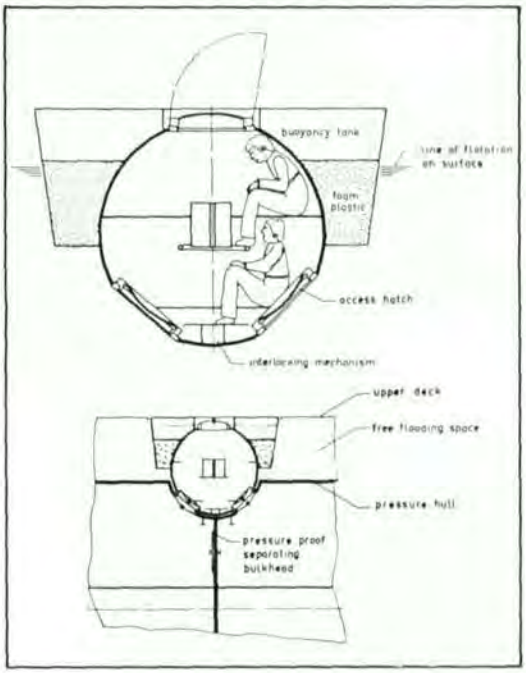
U19 during quick surfacing test

Another rescue means currently under preparation is the so-called rescue sphere which may be used for all submarines provided with pressure-proof subdivision. This development means that during the submerged mission, the submarine can now effectively carry her own lifeboat. The rescue sphere is situated above the pressure-proof bulkhead and may be entered from the space forward as well as aft of the pressure-proof bulkhead (see Figure 5). Dimensions of the rescue sphere are such that the total crew may be accommodated. After the crew have entered the rescue sphere, it is released from the submarine and surfaces under its own buoyancy. Its behaviour on the water surface is similar to that of a normal lifeboat.

FUTURE ASPECTS

If the great powers, USA and USSR, as well as part of the submarine forces of Great Britain and France are excluded, submarines provided with the classical propulsion systems are still the standard submarines of most navies today. Considerable numbers of them are under the construction or will be built in the near future, and improvements are continuously included.

FIGURE 5



Rescue Sphere

AUSTRALIA — A CHANGING ROLE IN A CHANGING WORLD:
INTERNATIONAL PRESSURES and DOMESTIC PLANNING IMPLICATIONS

This paper by Professor Francis West was presented as the Keynote Address at the 15th Biennial Congress of the Royal Australian Planning Institute held on 28th August 1978.

'Darling', as Adam said to Eve, 'we live in an age of change and uncertainty'.

I am not sure that anyone has ever lived differently, except that we are never allowed to forget it. We would all have difficulty in thinking of a day when we are not reminded that we live in a world which is rapidly changing — except, perhaps when there is a newspaper, a radio and a television strike; and, then, of course, nothing happens. If you listen to the rapid communication of news by any media, it is very easy to conclude that the speed of technological change has outstripped human capacity to understand it, still less to plan for it and far less to control it.

It is very easy to conclude that the situations created by modern technology have escaped the control of the human understanding and capacity which invented the technology itself. I think that I is a false conclusion, a counsel of despair, which is the result of being panicked by a myth of the speed of change. The robot or the computer which escapes from the control of its inventor is a common enough theme in literature or drama, but it is important to remember that these are fictions, as much the inventions of the human mind as the technology they fictionalise.

The speed of change, in any case, is primarily that of change in technology, of the method of

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In 1955, Dr West was appointed Senior Lecturer in History at the Victoria University in Wellington, where he taught for four years. In 1958 he was awarded a SEATO fellowship to make a comparative study of Fiji, American Samoa and Tahiti which formed the basis of a book on political advancement in the South Pacific, again published by Oxford, in 1961. He returned as Senior Fellow to the Australian National University in 1959. In 1964 he was appointed to the Chair of Comparative Government in the University of Adelaide at Bedford Park, now Flinders University. Following his biography of Hubert Murray and an edition of Murray's letters, he was invited in 1970 by Arnold Toynbee to write the official biography of Gilbert Murray, OM, younger brother of Hubert, which was published by Oxford University Press in 1977. In Canberra, Dr West taught history and mediaeval studies in the undergraduate section of the National University.

Francis West was elected a Member of the Australian Humanities Research Council in 1966, a Fellow of the Royal Historical Society in the same year, and is a Foundation Fellow of the Australian Academy of the Humanities (of which he has been a Council member and, in 1973, Secretary) in 1969. In 1970-71 he was Thank Offering to Britain Fellow of the British Academy. He has broadcast extensively on radio and television for the Australian Broadcasting Commission, the British Broadcasting Corporation and the New Zealand Broadcasting Service.

doing things, not in the aims or objectives we have, not in the things to be done. Those, in my opinion, do not change very rapidly, and that is particularly true of the international pressures upon Australia. We may fly to Europe or Japan or the United States in half the time it took twenty years ago, but the ships on the trade routes are not much quicker than they were. We can get instant replay of a football match or a papal funeral, but negotiations over a wheat, a beef or an iron ore contract, over the purchase of defence equipment, or even a Middle East peace settlement, take just as long as they did before travel was quick and the news instantaneous.

A great deal of this image of rapid change comes from a bad analogy with the speed at which a computer can make calculations. A bad analogy because, to use the jargon of the computer trade: garbage in, garbage out. In short, if we wrongly identify the problems to be solved, if we compound that with bad information, the speed with which answers can be offered is irrelevant. The solutions and the answers will still be wrong.

In my opinion, the problems created for Australia by international pressures are being wrongly identified. This is not so much the result of identifying false problems, problems that are not really problems at all, but of looking at particular and immediate difficulties in isolation from each other, and with far too little consideration of the long-term implications. For example, almost every day there is some news about our export markets. We have troubles with beef or wheat or wool or dairy produce or sugar. We have troubles with iron ore or steel or uranium. And we diagnose these difficulties largely as the result of the protectionist trade policies of those to whom we export.

At the same time we report, at far less length and with much less prominence, the complaints of our Southeast Asian neighbours against our own protective trade policies. What this says to me is that we are considering each trade problem separately, not as part of a total picture. We export to Japan, which has a considerable interest in supplying our domestic market, far more than we import. We import from Britain and the European Economic Community which are hostile to our produce, far more than we export. To anyone's mind, this is an obvious imbalance in our trading. It is an imbalance which is the more obvious when you consider that from our South East Asian neighbours we import far less than we export. Now, I have no doubt that the Department of Trade's senior officials look at the general trading pattern when recommending policies to the minister of the day, although their advice is not necessarily taken. But I doubt very much that the trading pattern is considered with foreign policy very much in mind. If it were then I would have expected a much more systematic policy towards Japan and towards the growth economies of the Philippines, Indonesia, Malaysia and Singapore than has so far been exhibited.

If I am right that our trade policies towards individual countries and areas are not well co-ordinated, and that trade policies are co-ordinated still less with foreign policy, I am even more sure that they are co-ordinated not-at-all with defence policy. And yet the connection is obvious. It would not be unfair to describe the Australian economy as animal, vegetable and mineral: the export of primary produce to distant markets: to Japan, the United States and Europe. Export moreover, largely in other people's ships. We may, unlike

AMANDA MILLER. Australian built and Australian registered tanker used on coastal trade.

— by courtesy of John Mortimer

the oil rich nations or the banana or coconut republics, export more than one cash crop, but we are essentially in the same position: **we dig it out or we grow it and we export it so that we can buy whatever else we need to support an accustomed rising standard of living. That adds up to long lines of trade and communications which are vulnerable. That is the basic and inescapable fact of Australia's strategic position. In other words, trade and defence policies cannot be considered in isolation from each other. The connection between them seems to me obvious.**

There are people who ignore the connection. One way of doing that is the way of the last Australian Labor Party Government. in its Defence White Paper, the Labor Government believed that there was no strategic threat to Australia within the foreseeable future. In the Defence White Paper of November 1976, issued by the Liberal-National Country Party Government, that comfortable belief was not repeated; but the existence of any strategic threat to Australia was in effect discounted, not by saying that there was no such threat but by assuming that, if there ever were such a threat, someone else — a great and good friend like the United States — would help us. There is some informed professional judgment that the United States does not have the capacity to protect its own lines of trade and communication, let alone Australia's, but even if the Americans could look after their own and give some help to Australia, it would still be necessary for us to do as much as possible on our own behalf. For, if we cannot, then in circumstances far short of actual hostilities against us, we are vulnerable in the sense that a potential threat may significantly limit or coerce Australian policies. If we accept that Australia's strategic position is vulnerable and that therefore we need to acquire some capacity to deter any threat against it, then the time for planning is now because the procurement of the right equipment and the training needed to use it take time. When a threat actually materialises, it is too late. The potential threat is there already, if only as a side effect of Russian policies aimed at, on the most optimistic view, simply containing China and, on more pessimistic views, doing something more than just contain. Optimistic or pessimistic, though, common prudence requires that we draw the implications of the distances and the isolation of Australia's position.

Those implications are both short-term and long-term. Looking at the dimensions of providing even partial protection of our trade routes and lines of communiction, it would be easy to put the problems into the 'too-hard' basket. The direction of our trade routes — north through the Pacific to Japan, east across the Pacific to the Americas, and west across the Indian Ocean and beyond to Europe — you might conclude that Australia is indefensible, or that a major part of those links is indefensible. The route westwards to Europe, for example, may be indefensible except in close cooperation with South Africa — which would turn some sensitive political stomachs — and Britain which, because of its European commitment and its limited defence capacity, believes that with anything east of Suez the best is like the worst.

You might conclude that the northern route to Japan is only defensible if the Japanese are prepared to rearm with the right equipment and in the right strength and if we had similar defence co-operation with Indonesia and the Philippines. You might conclude that the trans-Pacific routes to the east are only defensible if the United States regards them as vital to its own position, not in terms of high political morality but in terms of its own national interest.

All of these assumptions which began with the word 'if' have the obvious political uncertainties that the use of the word implies. Some of these are beyond our influence. The domestic politics of Japan affect any question of Japanese rearmament. The question of the succession to the present leadership in Indonesia and the Philippines may affect their willingness or ability to co-operate with Australia. some of the uncertainties are of our own creation. Bad industrial relations, for instance, influence the Japanese to look for alternative sources of supply such as Brazil or China. Our attitudes over Timor or Papua New Guinea make Indonesian co-operation impossible. Our tariff and immigration policies alienate the Philippines, Malaysia and Singapore. These uncertainties of our own creation reinforce the point I made earlier. Our policies are too much framed in isolation from each other, not as part of a total picture of our national interests. That seems to me an effect of our adversary system in parliament and an executive composed of departmental ministers.

Australia's vulnerable strategic position, in particular its trading routes, seems to me the crucial link between different aspects of policy. To deter any threat to them, and still more to resist any threat, implies that we should not pursue policies which make that aim more difficult to achieve. It certainly implies that our domestic policies should give us some capability to deter, and if necessary to resist, such a strategic threat. In the first instance, to do this we need the right equipment, the trained man and woman power to use it, to service it and to repair it, and we need to be able to replace it. Behind this issue of defence procurement, there are major planning decisions which go far beyond defence to the nature of Australian society.

In an isolated situation, with vulnerable lines of communication and comparatively small population, one obvious option is to import a sophisticated technology, a high technology, in the form of the latest and best weapons platforms — air, sea and land — and all of the back up they entail. This is the option which has been taken with, for example, the *F111*, the *Leopard* tank and certain naval vessels. Australian industry, although it can supply some components, plays a minor role. In effect we are importing high technology and exporting jobs.

This is not the occasion to debate the merits of particular weapons, but the general principle — import the latest and best — is open to serious question. Is this type of equipment in fact the best for Australia? These are some good reasons to believe that a lower level of technology might better meet our defence needs, that more items of less sophisticated equipment may be preferable for our purposes than a few highly sophisticated ones. Much of that less sophisticated equipment could be made — or at least modified — in Australia. This option for greater self-reliance in defence procurement would have significant effects on Australian industry, and upon other policies. We would, for example, be giving some protection to aircraft and ship building industries, to electronics and to those parts of the motor vehicle industry which had defence potential. We would, incidentally, be creating jobs and not exporting them.

To recognise the international pressure exerted by Australia's strategic situation has these kinds of consequence for domestic policies. The low or lower technology option has the advantage of matching some defence needs with some of the present needs of the Australian economy, such as greater employment opportunities. Still, this is a short-term implication of our international situation. The longer term implications of our international position point to another option which is a much more fundamental planning choice.

I earlier described the Australian economy as a primary producing one — animal, vegetable and mineral — chiefly for distant industrial or industrialising markets. Although more than half of our imports come from the same small group of industrial nations, there is no balance in trade between us and any individual one of them; but from them as a group our major imports are machinery and transport equipment, manufactured goods, petroleum products and chemicals.

What this pattern of trade says to me is that Australia could obviously be self-sufficient in food for its population, and it could reduce its strategic vulnerability by trying to shift its agricultural export markets from the distant industrial ones to closer ones of nations which are industrialising or whose economic and population growth outstrips their own food resources. That, in my opinion, is not an impossible prospect. We have already made one such major shift over the last twenty years when the possibility of British entry into the Common Market and adoption of the Community's agricultural policy first became a likelihood. While it is improbable that there will be another General de Gaulle to give us rather more time to do so than we could reasonably expect, such a shift of our agricultural export markets is a foreseeable prospect.

By itself, however, such an attempt to redirect a significant proportion of our agricultural exports would have only limited benefits for the security of our international position. I think it is also necessary to plan for development which would use much more of our primary produce in manufacturing or consumption within Australia. this is a much more formidable task because of the complexity of the factors involved. Obviously it involves a major increase in population, because fourteen million is not an adequate market for consumption nor an adequate base for the greater industrialisation which the development of our own manufacturing capacity entails.

A major population increase, if it was to occur, brings problems with which we are all familiar. In particular, for Australia, it might entail a drop in the standard of living unless we secured water supply. I have heard it argued by competent scientists that until the de-salination of water is a commercial proposition, the population of Australia cannot exceed 15 million without there being a fall in the standard of living. Be that as it may, a policy of population growth, as a necessary component of industrial development, brings problems which need to be tackled both as prerequisites and as co-requisites. I do not underestimate the difficulties, especially since any early population growth can only come from immigration. I think the grappling with such problems is one of the obligations of the domestic planning necessary because of Australia's international situation.

'Industrial growth' or the growth of 'manufacturing industries' are general terms. I am not suggesting across-the-board development for its own sake. The development needs to be selective, and it follows from what I have said the first principle of selection has to be relevance to Australia's capacity to deter threats to its security and to reduce or abolish constraints upon independent national decisions. In short, to reduce our dependence upon imports essential to that purpose. If anyone doubts that principle, let me say

AUSTRALIAN ESCORT. A container ship used on overseas trade routes berthed at Glebe Island.

— by courtesy of John Mortimer

that Australia now imports equipment from Britain, France, Italy, Germany, Norway, Sweden, Switzerland and the United States, and that with the governments of these countries there was sometimes explicit and almost always implicit agreement that they must be consulted before the equipment can be used in any military operation. In fact, three governments — France, Sweden and Switzerland — threatened to withhold spare parts for equipment of their country's manufacture, if it were used in Vietnam. Quite apart from any such direct pressure, the need to import spares and to replace or repair equipment, especially under conditions of frequent or urgent use, is always a severe constraint.

At present, we import something of the order of 65 per cent of our defence equipment, at a cost almost equal to our deficit on current account after capital inflow has been discounted. So, leaving aside the reduction of international pressures upon Australia through its strategic and trading positions, the growth of a domestic, defence orientated industry has economic advantages in terms of our balance of payments.

If we were to aim at such a programme of industrial development, the key industries for development would be ship-building and repair, aircraft construction and repair, munitions and electronics. Because of their importance, these seem to me to be the industries which should be protected to foster their development, with the incidental advantage of job creation on a significant scale. If we set ourselves a target, for example of 90 per cent Australian production of defence equipment (that, incidentally is the Swedish percentage) both capital and necessary services in 1981, at a cost of $2,600 million a year, on estimate I have seen calculates that some 60,000 jobs would be created. A more precise measure is the reverse. When successive governments decided to buy the patrol frigates built in the United States instead of the Australian designed DDL destroyer which could have been built at the Williamstown dockyard, 2000 jobs disappeared.

The Williamstown case, however, makes another point. The industrial development which our international situation calls for is not starting from scratch. There are existing skills in all of the industries I have mentioned, underdeveloped though those industries presently are, which provide a base from which to start. They are incidentally skills which are dissipated when they are not used to capacity, so that they are wasting assets. There is, I think, an area in which new skills, building on the small existing base, could relatively quickly develop, as the Israelis have shown. It would be possible, especially with aircraft, to take an existing model and extensively re-design it. Not, that is, to start from scratch, but from an existing technology. The same could be done for ships and tanks.

I have mentioned two spin-off benefits of such industrial development: a contribution to our balance of payments; job creation. Obviously a third is the development of skills, and those skills are exportable, either as technology or through the sale of what they have produced in Australia.

One specialised skill in particular is exportable in itself and in its product. That is "tropicalisation", the adaptation of equipment to the conditions in parts of Australia — I make the obvious exception for Melbourne and Victoria — which are much the same as those in the southeast Asian area where potential customers are. Indonesia and the Philippines have, during ASEAN meetings, made clear their interest in such skills and equipment. In developing industry of this type we are not only helping ourselves but our neighbours.

In speaking of 'our' region, in the context of the kind of industrial development I have been discussing, the region means South East Asia. To be more precise, those nations of South East Asia, which are members of the Association of South East Asian Nations — ASEAN — to which Australia belongs. The Australian domestic policies and planning I have been arguing for entail that our association with the region should be closer. The region constitutes a large, close, not distant, potential market for our primary produce and for the manufactures, including a large component of defence equipment and its civil spin-off equipment, which we can produce with our own potential industrial development to off-set the major international pressures upon us.

It is a region which, apart from our active exploration for oil, can supply us with two essential commodities we lack: oil and rubber. As a region, it has a complementary, not a rivalry, of economies which makes more sense as a common market or as a free-trade area than did the economies of western Europe when the treaties of Rome were signed to form the European Economic Community, the Common Market.

The international pressures upon Australia, so I have argued, must shape Australian domestic policy and planning towards a reorientation of our export markets and towards an industrial development orientated towards the defence of our exposed strategic position, with important spin-off benefits for our domestic economy and for our export economy in southeast Asia. I have argued that there is, in consequence, a strong case for planning towards a free-trade area of the ASEAN nations. Not a Common Market, for that would imply the free movement of labour. You will notice, however, that I have not included Japan. Indeed the kind of development for which I have been arguing introduces some competition with Japan, both in the South East Asian region and in the Australian domestic market. We would be doing things which the Japanese can also do. But if you remember, I said at the outset that it was our lines of trade and communication with Japan which in part made us strategically vulnerable. If they were cut or seriously interrupted, in our present situation we would be severely hurt; and of ourselves we do not have the means to protect them.

Asia which are members of the Association of South East Asian Nations — ASEAN — to which Australia belongs. The Australian domestic policies and planning I have been arguing for entail that our association with the region should be

To include Japan in our regional planning would make sense only if the Japanese themselves wanted it sufficiently to enter into what would, in effect, be a military alliance of the ANZUS type. I see no signs that the Japanese want that, nor that a Japanese government politically could undertake the necessary rearmament nor make the necessary military commitment. I think Japan sees, or is likely to see, the future more in terms of a relationship with China. Japan's own vulnerability points away from involvement with a distant vulnerable Australia and towards a different regional power grouping than the South East Asian one, although the Greater East Asia Co-prosperity sphere, including Australia, remains an option. If, however, it is right that Russian policy is primarily anti-Chinese, with a ring of bases from the Horn of Africa, through Aden, India, Afghanistan, Vietnam, to Vladivostock and Mongolia, then such an option may already be foreclosed. Japan would be an incidental casualty of Russia's China policy in a way that Australia and a South East Asian regional grouping would not be, if such a grouping, including Australia, had the capacity to deter any threat.

In saying this, I have re-stated the premises from which I began: that Australia is presently vulnerable, that we should, as the main thrust of our domestic policies and planning, seek to reduce this vulnerability, and that there are major incidental benefits from such a policy. You may reject the premises, and believe that there are no such threats to Australia, that we can continue much as we have been doing, in the comfortable belief that the age of peaceful co-existence has really come or at any rate is about to dawn.

I wish I could share that belief which would allow us to plan for a certain future, but I cannot. Indeed, I think we are entering a particularly uncertain period, with an aging leadership in the Soviet Union and, I would judge, a struggle for the succession after Brehznev in which Russian foreign policy may be an important piece in a domestic chess-game.

That is an immediate prospect, but it is also, in the politics of a totalitarian society one which will recur. It is not the sole reason for our domestic planning to take the direction I have urged; I think the domestic and regional benefits are justification enough. But the particular uncertainties of the near future are a timely occasion to start, and I do not think that the opportunities we presently have in South East Asia will remain open for long.

THE DEVELOPMENT OF A STRONG MARITIME STRIKE FORCE FOR AUSTRALIA

by Major John Cambridge

This article is based on a paper written in 1977 and may be dated with regard to some matters of detail.

'For many centuries the ocean expanses have not only been a convenient means of communication between continents and between the suppliers of products vitally essential to mankind, but also an arena of fierce struggle and military conflicts. The scale of utilizing the water medium for military aims, ie, for the defence of one's own country and to seize overseas possessions, has grown in relation to man's knowledge and mastery of the ocean.'

— Admiral of the Fleet of the Soviet Union S.G. Gorshkov

INTRODUCTION

In November 1976, the Australian Government in its White Paper on Defence stated that 'the first responsibility of government is to provide the nation with security from armed attack and from the constraints on independent national decisions imposed by the threat of such attack'.(1) The paper and the ideals it encompasses are commendable. Any deficiencies and shortcomings in the document may be forgiven on the grounds that it is a constructive attempt by the Australian Government to openly state its defence policy. To an extent, it represents a turning point in thinking about and planning the national security of Australia.

For the first half of this century, Australia was dependent on the United Kingdom for protection. The decline of Britain as a world power saw a shift in dependence from the UK to the US. The US is still officially the basis and foundation of Australia's national security. This is manifested through the ANZUS Treaty which came into force in April 1952. Despite growing scepticism amongst some academics over the degree of support the treaty provides, the White Paper states that it 'gives substantial grounds for confidence that in the event of a fundamental threat to Australia's security, US military support would be forthcoming'.(2)

Irrespective of the value of the ANZUS Treaty, there can be little or no argument that 'a primary requirement ... is for increased self reliance',(3) when planning and building Australia's

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Major John Cambridge was born in Adelaide in 1944 and attended Adelaide Boys High School. He graduated from RMC Duntroon in 1966 and was commissioned into the RAASC. After six months postgraduate training he served with 8 Petroleum Platoon and, on promotion to Captain, as an instructor at the RAASC Centre. In 1969 he attended the Long Petroleum Installation Course in UK and, after attachments to BAOR and US Army Units in Germany, he served as OC 8 Petroleum Platoon in South Vietnam from October 1970 to September 1971. After two years at the RAASC Centre he transferred to the RAAOC when the RAASC was disbanded. He next served at HQ Third Supply Group, where he was promoted to Major, followed by a tour at HQ Logistic Command before attending Staff College in 1977. He is currently serving on the staff of the Director General of Supply, Army Office.

defence. However, self reliance is a total concept involving more than defence and cannot be achieved in a short period. It could take a century for Australia to develop the political, economic and social capacity to sustain a self reliant posture. In the meantime, the nation can only depend on the US for protection should a major or fundamental threat develop, and work towards self reliance.

Like all western countries today, Australia faces increasing demands for national resources. The Australian economy is virtually static at present and is not likely to improve markedly for some time. It is unlikely that national security requirements will get any higher priority than they are currently given or have received in the past. Consequently, it is improbable that the defence vote will be increased in real terms. In the last five years, expenditure on the defence function has never risen above 3.3 per cent of Gross Domestic Product.[4] It is likely that future defence requirements are likely to meet more competition in the allotment of limited national resources.

While progress in technology has improved military material, the costs of weapon systems and equipment has risen tremendously. Given these two conditions, defence planners are going to have to achieve self reliance without increasing the cost to the nation. Australia must, therefore, maximise the effect of every dollar spent on defence. In the past, Australia's defence structure has tended to consist of a variety of weapon systems and equipment which have not always complemented one another. Corps and Service jealousies have created a division of interests and a conflict of priorities. As Dr Millar observed in the 1960s 'competition for available funds was for years intense and still exists'.[5] These factors subconsciously thrust Australia's national interest into the background.

If Australia is to achieve any form of credible self reliant defence posture, it should adopt a unified and total approach to planning the security of the nation. While the reorganization of the Department of Defence in 1973 provided the structure for a joint approach to defence problems there is little evidence to show that the Services have changed their thinking.

It is my belief that the need for increased self reliance in the defence of Australia can best be met by giving priority to the development of a strong maritime strike force.

Maritime strike forces are not defined in Joint Service Publications as such, but an appropriate definition is given by Vice Admiral Sir Peter Gretton when he describes 'maritime forces' as:

> *'Any military forces used on, above and under the sea. Not confined to naval ships and aircraft.'*[6]

Maritime forces could include, in addition to the naval ships, aircraft and submarines, any army component afloat, marines, amphibious forces and any aircraft used or deployed over the sea. It is essential that the definition be broad enough to include all army services or elements of them. The important point is that a balanced force can be structured or deployed consistent with strategic objectives and priorities. It follows that such a force is structured for maritime operations and that the equipment it possesses is designed or purchased for that primary role and function.

STRATEGIC ASSESSMENT

The most basic and fundamental step in defence management is establishing military requirements. Military requirements depend on the determination of force structure and levels best suited to attaining national security objectives. Arriving at national security objectives is a difficult and complex matter which involves many uncertainties. The basis for Australia's national security objectives is the Strategic Assessment.

Despite the latest strategic assessment, there are a number of facts and international elements which Australia could use or take heed of, for national security planning. The first of these is the growing international importance of the Indian Ocean. Japan and Australia are closely involved with the stability and security of the Indian Ocean although both countries are located in the Western Pacific.[7]

This is supported by Coral Bell who says that 'no other country of the Western tradition is more vulnerable than Australia to any international storms that may arise in the Indian Ocean, and none has a clearer or more direct interest in the construction, if possible, of a viable security system covering that very extensive portion of the globe'.[8]

The location of Australia is relevant. Australia is adjacent to South East Asia with the nearest neighbour being Indonesia with a population of more than 100 million. There is very little unity in the region, which contains many peoples, races and ideologies. More than 2,000 million Asians live closer to australia and New Zealand than any Europeans. Australian cannot assume that this significant part of the globe will be stable, and according to Dr Millar, 'we cannot assume that we will be given a lengthy warning of approaching war'.[9]

If Australia wishes to become an actor in Indian Ocean politics, it must develop a strong maritime strike force. At present, it is the area in which major powers are contending for access and influence.[10] This is supported by the Soviet build-up in the Indian Ocean.

A most important and intangible aspect of the strategic assessment is the time that is likely to be available for defence preparations. Australia is likely to use all available political and diplomatic measures to ease an adverse strategic situation before mobilizing a Defence Force. It is difficult to estimate the amount of time that may be available from the time the threat is perceived until hostilities commence. It has been argued, by Mr Ross Babbage, that defence preparation time is not likely to exceed 17 months.[11] Whatever the time is or may be, it is dangerous waiting to commence planning, purchasing or equipping a defence force until after the threat is perceived. Furthermore, it is unlikely that the time availale will be sufficient to plan, purchase or even manufacture large capital equipment items such as ships, aircraft, tanks and modern weapon systems.

At present Australia does not possess the capability to manufacture most of these items. If Australia is serious about self reliance, it must either develop the capacity to manufacture essential capital items, weapons and equipment, locally, or ensure that it has sufficient quantities on hand or in service before the threat develops. The latter alternative involves a guaranteed source of supply. Dr Millar points out that 'it is axiomatic, in view of our dependence on overseas sources for certain strategic materials and military equipment and the need to pay for these by exports of our primary commodities, that these sea routes must be protected'.[12]

The White Paper places a great deal of importance on the Australian-US alliance and it assumes that the US would be the major overseas source of equipment and material in a time of threat. The two main problems arising from this attitude are:

- the US may not be able to provide sophisticated, high cost capital equipment at short notice, and
- Australian interests may not always coincide with those of the US, in which case the US may not wish to become involved indirectly or by implication.

This points to the requirement for sophisticated, high cost, long lead time military equipment being available or in service in the Australian Defence Force before any threat is perceived. The most expensive capital items in terms of cost and lead time are ships and aircraft.

Australia should equip its capital intensive areas of defence in peace as a matter of priority. The maritime strike area should receive first priority in the allocation of resources.

There are some fundamental environmental factors that can be considered not only for determining the characteristics of the defence force but for allotting priorities. Australia's physical environment as described by Rear Admiral Synnot includes 'certain enduring features of geography, of population size and distribution, of national infrastructure, of industrial capacity and of resources distribution'.[13]

PHYSICAL ENVIRONMENT

The Australian mainland occupies approximately three million square miles and has 12,000 miles of coastline. Approximately two thirds of the land mass is undeveloped and sparsely populated. The majority of Australia's population is centred in the east within 500 miles of the coast. Nearly all of Australia's industrial and agricultural wealth is located in the eastern littoral. Much of Australia's resources, such as natural gas and oil, lie near or in the seas or depend on the sea for transport and communications.

A further significant geographic fact is the many islands to the north of Australia which link the country with the Asian mainland. One chain of islands stretches from the Ryukyu Islands southward through the Bonin and Volcano Islands, the Marianas, the Philippines, and the Marshall, Caroline, Gilbert and Solomon Islands. The other chain links the Malay peninsula and the Indonesian Archipelago to New Guinea.[14]

Australia also has a number of territories outside of the mainland. Among these are the Torres Strait Islands, the Cocos (Keeling), Norfolk, Lord Howe, the Macquarie, Ashmore, Cartier, and Christmas islands and the Australian Antarctic Territory which includes Heard and McDonald Islands.

In addition, there are many other islands which are dependent on Australia for trade and industrial support. Nauru, Solomon Islands, New Hebrides and New Caledonia are the more significant ones.

It is only logical that Australia should place emphasis on maritime strategy and this is sup-

ported by the White Paper and the characteristics of the defence force that are deduced from the physical environment of Australia.[15]

The Law of the Sea negotiations and the possible declaration of a 200-mile resource or economic zone is likely to have a significant effect on Australia's security. The expansion of Australia's maritime area by 2.5 million square miles introduces major problems of surveillance and protection. Any international disputes over access or rights to resources in the 200-mile zone are likely to involve maritime forces.

Neighbouring countries may look to the manner in which Australia approaches the control of the zone when assessing how strong or weak the country is in terms of national security. Everything Australia does in the 200-mile resources zone will have defence implications.

The sea is increasing in importance as a source of food and energy. Japan in particular, is very dependent on fish proteins, and in 1963 they constituted 70.6 per cent of the country's total animal protein consumption. Similarly, other Asian and South East Asian countries which are located within Australia's sphere of influence rely heavily on fish proteins as a source of food. The fishing grounds from which some of the fish protein is obtained are located in or around Australia's maritime resources zone. It would be ludicrous for Australia to deny other countries access to these and other natural resources which the country possesses, but Australia must have the ability to enforce any controls or laws it makes in relation to its resources.

OVERSEAS TRADE

Australia's economy is dependent on overseas trade, the majority of which consists of maritime trade (99 per cent of Australia's external trade goes by ship).[16] Maritime trade is sensitive to external factors and consequently has implications for defence.

Australia is a major trading nation and lies 13th in the world in terms of total value of trade. As a percentage of Gross Domestic Product (GDP), Australia's trade is approximately 31 per cent and is higher than that for Japan and the US. Imports are essential to the economy and have increased five-fold in the last decade. They consist mainly of capital equipment and producers' materials.

Similarly, Australia's export trade has grown to offset payment for the country's imports. While agricultural products are the major exports traded, they are gradually reducing in proportion to the export of manufactures and mining products. The growth of the mining sector is significant because it represents 24 per cent of Australia's export trade, while the export of manufactures has increased to 20 per cent. Although decreasing, exports of agricultural products amount to 52 per cent of Australia's total exports.

Oil is particularly important to the security of Australia. Local oil production provides approximately seventy per cent of the nation's requirements. The remainder comes mainly from the Middle East countries. Australia is dependent on heavy Middle East crudes for use in heavy industry.

At current consumption rates local resources are unlikely to last beyond 1985 unless further oil fields are discovered. This means that Australia will become dependent on overseas sources especially the Middle East countries.

Australia must be able to guarantee its maritime trade in peace and war. To do this, the nation requires the capability to monitor and protect coastal and overseas shipping and sea routes from acts of sabotage, aggression and blockade.

Overseas bulk trade shipping is most intense on the west coast of Australia, from the iron ore ports of Dampier, Hedland and Walcott. Much of this trade goes to Japan via the Ombai and Lombok Straits. At any one time, there are 30 bulk ore carriers in transit between Australia and Japan.[17] Other exports from Western Australia include grain to Asia and the Middle East countries as well as exports of alumina and mineral sands.

On the east coast of Australia, bulk ore ships transport bauxite from Weipa to overseas countries (mainly Japan) and the Australian alumina plants at Gladstone (Qld) and Bell Bay (Tas). Bulk coal is shipped from Gladstone and Hay Point in Queensland and Newcastle, Port Kembla in NSW to overseas countries (mainly Japan). Other exports which involve bulk shipping are wheat, sugar and liquified petroleum gas (LPG). Oil in bulk tankers is primarily imported through the eastern sea ports of Adelaide, Westernport, Altona, Geelong, Kumell and Brisbane. Refined oil products are also distributed around Australia by sea except for Darwin and ports in the north west of Australia which are supplied from Singapore.

General cargo to and from overseas is mainly transported in container ships, with the majority of cargo being handled at the major ports of Sydney, Melbourne and Fremantle. Australia is heavily dependent on shipping as a major mode of transportation for overseas trade. Approximately 11,000 ships arrive from overseas each

year with cargo. The majority of this shipping involves Australia's trade with Japan and moves through the strategic straits of Lombok,Ombia and Jomard to the north of Australia.

Coastal or domestic shipping around Australia is small in terms of tonnages moved. Only 5 per cent of freight carried in Australia is transported by sea, but this freight cannot be transported by other means. This is the case with bauxite from Weipa, as well as iron ore from the ore ports in the north west of the country. Most of Australia's coastal shipping moves via Torres Strait which is strategically important to Australia.

Maritime trade is essential to the Australian economy in peace and war. Overseas trade is likely to increase in the future as the nation utilizes its abundance of natural resources and realizes its economic potential. An island such as Australia does not necessarily need to be invaded to be captured [18] or even theatened. Australia cannot afford to neglect the security of its maritime trade in peacetime especially as the nation is so reliant on overseas markets for defence material.

MARITIME STRIKE FORCES

Maritime strike forces, in particular the naval component, have a unique advantage in peacetime. They can be used for the purpose of demonstrating the economic and military power of a country beyond the borders of that country.[19] In peacetime, Australia needs to demonstrate that it has the capacity to protect itself, its neighbours and if necessary back up its foreign policy. It can do this by despatching elements of its maritime strike force to other countries and subtly demonstrating its technology, skills and professionalism. this is not new in the global sphere of politics and diplomacy and yet it has played a great role in deterring would-be aggressors. It is difficult to 'show off' the capacity or capability of Australia's land force except by advertising the equipment purchases and conducting large scale land exercises. Similarly, it is difficult for another country to assess the effectiveness of Australia's air defence force without engaging in combat with it.

Maritime strike forces are well suited to assisting in the rescue and alleviation of disasters at sea as well as natural disasters, such as occurred with Cyclone Tracy. The rapid despatch of a maritime strike force to a disaster in a neighbouring country can provide goodwill between the countries and be a significant diplomatic asset.

More military activities of a maritime strike force involve defence of the economic resources zone, protection of shipping from hijacking and acts of sabotage and naval blockade.

Inevitably, the overriding consideration and limiting factor affecting the development of a strong maritime strike force for Austalia is the cost. Maritime strike forces are expensive in absolute terms and it is doubtful whether Australia can afford such a force without increasing the defence vote or making sacrifices in other areas. It has been argued previously that it is unlikely that the nation could afford or be willing to increase the defence vote above 3.3 per cent of GDP. Consequently, some other aspect of defence would need to be sacrificed in orde to give priority to the development of a strong maritime strike force. This would require strict and hard reassessment of funding within the Department of Defence.

MANPOWER AND EQUIPMENT

Suggestions of reducing land forces to achieve some savings is certain to meet with emotional hostility. The same would be true of any suggestion to critically examine the Air Force and the current TFF replacement for the *Mirage*. However, the matter deserves investigation before any government agrees to increasing the defence vote (which is unlikely) or redistributing funds within the Department of Defence.

What sort of land forces does Australia need? Paragraph 32 of Chapter Three of the Defence White Paper states that the physical environment of Australia suggests that the characteristics of our force structure should include

> 'readily transportable and mobile land forces, with adequate capability for reconnaissance, to meet hostile incursions at remote localities.'[20]

This paragraph also gives six other characteristics, five of which support naval and air defence elements of the Defence Force structure. The characteristic quoted above is further developed in Chapter Four of the White Paper in the section on Land Warfare but not to any degree that indicates or justifies a substantial land force in being in peacetime. The strategic assessment does imply, and is supported by the treatment and emphasis given to maritime elements of the Defence Force in the paper, that Australia needs 'very mobile, light land forces capable of mopping up small hostile incursions at remote localities'.[21]

It is difficult to understand how this characteristic justifies the purchase of a new main battle tank or gives credence to the maintenance of a large land force in being. It is difficult to support any concept which visualizes land forces sitting in bases in the North, North West and Centre

RAAF Mirages flying over West Malaysia

— by courtesy of Defence Public Relations

Leopard Tank

— by courtesy of Defence Public Relations

Army engineers laying a pontoon bridge

— by courtesy of Defence Public Relations

of Australia in peacetime. The infrastructure to support them would be large and costly and clearly unacceptable in a peacetime environment. As Dr R.J. O'Neill stated recently 'We must develop a strong maritime capacity to give any enemy pause for thought before sending forces against Australia and we must have sufficient of a land defence capacity to make him transport the large numbers which will offer attractive targets to the maritime strike forces. Therefore we should give priority to the development of maritime strike and protracted land doctrines'.[22]

Any threat or scenario which supports the maintenance of a large land force also supports the need for a strong maritime force. Logically, the land force is the second line of defence and is more necessary if the maritime force is weak or neglected. Many strategists support the idea of meeting such a threat on the other side of, or in Australia's moat rather than allow uncontested entry to the mainland. A strong maritime force would also allow more time for land forces to deploy or mobilize. According to the White Paper, such a threat could constitute a fundamental threat to Australia's security and US support would be forthcoming. If US support can be guaranteed then there appears to be little need to maintain large land forces in peacetime. But can US support be guaranteed?

There are some more fundamental aspects of maintaining land forces in peacetime which are relevant, not the least of which is manpower costs. Nelson and Wellington both said on separate occasions, the man was the most important factor in war. If they had to deal with Australian manpower costs, they would have said the same thing but with a different inference.

Wages and salaries represent more than fifty per cent of the 1976-77 estimates for defence expenditure ($1 210 million out of an estimated total expenditure of $2 255.5 million).[23] The estimated expenditure on capital equipment for 1976-77 is $311 million or 14 per cent of the defence budget.[24] Manpower costs have more than doubled in the last five years,[25] while there has been no significant increase to expenditure on capital equipment in the same period of time.

The Army is the most manpower intensive area of defence, with estimated manpower costs totalling $360 million for 1976-77 for a regular or permanent force strength of 31,430 (as at June 1976). In comparison, the Navy has a permanent strength of 15,993 and incurs manpower costs of $175 million. The Air Force is in between with a permanent strength of 21,351 and a manpower cost of $245 million.

The government planned to spend $12 000 million (at 1976 prices) on capital equipment and facilities in the five-year programme commencing 1976. This represented a rise of approximately six per cent in 1976-77 terms.

Just how much new additional equipment $12 000 million will purchase remains to be seen. A large proportion of it will certainly be allocated to the TFF replacement for the *Mirage*. What is obvious is the need to spend as little as possible

on manpower-intensive activities until it is absolutely necessary. The lead time to recruit and train personnel for land forces is two years, in comparison with equipment lead times of five to ten years. If Australia has to make a trade-off between deterring and repelling an enemy over the ocean on the one hand, and destroying him on land on the other, then the country should invest in a strong maritime strike force with a skeletal expandable land force. The land force in being should consist of a highly integrated reserve and regular force to provide the base for expansion. The force should be capable of operating in different terrain and conditions with a rapid response capability to meet various low-level contingencies.

THE NAVY

The RAN currently consists of one aging aircraft carrier which will need to be replaced shortly, twelve destroyers, four submarines, one minesweeper, two minehunters, twelve patrol boats, six landing craft heavy, two support ships and four survey and research ships. The Fleet Air Arm has three front-line squadrons, a strike and fighter squadron (A4G Skyhawks), a fixed-wing anti-submarine squadron (S2E Trackers) and a helicopter anti-submarine squadron (Sea King).[26]

The replacement, or otherwise, of the carrier *HMAS MELBOURNE* is a matter which will require resolution in the near future at a time when the country will have expended a large proportion of its Defence monies on a TFF replacement. It is unlikely to receive an objective assessment, coming so close to, and on top of, a major purchase such as the TFF replacement programme. It is significant that seven of the RAN's twelve destroyers are more than ten years old and require resources for modernisation programmes. Two of the oldest destroyers will be replaced with guided missile frigates around 1980-81. Two new *OBERON* class submarines have just come in service but the four earlier submarines need improvements to their weapon systems. A new fleet oiler is required to replace the current oiler *HMAS SUPPLY* which is due to retire in 1980 and a second ship is being considered 'to provide added capacity for deployment, and to permit operations in both the eastern and western ocean areas.'[27] In addition 15 new patrol craft will enter service between 1979 to 1984.

The replacement and update programme of the RAN is an enormously costly business which leaves little scope for major capital equipment purchases to increase the size of the maritime strike force. A strong maritime strike force consisting of fast patrol craft, modern guided missile destroyers, low profile aircraft carriers and an amphibious squadron capable of carrying an Army task force should form the basis of Australia's Defence Force. The TFF replacement for the *Mirage* should have the capability of maritime strike as well as being an air superiority fighter. In addition, the primary role of the *F111* should be maritime strike.

It is more than unfortunate that the replacement times for major RAN items coincides with the RAAF replacement programme for the TFF and jet trainer. Unless strict priorities are allotted to the three Services from Defence Central, little change is visualized. The maritime area of defence could well lose out in a closely fought contest for national resources, the implications of which may be immeasurable. The priorities and decisions on allotment of resources must come from the top, not from the bottom, where the real issues are clouded by Service rivalries and the 'state of the art' syndrome.

CONCLUSION

Australia has never been threatened to any significant degree and no war has ever been fought on the Australian mainland. Consequently the nation has been lethargic in its approach to defence matters and has been plagued by a lack of national security objectives. Suddenly Australia is faced with the prospect of having to plan to defend itself against all but the most major or 'fundamental' threat circumstances without outside assistance. The implications of a more self reliant posture for Australia are numerous and pose a significant challenge to Australian defence planners.

National security objectives are fundamental to the defence of the nation, for they are the basis for planning and allotting resources. They should be formulated at the highest level of government by a body called the National Security Council. While the Defence White Paper is an attempt to assess Australia's strategic circumstances and its priorities for security, it does not go far enough.

The paper is too broad and vague in some areas to allow defence planners to determine the best structure for the Defence Force and what equipment it should have. It would appear that very little direction or guidance is given from the top; rather that the three Services interpret or develop their own requirements and priorities. Providing their arguments accord with the broad guidance given in the strategic assessment, the structure or equipment is approved. This, coupled with inter-Service rivalry, leads to fierce competition for scarce resources.

In the final analysis, the Services may not get the equipment or structure they want but it may not necessarily be that which is best suited for the defence of the nation, taken in totality. Such a system of bidding lends itself to the less than optimum use of resources and arguments based on 'the state of the art' syndrome.

Self reliance is a total concept involving political, social and economic development. Defence is a part of that development, but it is an area which is unlikely to receive an increase in its allotment of resources. Self reliance is going to have to be achieved within that allotment. Consequently it will be essential to lay down priorities in order to maximise the value of every dollar spent on defence. Some areas of defence may have to be sacrificed for more important ones initially.

There is no clearly identifiable threat or even a probable threat on which to base force structure studies. Nevertheless, there are some fundamental factors such as Australia s geography, location and trade which indicate certain characteristics of the Defence Force. Those are outlined in the Defence White Paper but the priority which they should be accorded is not.

Australia's geography and location are such that the country is dependent on sea lines of communication which are vulnerable in peace and war. The nation has a large volume of maritime trade on which the economy is dependent. In addition, a large proportion of Australia's defence equipment is manufactured overseas. The sea routes by which these essential items are shipped to Australia should be protected. The Law of the Sea negotiations and a 200 mile resource or economic zone have significant defence implications. All these factors not only support the need for a strong maritime strike force but emphasize the requirement for priorities. Given the substantial dependence that Australia places on the US in the event of a major or fundamental threat to the country, and the characteristics which the Defence Force should have, priority must be given to the development of a strong maritime strike force.

Maritime strike forces have a unique advantage in that they can be utilized in peacetime to protect trade routes, maritime resources and domestic shipping. They can also be used for political and military purposes and can demonstrate that Australia has the capacity to protect itself and give a potential adversary reason to pause for thought before engaging in hostilities. Their non-belligerent activities make them a useful adjunct to a nation's foreign policy in peacetime.

Australia is not, and is not likely to be in a position to develop all facets of defence concurrently. Few Australians would be prepared to sacrifice their life style for total self reliance, and no politician would dare mention it. Consequently, resources are limited and priorities are essential. The first and primary priority for the defence of Australia should be to develop a strong maritime strike force, otherwise 'self reliance' may well be an act of self defiance.

NOTES

(1) *Australian Defence*, presented to Parliament by the Minister of Defence The Hon D.J. Killen, November 1976
(2) *Ibid*, Ch. 3, para 7
(3) *Ibid*, Ch. 3, para 6
(4) *Defence Report 1976*, table 9
(5) *Australia's Defence*, T.B. Millar
(6) *Maritime Strategy*, VADM Sir Peter Gretton, Cassel
(7) *Oil, Politics and Seapower: The Indian Ocean Vortex*, W.A.C. Adie
(8) *Oil, Politics and Seapower: The Indian Ocean Vortex*, Carol Bell
(9) *Australia's Defence*, T.B. Millar
(10) *The Indian Ocean in Soviet Naval Policy*, Geoffrey Jukes
(11) *Australia's Strategic Reorientation: Some Important Implications*, Ross Babbage
(12) *Australia's Defence*, T.B. Millar
(13) The Changing Challenge for our Defence Force, RADM A.M. Synnot, in *Army Journal*, May 1976
(14) The Need for an Amphibious Force, Lt.Col. L.D. Johnson *Army Journal*, 1973
(15) Defence White Paper, Ch. 3
(14) *Australia's Defence*, T.B. Millar
(17) Australia's Maritime Trade, CAPT N. Ralph in *Journal of Australian Naval Institute*, May 1976
(18) *Australia's Defence*, T.B. Millar
(19) *Navies in War and Peace*, Admiral of the Fleet of the Soviet Union S.G. Gorshkov
(20) Defence white Paper, Ch 3
(21) *Ibid*
(22) The Development of Operational Doctrines for the Australian Defence Force, R.J. O'Neill in *The Defence of Australia*
(23) *Defence Report 1976*, Table 4
(24) *Ibid*, Table 1 of 3
(25) *Ibid*, table 5
(26) *Ibid*, Ch. 10
(27) Defence White Paper, Ch. 4

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SHIPS AND THE SEA

ANDREW MILLER'S NAVY

'That's 'ow it is in the Navy ..... That's what we call the Navy ..... A press man called Andrew Miller ..... forced so many blokes to join, that it got to be known as Andrew's Navy. Then they shortened it to the Andrew'(1).

The press gang so dear to film makers and English folklore is commonly regarded as a typical example of the brutality that prevailed in the eighteenth century days of sail in England. The fact is that press gangs may have been common to the English days of sail, but 'impressment' goes back a lot further and showed little distinction between either branch of the forces. Falstaff misused the press badly, although the army preferred to use methods of guile and bribery when every effort to attract volunteers by bounties failed.

'Impressment' (from the French empressor) came into use for commandeering ships and men. It was confused with 'imprest' meaning money or token payment of the King's shilling. Any man accepting it being 'pressed' and hence liable to service. By Georgian times the word 'impressment' had come to mean recruiting in any form.

The press gang was an accepted feature of English life long before the age of Nelson, but it was at this time and during the twenty years' war with France that its activities were better organised and wider spread. No one liked it, neither the Admiralty — because of the expense, Naval Officers who despised the type of man it produced, nor least of all the poor wretches caught by the gangs. But since bounties failed to attract a sufficient number of volunteers, there was little if any alternative.

The accepted views that the press gang were always on the wrong side of the law are in error. Consider these learned judgements:

> *'The practice of pressing is one of the mischiefs war bringeth with it. But it is a maxim of law, and good policy too, that all private mischiefs must be borne with patience for preventing a national calamity, and no greater calamity can befall us than to be weak and defenceless at sea in time of war, so I do not know the wisdom of the nation has hereto found on any method of manning our navy less inconvenient than pressin ..... The right of impressing mariners for the public service is a perogative interest to the Crown, grounded upon Common Law, and recognised by many Acts of Parliament' and and*

> *'The power of pressing is founded upon immemorial usage, allowed for ages. If it be so founded, it can have no ground to stand on, nor can it be vindicated or justified by any reason but the safety of the state. And the practice is derived from the trite maxim of the constitutional law of England, that private mischief had better be submitted to, than that public detriment and inconvenience should ensure ..... Persons liable must come purely within the description of seaman, seafaring men, etc. He therefore who is not within the description does not come within the usage.'*(3)

Therein lay the basic difficulty of pressing men for service, who decided who was a seaman or seafaring man. Pressing Officers were paid by results and naturally they were none too careful. Wrote one Admiral in 1775 — *'I don't know where they come from, but whoever was the officer who received them, he ought to be ashamed, for I never saw such except in the condemned hole at Newgate. I was three hours and a half mustering this scabby crew, and I should have imagined that the sum of the earth had been picked for this ship.'*

There were ways to beat the press gang of which one was the passport. Any man living in a coastal district could be issued with a passport proving that the bearer belonged to a protected occupation. At one time or another a great variety of persons were protected. Trinity House, Cus-

toms, those employed on (official) Naval business. An Act of 1779 gives a general list: all those below the age of 18 and above 55; foreigners, Greenland fishermen, but not those from Newfoundland etc etc.[4]

In 1779 it was estimated that some 14,800 passports had been issued, 7,000 of which were held by those in the Newcastle collier trade. Because of the voracious use of coal these North Country collier crews were allowed 4 free men per 100 tons of shipping, and recruitment was avoided from the coal trade except in time of crisis. *'It is worth recalling that James Cook, the finest seaman produced by this country, volunteered at Wapping in 1755 in order to better himself after being employed in a Whitby collier. Had he not done so, he might well have been pressed.'* [5]

But now to the present. In a book published in 1913 devoted to the subject of 'impressment' and speaking of the English people (the author) concluded with a pathetic sentence — *'A people who for a hundred years patiently endured conscription in its most cruel form will never again suffer it to be lightly inflicted upon them.'*

Yet 3 years later (1916) conscription was introduced in England!

Readers will notice that a new word has been added to 'impressment' that of 'conscription'! Have we now come the full circle? 'Impressment' it is said dates back to Edward I and feudal times, legal in principle and sanctioned by custom. Therefore in old (and new) terms 'impressment' is just military service required as a feudal obligation.

So in this day and age, although the press gang per se has gone forever, 'impressment' remains in the more polite and more effective terms of 'conscription' and 'National Service'.

ROBIN PENNOCK

NOTES

1. *Liberty Man.* G. Freeman
2. Sir Michael Foster, Rex vs Broadfoot 1743
3. Lord Mansfield, Rex v Tubbs 1776
4. *The Press Gang and the Law* Christopher Lloyd
5. Ibid
6. Ibid

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