

SEAPOWER 81

PROCEEDINGS



SEAPOWER *and* INDUSTRY

SEAPOWER '81

AUSTRALIA'S MARITIME DEFENCE AND ITS RELATION TO INDUSTRY

AUSTRALIAN NAVAL INSTITUTE

SECOND NATIONAL SEMINAR

10th — 11th APRIL 1981

SEMINAR PROCEEDINGS

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SEMINAR PROGRAMME

SEAPOWERS '81

Australia's Maritime Defence and ITS Relation to Industry

Conducted at University House and the H.C. Coombes Theatre, Australian National University, 10th and 11th April 1981.

FRIDAY, 10th APRIL, 1981

Afternoon

Introduction to the Seminar

Rear Admiral R.C. Swan, CBE, RAN President of the Australian Naval Institute.

Australia's Regional Defence Commitments and the Capabilities Response

Sir Arthur Tange, AC, CBE. Discussion chaired by the ANI President.

Shipping and Maritime Communications

Sir Ronald Swayne, MC. Speaker introduced and discussion chaired by Commodore V.A. Parker, RAN (Rtd), Past President of the ANI.

Opening Address

His Excellency Sir Zelman Cowen, AK, GCMG, GCVO, KStJ, QC, Governor-General of Australia.

Keynote Presentation: An International View of Maritime Defence

Admiral of the Fleet The Lord Hill-Norton, GCB
Speaker introduced by the Honourable D.J. Killen, MP, Minister for Defence.
Discussion chaired by Dr R.J. O'Neill.

A View of Australia's Maritime Defence Needs

Rear Admiral G.R. Griffiths, AO, DSO, DSC, RAN (Rtd) and Air Commodore G.G. Michael AO, OBE, AFC, RAAF (Rtd)
Speakers introduced and discussion chaired by Commander A.W. Grazebrook, RANR, Associate Member of the ANI.

Evening

Defence and Industry: An After Dinner Address

Mr R.J. Hawke, AC, MP
Speaker introduced and discussion chaired by Captain L.G. Fox, RAN (Rtd) Past Senior Vice President of the ANI.

SATURDAY, 11th APRIL, 1981

Morning

Industrial Keynote Presentation: The Industrial Foundations of Maritime Defence

Admiral Sir Anthony Griffin, GCB, Recent Chairman of British Shipbuilders

Speaker introduced and discussion chaired by Commodore P.R. Sinclair RAN, Vice President of the ANI.

The Future of Australian Industry and Defence

Professor W.E. Kasper

Speaker introduced and discussion chaired by Captain W.S.G. Bateman RAN, ANI Councillor.

Defence Oriented Resources

- Energy — Mr R.K. Gosper
- Strategic Materials — Sir David Zeidler, CBE
- Research and Development — Mr A. Sharpe

Speakers introduced and discussion chaired by Commodore P.G.N. Kennedy RAN, Member of the ANI.

Afternoon

Australian Industry's Present Capabilities to Support Maritime Defence

Mr N.F. Stevens, OBE

Speaker introduced and discussion chaired by Commodore J.A. Robertson RAN (Rtd), Past President of the ANI.

The Way Ahead for the Maritime Defence Industry in Australia

- Shipbuilding — Mr R. Humbley
- Aerospace — Mr R. Kingsford-Smith, DSO, DSC
- Electronics — Mr B.R. Goddard
- Heavy Industry — Mr P. Scott-Maxwell, DSC & Bar

Speakers introduced by Commodore J.A. Robertson RAN (Rtd). Discussion chaired by Mr N.F. Stevens, OBE.

Summing Up

Admiral of the Fleet Lord Hill-Norton, GCB and Dr R.J. O'Neill.

Closing Remarks

Rear Admiral R.C. Swan, CBE, RAN.

INTRODUCTION TO THE SEMINAR

President of the Australian Naval Institute, Rear Admiral R.C. Swan, CBE, RAN

Your Excellencies, Minister, My Lord, distinguished guests, ladies and gentlemen. On behalf of the Council of the Australian Naval Institute I welcome you all to this our second national seminar, Seapower 81.

The theme of Seapower 81 is Australia's maritime defence and its relation to industry — or more simply, seapower and industry. Arranging a seminar such as this flows directly from the aims of the Australian Naval Institute, namely to encourage discussion on naval and maritime matters. In effect, our role as the Institute is to

provide an appropriate forum. We have endeavoured to do that by holding this seminar. We rely on our speakers and our audience to give life and substance to discussion.

You will see from the programme that we are honoured to have so many distinguished speakers many of whom have travelled considerable distances, as have many in the audience. At four o'clock our Patron, His Excellency the Governor-General will deliver the opening address.

I would now like to introduce the first of our distinguished speakers, Sir Arthur Tange.



Lively discussion during a break. L to R: Admiral Swan, Admiral Sir Anthony Griffin, Sir Arthur Tange, Lord Hill-Norton, Mr Killen.

AUSTRALIAN REGIONAL DEFENCE COMMITMENTS AND THE CAPABILITIES RESPONSE

by Sir Arthur Tange, AC, CBE

In defining the international tasks that might be expected to fall upon our Defence Services and those that support them at home, I shall not confine myself to commitments in the more formal sense that may be found in various international instruments. They include the United Nations Charter, the Anzus Agreement and some bilateral agreements with the United States, the Manila Treaty, the declarations of intent in the Five Power Communique about the security of Malaysia and Singapore, and informal cooperation arrangements with Papua New Guinea and Indonesia. The purpose of our defence capabilities is to protect the interests of Australia. Those interests are not limited to satisfying our obligations to others; indeed our perception of national interest should determine what we do for others. And that perception varies from one government to another under domestic influence that may be as strong as international events.

For the purpose of this Seminar I advance for consideration two officially stated objectives of Australian defence policy. They are, first, to have a greater capacity to fight alone, sometimes called "self reliance"; and, second, "that we be seen as a nation that takes defence matters seriously and that our military capabilities and competence should command respect." So said the 1976 White Paper issued by the present government. At that level of generality I would not suppose there would be dissent by a Labor Administration.

To avoid misinterpretation of what I have in mind I should make two further observations. First, no Government will interpret "self reliance" as meaning necessarily that Australian production should be looked to: the sourcing of each category of the millions of supply items will be examined against various considerations that may well come under discussion by others. Secondly, when we project abroad evidence of our military competence — primarily in our Northern neighbourhood but also wherever United Nations duties take our Forces and wherever and with whomsoever our Forces exercise — the message extends beyond the constituents of maritime power.

To translate the judgement of the external environment into the right force structure and size is the most challenging of all problems. The selection of weapons, and their platforms and vehicles, is important. It is made easier — I shall not say "easy" — by the high professionalism in the three Services and in the supporting scientific and engineering services, and by the advantage of remarkably uninhibited access to international weapons technology and doctrine. More elusive, and perhaps more important, is the definition of the tasks for which the Services, and all that lies behind them, **should** be prepared. This decision is not for the Services. It is for Governments because it is the fundamental of Defence and to some extent Foreign Policy. Governments should be articulate about their reasoning.

While the country benefits from the lack of a clearly defined enemy with motive and ability to attack the continent, this circumstance creates uncertainties and choices different from, for example, the NATO members or India or Pakistan or Israel and many others. Nor do we have the benefit of joint planning and assigned roles in the event of attack by a defined enemy.

Before a Seminar launches into discussion with the military and industry experts, it seems to me necessary to establish how wide are the choices, and daunting the uncertainties, facing governments in deciding the tasks. They are not all self-evident and predictable. They may be unique to a continent, peopled as it is and with the economic structure that it has, in propinquity with two vast Oceans and a northern neighbourhood of very different cultural composition. It needs its own strategy which is not confined to responding

THE SPEAKER

Sir Arthur Tange, AC, CBE was Secretary, Department of Defence from 1970 to 1979. He served as Australian High Commissioner to India and Ambassador to Nepal from 1965 to 1970 and was Secretary, Department of Internal Affairs from 1954 to 1965.

The Speaker was introduced by the President of the ANI, Rear Admiral R.C. Swan, CBE, RAN.

to the accident of a global nuclear exchange in which Australia will not be a centrepiece, but one which accommodates the contingencies of a different kind that could closely involve us two to three decades hence and for which some preparation is necessary now—rightly directed. Old strategic signposts are simple and comforting. Being part of Australian history or Service experience does not guarantee their validity. The debate should be questioning but you will not be surprised by my view that little useful contribution is made by the headline grabbers with their instant solutions.

Some matters that deserve some attention in the search for light on dilemmas and policy choices are these:

- in defence spending what should be the balance between two postures: one that can be promptly deployed to make a contribution, in a situation of dependency on the leadership, complementary operations and logistics of others; and one that creates the wide base of a force so versatile that it could, with threat warning, be expanded to act on Australian initiative to protect Australian interests at predominantly Australian risk — a force which in the absence of high and sustained funding would be so diverse as to have a low immediate deployment capability?
- a related question is how far should we mortgage to allies, or trading partners like Western Europe or Japan, defence capabilities selected for their relevance to the way the Soviet deploys its high technology — as against the training and equipment best capable of responding to a variety of threats directly against Australia's territorial sovereignty?
- how far are the two requirements identical?
- what duration and what intensity of war operations should be assumed in planning the public and private sector production and logistics base?
- what are the implications of trying to avoid provocation of Soviet nuclear attack upon Australia in a general war?

I would suggest that much of what is likely to be said here about shipbuilding or sea control or aerial refuelling or matters not on the agenda, like heavy lift helicopters, artillery and such matters, presuppose an answer to these questions.

Moreover, these are all matters for Governments and the Cabinet Room, not Russell Hill. In the life of an aircraft carrier or air superiority fighters, governments are likely to change. This country needs more consensus on the fundamentals of defence between the Parties (keeping the shadow boxing and imagery and the genuine conflict of view to the peripherals). We need this

consensus not for amiability in public life or even to comfort allies or discomfort potential adversaries abroad, but for the practical reason that the country cannot have a rational defence programme — specialist training, specialist weapons and vehicles, defence works, investment by the right industries and even stockholding — if there is not the prospect of adequate continuity under different governments. That continuity is needed in respect of two matters:

- strategic priorities and the acceptable level of military commitment to the Western alliance (in military preparations as distinct from diplomacy or rhetoric);
- how far we are prepared to go militarily by way of assistance in our immediate neighbourhood, and what diplomatic tolerance will be shown to political regimes in the only countries from which direct invasion of Australia could be mounted — which include Indonesia and Papua New Guinea.

Other speakers can speak more authoritatively than I about lead times for delivery of a man trained for a special role, or equipment trialled and in service, or quality approved deliveries from a production line. I think there would be agreement that radical change of strategic direction by governments cannot be quickly absorbed.

This is not to say that there has not been much continuity by all governments in respect of some things in the past decade: e.g.

- responses to United Nations requests;
- in assistance to Malaysia and Singapore (including a RAAF deployment);
- in concern with the security of the archipelagic countries and straits, and freedom of passage, and with the S.W. Pacific;
- in acceptance of the value of maritime surveillance (at least for the ocean approaches to Australia) by mobile or static means;
- in more explicit attention to the means of defending Australian soil;
- in acquiescence in maritime defence being our first line (accepted by all three Services too);
- in acceptance of whatever high levels of technology are necessary to permit our Services to operate in concert with the United States;
- in increased attention to the vulnerability of such a force to interruption of supply or queuing overseas;
- in acceptance of the methodology of basing defence preparation on threat estimates, the enduring features of this continent and a contingency factor.

Some of these matters have implications for different industries. There has been less con-

tinuity in respect of overseas deployment of ground forces, and in assessment of the relevance of situations in the Indian Ocean and its enormous littoral to Australia's security. And in the remainder of my remarks I want to dwell particularly on the implications of uncertainty as to what the government of the day in future — Coalition or Labor — may consider to be Australia's "primary strategic area", or "our region" which is the question-begging shorthand sometimes used by Foreign Affairs and Defence.

Has there been a permanent change in the strategic course set for the Services by the Government since the Soviet occupation of Afghanistan? To what extent have we turned to global or Indian Ocean "strategic circumstances" (the latter being hardly "regional") as the determinant of the force structure we require, rather than the contingency of circumstances more local to Australia? The question is prompted by the Prime Minister's treatment of this subject in his statement of February 19, 1980, and by the explanation by him and by the Minister for Defence of the deployment to the Indian Ocean of maritime "patrols", avowedly for deterrent purposes.

We have thus moved on from 1976 when, while the White Paper of that year spoke in favour of the United States putting countervailing force into the Ocean, it spoke of Australia in the following terms:

"... Our military resources are limited and the first call upon them must always be in respect of our own national security tasks. We would not sustain significant operations in two theatres concurrently ... Events in distant theatres such as Africa, the Middle East and N.E. Asia ... are beyond the reach of effective defence activity by Australia."

Since 1976 much has deteriorated in the certainties of oil supply. Iran and Iraq are at war; dangerous instability now prevails in the relations among the powers surrounding Afghanistan and the United States. President Carter's attempt to get agreed maritime limitations in the Indian Ocean failed.

I do not know how far we have taken geographically our Indian Ocean policy. Presumably there is no notion that Australia could in any significant way operating from its East Coast bases, compensate for the maritime deficiencies of the major oil dependent European economies or Japan if we remind ourselves that the Gulf is nearer to Europe than is Australia, and Japan has yet to spend 1% of its G.D.P. on defence.

What the Government may have in mind has implications of many kinds — going beyond particular air and surface and subsurface weapons and platforms. If there is intended a significant change in priorities, industry as well as the

Services need to know about it. For reasons of the lead times the defence posture is not wholly flexible.

There are two contingencies which justify misgivings about permanent maritime commitments to operations in the Indian Ocean matching Soviet power and technology. This Seminar might ask questions about both of them.

The first is whether, because of resources competition, we will be obliged to deny the development of a Defence capability of a different kind which is specifically designed to deter or resist a lesser power or organization of force on the ground much closer to Australia than the Northern and North-Western expanses of the Indian Ocean — and where the maritime forces might not have as much value as alternatives. We must allow that such a threat, while low in present probability, would be high in seriousness for Australians; and that Australian incapacity to act decisively as soon as it was recognised would have a devastating effect on the credence given to Australia's military capacity and national significance in what is our real neighbourhood, perhaps before a shot is fired — remembering too that in these circumstances we would be alone with weak local allies without United States combat assistance except in national extremity or the involvement of a super power.

The risk of being caught with an inappropriate balance of strength can be mitigated by warning of changing circumstances, and by enough funding to prepare on all fronts. The present government has promised a remarkable 7% real growth rate until 3% of G.D.P. is reached. But how much continuity will there be under this or alternative government? The historic trend of community spending on defence is not encouraging.

So some of our industries and the Services trainers and provisioners must live with uncertainty. But more than money is uncertain. There are political differences in outlook as to what we owe to allies, where the balance of reciprocal benefits between us lies, while one side of politics tends to promise allies too much and the other too little, reacting against each other like a law of physics at work. Where will our forces join our allies and where not?

These reflections will explain why I think we are in for trouble without more political consensus on defence — practical trouble with the structure of our Defence force in later years. Putting aside what the Opposition needs to do I suggest the Government as a start might look carefully in the Cabinet Room as to what it considers to be Australia's "area of strategic concern".

Super powers can encompass the maritime world. France may keep a toe in several oceans; but NATO is highly selective in the scope of its maritime obligations because, over and above the

formalities of its constitution, there is opposition to distant commitments from some of its smaller members. They are countries with economies not markedly different from Australia's. It would be incongruous for Australia to be less discriminating in the acceptance of maritime obligations.

In short, our "regional" commitments could mean different things to different people. Defence diplomacy justifies some licence in what Ministers say, some ambiguity or reticence about external intentions. Western Europe has left matching the Russians in the Indian Ocean to American power and for a time it was by no means clear that the Americans were willing. Perhaps last year Australia in effect made a small subscription to

what it hoped would be a collective maritime effort rather than buying in permanently with all that implies. Certainly the silence in recent years as to whether our foreign policy has regard to defence priorities has ended. My thesis to you is that government should be careful lest they give the wrong signal to the Services and industry about the intended strategic priorities of the country, lest its successors have to back off and head in a different direction under necessity. But some signals are clear: the nature of the country's physical environment demands that maritime capabilities occupy a prominent place in defence. Their description is for other speakers.

DISCUSSION

Chaired by

Rear Admiral R.C. Swan CBE, RAN

Commander Nekrasov, Navy: Sir Arthur, you mentioned adequate warning in your talk. What would you define as adequate warning — or is it a curly question?

Sir A. Tange: Is it a — — — ?

Commander Nekrasov: A curly question.

Sir A. Tange: Very curly indeed!

Calculation of minimum warning time is the problem that bedevils all governments and all defence services, but one cannot run away from trying to establish what level of defence preparedness has to be maintained in any case. It is a question of, I think, establishing orders of probability. In a world in which the community was so convinced that governments would necessarily also be convinced of the need to take out complete insurance, the Australian defence vote would be very much larger than it is today. But we live in a world of reality, and no doubt your discussions here are going to be based on reality, and that means accepting that we shall always live with an element of risk.

And adequate warning is going to mean different things to different services. It is a question that those in uniform who follow me would be much more competent than I to answer, but I would imagine that it would vary from specialisation to specialisation; it would vary from supply item to supply item. And I think it is the essence of judgement of government to distill out of that what is the degree of risk which the country can accept by maintaining a force of this or that composition at this or that level, and where is the point at which it must enlarge its preparation and spend more.

Commander Alan Brecht, Member of the Institute: Sir, you spoke at some length about the need for consensus, and having regard to the theme of the seminar, I ask you for an opinion on the degree of consensus that you think might be achieved politically and also within the general sphere of people interested in the thought that we might channel our resources as a nation into developing our infrastructure instead of spending that money on our defence force. I do not mean that we should not have a defence force, but instead of spending large amounts of money on that, should we not spend the money on developing our resources as a nation to support the force?

Sir A. Tange: I would think that you would probably have a pretty robust debate between the two sides of parliament on that very issue, as things are at present. And provided it is a thoughtful one, I would have thought it was the kind of debate we ought to have. Again it involves essentially a question for government as to how far the government thinks we should live, and the services should live, or the community should live, with security risks in order to build up the infrastructure for the future. Every government, I think, is going to chart its own course on that. My own observations of what has been done in the past decade, which included three years of a Labor administration and seven of a non-Labor administration, suggests there has been a not greatly different emphasis. There has been some difference in view as to the amount of funding appropriate. Within the defence vote itself, in the balance as between the sharp end, and the more immediately deployable on the one hand, and the

infrastructure, defence works, and that sort of thing on the other, I think the objectives have been very similar. There has been on both sides, at least up until the time when I ceased to have any direct knowledge of what was going on, a common emphasis on increasing the infrastructure and the longer term capital, as will be seen in some published statistics about relative expenditure — for example, on manpower on the one hand, and investment on the other. I would have thought that was the right course; but then I might be thought to be subjective about it.

Malcolm Booker, Associate Member of the Institute: I was very interested in Sir Arthur Tange's indication of his own thinking about a possibility of an Australian commitment to the distant Indian Ocean, and I got the impression that he would prefer that we commit ourselves to a near strategic region, including our near north. I wonder whether from the tranquility of retirement he would tell us candidly that he would disapprove of an ambitious commitment to the distant Indian Ocean, and would prefer a commitment to our closer neighbours? Then, if the answer to that is yes, I would like to ask a supplementary one, and that is whether he sees the possibility of an attack upon Australia from one of our neighbours mounted independently by such a neighbour, or whether the only credible possibility is that an attack upon us would arise from a situation in which one of our neighbours had been taken over by a major power? The obvious candidate for such a take-over of course being the Soviet Union.

Sir A. Tange: As to the first question, Mr Booker, Ambassador Booker, in your retirement you

respected ability to read between the lines when you were living in foreign capitals seems to have left you. As to the second question, which, on your proposition, it is necessary for me to answer, there is very little perceptible now that suggests the probability or nature of a direct attack on Australia from a power to our north. But I would have thought that, given the national circumstances of this continent, that I touched on briefly at the beginning, we should always be so positioned with our defence force, and facing in such a direction, that it is organised and trained to enable it — with the warning that we will get (which is a bit question-begging) — to deal with threats from our immediate neighbourhood. And I would not, myself, accept that the circumstance you described is the only credible one.

There are lesser circumstances without the involvement of a super power such as imprudent testing of us, tests of our capacity to respond. Such a country would not need a capability to occupy Canberra. They might start by feeling us out in peripheral ways, in peripheral areas. Perhaps not alone, resting solely on their own domestic capacity, and their own supply lines and their own logistic system and tactical doctrine, but receiving some aid from, and acting by proxy for the Soviet Union, which I suppose is the most credible likely protector or patron. But not necessarily waiting until they are occupied by the Soviet Union. I think if one removes the stipulation that such a country has to be occupied or controlled by the Soviet Union, one has a more credible scenario for a potential local threat to an Australian interest as against more distant events, which belong in the category of a general erosion of security in the super power struggle.



SHIPPING AND MARITIME COMMUNICATIONS

by Sir Ronald Swayne, MC.

"Why do the heathen so furiously rage? Why do the Nations imagine a vain thing?" Why do Governments start wars when history shows that the aggressor rarely achieves his objective, and when after immense expense of blood and treasure, a war of revenge has usually restored the old frontiers. After 300 years of fighting between France and Germany, Alsace and Lorraine are still attached to France as they were in the 16th Century. Unification apart, the wars of Bismarck and Kaiser and Hitler added virtually no extra territory to the 2nd and 3rd Reich and Hitler even lost much of the gains of unification.

If only the virus of war could be isolated, the antidote cultivated, and the furious heathen inoculated, what a Brave New World it might be. The underlying cause of conflict may be greed, pride, avarice, religion or racial hatred, but surely there is one consistent proximate cause. Peace is at risk when countries which have much to lose allow the balance of military strength to tip in favour of a potential enemy.

The balance of power is still a determining factor in peace and war. An imbalance did not lead to world war for quite long periods after 1815, 1818 and 1945; partly because the victors were interested in trade and the peaceful creation of wealth; partly because those who wanted peace were dominant. But at all times the more affluent democracies enjoying the fruits of peace have tended to be complacent about changes steadily taking place in the balance of military strength. In our times the electorate seems to put higher living standards above all other considerations; politicians want votes; and the realities of the defence situation are widely recognised too late.

In February this year there was a remarkable event. The Directors of the Institutes of International Affairs of Germany, the United States, France and Britain, published a joint Report "Western Security. What has changed? What should be done?" It was remarkable because the trend of thought by the strategic and diplomatic establishment in all four countries starts from different points of view, and is exposed to very different influences. Indeed one of the main points of the document is to emphasise the danger of the four countries failing to co-ordinate their foreign and defence policies in a global sense. That the four Directors found it possible to issue a joint

appeal for a re-assessment, is a measure of their concern for the present security of the West.

A second document issued in the same month, "A Global Strategy to meet the Global Threat" by the Defence and Overseas Policy Working Group of the British Atlantic Committee, (including Lord Hill-Norton and Sir Neil Cameron), states the risks of our present situation even more bluntly and points to similar conclusions.

I have asked a range of friends and acquaintances in Britain, and found no one has read either paper. The Press has commented but not as widely as deserved. I am deeply worried by the unwillingness of my own countrymen and others in the Western world to publicly discuss and to face up to what these papers are emphasising: that changes in the balance of power are taking place, and we are not making the necessary re-assessment of our policies. In democratic countries it is not enough for ministers, or officials and experts on defence, to be aware of this and to be concerned. A new situation imposes new priorities for expenditure and painful adjustment of our thinking on many issues. It is an Anglo-Saxon attitude that a threat to security or loss of freedom, which is not too imminent, will go away if you do not think about it too much, an attitude which now seems to be shared by most of the affluent countries of the free world. I would like to commend to you the work of the Royal United Services Institute. Their skilled and dedicated work is perhaps at last widening the circle of those prepared to face reality in defence matters.

May I take a few comfortable assumptions which are still widely believed because change and the implications of change have not yet sunk in.

THE SPEAKER

Sir Ronald Swayne, MC, was educated at Bromsgrove School, Worcester and Oxford University. He served with the Commandos during World War II, when he was decorated with the Military Cross. Since the war, he has occupied a number of prominent positions in the British shipping industry, including Vice Chairman of the British Shipping Federation and President of the General Council of British shipping. He is currently the Chairman and Managing Director of Overseas Containers Limited. The speaker was introduced by Commodore V.R. Parker RAN (Retd).

First, that the the NATO Alliance is strong enough to deter Russia from aggression.

NATO was, of course, dominant until the 1970's when Russia increased defence spending by 35% in real terms. I quote from the Atlantic Committee's paper:—

"In strategic nuclear weaponry Soviet parity with the West has been achieved, some would argue superiority. In theatre long range nuclear weapons there is Soviet superiority. In conventional forces in Europe the Warsaw Pact outguns NATO three to one in tanks and more than two in one in combat aircraft and artillery."

"U.S. forces have been cut since 1970 from 3 to 2 million, barely half the number of Soviet troops which have gone up by a third of a million over this period." Not only is Soviet military power increasingly dominant in numbers, but the quality of their weapons has been steadily catching up and in some sectors may have surpassed the West. Hardly surprising, because 25% of their huge defence budget is invested in Research and Development as against 11% in the United States or Britain.

A second assumption is that Russia is still obsessed with the horror of the war of 1941/45 and that the expansion of its armed forces is defensive. Their policies since 1945 have hardly been successful in diplomatic terms. They quickly antagonised their late allies, have failed to make a friend of Communist China, and they are virtually isolated apart from the goodwill of militant ex-Colonies that have followed the road to Marxism. They may well be afflicted by the paranoia of encirclement.

Maybe the policy of Brezhnev has been defensive, but would you stake your freedom on it? Will the policy of his successors be the same; particularly if they inherit armed forces which have tipped the balance of power in their favour? It is under the policy of detente that over the last ten years they have allocated around 12% of national income to military expenditure against NATO's 4-5%. And is the commissioning of a nuclear powered submarine every six weeks necessary for the defence of the soil of Mother Russia?

A third outdated but still common assumption is the one that worries me most, because it is in this field that we may be slowest to react to change and therefore most vulnerable. That assumption is that Russia is a land animal and that all we need is a secure Western front in Europe.

Long before Afghanistan, I felt that our attitude to NATO was horribly similar to French reliance on the Maginot Line in 1939 and 1940. All of you here know that Russia has become a world Naval power. But may I quote another extract from the Atlantic Committee's paper:—

"Most spectacular is the power to intervene overseas, a capability until recently only possess-

ed by the West. Though the United States still has more air and sea transport lift, the Soviet Union has many more air-portable troops: 50,000 men, in up to 1,000 aircraft, could be moved to the Persian Gulf area in 48 hours. Western intervention capacity has atrophied." I would add that they are now spending 40% of their defence budget on air power of increasing range. This is presumably to strengthen the defence of their world naval power.

In addition to strong mobile forces and global naval power roughly equal to the West they now have a very large merchant navy, ideally suited as ours is not, for the supply and support of overseas allies, of their surrogates or their own troops. I will return to this in a minute.

They now have agreements and dispositions which would have been unthought of only five years ago. Anti-Colonial sentiment is still a potent force. They escaped this opprobrium and use the cause of Marx for intervention, which looks much more like modern Colonialism than the unselfish pursuit of ideology. They may not have planned each venture, probably they did not, but out of the opportunities which have presented themselves, an opportunist policy has left them singularly well placed to exploit trouble in the Third World to their advantage and the disadvantage of the West. Their Cubans may not be popular in Angola, but in the event of serious conflict over Namibia they are well poised to intervene. Their military base at Nakala in Mozambique is a toehold which the West does not yet enjoy on the East Coast of Africa. Their positions in Ethiopia, South Yemen and now Afghanistan, place their armed forces within easy striking distance of the sources of 60% of European oil consumption, 15% of US consumption, and 70% of Japanese.

As they have become a global military power they have expanded their Merchant Navy. They lie fourth place amongst the genuine National flag Merchant Fleets, and second for general cargo tonnage.

Merchant shipping as you know has been revolutionised in the last ten years through specialisation and economies of scale. Bulk cargoes are carried in ships four to ten times bigger than twenty years ago. For cargoes not carried in bulk (the rest of world shipping) we have mechanised and speeded up port handling by the introduction of the Container. In this way we overcame the barrier to operating very large general cargo ships, since we could not increase the size of the conventional ship without unprofitably extending time in port.

The Russians have built a limited number of large bulkers. They have continued to build in large numbers the old fashioned 10,000 ton vessel with its own cargo gear, long after the rest of us had converted to the cellular containership. Much of their tonnage is the same as we used in

the last war for carrying men, tanks, armoured cars, ammunition, military stores, food, lubricating oil and petrol in flimsies. These ships draw about 28 feet and can work cargo with their own gear in and out of barges, or on to any ground which they can lie alongside.

The West has achieved a breakthrough in productivity and a loss of serviceability for war. Our ships draw up to 48 feet and need specialised terminals with cranes and strongly reinforced quays which take months, if not years, to construct. There are few of these terminals on the coast of Africa, (apart from Durban and Cape Town), in the sub-Continent of India and in South East Asia outside Singapore and Klang. Modernisation, too, has reduced the number of bottoms we operate. My Company's fleet of 23 ships in service and building is equivalent to 150 conventional ships. 23 missiles or torpedoes could do the work of 150 in the last war.

Insofar as the Russians have modernised, they have built roll on, roll off ships, many of which are designed to discharge into barges at sea, and like conventional ships, need no cranes ashore. Except in certain trades, the West had concluded that these are less commercially effective than cellular ships.

Commercially the Russian Merchant Fleet is inefficient (my Company would be quickly bankrupt if we had to operate their ships). It is much more flexible and efficient for the support of surrogates or their own troops and for intervention in local conflict.

They must make a massive loss on their shipping operations, if profit and loss is counted in our terms. Their objective may be to earn foreign currency, but even the balance of currency profit must be negligible in relation to the investment.

Their operations, which now cover most of the cargo liner trades in the world except the United States (where they have been pushed out by the Unions), are not commercially efficient. They have to undercut our prices by up to 30% to get cargo.

Apart from achieving their objective of creating and maintaining a world size Merchant Navy, there is an added bonus that their subsidised rates of freight are seriously damaging to Western shipping.

One of our drawbacks in responding to a threat from the Eastern Bloc is the very feature of the political and social structure which we wish to defend. We are a plural society pursuing our commercial, industrial and professional objectives as private individuals without State direction. The State in the West is not a monolith with a centrally co-ordinated direction of foreign affairs, taxation, overseas aid, defence and the promotion of industry. If these strands meet in Britain or Australia it is through the comparatively small Cabinet Offices or in the overworked Cabinet.

Which system works best in terms of standard of living and quality of life? In 1979 the Gross Domestic Product of Soviet Russia was little more than a quarter of that of the United States. With five times the population of the U.K. it was only 60% greater. It was a quarter of the combined GDP of the European NATO countries and, in passing, note that the European NATO countries are now richer than the United States on whose defence expenditure we are so dependent. In terms of GDP, Japan, Australia and New Zealand, and the countries which lie between them are twice as wealthy as Soviet Russia.

The remarkable increase in wealth in the Western World during the last ten or twenty years has been due to an explosion in international trade. British overseas trade, as a percentage of the domestic product, has increased by 50%. For the countries of the Pacific basin and South East Asia, it is the basis of a steadily improving standard of life, political stability and the very structure of society. The developed countries are now dependent on the flow of oil in our tankers, sailing every few hours through the Straits of Hormuz, and on the millions of tons of minerals and produce of every kind moving from Central and Southern Africa, Malaysia, Australia and South America, which in their turn pay for the standard of living of the producing countries. There is a massive interchange of finished the semi-finished manufacturers between the developed and between the developed and developing countries.

Serious diminution of this trade would create a world economic situation compared to which the current recession, or the great depression of the 1930's, would seem like a golden age. Interruption for any length of time would make our lives nasty, brutish and short.

I have been told by a recent British Chief of Defence that traders and shipowners should not worry. The harassment of shipping and trade would mean war and we will continue to have sufficient power to deter Soviet actions which might lead to a drift into actual conflict.

This does not allay my concern. I have seen enough of Russia at first hand to know that their dread of war is as great as ours, and that global conflict may be a fairly remote possibility. My concern is what Lord Chalfont has called a more classical situation: the gradual extension of influence by a growing imbalance of military strength and a series of diplomatic, political and tactical setbacks for the West, none of which would justify a major step towards global conflict. We cannot afford further retreat; we must stabilise the present relative positions of Russia and the West.

We forget the extent to which trade and shipping depend on international law and order because until recently, world wars apart, we have

had no fear of privateers, local wars, or what internationally accepted law, incorruptly administered, has applied virtually throughout the ports and seven seas of the World. In the Roman Empire they said that a man could walk unarmed from one end to the other without fear. From 1815 to 1914 the Pax Britannica did the same for world trade, and then the Pax Britannica and Pax Americana supported by European and Commonwealth allies until the Second World War and for some 20 years after with NATO as the Cornerstone. Blank spots are now appearing on the map where our ships are not welcome and our merchants find it unprofitable or virtually impossible to trade.

The rule of law up to about 1965 applied not only in the Oceans dominated by the developed countries, it applied in the China Seas, the Indian Ocean, the Islands between, and virtually throughout Africa. There was no vacuum, because although British forces has been substantially reduced we were still East of Suez, linked with Australia, New Zealand, the U.S. and others in various understandings; and there was no major power to support a country challenging the rule of law. It would be an exaggeration to say that there is now a vacuum. There are British and French ships East of Suez, and regular visits by squadrons of the American fleet, but the underlying situation has changed.

First, there are potentially unstable areas in the Indian Ocean/Pacific Basin where the West cannot afford further political and strategic setbacks. It is sufficient to point to:

- the Palestinian problem;
- the Iran/Iraq war;
- the effect of the occupation of Afghanistan on the countries and racial minorities to the South and West;
- black Africa's view of white rule in South Africa;
- Vietnamese aggression in S.E. Asia.

Second, arms are available to the countries in these areas in a quantity and of a power that was not so even ten years ago.

Third, the world powers up to ten years ago were more interested in trade, peace and stability than instability and conflict and Russia's influence was limited, (that is why deterrence was effective notably in Malaysia and Indonesia in the 60's). Russia is now a global power with bases close to all these areas. It is only to a limited degree a trading nation and is explicitly dedicated to the ultimate conversion to Marxism of any country which is not already suffering from that disease.

Fourth, the anti-Colonial sentiment which Russia has turned to its advantage is a severe constraint on the ability of the West to position readily available strength. The political problems that could be caused by the rapid deployment

force calls for a more sophisticated approach than Washington seems to be showing at present. Britain and Australia have great experience in this field and should see that their views are listened to.

In short, a strategic situation has developed in which past policies are no longer relevant.

I am no expert in diplomacy or defence with answers to these problems, but I want to put one broad consideration to you at this stage in the Conference. The Pax Britannica was maintained at some expense because it paid us to do so. A large proportion of international trade was financed in London, was carried in British bottoms and we could afford the cost.

None of you in the Pacific Basin from Japan to New Zealand, including Malaysia and Indonesia, can afford a deterioration in the balance of power between those who want peace and stability and those who might gain by revolution and conflict. And may I remind you that in this area there lie five countries whose growth in per capita income is amongst the highest in the World, including the oil exporters and despite total dependence on imports of energy. The same is true of all the countries of Western Europe: trade is now almost as important for West Germany as it is for Britain.

It is a question of hardware and its cost; and of coordination of policies.

As to defence cost, we leave the Americans too large a proportion of the burden: 640 dollars per head, 5.2% of their national income. South Korea and Taiwan apart, Britain comes next on both yardsticks: 440 US dollars a head and 4.9% of national income. The European NATO countries range around 400 US dollars a head and 31% of national income. For Australia and New Zealand it is 2 to 3% of national income and for Japan under 1%. There would be no problem over hardware if we all paid the same insurance premium for peace and stability as the Americans do.

As to co-ordination of policies. This involves a whole range of diplomatic and political considerations, but again taking an analogy from the past, freedom of the seas from 1815 to, say, 1965 has been called the Pax Britannica, or Pax Americana, but in fact it was always supported by a wide network of alliances. Formal alliances may not be the way to achieve co-ordination. It may be that the better method of supporting the rule of law is by ad hoc or regional groupings and informal understandings. One thing is certain: the invasion of Afghanistan and the threat to our oil supplies has wonderfully concentrated the minds of the Governments of all those countries which need a greater measure of security than we seem to acknowledge at present, and outside the North Atlantic there is no mechanism for co-ordinating the protection of their freedom and security.

Gentlemen, let us look to our defences and let us start working more closely with these

countries, the great majority who want peace, stability and trade, not revolution and conflict.

DISCUSSION

Chairman: Commodore V.A. Parker RAN (Rtd)

Wing Commander Wainwright: Sir Ronald, is it not true that one policy of Soviet maritime strategy is concerned with the projection of commercial shipping power, namely a policy of subsidising the cost of operating the general cargo fleet to enable the Soviet merchant fleet to greatly undercut other merchant fleets for commercial shipping contracts, with the result that many western nations are becoming more and more dependent on Soviet vessels for their international trade. Given this as a long-term strategy of the Soviet Union, could you suggest what response is needed from western nations to counter this move?

Sir R. Swayne: The answer to your first question is: yes, most certainly. The Red merchant navy is part of Gorshkov's fighting navy, there is no doubt about that at all. They share common training facilities. They are heavily subsidised. It is very difficult to say they are subsidised in our terms because Russia is a price-administered economy. They try and bunker in Russia at their special domestic prices. They have very large bunker capacity. They are virtualised and stored in Russia. They are paid very, very low wages indeed but then of course, there is a very big social wage in Russia: free electricity and free theatre and all that sort of thing. They are very heavily subsidised. They are not terribly efficient, as I have said. I think their crews are good, from what I hear. The ships do not seem to be very well maintained. But they are an effective merchant navy and they are able to compete with us by charging prices which are miles below ours.

I saw a circular from the Russian merchant fleet's headquarters about their incursion into the trade between North Europe and East Africa. They wanted cargo to and from there because they were supplying the guerillas in Zimbabwe with arms and equipment.

In fact, rather surprisingly, they actually told me when I was in Leningrad that that was one of the reasons. The circular said you can undercut any western shipping rates by 25% without reference and in special cases you can go to 30%. If you have to go over 30%, you must refer to Leningrad, and it is unlikely that permission will be withheld.

So that was the sort of price competition we were up against. The other thing that I would like to say about the Russian merchant navy is that a change has taken place. They used to always pretend that all their shipping companies were separate. They had the Baltic Steamship Company, the Black Sea Company, the Far Eastern Shipping Company, and so on. When the longshoremen turfed them out of the United States, the entire Russian merchant Navy was redeployed in the matter of a fortnight. We saw them all gradually moving into position, with their best ships put into the UK, South-East Asia trade, attacking our trade to Jeddah and their very good class, (about 700 Twenty Equivalent Unit (TU), container ships), from the Mediterranean to South-East Asia. And a good class of ship was put into your trade — the Australian trade — with the Far East.

Those ships are now attacking those of us who operate in that trade, which are the Australian National Line, Chinese, Dutch, ourselves, Japanese. They have already captured very nearly a quarter of the Philippine cargo and they have seriously undermined the price structure in the Japan-Australia trade. But to get this in balance, I think I would hesitate to say that they are doing serious damage to us at the moment.

The Trans-Siberian Railway, which is undercutting the sea rates of freight by enormous margins between Europe and the Far East, is carrying about 20% of the cargo between Japan and Europe. They had a setback last year because again, with one of these wonderful switches, as soon as it looked as if there might be a boycott on Iran or as soon as it appeared that the situation there was hotting up, they switched a very large proportion of the capacity west-bound of the Trans-Siberian Railway from carrying European cargo to carrying Iranian cargo. That has prevented them positioning containers to come back in the east-bound direction and therefore in 1980 their carryings went down. But the capacity of the railway is increasing all the time and I have been told by the gentleman who runs the organisation which mounts this operation, (Soyuzvesh Transit) that their ob-

jective was 50% of the trade between Europe and the Far East. So, potentially, they are very dangerous indeed.

As to what we can do about it, we know the Japanese will not take any action until they see Western Europe take some action. My own government, the British Government is, I think, very ready to take action, probably in the form of a quota. I think it is true too of the Dutch and the Danes. The Germans are a little more hesitant because trade with Russia is very important to them, and the French have always been rather reluctant to do anything quite as overtly against the Russians. But we have persuaded the EEC to monitor their carryings. We have also persuaded all the EEC countries to take adequate powers to protect their own shipping if it could be seen to be endangered.

The final step is the most difficult one, and that is to get all our governments to use these powers. I am not totally despondent about doing it, but I think it will depend on whether relations deteriorate further and how clear the perception of a threat to our security from Russia is by all the people in Western Europe.

Mr Gaudry: Sir Ronald, in your address you touched briefly on Russian intervention in Africa as a further threat to oil supplies to western countries. Would you be prepared to expand that comment further to take account of Russian intervention in Africa as a threat to very scarce strategic minerals?

Sir R. Swayne: I am not really an expert on this, but I do not think I said that intervention in Africa was a threat to oil. I understand (but I may be wrong here, and the people who are professional defence people will correct me), that there are launching pads in Ethiopia. They are using, or I think it is the East Germans are using, Aden as a base. Where I think you are quite right is in the long-distance threat to very, very important raw materials in Central Africa, by the possibility of Mozambique and Angola becoming surrogates of Russia.

I am told by people who know Mozambique well that this is very far from what President Machel wants at the moment. But I do think that it is terribly important for the west to support these regimes. My own company, together with some other shipping companies, is trying to help Mozambique develop Maputo, as a proper container port. And this is the sort of thing they need. They could then have a railway from the east coast of Africa in Mozambique going straight through to Zimbabwe and Zambia without going through South Africa, which they have to do at the moment. I think that kind of support is immensely important and I think it is rather sad that the west has not come more to the assistance of Zimbabwe. You get rather frightening newspaper

reports about Zimbabwe. My own experience and the experience of a lot of friends of mine who are going there all the time is really quite optimistic; it looks worse and sounds worse than it is.

Undoubtedly there is this threat to these very important, strategic raw materials in the north of South Africa, in the Transvaal and in central Africa from Angola, with US Cubans and from Mozambique if it were to fall into the arms of Russia as a surrogate. I am really not qualified to speak about South Africa although I do go there regularly. It does seem to me that it is frightfully difficult for the west to frame their policy to South Africa because by being too overtly friendly with South Africa we are endangering our relationship with the black countries, particularly Nigeria.

On the other hand, it seems to me absolutely crazy that the South African ports and South African strength is no longer solidly with the west. I do not know the answer to that.

Commodore Martin: You painted us a very interesting picture, one which I am sure we all believe instinctively and want to believe and feel to be right about the situation as far as world merchant shipping is concerned. And we all see why we should be better at it, and not just because of strategy. In this country, I am sure we would be more efficient if much of our freight was moved by sea instead of on the roads as it is at the moment. But do you have any optimism about organised labour allowing us in the western world to make our shipping really competitive with that of the Soviets?

Sir R. Swayne: Organised labour is just as hard on the Soviets overseas as they are on the Poms or the Germans or anybody else. I think one can overstate this threat in the ports from dockers. It is a most irritating part of the life of anybody engaged in shipping that we have disputes in Britain and in Australia. But, you know, elsewhere in the world we do not really have very much trouble. My ships, sailing in some of the cross trades, never have a dispute at all although, indeed, ports vary. We do not have any trouble in South Africa, I can tell you that.

I think you can overstate that, I do not think that is a threat. And our British seamen, went on strike for only the third time in 81 years, last month. I have absolutely no doubt as to their loyalty if there was trouble.

Commander Jessurun: We often hear that as a result of the Russians taking up so much of the trade that we will be left without any ships ourselves. If, say, as a consequence of a Polish invasion, a ban was to be put on Russian ships, could we take up the slack and what would be the consequence to our economy?

Sir R. Swayne: We could easily take up the slack if Russian shipping was banned, there is no doubt

about that at all. In fact, it would be a little bit difficult in the trade between Europe and the Far East to take up the slack if the Trans-Siberian Railway was banned. So much cargo is moving on it now, that if it was suddenly stopped, we would find it very difficult to find the tonnage to replace the lost capacity. I hope I have not exaggerated the amount of actual volume damage the Russians are doing to us. They have done a lot of damage in various trades by cutting rates very substantially to levels which are quite unremunerative.

So if the Russians were pushed out, you would find that some rates of freight would go up, and that would be very nice for the shipowners. But I think it is not really to the advantage of shippers in the long run for rates of freight and prices to be driven down to a level where it is not worth the while of financial institutions investing in shipping. And that is the danger.

Rear Admiral Rourke: Sir Ronald, could you give us your view on the weight this country should place on having a national flag carrier, in the light of defence needs, and perhaps you might associate it with the incentives or abilities we might have to persuade allied flag carriers to continue operating through what might be very troubled waters?

Sir R. Swayne: I think the answer is yes, you should have your own. This sounds rather patronising to say and I hope it does not sound it, but of course you should have your national flag. You are nevertheless mainly a trading nation, and I think you will remain with a greater interest in trading than in ship owning. And I think it is in your interest to see that shipowners are efficient and do not charge too much. I think it helps to have a national flag to do that. The two great difficulties about operating under the Australian flag are, first, that shipowners here get no fiscal advantage. This is very unusual.

Our fiscal advantage is that we can use 100% depreciation (on initial ship costs) in the first year, instead of getting it over the 12 years. That is about average round the world for government support for shipping. It is not much better and it is not much worse in most of the maritime countries. It means you get a free interest loan, really, from the government. In Australia, I do not think that there is any financial advantage at all and the second disadvantage, of course, is your seafarers unions.

It is not only the fact that they do not work very long hours and they are paid very high rates of pay and that they are thoroughly overmanned, there is

also an actual difficulty to get them to do certain tasks which other crews do quite happily and which save costs ashore. So, one way and another, it is pretty prohibitive employing Australians. Now, it is no surprise to me that I know your Australian National Line has a great difficulty in making an adequate profit, if a profit at all. I do not know what you can do about that. It seems to be an Australian problem.

Mr Hayes: Sir Ronald, could I follow up the second part of Admiral Rourke's question, and that is what is the readiness of international carriers to continue sailing their ships in troubled regions; potential conflict situations and emerging military situations? How far and how long will international carriers be ready to continue to operate?

Sir R. Swayne: There is the owner's problem and the crew's problem. The owner's problem is solved by war risks insurance which is subsidised by the government. It is an insurance scheme which a lot of countries are joined to. I think the Swedes, the Germans, the French and the British and two or three other countries all belong to the same war risks insurance scheme. It is not a NATO thing. It is a sort of club. But it has been going a long time. It is well-funded, and when the Iranians and the Iraqis started shooting at each other, provided your ship was of the right flag, there was no problem at all. I mean, the ship was covered for war risks, and at a comparatively small premium. The premium on the market is very high indeed, and it was jolly nearly prohibitive. So it is a problem for some countries but I think for most of the NATO countries, anyhow, it is not a problem. So far as the crews are concerned, I cannot remember any time when we have had any trouble in getting the crews to go into a dangerous area. We had a ship up the Yangtze when there was all that shooting going on, she got stuck up there with the AMETHYST. We have had ships in trouble in Indonesia and in the Gulf, of course, quite a lot of ships actually got shot up in the Shal-al-Arab.

The crews have been very good about this. They want extra pay and my God, they deserve it and I do not think any of us would deny them that. It is usually done very quickly. It is not so easy though, where you have Chinese crews or overseas crews like Ellice Islanders, sometimes it is not so easy to get them to go to sea. But, on the whole, I do not think people have had trouble.

Commodore Parker: I am sure we have all had a very interesting discussion with Sir Ronald, and I would like you to thank him in the usual way.

OPENING ADDRESS

by His Excellency the Right Honourable Sir Zelman Cowen, AK, GCMG, GCVO, KStJ, QC,
Governor-General of the Commonwealth of Australia and
Commander-in-Chief of the Defence Force

Two years ago I opened "Seapower '79", which was the first national seminar organised by the Australian Naval Institute. The seminar was addressed by distinguished international and national speakers, and there was a well-informed attendance, and good and vigorous discussion. The seminar attracted favourable comment.

After this interval, the Institute has organised this second seminar on the subject of Australia's Maritime Defence and its Relation to Industry, an important and substantial theme which reflects the Institute's continuing concern with matters touching the national security, and with a specific focus on naval and maritime matters. Such seminars, together with the other activities and publications of the Institute, serve the national interest by inviting public attention to the discussion of important issues of public policy, and presenting decision makers with ideas and information which will contribute to the processes of policy making.

Since the last seminar was held, I have accepted with pleasure the invitation of the Institute to be its patron. And I can report that in this period I have taken part in a variety of naval and maritime occasions. Early last year I re-dedicated *OXLEY* to the fleet; she was the first of our submarines to be re-equipped and refitted under the submarine weapons update program. This complex program was first conceived some years ago, and in the case of *OXLEY* took a little more than two years. It gives her a substantially improved capability, and other submarines will follow her in the program. A little earlier I visited the North Queensland Engineers and Agents, where the patrol boats of the Fremantle class are building. Then, as husband of the launching lady, I attended the ceremony at Carrington's slipways when *TOBRUK*, the Navy's new amphibious heavy lift ship was launched, and we hope to be present very soon at her commissioning. All of these events relate to the concerns of this seminar. And so, too, in a historical sense, did my visit to Garden Island to take part in a service and to unveil a memorial window commemorating and honouring the *BATHURST* class corvettes of World War II. They were built in Australia as part

of the wartime shipbuilding program, and sixty, including four for the Royal Indian Navy, were built. The task was undertaken by Australian shipbuilders with great success. Shipyards like Evans Deakin in Brisbane undertook shipbuilding operations for the first time in 1941, and went on to build eleven of these corvettes in record time and to the highest engineering standards. Other yards which were involved included Morts Dock, Williamstown Dockyard, Cockatoo, Walkers of Maryborough (Queensland), Poole and Steel of Sydney and B.H.P. in Whyalla. It was a notable performance and the ships performed well under severe tests.

I was briefly at sea in *MELBOURNE* and *PERTH* when they were exercising off Jervis Bay last year. I had a brief view of Kangaroo III. I have flown in an Orion of No 11 Squadron at Edinburgh, and that points to surveillance responsibilities of the Air Force and the Navy which are enlarged by the proclamation of the Australian Fishing Zone at the end of 1979, and which are enormous in their range. I was flown by helicopter to Halibut, the major rig in Bass Strait, and the siting of that rig and the pipeline reminds us of a vital lifeline of this nation, in need of unceasing and vigilant surveillance and protection.

This account, looking back into history, and also concerning present activities and issues, serves, I hope, to say that I am well aware, if not very perfectly informed, of matters associated with the subject matter of this seminar.

Australia and Australians have had a concern with maritime defence for a long time. The government of the Colony of Victoria acquired the *CERBERUS* in the 1860's; that reflected a concern for local naval defence of settlements and ports against possible raiding ships. The colony and other colonies acquired some maritime force for this purpose. In the 1880's there was intercolonial discussion for the purpose of augmenting the British squadron in Australian waters. This was carried into a broader intercolonial conference in London which discussed the provision of additional ships, issues of payment and issues relating to the stationing of such ships. And early in this century, in the

important Imperial Conference of 1907, after federation, the ground was laid for the establishment of a Royal Australian Navy. Out of that, as I told when I attended the seminar in 1979, came the occupancy by the Governor-General of Admiralty House in Sydney as his official residence there. The British Admiral moved out in 1913, and my predecessor of the time moved in, and, in due course, I followed. But I must not go off on such a frolic; let me say that the point of this very brief recitation of history is to draw attention to a continuing Australian concern with maritime defence, and to a growing appreciation of the need for increasing self reliance.

At the 1979 seminar I referred to Dr Millar's then recent book, *Australia in Peace and War*, in which he said that a map of the world centred on Australia shows it to be the most isolated of the continents, almost surrounded by oceans and with only a thin, broken chain of islands to the Asian mainland, almost 3,000 kilometres distant. He pointed to the difficulties in providing a comprehensive defence of Australia's territory with 20,000 kilometres of coastline, difficult even to keep under aerial surveillance, let alone protect by continuous defence. And as post-war history shows, Australia has been directly involved in military activities in its region. We are, I believe, well aware of the soundness of what Admiral Lord Hill-Norton said, and not for the first time, in a

seminar on Australia's Place in Western Defence Strategy late last year, that economic survival of the free world depends absolutely on the freedom of seaborne trade. Lord Hill-Norton pointed out that for many years we had relied in great measure for protection against invasion on more powerful friends; he said that there was a persisting belief on the part of some, anyway, that 'someone will bail us out'. And he said this:

"It is important for them, and for all of us, to remember that military feasibility and political possibility of Australia's friends to do this is much diminished in the world of the 1980's while at the same time the real threat has come much closer to home.

"I would remind my many Aussie friends of some words of Captain Stephen Roskill who wisely said, 'as long as the mercantile and maritime traffic of a nation is chiefly seaborne, the stoppage of that traffic will be a strategic defeat of great importance'. Surely that cannot be denied in Australia, or indeed anywhere else."

This points to the need for appropriate response; it also underlines the need for self-reliance. And this has been underlined by Australian defence leaders. In July 1979, Admiral



His Excellency addressing the seminar.

Sir Anthony Synnot wrote that:

"We Australians must take the primary responsibility for our own security. Such a policy means that our defence force must have a significant degree of self-reliance. By this I do not mean self-sufficiency, because such are the implications of modern military technology that this is practicable now only for the super-powers. Our self-reliance should give us a capability to operate as a unified Australian force with its own logistics, supported by a repair and modernisation capacity."

Not long before, in an article in *The Australian newspaper*, the then Secretary of the Department of Defence, Sir Arthur Tange, had said that:

"The best contribution to Australian self-reliance is to be able, at an acceptable economic cost, to have the maintenance, support and replacement capability in Australia itself — in its factories, in its dockyards and its service industries, such as computers."

Sir Arthur pointed out further that "there is a point, admittedly difficult to define, at which the cost to the peacetime economy is not acceptable".

The costs and the demands are very heavy. On other occasions, I have quoted more than once from an address in 1979 by Admiral of the Fleet, Sir Terence Lewin, then Chief of the Naval Staff and First Sea Lord, on *The Royal Navy, Present Position and Future Course*, in which he pointed to changes over the forty years of his naval service dating from the beginning of World War II. The succeeding forty years, he said, have seen a rate of change in maritime warfare greater than the previous thousand, indeed greater than at any time in history. The illustrations he gave were all of a complex and immensely costly and rapidly changing technology. And at this seminar in 1979, I quoted from a statement by Admiral Hayward of the United States Navy on *The Impact of Technology on Strategy*. He spoke of the critical importance of technological leadership, which depended on a continuing research and development push into the broader spectrum of all of the sciences. In the specific context of seapower he said that "the power to use the sea is now and will be in the future dependent on our technology and our use of it in modern weapons systems at sea". This holds good for Australia as for the United States; our problem in the acquisition of the technology is a rather different one, having regard to our resource. The costs involved in the acquisition of the technology and its products are massive.

All of this points to the importance of this seminar and the issues it will traverse. It is organised in such a way as to invite the views of

authoritative speakers on international and regional aspects of maritime defence, shipping and communications, in pointing the way to a formulation of Australia's maritime defence needs. That sets the seminar on its course, and what will follow will be a consideration of the industrial infrastructure on which maritime defence must depend. The speakers will provide a background against which the present capabilities and the way ahead for maritime defence industry in Australia can be approached.

I note a recent article on Industrial Support for Maritime Power in the Institute's journal by Lieutenant-Commander Hazell in which, referring to the statements by Admiral Synnot and Sir Arthur Tange, which I have quoted, he summarises the requirement for industrial support of military power in Australia in terms of indigenous re-supply of logistics, indigenous maintenance and repair capability, indigenous modernisation and replacement capability, and largely overseas sourcing of technology for acquisition of new equipment. While the fourth requirement could be regarded as not essential to the sustenance of a capability to exercise maritime power in a conflict situation, the three former requirements must be considered as necessary elements of a self-reliant industrial support infrastructure. He makes the important point that the industry of any country will be in a very poor position to effect the timely replacement of equipment lost due to battle attrition if the requisite industrial skills, experience, management and the like are not maintained in peacetime. The exercise of seapower, even at modest levels, rests upon an industrial base furnished with skills, technology and capacity sufficient to provide running support for the ships, aircraft and weaponry involved.

It happens that this opening takes place after some distinguished batsmen have already gone to and left the wicket, though the language of metaphor should not suggest that they are out. The reason is my own program which has prevented me from coming earlier. Perhaps this should be styled *intermezzo* rather than opening. I look forward to hearing the address by Lord Hill-Norton, to whom I have already referred; I welcome him and the distinguished overseas visitors who have agreed to participate in the seminar. There are also distinguished Australian participants drawn from many areas: the services, industry, academia, and from politics, and we shall hear their contributions with great interest. I congratulate the President and officers of the Australian Naval Institute on their planning and organisation of this seminar, and I express the hope that it will generate active discussion, and that it will make a distinct contribution to the understanding and resolution of issues of great importance to this nation.

INTRODUCTION OF KEYNOTE SPEAKER

by The Honourable D.J. Killen, MP, Minister for Defence.

Mr President, your Excellency, your Excellencies and ladies and gentlemen. Sir, presumption is something that I regard as a sin, although it is not always identified as such. And, at the risk of sitting in a hitherto undiscovered field and adding to the massive explanation that I will be required to give, may I presume to say that your whereabouts this morning will be a matter of public knowledge tomorrow when the vice regal notes are published. And, as a consequence, I would presume to say on your behalf that you were involved this morning at lunchtime attending a Naval engagement, namely a meeting of the Carbine Racing Club in Sydney.

That, of course, is perfectly true, as I reminded our distinguished guest at lunch, that it was left to an RN Admiral Rouse to devise the weight-for-age scale, and for those who scorn and scoff at conservatism, that weight-for-age scale has remained unchanged down through a century and a half. But, sir, it is rarely I get the opportunity before a distinguished audience such as this to pay tribute to you for the concerned interest you show constantly in the Services of this country. We are all grateful. I have the honour to have the ministerial responsibility. Your role as Commander-in-Chief is no mere formality, and to those of us who have the opportunity of seeing you in so many parts of this great continent looking at the Services, questioning, advising, graciously and warmly, we are indeed grateful. And may I, on behalf not merely of this gathering but on behalf of those who serve in uniform, thank you most warmly for what I describe as a concerned and constant interest.

It is my pleasure to introduce our distinguished guest. I would like to say to you, my Lord, that since you were last in Australia that politics here have been taken to a new state of tranquility. But I understand some turbulence has appeared at home. Well, I do not know, but I suppose we can sort things out by some exchange. But it was left to an Englishman who came here, a captain of a cricket team who said "There's nothing very much wrong with Australia. It is spoilt by two things; the climate and the people".

But, my Lord, since you were last among us, and you are no stranger, you now sit in the House of Lords. There are people in this country who for more than a quarter of a century who have been

translating me here and there. I would not like to give away too much, I have an earnest quest for a quiet place in heaven, but I envy you enormously sitting in the House of Lords. It must be quite one of the most civilised debating chambers left in existence and may I say in utter seriousness the most informed debate I read on Afghanistan was in the House of Lords. But on that count, my Lord, I should explain to you that I gathered for myself an explanation from reading a debate in the House of Lords regarding the test laws, when the Earl of Sandwich, a name well-known, of course, in England, complained to one of my lord bishops that he did not understand the difference between orthodoxy and heterodoxy. "Oh" said the bishop, "orthodoxy is my doxy, heterodoxy is your doxy".

Sir, in your distinguished career, you have held many commands, and to read the commands you have held is indeed a singular indication of your own personal accomplishment and of your own personal involvement over many, many years. I am sure it would be not regarded as impertinence on my part if I were to single out one of your commands which I suspect gave you great pleasure, and that is when you had the command of *Ark Royal*. A famous name with a sweep of accomplishment of those who served in ships bearing that name, their exploits, and the quiet women who waited at home. But the motto of that ship "zeal has no rest" seems to me to epitomise your present state of retirement. "Zeal has no rest", because today you are involved, heavily involved, in Britain and Europe and around the world, cautioning, encouraging, persuading — and for what end, to understand.

For people, for those who sit in parliament to understand that there remain great causes yet to be served. Peace has her splendid virtues and blessings, but she also has her dangers. Men and women can be persuaded to believe that the precious estate of liberty requires no attention and no nourishment. You, my Lord, by your presence here in this country today, you remind us of the substance of that; that we do need to nourish and to attend to the great estate of liberty. It is my pleasure, ladies and gentlemen, to welcome to Australia, to this seminar, one of the distinguished Britishers to come here, one of the great servants of peace and liberty in this world, Admiral of the Fleet, the Lord Hill-Norton.

AN INTERNATIONAL VIEW OF MARITIME DEFENCE

by Admiral of the Fleet, The Lord Hill-Norton, GCB

Introduction

The Communist threat is now global, and at long last people in the democracies are beginning to realise it. I and others have been saying so for years, and the Soviet leaders have constantly and publicly proclaimed that their aim is the domination of the world by Communism — and they mean their own loathsome brand of it. Over 100 million unfortunate people in Eastern Europe have been brought under their heel, and the rest of the world appears ready to let the Breznev Doctrine run. There can surely be no doubt after the events in Angola, Ethiopia, Somalia, the Yemen, Vietnam, Kampuchea and now Afghanistan, where the same objectives have been achieved, by naked force, that the global threat must be met, challenged and deterred on a global basis, unless the process is to continue until their aim is achieved. It seems to me that this must be the point of departure for any consideration of Western, and also Australian, strategy and also of how best each can support and complement the other.

I know of no informed observer who would dispute this general view, and I would go further in setting the scene for my address to this seminar. The continuing acquisition by the Soviets of highly capable 'out of area' ships could well presage a more aggressive policy, even the acceptance of some risk of limited conflict at sea with NATO, or Western, maritime forces which (in their judgement at any rate) would be unlikely to trigger either general land-air war or a nuclear exchange. Fleet Admiral Gorshkov has shown that the free world is very vulnerable to a strategy of sea denial, which for the West — and its like-minded friends — could include harassment and positive interdiction of the energy and trade routes in the Arabian Sea, the Indian Ocean and the Cape route and the South China Sea and the Pacific. For NATO in particular the cutting of the Atlantic Bridge and the isolation of the weak and vulnerable Norwegian and Aegean flanks.

We already have hard evidence of the Soviet determination to exploit all their maritime assets, as Sir Ronald Swayne has just so eloquently told us, their enormously expanded merchant fleets which exert persuasion and economic pressure on all the trading nations of the free world. It is

common knowledge that this merchant fleet is already under cutting shipping conference rates by 50% or sometimes more, and that same fleet has no real role in the essential trade support of Mother Russia. Thus there can, surely, be no other logical explanation for both these vessels, and their continuing acquisition of a maritime power projection capability which now includes aircraft carriers, amphibious ships and a large and reasonably efficient Fleet Train, than a determination to dominate the oceans of the world.

I might round off these rather lengthy introductory remarks by sketching very briefly the other, and more encouraging, side of the coin. First, as I indicated at the outset, the penny really does seem at last to have dropped among the NATO Allies that a threat at least as grave as that in Central Europe is now plainly visible outside the NATO area. I should say at once that I do not think that the Alliance is ready, and perhaps never will be ready, to expand its present Treaty area, but I do believe that the non-maritime Allies will be quite ready to give credit and support to those members who can deploy appropriate forces to deter the global threat. Moreover the Nixon doctrine that 'Uncle Sam will help those who help themselves', has been refined and restated since his day, and it seems clear enough to me that the Reagan administration is determined to confront and deter maritime threats wherever around the world they may appear. This will be in as much a

THE SPEAKER

The Lord Hill-Norton served in the rank of Admiral of the Fleet for over six years, first as Chief of the United Kingdom Defence Staff and then as Chairman of the NATO Military Committee. Immediately prior to this promotion he served as full Admiral successively as Vice Chief of the Naval Staff, Commander in Chief of all British Forces in the Far East and as First Sea Lord and Chief of the Naval Staff. Since retiring in mid-1977, Lord Hill-Norton has published, in June 1978, his account of the politico-military realities of NATO, under the title of 'No Soft Options', and has since written extensively on maritime affairs. He broadcasts on television and radio on a wide variety of defence topics. His seven-part television serial on Sea Power, for the BBC, was broadcast in the UK in February and March this year.

political manner as military, and was neatly expressed in a letter to the London Times six weeks ago which said:

"There are no imperialistic designs by the West, but, on the contrary, the new American Administration plans to treat the countries of the Third World not as mere recipients of Western pittances but as responsible sovereign states . . . there will be a normal element of reciprocity . . . no longer will the beneficiaries of Western aid be able to bite the hands that feed them . . . from now on a political quo will be expected for the economic quid. This is just common sense."

It seems to me, in the context of our Seminar here, that these are wise words; and if this view prevails it can do nothing but good in helping all of us to decide who are our friends, and who are not. This is an essential pre-requisite to the formulation of a positive policy and strategy to meet what I have twice already described as the international maritime threat.

The Objective

Let me turn to objectives. We must look at once, against that background, at the objectives of the Soviet Union on the one hand, and those of the democracies on the other, if we are to be clear about the total defence scene. In doing so we should, obviously, start by deciding what each side has at risk, and proceed from there to examine, and form an objective view, on whether the military means available to each side are adequate to achieve those operations.

To consider, then, the objectives of both sides, which in itself would be a study of some magnitude and detail, it can fairly be asserted that naval warfare is today (and probably always has been) about control of sea-borne lines of communication. This lies at the very heart of what will be fought for in any future war at sea. Yet we run at once into the seeming paradox that never has the ability of either side to command the sea been less; and the best that each can hope to achieve is command, or denial, of certain parts of the world's oceans, for a limited time. Is this enough for either side to achieve their aims? It may well be so.

Those same oceans are of infinitely more importance to the West than they are to the Soviets, because it is along Conrad's great highways that their energy, raw materials and much of their food, travels to North America and to Western Europe in peace; and their manufactured products in the opposite direction. Any interruption of that truly vital trade would bring their industry (and not just their Defence industries) to a halt very quickly, as well as making all their peoples cold, and dark and hungry. To give some

perspective to this assertion, by way of just one example, over one billion tons of crude oil were imported into NATO countries by sea in 1978 alone. In military terms it is the integrity of the 'Atlantic Bridge', for the supply, reinforcement, and re-supply of Europe from North America upon which the whole of NATO's deterrent strategy depends — and both sides know it. This, very starkly, is what the West has at risk, and from which, broadly and simply, their primary objective can at once be discerned, and is no more, nor less, than a quite over-riding necessity to keep those highways and that bridge open to traffic in both directions. The Soviets, by contrast, have no such need of sea-borne trade either for their economy or for their war-machine. Certainly they have built a huge merchant fleet, which is increasingly used today as a powerful economic weapon against the West, and has already been used as rather more than merely a convenience for the logistic support of their military ventures by proxy in Africa, Arabia and the Far East; not to mention its use for the transport of such grain and other commodities as the West sees fit to sell them. But if all their merchant fleet remained permanently in harbour it would make no perceptible difference to their ability to prosecute a war — either at sea or on land. So here, too, their primary objective can be readily perceived, and also amounts to no more and no less, than to cut the sea borne lanes of communication upon which the West so critically depends.

To what extent, we must now enquire, does each side possess (or lack) the means to achieve these simply stated, but crucial, objectives? Are there other objectives of either of the super-powers, which, while not central to their respective grand designs, bear hard enough upon the size and shape of their maritime power to alter its thrust?

It is, indeed, in seeking the answer to the latter question that Gorchkov has fashioned the Soviet Navy in the last 25 years, so that it has also become a suitable instrument for answering the former, though some of its strengths and weaknesses in either role will receive attention shortly. The same cannot be said of the NATO navies, which for nearly two centuries have remained much the same shape, though their size has grown and diminished during that long span, as crises have ebbed and flowed. It is highly relevant to 'what might happen' that we stand at a moment in history, when, though their objectives remain very much the same and the threat has enormously increased, both the Royal Navy and the United States Navy, the pre-eminent Allied maritime powers, are smaller than they have been for a generation.

It is possible to examine maritime capability and evaluate it in a host of ways, but in the broader

context of whether the power of each side seems adequate, not only in their own eyes but in those of their adversaries, to achieve the fairly simple objectives just set out, a careful look must be taken at how the respective fleets (in the old and widest sense of that term) have evolved. This must, of course, flow from the broad politico-military policy of the State, but can be given form and substance for scrutiny in terms of material, such as ships and aircraft and their weapons, and in the much less tangible but equally important area of aptitude, for what Churchill called 'the sea affair'.

Neither in the time of the Tsars, nor that of the C.P.S.U., has sea power been more than marginal to Russia's strategic needs until they had a global navy, but once this was achieved a host of new options opened, and these, in turn, have had a measurable impact on both the size and shape of the Soviet fleet, and thus upon their ability to achieve their aim. This 'chicken and egg' situation of policy and the means of executing it, is there for all students of almost any historically continuous enterprise to see, and the acquisition of the British Empire and its recently completed dismantling is an excellent example.

The means available

Let me look at the means available in the way I have just said. There is hardly any doubt that the Soviet submarine fleet is formidable by any standards. Not less than 300 of these vessels, of which nearly one third is nuclear-powered, are now deployed, and one may reasonably compare that number with the 50 much slower, shallower, diesel-electric submersibles with which Grand Admiral Doenitz started his assault on the Atlantic Bridge (or lifeline) in 1939. If we reflect on what I have just described as the primary objective — indeed the secondary objectives too — of the Soviet Navy, it must be seen that in their submarine arm must lie their gravest threat to us, and the greatest hope of success for them. It is therefore rather strange that possibly the most obvious weakness of the Soviet Navy is in anti-submarine-warfare. It is generally held by objective observers that they are well behind the West in this field, which must bear considerable weight in the balance we are attempting to strike, though there can be no room for complacency in this — or any other maritime — matter when the speed of Soviet technical advance in so many other fields is borne in mind.

Another element to be considered when seeking to establish the extent to which the Soviet Navy can achieve its aims, is that of maritime air power. Until their large aircraft carriers are proven in service, which will not be for some time yet, they have relied on their very large shore-based naval air arm, and whether their carriers are successful

or not, they will inevitably continue to do so. This large force has demonstrated its ability to cover all those seas and oceans through which the Western lifelines pass, and the aircraft are lavishly equipped for maritime reconnaissance, and equally well armed for offensive anti-ship operations. There is no comparable shore-based maritime air power in the West, and as has already been noted, Allied aircraft carrier numbers have seriously declined. Nor should the constantly orbiting radar ocean reconnaissance satellites, against which there is at present no counter, be left out of the tally of Soviet strength.

So much for the material means available to them for achieving the objective of interdicting, or finally severing, the arteries which carry the trade of the democracies around the world. As stated earlier, the 'chicken and egg' acquisition of a balanced global naval power made possible the expansion of their overseas objective of a communised world. The truism that trade follows the flag was digested and applied with no less readiness and enthusiasm, than the pursuit of the parallel notion of making friends and influencing people by a naval presence, which lay at the heart of the success of the Pax Britannica to which Sir Ronald Swayne has referred for virtually the whole of the nineteenth century. Cynics may say, and with some truth, that neither the British nor their Soviet successors have made many friends in this process (though it is possible to hope that the British were exporting something a good deal less damaging and dangerous than Communism), but there can be no shadow of doubt that the world wide influence of a globally deployed navy is hard to over-estimate. It has depended historically on a very broad spread of naval presence and was and is enhanced, perhaps obviously, when that presence includes large surface ships such as those which have been added, and are still being added, to the Soviet fleet. So it may be asserted with confidence that attaining this subsidiary objective lies well within the means of the Soviet Navy already. It is, that said, an arresting thought that it was very likely the process of decolonisation by the Europeans, starting in the 1950s, which provided the trigger and the opportunity for the C.P.S.U. to start their colonial — or at the least surrogate — expansion, and that it was then that the need for a global navy as the optimum means to that end was finally foreseen and adopted. At least, now that the job has been largely done, there is no question but that this impressive maritime force is seen by the Soviets as an instrument of policy, being able to threaten war, being able to conduct limited operations well below the threshold of general war, being a negotiating chip in diplomatic exchanges, and in general adding to the dignity, status and strength of the Soviet Union.

If we may turn from the broad sweep of Soviet macho politik, and from the tangible ships and aircraft and their weapons systems as a means of making it good, to the aptitude of the Soviet sailors for a war at sea, a less impressive, and correspondingly less daunting, picture quickly emerges. The Russians have certainly had a long naval tradition, but it is not bred in the bone of that vast country, where only a tiny proportion of the population has ever actually seen the sea. The Bear has been, and almost certainly still is, a land animal even if, as it is now fashionable in naval circles to say, he has learned to swim. It must be supposed, on grounds of age alone, that none of the officers and men in the Soviet Navy have ever been in action at sea; and for those still in the business at the top, their memories of the ultimate test of aptitude can only be of their disastrous failures in the Second World War. It must be common ground, certainly among professionals, that there can be no substitute for combat experience, however thorough and well planned peace time training, even in major exercises, may be. For this reason alone it is not to err on the side of under-estimating the opposition, to assume that the performance of the Soviet fleet, whether deployed in task groups or in single units, will fall short of that of the Allied navies with a much more recent (for example in Korea and Vietnam) and a much more successful, track record over many years.

It is tempting to venture an opinion on some of the other intangibles connected with the man, dangerous though such speculation on so grave a matter may be. The available literature suggests that Soviet leadership at sea — which requires very different qualities to that on land or in the air — may well be suspect, and will almost certainly react less well and recover less quickly when events do not go according to plan. If this be true (and in my view it is almost certain to be so) it is a fortunate historical fact that hardly any battle has ever gone according to plan. We may, perhaps, leave this short survey of whether the Soviet Navy can achieve its aims, with the means available to it, there for the moment.

To turn at once and examine the other side of the equation is, by now, a somewhat shorter and simpler task. The terms in the equation are similar in nature, if opposite in sense; our own objectives are in many respects more straightforward; our strengths and weaknesses are better known, and much has already been said, or implied, in the scrutiny of Soviet capability, as, for example, in discussing briefly the aptitude of their sailors. The attempt to put some similar flesh on the bare bones of whether NATO has the maritime power to meet its primary objective of keeping the Atlantic Bridge open, and more generally whether the West is capable of keeping Conrad's great

highways open, must nevertheless be made, before we come to 'what will happen' should it, unhappily, be put to the ultimate test of war.

It is necessary, before looking more closely at whether the size and shape of Western navies are apt for this purpose, to deal with some theological undergrowth which is rather confusing — indeed dangerously misleading — until it is cleared and put in sharper focus. This is particularly relevant to any comparison of numbers, and thence to the ratios which should lead to success in either offence or defence in a maritime environment, because the effects of both those factors are quite different to similar comparisons in a land-air campaign.

The numbers game

To deal first with the numbers game, it can be said at once that it is at sea, and only at sea, that the West today is in the broadest sense still superior to the Soviets, despite the constant pre-occupation — amounting almost to hypnosis — of the European Allies with the land-air balance in their Central Region. It is undoubtedly more difficult to compare numbers on, over and under the sea in a meaningful way, partly because types of both warships and their offensive and defensive weapons differ more markedly than they do on land or in the air, and partly because the influence of the tangibles and intangibles is much more pronounced at sea. It is generally accepted, as a base line, that the NATO navies together outnumber those of the Soviets (and even those of the Warsaw Pact, for the Polish and East German navies are far from insignificant). A detailed catalogue would not contribute much to an understanding of the whole maritime balance, but the tonnage of NATO navies is a good deal greater, they have at least six times the number of attack aircraft carriers, an advantage of perhaps one and a half times in numbers of ships of frigate size and above. On the other hand the Soviet Navy has rather more nuclear powered attack submarines and at least five times as many diesel-electric submarines (though many of these are obsolescent), and about ten times more land-based maritime aircraft, with a similar ratio, in reverse, afloat. Finally, and merely for the record, the number of sailors deployed in the maritime balance shows a ratio of about seven to four in favour of NATO. If these ratios are then recalculated to include the navies of like-minded democracies of the world, as for example, Japan, Australia and New Zealand, South Africa and the South Americas, the balance of men and material on a straight head-count, tips even more clearly against the Soviets. It must, of course, be understood that the United States Navy is the backbone, and by far the greatest strength, of the Allied (and Western) naval order of battle, and its

actual and future power requires some qualification, as will be shown shortly. The simple numerical comparison may be rounded off with a feature of some surprise, in the light of all that has been observed and written about the astounding expansion of the Soviet Navy in the last 15-20 years, and is that the rate of construction of all types, with the sole exception of nuclear powered (and nuclear armed) submarines, in the Allied and Western navies has been, type for type, broadly in line with that achieved — at unparalleled economic and social sacrifice — by Gorshkov. It has been calculated, however, that on present trends (and unreplaced obsolescence is possibly the most important) even this basic numerical balance could have shifted markedly in favour of the Soviets by, say, 1995 — and this could well have a strong influence on 'what might happen'.

To add an essential gloss to this excursion into numbers, due account must also be taken of the ratio of offensive to defensive forces in naval warfare. It has been established for many years that in a land-air war in Europe an attacker (or aggressor) must be able to count upon a general superiority of three to one in men, and all the engines of war they man and fight, to have any real confidence of success. This ratio, commonly known as the Liddell-Hart factor after its first propounder, can obviously be varied up or down by surprise, or concentration, greater skill, better weapons, better leadership or tactics, and other variables mostly intangible; but hardly any of these apply at all, and those that do have much less force, at sea, because the 'battlefield' is infinitely larger, is three rather than two-dimensional, and has no boundaries, natural obstacles (except the land), nor advantages of terrain. So not only does the Liddell-Hart ratio have no relevance to the war at sea, but the entire operational experience of both the first and second world wars has conclusively shown that it is actually sharply reversed, and that the defence of shipping requires much larger forces than those of the attacker. No comparable rule of thumb ratio has evolved which is of general application, partly because of simple geography, and partly because the control or denial of particular sea areas may be hindered or helped by varying surrounding circumstances such as proximity to bases, or staging posts, the depth of water which makes submarine and mining operations more or less feasible, the availability of shore-based air power, and a number of others. Some 'feel' for what this startling (and for the West rather alarming) reversal of the offensive/defensive ratio means in practice, may however be deduced from the level of current deployments in the Indian Ocean. This has stabilised over the last year or so, and in round figures some 55 Allied ships have been deployed to maintain what is considered to be adequate power to deter or

contain the 27 ships normally on station in the Soviet Indian Ocean squadron.

Is the threat Real?

I do not need to remind this distinguished, and fairly specialist, audience that the by-now widely accepted definition of the Threat — any threat, not just a military one — is generally agreed to be a compound of capability and intention. I would ask you to bear this in mind during the course of my remarks, in the sense that I shall attempt to describe what is, in real terms, the Threat we face in the democracies to our way of life. Please also bear in mind that such a threat, in the last two decades of this century, is bound to be a compound of military, political, and economic elements because it is no longer possible — if, indeed, it has ever been — to separate them.

Before attempting to give you my views on Soviet capabilities and intentions I should like to draw a fairly sharp distinction between our ability to perceive each of them. I have found frequently in recent years, and among all sorts and kinds of people, what strikes me as a strange failure to appreciate that these two components of the threat are of quite different natures. What I wish to get across at once is that capability is a matter of fact, and intention is a matter for speculation. Capability, certainly military capability, is now measurable in a variety of ways with very great precision. It is, I am sure, no surprise to any of you to hear that reconnaissance satellites can now accurately photograph things as small as a Mini, much less a tank or a tank transporter, or a combat aircraft, or an ordnance depot, factory or shipyard — and so on. So we can now know, and know precisely, the size and shape of all these ingredients of military power.

Intentions, in stark contrast, are in the mind. We do not know what are the intentions of the Soviet leadership. It is doubtful if even all the members of the Politburo know them. Even if we did know them, because they are in the mind, they can change and do so over-night, and it is likely, if not certain, that either through the due process of age, or the less predictable process of political evolution, the present intentions of the Soviet leadership will change in a period measured in months rather than years. By contrast, because it takes somewhere between 8 and 10 years to develop and produce in quantity new weapons systems, military capability simply cannot change quickly, and absolutely certainly not over-night. Thus I hope you may agree with me that our counter to the threat, in fact the Defence and Overseas policies of the free world, will be more soundly based on the facts of the capability which we face, than on the assumed intentions of those who now control it. I have no personal doubt that it will always be wise, and certainly prudent, to remember that speculation of this nature can

never be more than that, and also that in a climate of endless talk about detente and a widespread longing in the democracies for a quiet life, such speculation is almost bound to err on the side of over-optimism. So I hope that you will agree with me that there is, indeed, a threat and that it is very real.

How can the threat be contained?

Were it not for the lamentable and widespread ignorance of the considerations so far rehearsed, it might seem superfluous to make the point that the very first step to take in deciding how to meet these grave potential dangers to the maritime trading nations, is to realise that they actually exist. There is no evidence whatever to suggest that any constructive thought has been given by Western Governments to the threats which have been described, on a joint basis. Even within the well-organised management of NATO affairs the collective focus on maritime affairs is still — and to some extent at least, properly — given to the reinforcement and re-supply of Europe in times of tension or actual hostilities.

The threat is miles away from the North Atlantic, but once the democracies are seized of the realities and possibilities of this historically ancient form of power politics, surely there can be no reasonable doubt that they must, above all, work towards and insist upon political cohesion in a general respect for maritime law and order worldwide, in agreeing upon the general rules which must govern the great ocean highways and, where this is found to be necessary, joint support for the policing of them. In a word any power, large or small, which might seek by force or the threat of it to interrupt the safe and innocent passage of this very life blood of seaborne trade, must be deterred from doing so. This has, it may be observed, nothing whatever to do with ideology, nor is there any respectable reason why any nation which sincerely shares its aims should not join the Club.

Implementation: some essential elements

Clearly any constabulary force on the high seas must dispose of maritime forces which are adequate in quantity and quality to do the job, and the first task of those like-minded States which together have the wit as well as the will to determine to create this new sort of deterrent must be — in the words of the first two lessons at any Staff College — "to select the aim and then maintain it". The first of these, surely, in the light of what I have said, should present no serious political or military difficulty; it is maintaining it that hurts those people including some politicians, who do not like to spend money on defence, and members of the public who would rather spend it on the social services.

But to keep good order and maritime discipline on Conrad's highways we need, without describing them here and now, adequate air and surface and sub-surface surveillance so that we know who is there and doing what; we need a sophisticated communication network so that all those concerned may share a common data base; and we need what might be called a command and control system, however loose and informal. To those who may say that this is an Utopian dream it should be sufficient answer that in the world of international civil aviation just such a system has already existed for more than 20 years. It can be done.

I have not time to go into the difficulties which face the North Atlantic alliance by the arbitrary selection of the Tropic of Cancer at 23½° North as the southern limit of the NATO area but what it does mean and that line does not mean anything to anybody else except an aggressor, is that there is no police force of any sort in any of the other oceans which is jointly owned and managed. It seems to me that the alarming possibility that this must bring to those people such as Australia with a coastline of 12,000 miles halfway around the world, as far as it is from here to London and to those people who have the littoral states in the Middle East and the Far East, South America and Southern Africa, to ignore the growth of the Soviet Naval presence in the Gulf and those other seas would be an act of political folly.

The huge un-policed sea areas outside that imaginary line of NATO's are crucially important today, and will become increasingly so as the pattern of new world industrialisation, and the consequent variations in the patterns of world trade evolve. So all the democracies, and in particular Australia, New Zealand and Japan, who share the same vital interest in seaborne trade as the nations of Western Europe and the Americas, must together determine that orderly development on the great highways of the world proceeds in a properly regulated and above all, in a peaceful way.

Further questions and answers

What we need to ask ourselves is whether the policies and plans of all sovereign States, and especially those of the democracies, take account of their total dependence on the outcome; whether consideration has been given to the political issues, and just what work has been done nationally and internationally towards establishing acceptable codes of maritime conduct and the means of enforcing them?

I know what I think the answer is. It seems to me that to weld together the sort of forces we need into what I have called a maritime constabulary force will be a formidable undertaking, but that is

no reason for not accepting it. Vigorous diplomacy backed by political determination, have in the past overcome much greater difficulties. It was indeed done, and successfully done, in two world wars in my own lifetime, and on a smaller scale more recently in the Korean War.

Conclusion

I conclude that the threat demands that the attempt should be made, for what is most at risk

for all the democracies lies on and over and under the world's oceans. It can only be safeguarded by a joint and collective and positive maritime deterrent strategy. There would be little to fear for our way of life were such a grand design to be accomplished. The military elements are not out of financial nor technical reach, and such political difficulties as may arise — as they certainly will — can certainly be overcome, if the determination to do so is forthcoming.

DISCUSSION

Chairman: Dr R.J. O'Neill

Captain Berger: Member of the Institute. Lord Hill-Norton, withdrawal of British forces from East Suez left a vacuum. To what degree do you think that early vacuum contributed to the instability of the North-West Indian Ocean today?

Lord Hill-Norton: I have not the slightest doubt that it was a very serious political and military blunder. I said so at the time and I have been saying so regularly ever since. I have not the slightest doubt that it did contribute to the vacuum and I have not the slightest doubt that that is why the Soviet Navy decided to fill it.

Captain Hole: Sir, in the early part of your talk you concentrated on objectives and pointed out specifically with the geography of the USSR that being self-sufficient, when it came to projecting maritime power they could really afford to look at the weaknesses of other Western countries. The objectives of the Western countries then implicitly became the protection of those weaknesses, the supply lines and so on. You also made the remark that defensive action in a maritime sense, is more costly and involves more vehicles and so on than attacking action. Presumably this sort of line could lead us to perhaps examining in more detail Russian weaknesses and as well as endeavouring to look after our own defence to start motions that might be capable of attacking those Russian weaknesses. We always seem to be on the defensive. Perhaps an offensive attitude might be something more that we could look at, political allowance being there. Their weakness as you mentioned, was perhaps the man himself, leadership and so on and therefore one attitude might be, perhaps, further use of electronic warfare to stop instructions getting through. You also mentioned their ASW capability was somewhat less. Perhaps that is another area. Their organic air is not as good. Perhaps that is another area we should be looking at. Perhaps you would care to

make comments, sir, on the attitude of offence rather than defence in that context.

Lord Hill-Norton: This is an awkward one which often comes up and quite properly too. There are about three things to say really. The first is that the NATO alliance first and foremost and any such other grouping as I had suggested that would be prudent to work towards would probably best be started first on a regional basis and are, by definition defensive alliances. NATO certainly is. That is what it was formed for. The other two things to say are first that it is entirely possible as the questioner suggested to examine in a professional way the weaknesses and I mentioned some of them, of the Soviet Navy and so to fashion our own forces and the tactics which our own forces use as to exploit those weaknesses and it would be not only foolish if we did not do so but it would be a great surprise to me if the chiefs of the various naval staffs around the world had not got this in mind.

The third thing to say is that any attempt to exploit those weaknesses short of actual hostilities becomes an extremely complicated and very difficult and dangerous political matter and not a military matter at all. There is no doubt in my mind after 50-odd years in a dark blue suit that the chicken and egg syndrome which some people claim to exist between the military and the political departments of state does not in fact exist. The military are there to carry out the political wishes of the government. Their job is to advise the government on what is necessary in the military sense to carry out those wishes. They have no right, much less a duty, to initiate action which might lead to hostilities. They have every right and a positive duty once hostilities have begun to prosecute them with the utmost vigour.

So what I am trying to say to you is that there are other things which can be done to deter the

Russian maritime threat such as counter action of a quite different nature. If you are beastly to us in the Indian Ocean we will do something beastly to you in East Germany, for example. Not an original idea of mine. I probably read it in the Readers Digest. These are political matters and of course you would be sopping wet if you had not got a sackful of these options up your sleeve and unless everybody has been fast asleep since I retired and even if they have they could dust off the ones I had up my sleeve three years ago and none of these things is difficult either to imagine or to work out.

I do believe and I mean this seriously, we would be making a grave mistake if we fashioned our various navies only to exploit the weaknesses which we perceive in the Soviet Navy because as they spend four times as much on defence as we do and they spend about six times as much on research and development as we do, they would catch up quicker than we would.

Lieutenant Clancy: RAN. My Lord, I do not believe that there is anyone here who does not believe that the United States could, if it so wished, out-build and out-gun the Russians. But on this day when the United States is launching its space shuttle, when the United States experimental computing power is immense far beyond our belief, when the United States has a monopoly on deep-sea mining technology, I would like to ask you whether or not the United States has not perceived the battle with the USSR in terms other than in competing fleets, and has spent its money accordingly? Has America believed that the battle lies in the area of high technology, and spent its money in that area?

Lord Hill-Norton: I am not sure that I agree with that proposition, actually, that America does believe that. What I am sure is under-understood rather than misunderstood is that we are all talking in these days about deterrents. And certainly the North Atlantic alliance is based on the 3 Ds of forward defence and deterrents and detente. And I believe that is a sensible political position to be in providing you provide the military means to maintain it. And so I am not answering your question because I do not think there is an answer to it. I do not think that the battle I am talking about is going to be won or lost on high technology. I think it is going to be won or lost on number and guts, political guts.

Lieutenant Colonel Pearson: Australian Army. Sir, Fleet Admiral Gorshkov has been the driving force behind the expansion of the Russian Navy for, I think, some 20 to 25 years. Would you like to conjecture how much the continued impetus of the maritime expansion that you have been talking about relies on Admiral Gorshkov, and is it likely to fade away when he fades away?

Lord Hill-Norton: I wish I thought so; I do not. What I do think about this man is that it is quite remarkable to any Kremlin watcher that he is still there doing the same job as he has been for — well, it is about 22 years actually, but never mind. I am bound to believe, although I have no inside information, but I am bound to believe that he must have trained up men who could take his place who will have similar ideas. I have no better means than anybody in this room of guessing whether that successor would have the same clout in the inevitable argument on resource allocation which must go on in the Politbureau just as they go on in our own government.

My guess is that no successor would have the power within the central government that Gorshkov has. But that does not mean that I think that the Navy will decline. What I do believe, whether Gorshkov continues, and for how long he continues I do not think matters very much, what I do believe is that they have reached more or less a plateau. They have built, or started to build the aircraft carriers, which surprised most Kremlin watchers. We thought they would come along much sooner, if they were coming at all. They are building this gigantic submarine — nobody knows what for. They are building a battle cruiser, and probably more than one, which seems a very strange thing to do. It is rather as though some small boy had looked through Jane's Fighting Ships dated 1914 and decided "We must have one of each of those". I cannot believe that they are as wet as that, even if they have got unlimited resources of men and money, but I do think they are making a blunder over the shape of their navy.

So that all the rather discouraging things I have said this afternoon are merely intended to make your blood run cold. I do not think that they are ten feet tall. I think we are both about six feet tall. But if we do not watch it, we shall shrink and they will grow.

Mr Hazell: Associate Member of the Institute. Lord Hill-Norton, we have seen the Soviets successfully exploit the utilisation of proxy powers to extend their influence on continents on a global scale. Looking at some of the possible Soviet maritime objectives and how they could be achieved, which you so clearly stated in your address, do you see the possible similar use of proxy powers to extend or implement Soviet maritime influence?

Lord Hill-Norton: No, I do not. I do not, really. There are not any considerable navies available as surrogates except those two I mentioned, the Polish and East German navies, which are quite large and efficient, but I do not think are properly apt, to use the word I used before, for service on the blue waters outside the Baltic. I know of no surrogate country which disposes of any sensible sort of navy. What I think is much more likely to

happen and it has to some extent happened already, is that client states and satellite states and those that fall into that status are likely to be supplied with small craft with a guided missile fit such as we have seen already in action in the Arab-Israeli war with great success; a very early version of the Styx missile. And these would present a considerable challenge even to quite a large maritime power in the coastal waters of a relatively small power.

But I do not want to explore this, because it is part of a speech I am making in Melbourne the day after tomorrow, and some of you may be there.

Mr Brieger: of Vickers Cockatoo. We heard earlier that Russia has a dismal gross domestic product on a per capita basis, certainly appalling by our standards. In other words, a very inefficient economy, very low productivity, etcetera. Of that gross domestic product, it spends an enormous amount on defence which is a non-wealth producing investment and which obsolesces at a breathtaking rate. It also runs its merchant fleet at a thumping loss, and God knows where else it spends its money. Now, economically, how much

longer can it go on like this before it has to start a shooting war in order to keep the people at home interested?

Lord Hill-Norton: It is a perfectly reasonable question, that, which I have asked myself, more than once. I do not know the answer; nobody knows the answer. What I think Sir Ronald said in terms of the merchant navy, is equally true of the fighting navy, their men are paid or their manpower bill is about 20% of their budget whereas I do not know what is in Australia — I suspect it is between 50 and 60% as it is in most western navies. Men do not cost much, and they do not expect much, and their ships are extremely uncomfortable and our sailors would not stay in them for very long.

I do not know how long they can go on doing this, and you read books which tell you that the situation will get to the point where they have to have an external adventure to take the populace's mind off their internal miseries. I do not myself feel that I am the right chap to answer that question. I could only give you my own opinion, which is that it will take a long time yet.



The H.C. Coombes Theatre during a presentation.

A VIEW OF AUSTRALIA'S MARITIME DEFENCE NEEDS

by Rear Admiral G.R. Griffiths, AO, DSO, DSC, RAN (Rtd) and
Air Commodore G.G. Michael, AO, OBE, AFC, RAAF (Rtd)

Presentation by Rear Admiral Griffiths

It is an honour to have been invited by the Australian Naval Institute to offer you my views on Australia's Maritime Defence needs. I have assumed that really means beyond 1990 — because we are not known for making quick decisions to procure ships or aircraft.

Thirty minutes should surely give me ample time to discuss the simple and straight forward question of our maritime defences — we inhabit an island continent, attractively rich in resources, heavily dependent on seaborne trade to support our economic development and to improve our standard of living generally. There is no doubt we need a maritime defence capability, but just what do we mean by maritime defence? For many I suspect the expression means the coastal surveillance task in peacetime, and in hostilities, the military defence of our extensive sea borders.

Firstly take the need for coastal surveillance. It is easy to understand that patrol boats are required to police the exclusive economic zone, and in co-operation with aircraft to control access to our offshore fishing zones — to prevent unauthorised development of underwater resources — to deter illegal immigration — to prevent smuggling, and so on.

The existence of offshore mining rigs adds to the complexity of offshore protection problems in this zone and it will be necessary to consider whether patrol boat types can fully meet the task, or whether a corvette, with longer endurance and better seakeeping qualities may be required. If so, ships of the type used in the UK, which are adaptations of commercial hulls, may also be suitable for our sea conditions within 200 nm of the coast. Some years ago I understand one of our shipbuilders proposed an adaption of their offshore oil rig supply ships — it could be worth investigating that proposal.

The vast areas of the EEZ make air surveillance essential. At present civilian contractors carry out a beach surveillance role whilst the Air Force covers areas further offshore — also Fleet Air Arm Aircraft have been deployed to cover specific tasks.

The present departmental involvement in peacetime surveillance is complex, with a number of interested authorities — particularly the Departments of Immigration, Health, Customs, Transport and Defence. There is also the co-ordination of search and rescue by the Department of Transport. The overall co-ordination of peacetime surveillance activities is planned by a Committee, but the question must be asked whether the present peacetime organisations would continue in time of emergency or war.

There seems little doubt that in an emergency it would be turned over to defence, with the command and control of ships and aircraft being placed under the maritime defence commander. Therefore, it is difficult to see the logic in continuing the present arrangement — why not give the maritime defence commander command and control of ships and aircraft engaged in offshore surveillance in peacetime. If this produces a problem in the command and control of civilian aircraft, then let me say that I believe this type of surveillance would be more effectively carried out in service manned aircraft.

There is also the question of co-ordinating search and rescue activities — given that this would fall to the maritime defence commander in time of emergency, then it seems logical the same organisation should be responsible in peacetime. Any proposal to form a civilian-manned coast-guard is also disturbing from the cost aspect — take the simple fact that a third mate costs some

THE SPEAKER

Rear Admiral G.R. Griffiths, AO, DSO, DSC, RAN (Rtd) retired from the Navy in 1980 on completion of 44 years service. His sea postings included command of HMA ships *PARRAMATTA*, *HOBART* (including service in Vietnam) and *MELBOURNE*.

His senior staff postings include the Director General of Naval Operations and Plans, Chief of Naval Personnel and Flag Officer Naval Support Command. He specialised in gunnery during his naval career and is a graduate of the Royal College of Defence Studies.



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I am using the words 'peace' or 'peace time' here in their normally accepted Western sense — that is an absence of war. I do not use it in the Soviet sense of a continuation of war by all means short of war — it is an important difference — many well meaning people think that when the Soviets profess their desire for peace they mean what their Western listeners want to believe.

For hostilities our maritime defence obviously needs mine warfare forces — mines and mine-layers to prevent hostile use of our coastal sealanes, and mineclearance forces to maintain the use of ports and coastal waters. Historically, mining has only taken place in a declared war environment — but this may not always be so, as in Vietnam. It is good to see that plans are underway to replace our overage small mine-warfare forces.

We would need suitable escorts for our important coastal trade which carries so many bulk items which are essential to our economy. I do not see a priority need for missile firing patrol boats in peacetime, but our patrol boats should have the growth potential for the installation of such weapons, should strategic developments show that this is necessary.

For many people, that would just about solve all our maritime defence problems — unless we had ideas of what even Stalin saw as an active defence of the sea border — forces which could range further out, submarines, and aircraft armed with air to surface missiles — but how far should they be able to operate from our coast?

Well the Defence White Paper of 1976 talks about defending focal areas and "exercising control in areas of Australia's maritime jurisdiction". Can that be right? Our area of maritime jurisdiction in 1976 was the three mile limit on territorial waters. Why then do we need LRMP aircraft, a carrier, ocean going destroyers and submarines? Maybe it was a slip and it means the 200 nm EEZ over which we have some internationally recognised legal rights — even so it is not very far is it? If that is what was intended — and the reasons escape me — why should we broadcast the fact that we intend to go no further? So I am left with the conclusion that I have been trying to answer the wrong question.

The words "maritime defence" conjure up a maginot line concept at sea — with occasional forays by strike forces charging out from the secure fortress to head off the Indians at the pass. Is that all there is to Australia's maritime defence needs? My answer is no! I believe that what I really need to address is the application of maritime strategy to Australia's circumstances. In fact, within Australia's military strategy for the long

term uncertain future, how much emphasis should be placed on a maritime strategy for the obvious reasons of geography and our need to use the sea?

Alfred the Great has been quoted as saying "there is no advantage of living on an island unless you control the waters that wash its shores". The technology of modern maritime warfare has extended the distance this island needs to control its adjacent waters — somewhat further than Alfred's concept! Therefore we must ask ourselves is 200 nm enough, or is 2000 nm nearer the mark? or 3000 nm? or beyond 3000 nm? No doubt there are many who would envisage a map of Australia surrounded by a shaded area out to 2-3000 nm, and immediately conclude that the task would be beyond us. But they are thinking in land locked terms. To use Corbett's definition, "Command of the sea means nothing but the control of maritime communications whether for commercial or military purposes. The object of maritime warfare is the control of communications and not, as in land warfare the conquest of territory". I believe we should be able to exercise sea control — in strategic jargon, to conduct the "sea denial" and "sea assertion" missions out to at least 2-3000 nm.

Although we seem to understand the need for sea denial — that is to prevent an enemy using our adjacent waters to our disadvantage — we appear to be pre-occupied with developing a capability to strike surface ships. Why?

Both the Minister and Admiral Synnot have recently discounted the prospects of a conventional amphibious invasion, but it has been part of our folklore for so long that it manifests itself in what we are doing — fitting Harpoon in our LRMP aircraft, Harpoon in our DDG's and FFG's, and Harpoon in our submarines.

After 1990 perhaps we should be more concerned with the availability of relatively cheap submarine launched cruise missiles which could be used against us. For the location of these submarines I suggest we need to expand our underwater detection capabilities — with fixed underwater arrays on the lines of the United States Sossus system — the technology to do this already exists in Australia.

In addition should we not develop simple ships with towed array sonars — here an adaption of commercial vessels may be useful — given that they have adequate endurance, or alternatively the peacetime surveillance corvette vessels I suggested earlier could do both jobs.

In this anti-submarine kit, the development of the Barra Sonobuoy is a noteworthy achievement — but it could not, and should not, be expected to handle the underwater surveillance problem single handed. The LRMP aircraft and the Barra

Sonobuoy technologies need to be integrated with other effective measures and controlled as a comprehensive ASW underwater surveillance system. At present these ASW forces would consist of the 20 P3's based at Edinburgh and the 6 submarines. Air Commodore Michael will discuss the LRMP capability, but I would like to suggest that the present LRMP force could be better deployed to produce greater effectiveness from the existing assets — that is one squadron to be based at Pearce, the other to the Sydney area — if that means duplicating maintenance support — so be it. Also, I would suggest that the submarine force be increased to 9 boats, which should allow about 3 operational boats to be deployed to both the West and East coasts.

The forces I have just discussed under the sea denial mission obviously have a sea assertion function, and this applies to other capabilities in our maritime forces — very few are so specialised that their capabilities cannot be used in more than one sea power mission. This flexibility is a characteristic of naval forces.

Before I leave the ASW area there is one weapon which seems worthy of serious consideration and that is Captor, the anti-submarine encapsulated torpedo. This could be useful in our inventory.

I would now like to deal briefly with the seapower mission of power projection. I do not see Australia in the business of opposed amphibious landings on any great scale. Nevertheless, the present capability being developed with Tobruk and the Squadron of LCH's backed up by Jervis Bay is certainly minimal. The LCH's, besides their age, are very limited operationally, and Jervis Bay, being constrained to loading and unloading at specialised port facilities, lacks the flexibility needed in the amphibious business. I suggest a second Tobruk type ship could replace the LCH's and then the two ships would probably provide about the right level of amphibious capability. This would enable us to keep abreast of the techniques of landing soldiers and their equipments across beaches, and would provide self-contained, and self-sustaining headquarters and accommodation, for the deployment of small peace keeping forces or for other appropriate deployments in an emergency.

The naval gunfire support of land forces has been practised for decades and may still be useful in the future — so unless there is some tactical development which supersedes this type of support then this capability and expertise should not be discarded. There could be occasions when the ground support of these deployed land forces would need the assistance of fixed wing ground attack aircraft. In cases where these forces are deployed beyond the range of shore based aircraft this role would be covered by carrier aircraft,

but I would not see it as a main role for carrier aircraft.

So far there may be a fair measure of agreement with what I have said. Why then is the naval element of our maritime force structure such a problem to us? Why do we have a 25 year old carrier at the end of her life? Why do we have so few operational destroyers?; and those presenting us with the problem of block obsolescence in the late 80s. ADELAIDE was commissioned last November. But why was ADELAIDE the first destroyer type ship to enter service since TORRENS which was laid down as long ago as 1965 and commissioned in 1971? Why do we have such a poor afloat support capability in 1981? And now that something is being done, why is the increase in naval capital equipment expenditure over the last two years causing so much comment?

Let us be honest. Defence planning in the years of our forward defence strategy, and since, has had a hang up on the amount and type of blue water surface navy we need. Navy budgets have been consistently the lowest of the three services for about 20 years — and by considerable margins. As I have suggested earlier, I believe the problem arises from the image created by the words "maritime defence" — that we should face an aggressor a short distance from the coast — the last ditch stand before the hordes come over the beaches.

I also referred to the need to look at the application of a maritime strategy to Australia's circumstances. What are these? Surely we are a regional power, and have been for some time. We have our own particular areas of strategic interest, our own economic make up, and a special dependence on the surrounding oceans and trade routes. Also, for some time the need for self reliance in defence matters has been evolving steadily. Under these conditions the question must surely arise — have we yet recognised the importance of maritime strategy and its position in the country's total military strategy? I believe we have not, nor is the meaning of seapower fully understood, nor is its application in Australia's circumstances fully understood.

Surely the "business as usual" approach in the appointment of the defence vote over the last two decades is a clear testimony to this lack of understanding. In fact, we could almost be accused of looking around for every conceivable reason to avoid upsetting the business as usual approach. We have sought justification in unprovable judgements — that no one would dare interfere with our sea lines of communication — and that in any case we are pretty self sufficient.

We sought justification in combat technologies — that ocean surveillance systems (which are only possessed to any degree by Russia and the USA), and modern precision guided missiles

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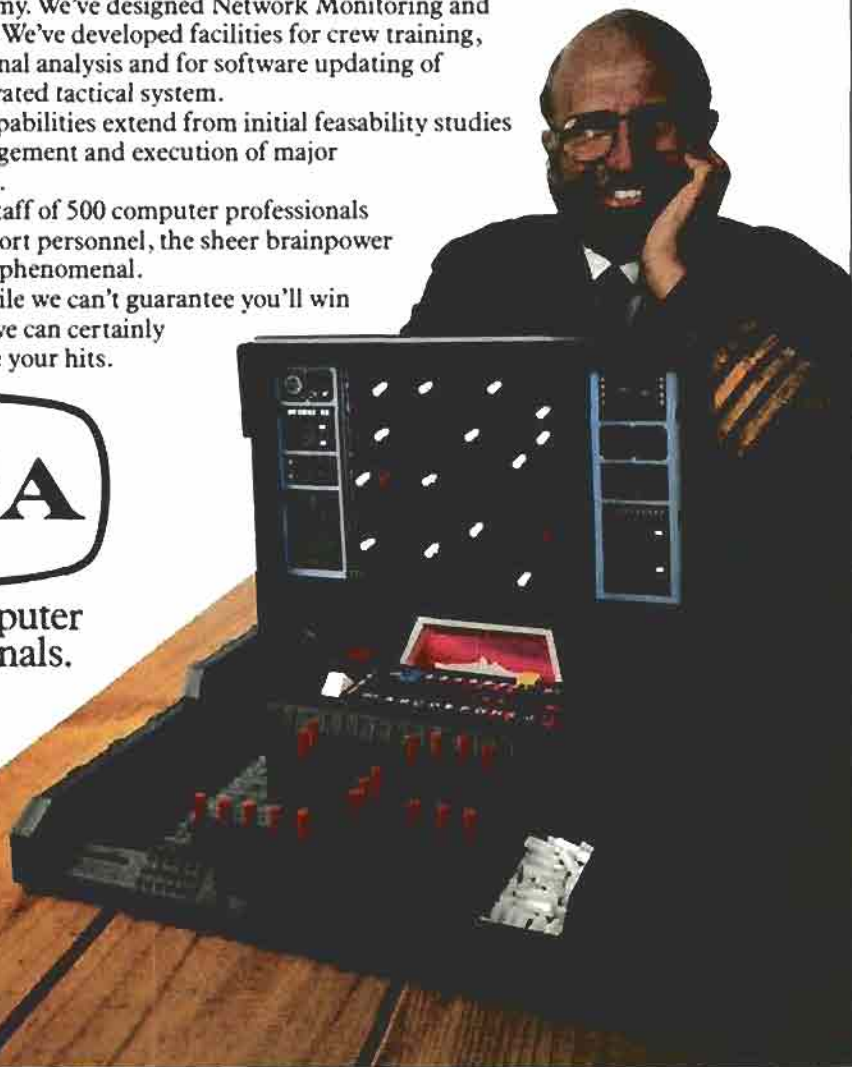
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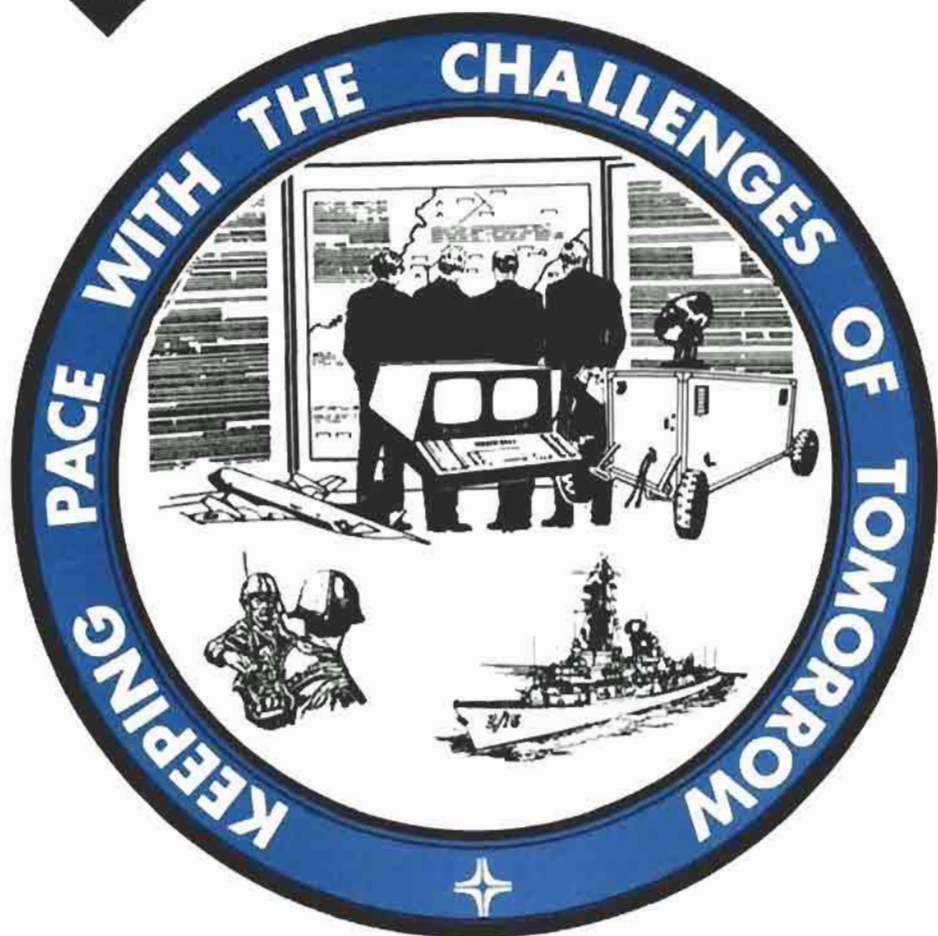
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spelt the end of surface ships. Like the "Jeune Ecole" of the 1880's, which said that the torpedo boat had doomed the battleship, a new "Jeune Ecole" is with us in the 1980's. Are those words "maritime defence" totally responsible for our attitudes? It would indeed simplify the problem if they were.

An analysis of the application of seapower in history could well show, that among its main benefits has been its use in peacetime by Governments which have skilfully used its visible instruments of power. This is not to minimise its importance in time of war. I am sure this audience recognises that the majority of international situations, differences of opinion, projections of influence etc, would occur and indeed be settled in situations short of conflict. The possession of appropriate seapower provides the government with a wide range of options to check influences which run counter to our interests, and in addition, provides an excellent means of promoting goodwill and influence consistent with our interests.

Ken Booth, in the Summer 77 Edition of the US Naval War College Review, wrote on the functions of navies. He said the main peacetime functions are the policing role and the diplomatic role. The former covers coastguard type responsibilities and a contribution to nation — building, and internal security aspects such as national disasters. For the diplomatic role, he states, "This role is concerned with the use of navies in the support of foreign policy short of the actual employment of force. In this role navies are the handmaidens of diplomats in carrying out international bargaining: warships might have their effects by being kept in the background, or be being brought forward explicitly into the foreground.

Seapower deployed by the Government provides it with a finely controlled force which can be used as a deterrent to adverse influences in both peace and war situations. To be credible, this deterrent force must possess tactical capabilities which command respect, even if they are deployed in a high capability area. By this, I do not for a moment mean that we should strive to achieve a high tactical, indeed strategic, capability such as that in the U.S. carrier strike forces — but Australia certainly needs more than low level, short range, offshore maritime defence forces, restricted to the sea denial mission.

Australia has a vital interest in its sea communications and that makes it a major strategic interest. Australia does not have to provide a sea assertion capability for regional defence over the whole length of its trade routes, but I suggest an independent capability should take us further than 200 nm offshore, and 2-3000 miles is a reasonable working figure.

The tactics of maritime warfare, and the aircraft and missiles available today, turn a considerable part of maritime warfare into an air defence problem. Therefore a surface force commander needs effective control of his airspace out to about 200-300 nm. That requirement calls for a tactical organic air capability which can only be provided by a carrier. In a regional conflict we could be spared the saturation attacks that opposing forces could mount in say the North Atlantic — but we do need to eliminate the shadower which provides targetting information to missile launchers. Land based fighters cannot perform this task and I believe it is high time that we progressed beyond this type of argument.

For the last eight years the country has been led to believe in the core force concept, whereby the present capability in each service, besides being stated as adequate for present day needs, forms the basis for expansion in time of threat. I believe this concept has not been agreed by the military professional for two basic reasons:

- Firstly, history has shown that the rate of the development of and the intention to apply a threat, virtually defies accurate forecasting;
- Secondly, the lead time involved to procure military hardware, especially naval ships which are long lead items, is unlikely to coincide with a threat development.

Let me ask you to reflect on the number and type of naval ships you could expect to obtain within a forecast threat period of say one, three, five, or seven years. The factor of surprise remains one of the principles of war — who is likely to inform us that we have until say 1990 before a threat emerges?

The fact remains that a maritime capability in being could provide the only options available to the government to cover a considerable number of cold and hot war situations. Therefore I believe, for the provision of major naval ships, a minimum of two carriers is needed as the basis on which to build the naval surface force structure — this includes destroyers and afloat support ships.

The size of the carrier is a major factor affecting the total capability available from a mix of aircraft which can be embarked, and an important part of that tactical air capability should be an air-borne early warning (AEW) system. Future carriers should be capable of operating suitable AEW aircraft.

In the RAN we have always operated a rather variegated group of destroyers — since World War II we have acquired them in penny numbers, 2 Battles, 4 Darings, 4 Rivers, 3 DDG's, 2 improved Rivers and 4 FFG's. We have lacked any indication of endeavour to standardise on ships or weapon systems.

The ill-fated DDL programme, cancelled in 72/73 because it was allegedly too expensive, was an attempt to standardise. The ships were to have been built here; and given a continuous production line, completing one every 2 years, with a ship life of say 25 years — this would have produced a destroyer force of about 12 ships. The project had developed significant backing by Australian industry — and there were burnt fingers when the project was cancelled.

The recent statement by the Minister that future destroyers would probably be built in Australia I hope is widely welcomed — not only by the workforce at Williamstown Dockyard which has built fine ships in the past — but also by industry. I imagine the prospect of supporting a defence project in country is more attractive than part participation in an overseas project. Nevertheless, standardisation and industry support will suffer unless there is continuity of construction. Naturally, there would need to be an updating process to ensure that the ships remain tactically effective within the developing operational environment.

How many destroyers? The Defence White Paper says 12. I understand that over the last two years our destroyer assets have totalled eight operational ships only and this would have included at least one, and at times two, in refit. In about two years time we should be back to a total of 12. Assuming two carrier task forces with four destroyers each, it would appear that about 12 operational destroyers would be required to provide for these and other activities. Taking into account routine refits and modernisation, a total number of about 16 would seem more realistic.

Afloat support is an indispensable part of effective seapower. It is essential to sustaining independent operations at any distance from land bases, and its characteristics and value have been amply demonstrated throughout World War II and each year since. In almost any deployment away from home bases in Australia the Navy is faced with endurance problems. The announcement that SUPPLY will be replaced with a one-stop replenishment ship (AOR) was most welcome, but to achieve full operational effectiveness from a carrier task force of one carrier and four destroyers deployed say 2000 miles from base, two AOR's would be needed if the force was required to maintain a presence for a prolonged period. As you know, the Government has stated an intention to acquire a second AOR.

There are many points which should be covered in this complex and interesting subject of maritime force structure, but before I end let me mention just one or two.

Firstly, the logistic support capability ashore requires the organisation and facilities to integrate the activities of spares procurement from industry,

the issue of spares to ships and refitting dockyards, the processing of repairable items, together with control of storage and inventory control — the present facilities could need updating to provide an effective and economical means of meeting this task. Without an effective support system ashore the operational effectiveness of ships deployed could be seriously degraded.

Secondly, I must mention nuclear propulsion. The prognosis for our in-country oil supply remains unattractive, and observing the ocean distances involved for deployments within our areas of interest, there is an urgent need to consider nuclear propulsion in future ships of destroyer size and above. It is difficult to accept that technology is not available to engineer suitable systems for destroyers in the 4000 ton bracket.

I realise there are many aspects, such as the importance of an adequate hydrographic service, which I have been unable to cover in the time available, but I now turn over to Air Commodore Michael to talk to you on the LRMP aspects of our presentation after which I will conclude.

Presentation by Air Commodore Michael

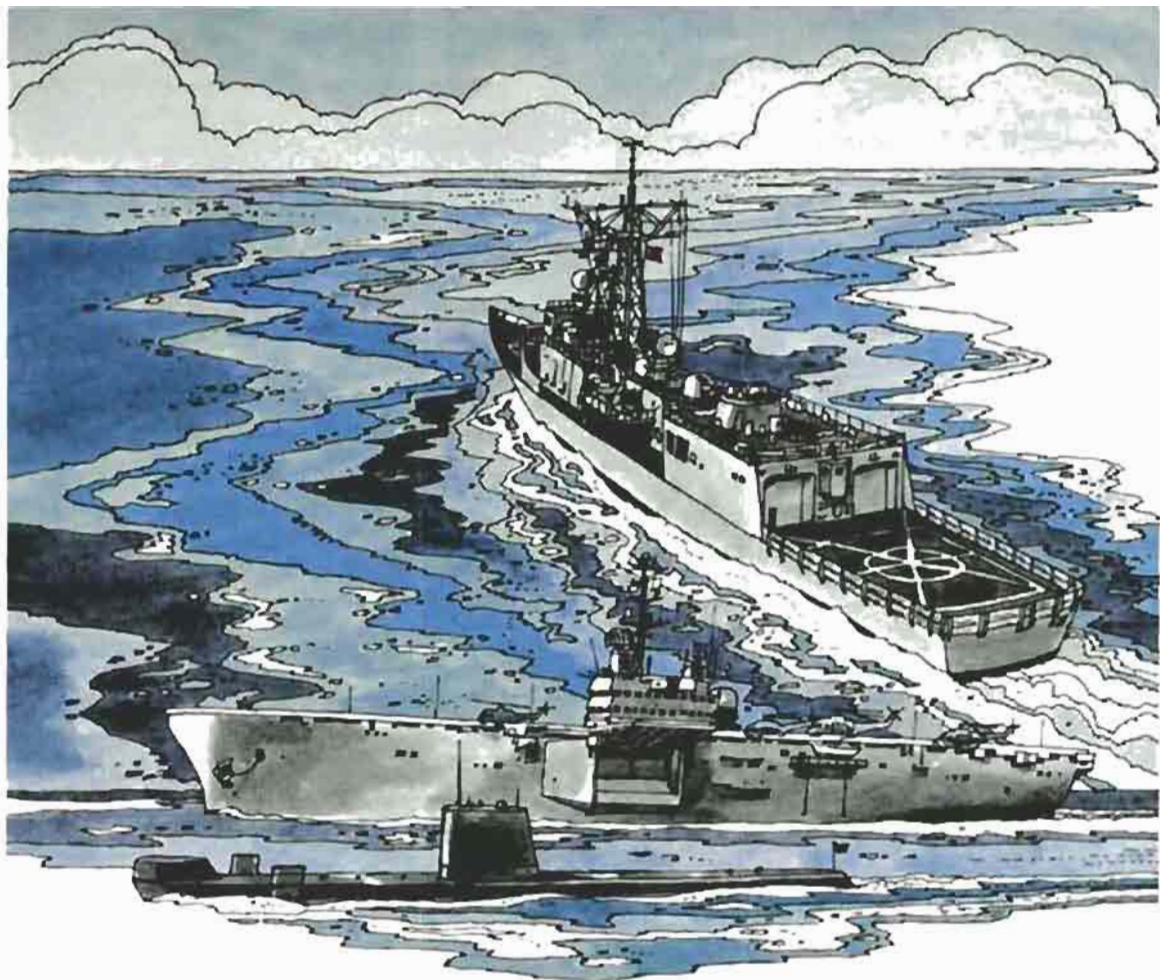
In general I agree with the philosophy expounded by Admiral Griffiths. We have some differences of opinion on forces and their utilisation. However, these do not in any way affect our presentation.

Recent history has emphasized the lesson that air power is a vital element, indeed I could say the vital element, of any maritime defence situation. My address will deal with those capabilities of air power which I consider necessary for Australia's maritime defence needs. I will concentrate on broad capabilities, without specifying aircraft types. Also I will not raise the debate on land-based versus carrier-based aircraft, as this question is not relevant unless specific geographic scenarios are considered. Fortunately, time precludes such an examination during this talk.

In the first instance, our maritime defence elements must constitute a viable deterrent. Any potential enemy who may contemplate maritime aggression against us should be aware that we have:—

- Firstly, the means to detect and track him well before his maritime forces can enter our area of immediate interest, and
- Secondly, the potential to strike and destroy his forces, to an extent that in any venture against Australia he must expect to suffer prohibitive losses.

To achieve the first objective we must contribute to and be part of an effective maritime



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intelligence organization which covers all maritime approaches to our area of interest. Currently our LRMP aircraft make a meaningful contribution to the achievement of this aim. During peacetime, this capability in co-operation with our Allies, must be developed and nurtured. Furthermore we must utilize modern technology and strive for a real time intelligence picture which will enable us to detect and track targets under, on, and above the ocean. To this end we must pursue the development of over the horizon radar (OHR), advanced long range fixed arrays and eventually satellite surveillance. In the employment of any of these systems, the fixed wing aircraft remains a vital integral part. In terms of capability, the aircraft should have the ability to covertly or overtly detect, classify and track any potential target. In the future I predict that target classification could prove to be the main role for the aircraft in the military surveillance role. It certainly presents the predominant problem area to our surveillance forces today, and I will discuss this problem further in the context of our capabilities in a hostile environment.

The LRMP force conducts surveillance primarily to keep watch on activities in the Australian area of interest and to some extent to "show the flag". More importantly, these missions have the potential for the collection of intelligence material necessary for the conduct of military action, should ever the need arise.

The procurement of the Harpoon missile has given the Australian defence force a quantum jump in its anti-shipping weaponry, but without the availability of appropriate electronic and acoustic tactical intelligence, from which potential targets can be identified, it is difficult to see how such weapons can be employed successfully without tragic results to friendly and neutral shipping. Either strike or LRMP aircraft can serve as the vehicle for this most effective weapon in the air to surface mode. However, the LRMP aircraft have the additional advantage of being able to classify surface targets, given basic intelligence, whilst remaining covertly outside the range of surface weapons. An aircraft is the only vehicle which is capable of exploiting the full potential of the Harpoon.

I would like to divert slightly to discuss the problems of target classification, the current means at our disposal and the areas where technology can further the cause. Basically, a surface vessel target can be classified by any one of the following means:—

- Visually
- Electronically
- Acoustically, or
- Imagery

Visual identification, which is the most reliable means, presents the most problems in

that normally if you can see an enemy ship, the ship can also see you. Worse still it can fire at you with a very good chance of ruining your day.

Identification by electronic signature, i.e. The use of electronic search measures, or ESM, allows identification of radio/radar types which when combined with other intelligence provides a covert and reliable means of classification. As ESM provides a covert detection and classification capability, our aircraft should be fitted with the best such equipment which modern technology can provide. The computerized ESM of the P3C weapon system has improved our capabilities in this field, however, even this system possesses shortfalls which should be addressed by our research and development resources.

The Barra Sonobuoy supported by the AQS 901 Processor, has enhanced our potential to covertly detect and classify both surface and underwater targets acoustically. Again, these acoustic signatures can be identified well beyond the radar or visual detection ranges of surface ships. The acoustic detection equipment fitted to our P3Cs is as good as any operational equipment in service today. Acoustic identification can be used in conjunction, not only with intelligence and ESM, but also with radar.

Imagery, or more specifically in the case of the P3C, the infra-red detection system, permits covert visual classification at night. This capability poses a particular problem to the electronically silent ship which, if it denies the aircraft ESM detection and classification, can itself be classified and attacked by the aircraft without warning.

There is a bleak side of course and I stress that all means of classification can be subject to counter measures of various kinds. Therefore, our research and development resources must strive to ensure that our technology and intelligence, especially in the areas of ESM and acoustics, are maintained at a level compatible with military equipment employed by any potential enemy.

The importance of ASW seems to have diminished in recent years; probably because of the

THE SPEAKER

Air Commodore G.G. Michael, AO, OBE, AFC, RAAF (Rtd) retired in 1979 after a long and distinguished career in the RAAF. His operational flying career totalled over 24 years, of which 16 were served in Long Range Maritime Patrol Aircraft including command of a SP.2H Neptune squadron and exchange service with both the RAF and the US Navy. His staff postings included that of Director General of Operational Requirements — Air Force. He attended the Royal College of Defence Studies in 1973.

The speakers were introduced by Commander A.N. Grazebrook RANR.

high costs involved in establishing and maintaining a capability and secondly, because of the ever-increasing difficulty of the task. However, we must continually remind ourselves of lessons of past conflicts and recognize the very real threat submarines can pose to this country. A relatively small force of submarines could maintain one unit on-station on both our East and West coasts. This could effectively tie up our ASW assets and throw our sea lines of communication into disarray.

In 1951, Admiral Radford stated 'The submarine problem will be licked in a couple of years'. Unfortunately, the submarine still retains its supremacy over all ASW forces. Even though we continue to make significant progress with sonobuoy and processor capability such as the Barra system, we have experienced in real terms about a 60% loss of ASW capability over the last two decades. There is no indication that this trend will stabilize, let alone be reversed.

The P3C with its Barra fit represents the best ASW aircraft platform in the world — an aircraft we can be proud of. On the other hand, the P3B with its early 60s technology, requires an urgent modernization or replacement, if the total P3 force is to achieve an adequate state of ASW readiness.

Mining is yet another role which appears to have slid into the backwaters. Fortunately for Australia we have in being some of the best aircraft mining platforms that are available. The F111 is especially suited to the offensive mining role — it has a large mine carrying capacity, accurate navigation and a superb low-level operating capability. Also, the P3 possesses all the attributes to meet the demands of defensive mining. However, there are some who believe that mining is a very simple task and that the planning and delivery expertise can be achieved at very short notice. I can assure those who think this, that it is not true. Mining is a very demanding role if it is to be conducted successfully, i.e. if the mine field is to be usable by our forces. If anybody doubts this, they should look closely at the intensity of the USN mining training and inspection programmes and the priority given this role by that Service.

In the final analysis, the viability of our maritime defences will hinge on the strike potential of our forces. The air element of our maritime strike force will consist of the F111 element, the P3 element and the tactical fighter force. The first two elements fitted with Harpoon and guided bombs are a credible concept. The new tactical fighter, especially if augmented by in-flight refuelling and fitted with appropriate weapons, will provide a deterrent capacity against any likely hostile maritime power. It would be disastrous, in my opinion, if a new tactical fighter were selected which is not capable of an anti-shipping role. Our limited

assets must dictate that we strive to have a multi-role capability for all our fighting platforms. The viability of the actual size of the air component can only be assessed in a particular scenario. For example, elements of the strike force could be required primarily for land strike; the new tactical fighter may be confronted with an air defence problem; and the LRMP force could face a submarine threat well in excess of the capabilities of the existing number of aircraft. An examination of aircraft numbers is beyond the scope of my talk, however, regardless of the scenario, and given current lead times for new equipment, the size of the LRMP force, i.e. twenty aircraft, seems inadequate for an island continent the size of Australia. I base this statement not only on the geographical scale of any maritime defence problem which could confront Australia, but also on the flexibility of roles currently inherent in the LRMP force. We could not expect the current force to cope with more than two detachments and probably two roles simultaneously and still maintain its training role. Also, if more P3 aircraft were to be obtained, we must ensure that all aircraft have the same capability so as to meet the demands of all roles to provide the required operation planning flexibility. A modernized P3B could have, in the main, identical sensors to the P3C, but, there would still be considerable differences in software and ordnance systems which would dictate production of new training syllabus, operating procedures and tactical doctrine. Essentially a new LRMP platform would have to be developed. This would take time and would be at considerable cost. The P3Bs have already been in RAAF service for 14 years and could be 20 years old by the time an update was completed and they became operational with the new fit.

If the LRMP element is to be updated, and I firmly believe it should be as a matter of urgency, then more P3Cs should be acquired to replace the P3Bs on a one for one basis. This would be by far the most cost effective option.

One critical area related to maritime defence, indeed to any defence situation, is the availability of weapons. If we have the sophisticated weapons required for modern maritime warfare — and I refer not only to stand off weapons but also to aerial torpedoes and mines — is there a stockpile of these weapons to maintain a sustained maritime battle, even of limited duration? We will always be confronted with the problem of lead time and end of production line problems with any high technology weapons we acquire for our inventory. I suggest that a current ability to manufacture high technology weapons within Australia is most desirable. In practice I am aware that the number of weapons we need and their costs would make an Australian production line to

meet our own defence requirements prohibitively costly. However, the production of these weapons for sale overseas as an offset arrangement to a major defence overseas buy could be an avenue worthy of investigation.

Some other areas available for future industrial participation include:—

Software development. Computers are now used extensively in both the operation and support of P3C aircraft. The software support of these equipments is currently provided by Computer Sciences of Australia (CSA) and is beyond the capability of the RAAF (in terms of trained manpower) and is likely to remain so. I see a long term and ever increasing industrial participation in this field.

Aircraft modernization. If we are to keep abreast of the latest maritime techniques and maintain the maximum fighting capability, we will need to conduct regular aircraft/system modernization programmes. There is considerable potential for industrial participation and initiatives in this area.

Weapons maintenance. Various maritime weapons are currently maintained by defence civilian personnel. Civilian personnel can be expected to continue in this field and increase as more sophisticated weaponry is procured and serviced in Australia.

General. Participation by other than military personnel in the direct support of the defence force can be reason for concern (industrial disputes etc). However, we must remember that overall community support is essential for the successful prosecution of any conflict.

There is probably much more that could be said and should be said. However, time does not permit so I will hand it back to Admiral Griffiths to conclude our presentation.

Conclusion by Rear Admiral Griffiths

Gentlemen, in closing we both realise the complexity of the subject and the many factors involved, and the fact that some have not been covered in the time available. But the important point we both wish to emphasise is that urgent action be taken to formulate a much more realistic maritime strategy than we have employed in the past. This maritime strategy should be given priority in our national military strategy in the future.

When this has been done, it should be possible to provide the population with a sound understanding of the importance of developing an adequate maritime force structure to support that maritime strategy.

DISCUSSION

Chairman: Commander A.W. Grazebrook, RANR

Professor W. Kasper: Could I ask Rear Admiral Griffiths to supplement the Naval shopping list he outlined by a cost estimate? What expenditure plan do you envisage that these items will add up to? I know I am only asking about paper money but alas as an economist I cannot help but always remember the tax dollar dimension.

Rear Admiral Griffiths: I did not come here this afternoon with a cost estimate of what I have said. I brought it here as a basis for discussion. My presentation of the idea to you is that if we indeed appreciate the importance of having a maritime strategy within our overall military strategy, then I am sure with the background of what has been said this afternoon we will find little difficulty in giving it priority. And if indeed it is a priority, which I suspect it will be, it will be apportioned money for spending. You do not have to spend it all in one year. God forbid we could ever do that. You would select and maintain your aim to build up your

maritime force structure and spread your expenditure accordingly.

At the moment nobody seems to be batting an eyelid about the expenditure of \$2.5 billion on another project.

Commander Shevlin: Member of the Institute. I was delighted to hear Admiral Griffith's support for the procurement of TOBRUK's sister ship, but I would like to strongly advocate that the procurement of that ship for the amphibious force should be as well as, not instead of, a continued LCH type capability. The LSH on its own cannot do its full job unless it is accompanied by self-deploying landing craft for ship to shore movement. There are a number of tasks for our current amphibious ships which would be a waste for a 6000 ton ship, like the conduct of beach surveys, small coastal deployments.

I do not think we need as many LCH types in the future, but I do suggest that we need both

TOBRUK's sister ship and some continued LCH type capability.

Rear Admiral Griffiths: Peter, I am delighted to have your professional input.

Commodore Robertson: Air Commodore Michael, in a projected national ocean surveillance system you mentioned the possibility of satellites. I have a question in two parts for you. My first question is; do you mean a single geostationary satellite or do you mean a number of satellites in asynchronous orbit with different sensors? The second question is; whether you have considered the alternative of an adaption of the U2 aircraft technology for our purposes here? I suspect some U2s might be more within our means and adequate for our purposes. I know the Americans were looking at this some time ago.

Air Commodore Michael: What I was referring to was the long term. I support fully what you have said about the cost and how we can do it cheaper in the near term. However, our most sensitive area would initially be satisfied with a stationary satellite, as I see it. I did make the comment of course that we need to be able to gather intelligence in our entire area of interest, but there was one specific area in the north-west which I think we should cover first.

Vice Admiral Sir Alan McNicoll: To what extent do our maritime affairs depend on the goodwill of the unions, — some of which are Communist led, some Communist orientated and some of course not so influenced — but without them we can neither maintain our ships, nor on occasions can we get the fleet to sea.

Rear Admiral Griffiths: Sir, I believe that our operational effectiveness to a large degree rests on the unions to support us in the dockyards and I would be delighted if you would rephrase your question in a more pointed fashion and direct it to Mr Bob Hawke after dinner.

Commander Herron: Member of the Institute. Firstly an observation, Admiral Griffiths — with regard to nuclear powered warships, the technology is available. In fact for those who wish to read Admiral Rickover's testimony to the senate

in 1979, the US Navy has concluded or did conclude then, that in 1979 oil prices it was cheaper to build cruisers and above with nuclear propulsion. The propulsion systems for smaller ships are available. Our problem is twofold. One, we do not have the technological support or engineering infrastructure support and we will not have this until we get a nuclear power station industry within Australia. The other problem is political. With regard to your presentations, if I may make some comments, I was most impressed by what I saw as a very good nuts and bolts presentation. I was more than surprised to hear nothing of command and control.

The most significant technological jump in maritime warfare is in the command and control area, which incorporates a wide range of skills and a complex and very expensive communications systems. One of those skills, and an inherent part of it which Air Commodore Michael touched upon, was intelligence. I would be interested to hear, Admiral Griffiths, why you made no mention of the intelligence field in your part of the address.

Rear Admiral Griffiths: Firstly, going back to your nuclear propulsion statement, I agree it requires quite a lot of action. What I am really saying is that I feel that if the Navy looks to the future and the availability of oil in the country, we will have very little option but to look towards nuclear propulsion. If there is sufficient recognition within the country for the need of nuclear energy, then perhaps the policies may have to be reviewed. Secondly, I did say that there were a number of aspects that I left out of my presentation and command and control of communications was one of these. I am entirely aware of the importance of it for the future. It is just that I did not have time to cover all these aspects.

When I was talking about turning things over to the maritime defence commander in peace time I did that because he actually does have the command and control organisation at the present time. I am also aware that a C3 review is under way. Command and control of communications are most important for the future.



DEFENCE AND INDUSTRY

by Mr. R.J.L. Hawke, AC, MP

It will be apparent to you by the time I have finished speaking, if it is not already within your comprehension, that I come before you this evening as something of an apprentice in the area of defence. In regard to some parts of what I will be talking about, of course I am far beyond being an apprentice insofar as I will be talking about industrial relations. I thought as indeed I am going in some point to be talking about Williamstown naval dockyard that I might share with you — that has come as a surprise, has it not? — a true story that occurred in a period of our history which some would prefer to forget — that was the period between 1972 and 1975.

It is a true story. You will recall that some of the decisions that were taken by the Labor government at that time did not attract the universal approbation of the trade union movement in this area and indeed as a result, it is said, of some of those decisions employment prospects in the Australian defence industries were not as stable as they might otherwise have been; so it was said. Indeed there was some decline in employment in a number of areas.

This had reached such proportions that the members of the unions affiliated with the ACTU had approached me and said that they wanted to have a meeting about this so that we could have some understanding of just what the degree of fall away in employment was. Being the democratic organisation that we were, I immediately responded to that request. So we had all the unions gathered together in the boardroom of the ACTU.

Before I go any further if any of you have people from another country sitting next to you who do not know the background of the Ships Painters and Dockers you might just — so that they will get the full flavour of the story I am about to tell — you might just indicate to them some of your understanding of their background. It will not necessarily be the same as mine.

So we had all the unions there and I thought as I usually conducted meetings — I thought it would be a good idea if we asked each of the unions there represented to actually give us a picture of what had happened in their particular area of employment and what redundancies and losses had occurred. So this went on and on and they all talked about what had happened. Lost a

few here and there. Then it came to the Ships Painters and Dockers — a great bloke, the secretary, he said "Yes" he said "Comrade Chair". It is a term of great distinction and long history before it was appropriated by a particular organisation. He said "Yes, Comrade Chair, I want to tell you that we have had real problems down at the dockyard. Fourteen of our blokes have disappeared." I tried vigorously to keep a straight face but I found it totally impossible.

Before I take a look at some particular aspects of the relationship between defence and industry in Australia, it is worthwhile briefly examining the broader context of military expenditure and its implications for technology and society. Defence is, in itself, the biggest industry in the world, the biggest employer and the hungriest consumer of funds for research and development. Total global military spending is now some \$500 billion per annum. There are 36 million men and women in regular and paramilitary forces around the world with another 25 million people in reserves or part time forces. Civilian employees in military related occupations total some 30 million. The cost of weapons research and development alone exceeds \$30 billion per year and there are more than half a million scientists and engineers devoting their skills to this kind of R and D throughout the world.

In the words of Mr Robert S. McNamara whose remarkable curriculum vitae as you know includes president of the Ford Motor Company, United States Secretary of Defence for eight years, more lately president of the World Bank,

THE SPEAKER

R.J.L. Hawke, is Federal Member of Parliament for Wills and Opposition Spokesperson for Employment and Youth Affairs and Industrial Relations. He was Federal President of the Australia Labor Party from 1973-1978 (for five years) and President of the Australian Council of Trade Unions from 1970 to 1980. He has been a member of the Reserve Bank Board of the Reserve Bank of Australia, and a member of the International Governing Body of the Labor Office. The Speaker was introduced by Captain L.G. Fox, RAN (Rtd).

said in a recent speech, quoting:

A greater research effort is devoted to armaments than to any other activity on earth and it consumes more public research money than is spent on the problems of energy, health, education and food combined.

Mr McNamara who, as you all know, is not noted as a dove declared in a recent address, I quote him again:

If we examined defence expenditures across the world today and measure them realistically against the full spectrum of actions that tend to promote order and stability within and among nations it is obvious that there is a very irrational misallocation of resources.

It is not difficult to cite examples, I suggest, of Mr McNamara's point, of ways in which these resources could be reallocated. For instance, the recent Grant Commission report on north-south relations indicated that and I quote:

1. The military expenditure of only half a day would suffice to finance the whole malaria eradication programme of the World Health Organisation and less would be needed to conquer river blindness which is still the scourge of millions.
2. A modern tank costs about \$1 million. That amount could improve storage facilities for 100,000 tons of rice and thus save 4,000 tons or more annually. One person can live on just over a pound of rice a day. The same sum of money could provide 1,000 classrooms for 30,000 children.
3. For the price of one jet fighter, one could set up about 40,000 village pharmacies.
4. One half of one per cent of one year's world military expenditure would pay for all the farm equipment needed to increase food production and approach self-sufficiency in food deficit low income countries by the year 1990.

There is today a greater weight of explosive material than food on this earth. In a pertinent introduction to the report of his commission Willy Brandt commented and I quote:

Business has been rewarding for both old and new arms suppliers who have spread an incredible destructive capability over the globe. It is a terrible irony that the most dynamic and rapid transfer of highly sophisticated equipment and technology from rich to poor countries has been in the machinery of death.

Ladies and gentlemen, I am not proposing, certainly not in this forum, that every nation should forthwith dismember its defence budget and re-allocate it to development projects and social

welfare but I am convinced that we should be wary of the expenditure imperative, the assumption that you can only get better defence by bigger spending. A final note from Robert McNamara puts this argument quite persuasively and I quote him again:

The concept of security encompasses far more than merely military force and society can reach a point at which additional military expenditure no longer provides additional security. Excessive military spending can reduce security rather than strengthen it.

If proof were needed, I suggest, of Mr McNamara's thesis one has only to look at the current strategic situation in Europe and the Middle East. Despite unprecedented increases in defence budgets we are still and without accepting the sometimes associated hyperbole in the words of my friend, Jim Killen, we are facing a most uncertain decade.

It is not a new situation. In the 1930s when Mr Leon Blum was premier of France, General de Gaulle is said to have warned him that France was conceivably facing military disaster. Mr Blum is reported to have replied "Nonsense" or I suppose "Merde". He said "We are spending more for defence than ever before." "Indeed" retorted the general "And it is what you are spending it for that concerns me."

I believe that here in Australia in the 1980s a great deal more thought, more analysis and more public explanation must be devoted to the nature and the purpose of military expenditure, what we are spending it for. It is this question I believe that lies at the heart of the relationship between defence and industry and which will dictate the direction of future technological development in the defence area.

The role of industry in the defence of Australia can only be determined on the basis of the overall strategic guidance provided to the government. Regretably I believe this guidance is either unclear in its conception or inadequately explained. The most common complaint of people who depend on this guidance or who have studied the government's statements on defence policy is that there is no clear and detailed exposition of Australia's basic national security policy. Various components of this policy are at different times given an airing by government ministers and officials but the composite picture that emerges is little more than a mosaic of clichés and catch phrases; the Soviet threat, the ANZUS alliance, an independent operational capability for Australia, increased regional co-operation, greater self-reliance, a core force concept, keeping up with the state of the art.

At regular intervals these magic phrases pop out of the defence machine like the numbered

Tattslotto balls that tumble out of those marvelous contraptions on our television screens every week. There is little evidence of order, of any coherent strategy in the defence decision making process and it is too important a subject to be governed by random factors. The winning ticket in this game can be the ticket to the future survival of our society, the values we have inherited and improved and ultimately the lives of our children and theirs.

I do not for one moment underestimate the complexity of policy making in the defence area. I acknowledge the particular problems of Australia in planning for a wide range of contingencies. As the chief of the defence force staff, Admiral Sir Anthony Synnott has recently pointed out we differ from many of our allies in that Australia faces no single clearly identifiable threat. The same, I might add, to be said for other countries as strategically different as Canada and Malaysia.

After acknowledging these particular features of our defence landscape we are still left with a whole range of unanswered questions and without the answers there can be no comprehensive industrial planning for the defence of Australia. Let me list a few of these questions. To what extent and in what circumstances can we place reliance on our major ally, the United States? Precisely what capability should we be developing as independent all-Australian capabilities? Where does self-reliance begin and end? Should we concentrate on a maritime defence policy using submarines, naval air power and long range strike aircraft? Is it desirable and feasible to adopt a territorial concept depending on large quantities of relatively low technology weapons to arm the populace at large? Given that our long coast line makes us susceptible to invasion, should we be preparing for an enemy occupation and resistance by an underground partisan force?

The other end of the scale and I am merely listing the question, certainly not advocating the position, is nuclear deterrent our best hope for peace and if so, at what stage do we develop a nuclear capability? When does the deterrent capability look like a threatening capability to neighbours like Indonesia or Japan? The development of defence industries in Australia depends on the direction of our basic policy for national security. A policy of heavy dependence on the United States, for example, presupposes a considerable degree of commonality of weapons systems and support equipment.

The policy of forward defence in the 1960s demanded a heavy emphasis on long range maritime forces, long range strike aircraft — namely the F111 — and equipment designed for tropical warfare. On the other hand a policy of defending essentially the continent of Australia

demands equipment suited to our geography with its extremes of climate and wide variety of terrain and ground cover.

Our present policy which is described by government spokesman as the defence of Australia and its interests seems too often like an unhappy liaison between forward defence and continental defence. The current unsettled state of our defence industries is one product of this unhappy union. Let me quote one example where a clear unambiguous strategic policy would lead to an apparently obvious response in terms of equipment.

Australia because of its island status should be able to block and destroy an invading force on the high seas before it reaches our shores. We should also aim to control our threat environment by forcing a potential aggressor into lengthy lead times for acquiring the capabilities of invasion. In the language of strategic analysts we would be aiming to push the putative enemy into disproportionate response. One way of achieving this is for the RAN to buy a further ten or twelve relatively inexpensive submarines to supplement the six excellent Oberon class submarines in the present fleet.

This would oblige a potential enemy to respond by developing anti-submarine capabilities at ten times the cost. As well as this cost burden the enemy will have to greatly extend its force preparation time since effective anti-submarine capabilities require complex command and control machinery, logistic support, properly trained crews and so on. Thus by a moderate expansion of our submarine force we could cause an enemy to defer or possibly abandon a seaborne assault on Australia.

The enemy was not deterred and instead started to develop the capabilities required for such an assault, we would still have the option of adding to our deterrent forces more submarines or other cost effective capabilities. This in turn would force the enemy into a further disproportionate response.

Given Australia's geography and resources it is a matter of continual puzzlement to me that submarines do not play a larger part in our defence structure. We have at Vickers Cockatoo dockyard a body of skilled workers who have been instrumental in transforming the Oberon class submarines into what the Navy rightly claims to be equal to the most effective conventionally powered submarines in the world. After some initial learning curve problems which caused unfortunate overruns in costs and time the Cockatoo dockyard is now a world class specialist in the overhaul and refit of conventional submarines.

As many of you would know, this process is virtually the equivalent of constructing a sub-

marine from scratch except for welding the hull. The other skills, stripping the hull, checking equipments, testing surfaces and sealants, precise measurements and the installation of sophisticated new equipment, these skills have been acquired, developed and maintained at Cockatoo. In addition the submarine weapons update programme is a further manifestation of the high level of competence in the workforce.

The problem at Cockatoo is on the shipbuilding side and it is a direct result of a most familiar complaint in the industry: the lack of continuous work load. In the 15 or so years since the destroyer support ship HMAS Stalwart was built at Cockatoo the specialist ship building skills inevitably decline. This was particularly true in the heavy metal trades and in maritime engineering. It is, however, pleasing to note that the government must be satisfied with Cockatoo's work on the under way replenishment ship HMAS Success. Otherwise the yard would not have been invited to tender for the second vessel of this class.

The significant point about that subsequent invitation to tender is that the original order for HMAS Success involved certain guarantees from the dockyard unions which have clearly been fulfilled to the government's satisfaction. The matter of industrial relations in Australia's shipyards is the subject I believe of a lot of ill-informed comment. As is so often the case the subject of industrial relations in shipbuilding gains prominence only when the news is bad. The success stories like Carrington slipways in New South Wales and NQEA in North Queensland go largely unreported.

The construction of the 6,000 ton amphibious heavy lift ship HMAS Tobruk at Carrington yard at Tomago was a story of generally harmonious and fruitful relations between management, government and unions. It was the biggest vessel built by Carringtons and it took just over a year from the keel laying in February 1979 to the launching on 1 March 1980. It would be foolish to deny that there are industrial problems at Williamstown but I do not propose to use this forum to apportion blame for a situation that I am confident can be remedied.

It is also a subject I should say which generally will come within the purview of the advisory committee on management and operation of the Williamstown Naval Dockyard chaired by Mr Ross Hawke of BHP who is here tonight and particularly within the purview of the industrial relations review team examining the dockyard under the joint leadership of Rear Admiral Bennett and my friend Harold Souter. Let me just say that you are not going to get industrial harmony in a situation where neither the management nor the workforce knows whether the present contract might be their last.

The result is what is familiarly known as the HMAS Ironlung syndrome. Put simply, if the current order is the last in sight you are not exactly going to break a rib to finish it. The total lack of continuity in Williamstown's workload can only induce uncertainty and instability and provide an opportunity for a potentially disruptive element in a particular union to capitalise on unrest. There is no question that the current refits of the destroyer escorts at Williamstown would be carried out more expeditiously if skills had not been lost through past discontinuity of workload and if the dockyard could be certain it would get the contract for the follow on destroyers of the FFG type.

It is worth recalling some of the points made five years ago by Professor Fink in his report on the Australian shipbuilding industry. He was very critical of the government's treatment of the total industry compared with assistance given by other nations to their shipbuilding yards. A number of governments provide finance so that shipbuilders can sell on terms at interest rates below prevailing rates. The OECD, for example, has regulations that provide for loans of up to 90% of the ship's cost repayable over 7 years at low interest.

The most important finding of Professor Fink's report was that it should be possible to retain the shipbuilding industry as a viable enterprise but he said it must be given the opportunity to improve productivity by ensuring the future requirements for ships below 90,000 tons are built locally. The report said that initially a 40% subsidy would be necessary to compete with Japanese prices but this could be gradually reduced to 25% as construction contracts increase.

Professor Fink noted in his report that the world over-capacity in shipbuilding caused vessels to be available overseas at artificially low prices, virtually a dumping exercise. One result was to make Australian ship building seem less efficient than it really is. Professor Fink was writing as an independent engineer well versed in industrial matters. He is, of course, now in the fortunate position of being able to inject his ideas into the top levels of defence decision making from his current post as Chief Defence Scientist.

I want to say a few very brief words about offset policy. If this were an aerospace conference I would be able to expatiate at some length but it is no secret that shipbuilding is the poor relation in the offset family as the experience of the guided missile frigates, the FFGs, amply demonstrated. Offset policy is, if I may say so, a curious creature. It manages to combine the connotations of both motherhood and virginity at the same time.

Like motherhood it is a concept that few dare to criticise but like virginity it is sometimes thought to be present until closer examination proves otherwise.

The defence industrial infrastructure is a national asset which must be judiciously protected if it is to serve its proper function. The nature and extent of government support are questions of political and economic judgement which cannot be shirked or pushed to the bottom of the pile. What is I believe now needed from government is the strategic guidance to permit the development of relevant defence industries, more effective communication between government, management and unions, a radical revision of the defence procurement process to encourage continuity and to streamline the present cumbersome procedures and perhaps the new attitude at some levels in the defence force.

I want to conclude on that aspect by quoting some remarks made by a former Chief of Air Force Technical Services Air Vice Marshall Compton. I quote him:

Certainly in the RAAF we generally are not over enthused about something being made in Australia or we have not been in the past because it usually leads us into a large management task, a lot of problems, delays in deliveries, cost overruns, failure to meet performance and so on.

The Air Vice Marshall was showing uncommon candour on the subject but these complaints are echoed, I know, privately throughout the Services. It is a task for government, management and the workforce to bring about an industrial climate that will enthuse the RAAF, the RAN and the Army and I for one refuse to believe that that task is beyond the capacity of Australians.

There are some obvious obstacles to be overcome before Australia can develop a viable base for defence industry; principally, the small volume of equipment to be purchased and the limited technology of indigenous industry in certain important areas but I think we often tend to undersell ourselves as far as Australian expertise is concerned. Some useful and I believe perceptive remarks on that subject were made to the Katter committee of the Australian parliament during its inquiry into defence procurement in 1978, 1979.

Mr Colin Herbert, then the Australian manager of the British consultants, Y-ARD, stated without qualification that Australia possesses the level of expertise and technology sufficient to design and construct the most sophisticated ships in service today such as a modern destroyer or small aircraft carrier. Indeed in the commercial field Australia has designed from scratch ships

which in concept, operation and propulsion are equal to anything built elsewhere in the world.

There is also a lot of waffle talked about high technology, and it is suggested by some people that Australia ought to concentrate solely on the top end of the technology scale. What is overlooked is that high technology is not simply the art of designing an advanced piece of intricate equipment. It depends on the capability to produce the materials for that equipment accurately and reliably and to test and operate it under the conditions for which it is required. It has been said that the high technologist in a low-technology environment is doomed to perpetually reinvent the wheel.

Australia has the capacity for high technology but too often the government and managements cannot see beyond the reinvention of the wheel. Of course there are commercial risks involved, but my experience of Australians, particularly on Saturdays, is that we are habitual risk takers. We also have some strong cards in our hands. Our reserves of natural resources, our high level of technical education, and our ability to generate funds for capital investment are supported by a workforce which is skilled, basically motivated, and comparatively well rewarded.

Against this, there are some further obstacles that are man-made or, rather, government-made. I instance the current shortsighted approach to the future of some of the government factories now under examination by Sir Philip Lynch and his so-called "razor gang". They are now threatening to close down the Government Clothing Factory at Coburg — I have a particular interest, because it is in my electorate — where the staff of about 720 are fighting a constant battle against the system of ordering that swings widely between peaks and troughs. Of course the clothing factory incurs significant overtime bills for some of the year, and relatively slack periods at other times. It is largely due to the problem familiar to many of you, of an uneven workload which afflicts so many government enterprises from shipbuilding to shirtmaking. The answer is not to shut down the industry and jettison the skills of a public enterprise which has served and can continue to serve this country well.

What is required in this whole area about which we are speaking is a new partnership between government, management and workers — a triad of forces, if you like, which may not make Australia invulnerable but which can begin to provide us with an efficient and profitable industrial base for the defence of our nation.

DISCUSSION

Chaired by Captain L.G. Fox RAN (Rtd)

Admiral McNicoll (Member of the Institute): Mr Hawke, I ask this question with some diffidence. I have, and we have been kicking defence around, and until your eloquent and delightful speech tonight, we have not heard the worker's side whatsoever. The question I was going to ask was this. That in the Navy, we are completely dependent on the unions, the workforce, to refit our ships while they are at home, and even to get the fleet to sea and on occasions — for reasons that I will not go into — they have failed to do that, either one thing or the other. And I would like to ask you if this would be any different in time of war than it is in time of peace?

Mr Hawke: I think you can answer that question in at least two parts. The first by looking at history, and second by theorising. I understand that while during the last major war, the Second World War, there were problems at times, generally speaking — and I obviously do not speak from intimate personal experience of that time — but generally speaking, I understand that those of our workforce who remained here and were responsible for activities in that area substantially and patriotically met their obligations. Now, of course, when you come to hypothesise about a future situation, I suppose you do straightforwardly have to make this point, that to some extent it would depend upon the particular conflict in which you were involved.

I do not want to go over the political events of the Vietnam experience, but it would be less than honest if in answering a question like that, one did not make the point that there was something significantly less than a universal approbation of the then government's decisions in that respect; and therefore that less than enthusiastic involvement on the part of many people, and including many unionists at that time, inevitably would have had some effect upon attitudes in respect of the question that you raise. And if you are talking about a future situation, I guess that the attitude of some elements of the relevant workforce could be coloured by a judgment on their part that the government of the day had made, again, what they may judge to be an inappropriate commitment.

But if you go to a situation where — and of course we all hope that this does not arise — but a situation did arise where we were at war and that involvement was one which was understood

universally or virtually universally by our people as being a necessary involvement, I would be extraordinarily surprised if the attitude of the Australian workforce were other than one of commitment to ensuring that our armed forces, in general, our navy in particular, that you referred to, should be other than fully serviced by whatever could be done by the relevant unions. Let me conclude my answer to your question, however, by saying that industrial relations, what people do is not something that you just drag out of a textbook or make judgment about in terms of the way you can make judgment about chemical processes, because what happens in those circumstances depends upon reactions and feelings of human beings.

And even in times of war when the very survival of your country can be in question, those questions of human emotions and reactions are going to reflect themselves at times in attitudes which may be assumed as less than satisfactory; which leads me to the positive points, that it seems to me in war and to a very large extent just as importantly in peace time, that we should understand that when we are doing something, whether it is manufacturing steel or providing a service to the Navy at a time of refit of one of its vessels, that the use of people is something basically different from the use of materials. And if you are going to get the best out of them, then what is required is the greatest possible degree of involvement of them and understanding by them of the decisions that are being taken.

And I think, certainly from the experience that I have had, that a very, very large number of the industrial disputes that have arisen have not been because either the unions have been bastards or the management have been bastards but, in fact, because there has been a neglect on the part of management, and some neglect on the part of unions, to involve themselves in an understanding of what the realities are of the situation in which they are involved. So I would make the point that in war, as in peace, I would press upon management to give to the area of industrial relations a greater importance than it tends to be given in our operations.

But I have made the point in other occasions, for instance in the Boyer Lectures. It never ceases to amaze me that managers of large enterprises when they are making decisions about invest-

ment programs involving perhaps hundreds of millions of dollars would never in the remotest stretch of their imagination believe that they should leave to subordinates decisions about such major investment programs; but in respect of decisions concerning relations between men and management in terms of how that investment was going to be used, if it was going to be used at all, they seem to think that that sort of relationship is something which is not significant to them as top management but something that can appropriately be left to people down the line.

It seems to me to be basically an unintelligent sort of approach. I am sorry that the answer is so long, but I would say this to you that if we ever did again get into the situation of conflict that you are talking about, and if I had anything to do with the running of things I would be saying to those in charge of that area of our affairs to give in advance, not after the problem, but in advance to say "Look, consultation, involvement of your workforce in understanding what is involved, what we are about, what the purposes are, is something of pre-eminent importance". If you do that in advance, it seems to me that you are going to avoid a lot of the problems. I mean that is, after all, what you do with your equipment in your re-equipment programs and your refitting arrangements. You do not wait until your ship is run down or sprung a leak, you have your preventative maintenance programs. You bring them in. Well, I guess that is what you ought to do.

And, similarly in the area of industrial relations, do not wait until the problems occur. Give the pre-eminence to industrial relations to get good relations and I would be very confident that in such a circumstance as you refer to, you would not be faced with any problems of any significance.

Squadron Leader Cornish, Naval Staff College: Military strategy is often the outcome of application of government policy to the military force. If you become Prime Minister of this country, would you support the attitudes you have expressed here tonight and, if so, how would you implement them?

Mr Hawke: This is a defence seminar, and you are going to see some beautiful back-foot defence now. I refuse to enter into speculations about my personal future, and I do not think we therefore need to respond to the question in the hypothetical situation that you have framed your question in. All I can say is two things. Firstly, as I said at the beginning, I do not — yet at any rate — pretend to be profoundly expert in the area to which I have addressed my remarks. I am developing a very significant interest in the area. I have got an enormous amount to learn, but what I have expressed tonight represents at least at this stage of my thinking what I believe is appropriate.

And I cannot see at the moment why I would have any reason to change it, and in whatever capacity I may find myself in the future I tend to think my thinking would go along the lines I have expressed. But, being an intelligent person, I am subject to the processes of persuasion.

Admiral Robertson, Member of the Institute. Mr Hawke, there is much that you have said this evening which I think a lot of people here would agree with but there is one particular question that a lot of us are puzzled over. You would be more aware than most that many of our shipyards around Australia over the last ten years, due to a variety of factors but in the long run to their competitiveness, perhaps, have closed down. Indeed, if it were not for Naval orders, perhaps all our shipyards except those building trawlers and things below that level would, indeed, have closed. We have now, of course, the campaign on the 35 hour week and I understand of course that certain yards which have Naval orders are, as you must know, suffering considerably from this which will indeed affect their competitiveness and may indeed result in whether or not in the future they are sufficiently competitive to be able to obtain orders. This seems to run rather counter to the principles you have been putting forward in your speech, and I wonder would you give your views as to why that industry, so important to defence, has been included in this particular campaign?

Mr Hawke: I am not quite sure whether when you refer to the damage to competitiveness you are talking about the possible damage effect of the actual campaign, stoppages and so on, or whether you are referring — which I probably think you are — to the possibility of the extension into that area of industry of a lower standard hours. And I assume, really, you are talking about the second rather than the first. And all I can say — well, not all, I could say two or three things which I think are relevant and perhaps helpful.

When we are talking about the move to reduced hours I think we have really got to understand, as I tried to put in the House the other day, that the world is not standing still, it has not been standing still and it is not going in the future to stand still. One of the observable changes which have taken place in this country since 1947 is a move to lower standard hours something like 40% of the workforce indeed has hours, standard hours of less than 40.

Now, one can leave one's prejudices aside on this and at least accept that that is the fact. You might not like it as a fact, but it is a fact. And it is also a fact — again one that you might not like, but it is nevertheless an indisputable fact that that process will go on in this community. I would suggest that every week there will be at least one enterprise in this country which will be moving to reduced hours. Now, if that were only happening

here in this country, then there would be, I suggest, a great deal of substance in your question; and if Australia were out of kilter with movements in other countries towards reduced hours then this could indeed be having a deleterious effect upon our competitive position.

But the evidence does not sustain that proposition. The evidence is that in fact there is this move to lower standard hours right round the industrialised world. And in strict economic terms, the move towards lower hours in the shipbuilding industry here would only have an adverse impact if in fact we were moving in that sector of industry and in associated ones, faster than is happening elsewhere. Now, I am not asserting to you that in other competitive areas that they are moving more slowly than we are; I do not know. But if it is the case that we are not moving more rapidly and do not move more rapidly than others, then that aspect, of itself, will not worsen our competitive position.

I would like to make one other point, and I want to make it in as non-partisan a sense as I can, because I do appreciate that on this 35 hour week issue there is quite legitimate room for differences of opinion. The evidence available to me from a fairly detailed examination that I have made of negotiations that have taken place in various sectors of industry does sustain, to my satisfaction, the proposition that properly negotiated agreements between management and unions on this issue can, in fact, produce countervailing benefits to offset the undoubted cost that can be involved in the move to lower hours. In fact, a number of such productivity bargaining events have taken place under the auspices of the Arbitration Commission.

True it is that in the decision earlier this week the commission suggested that that should cease, and they suggested it should cease because they said it was not compatible with a general campaign. But they did not say — because, I believe, on the evidence of their own decisions they could not say — that in particular industries or enterprises that you cannot get offsetting benefits. Now, these may well arise because perhaps unsatisfactory practices have, in fact, in the past, been militating against higher productivity. The point I make is that if in the shipbuilding industry where undoubtedly a number of unsatisfactory working practices do exist, if as a result of freely negotiated agreements you could get concessions by the unions, by the workforce, to give up restrictive work practices and positively to engage in more productive work practices, I put to you that it may well be that it will not be just a case of saying you just look and say there are certain increased costs in moving to lower hours. It may very well be that on the other side of the balance — it may not absolutely balance, it may be a bit less, conceiv-

ably it could be a bit more — by the abandonment of restrictive working practices and the adoption of more cooperative attitude between management and unions, you may get offsetting advantages. Now, I do not want to say that will necessarily happen, but I do feel that the available evidence would suggest that that has happened in other sectors of industry.

And I would conclude by saying that there does seem to me to be an enormous amount of evidence that in the sector of industry that you are talking about there is a great deal of room for improvement in working practices and more cooperative attitudes, and it may well be that in the circumstance that we are talking about, that could be achieved.

Mr Fynmore, BHP: Mr Hawke, I would like to take you forward in time — some of the speakers this afternoon were talking about the 1990s. Let us go out to the late 80s when perhaps you may be sitting on the other side of the house.

Mr Hawke: Before then.

Mr Fynmore: Given that we are going to have a resources boom — it may be coming along a little slower than some may have thought — in the late 80s I think we will be exporting gas from the north-west shelf, a lot of coal, minerals. I would think that our economy should be strong. I think most people expect we will have a stronger dollar even than we have today. Many pressure groups in the country, academics, politicians, lobby groups, others, consider that our tariffs must fall. In a country that is rich in resources, that considers it should have a defence industry — and I refer in particular, say, to the heavy engineering industry — what do you see for the future if we continue to pull down our protection?

Mr Hawke: I think everyone in the audience will appreciate that the question that has been asked here raises very fundamental questions about the nature of our economic development in the 80s and to do justice to the question I would have to give an exceptionally long answer. I will try and reduce it down to what I think are the essential elements. The argument runs that — and that is an argument which is put by those who for various reasons would not like to see the most rapid possible development of our mineral resources — the argument runs that if we develop those resources rapidly we will build up our external income and that the inevitable impact of that is that you have got to revalue your currency and, in those circumstances, either revalue the currency and/or a combination of reduction of the tariff, otherwise you are going to have unnecessary inflation or unemployment.

Now, you will appreciate that I am putting the argument in its barest of bones. I, and many of my colleagues within the Labor party, take the view that in fact we should not be afraid of the develop-

ment of our resources because that development, properly managed, can provide a situation in which the one major constraint against a more expansionary government policy to enable more jobs to be created would be removed. In other words, in economic terms, if you talk about the desirability of a more expansionary government program to create higher levels of activity, more jobs, the one basic economic constraint. So if you do that, you know the argument, that you run into balance of payments and exchange problems and so on. Now, if in fact from your augmented earnings from mineral development you do get a situation where the balance of payments constraint is removed or substantially mitigated, it seems to me that a government of either political persuasion if it is so minded is in a better position to adopt expansionary economic programs with a lesser fear of potential inflationary consequences.

And I believe that any government, Labor or Liberal, that is talking about expansionary programs does have a responsibility to think in terms of possible inflationary consequences. And the removal of a balance of payments constraint associated with this development does give any government, of either persuasion, the opportunity of thinking about expansion of a less inflationary kind. Now, that is, if you like, the general economic prospectus which I think fits around your question. It seems to me that in those circumstances that we are talking about, or in circumstances in which we were not having a mineral boom of whatever level of dimensions that you want to have, that there are going to be inevitably pressures upon our structure of manufacturing industry as it exists.

We know, basically, what those fundamental economic pressures are, and not the least of those, of course, is the fact that if you look at the growth patterns and growth paths of the countries of the world, the one thing that sticks out more obviously than anything else is that the growth path of the countries of the Pacific rim have been going at a very, very significantly higher rate than the rest of the world, and certainly higher than ours. And that in a circumstance where we are selling our agricultural and our mineral goods to these countries, there inevitably — it is a fundamental fact of economic life — there are going to be increasing pressures upon us to buy where we sell. And that, ultimately, is not something that can be avoided.

So what I come to, therefore, is that I think that really, on balance, the sort of developments that you are talking about are going to put us in a stronger position to deal with the sort of problems which inevitably are going to emerge. That is, some of our industry, I believe, will in one way or another be restructured. The problem for a country without resources is that if those

pressures upon your existing industry are such that a government has not got the capacity to develop alternative employment opportunities, then you are really down the gurgler. But the advantage, it seems to me, of developing our resources will be — and that is why I am in favour of developing them at a more rapid rate perhaps than some of my colleagues — the advantage, it seems to me, is that it will give a greater degree of flexibility to a government of any political persuasion to handle the pressures for restructuring in a way which can involve, if necessary, the creation of new employment opportunities. I am one — and, as you know, I was a member of the Jackson Committee and of the Crawford Committee. I am certainly one who would not be in favour of just moving to bringing down our tariffs because it is "a good thing". Because I do not think in economics or in politics there is any such thing as an unqualified "good thing". It would mean, if we were not in an economic position to develop alternative opportunities — it would mean unemployment of labour and capital resources, and I cannot see any economic sense in that.

So what we have got to be working towards as, I think, essentially we argued in the Crawford Report, what we have got to be moving towards is a situation where by the operation of expansion of the private sector with, in my judgment, stimulus from the government sector, we can lower the lever of unemployment. I think — my judgment is — that the development of our resources will put any government in a better position to do that so that we will be able, I believe, in the period that you are talking about, to handle restructuring in a much better, more efficient and humane way. I am sorry that the answer is a bit long, but I think it is a fundamentally important question.

Commander Campbell, Member of the Institute: Once upon a time, Mr Hawke, a very distinguished guest went to dinner in a great house, and in the course of the evening the discussion ranged from politics to sex to religion and under one of those categories the subject of unionism came up. The distinguished guest...

Mr Hawke: It could easily be under sex, could it not?

Commander Campbell: The distinguished guest turned to the butler and inquired whether he was a member of a union and the butler said "No, sir, I'm not". The distinguished guest said "Why?" and he said "Well, because I am unique" and, yes, I beg your pardon, the distinguished guest said "Bloody reactionary". By that definition, sir, we have some 70,000 reactionaries in the defence force. Do you see a role for unionism in the Australian defence force?

Mr Hawke: I have often been asked this question, and I answer it in this way. I have no reason to believe that it is not still the correct answer. It seems to me that this is a situation which ought to come from within the services themselves. If there is a substantial feeling amongst the services that their interests would be served by having a union then I do not see any reason why the interests of the community would be disadvantaged by that happening. I believe that you would obviously have to have certain qualifications. I mean, I do not think that you could have an unlimited right to strike in that situation because — well, I think the argument is obvious. I think that would be inappropriate in those circumstances.

I also think, and this is my own judgment, that

it would not be appropriate for them to be members of broader unions. I think it ought to be, if the feeling is there, it ought to be a service or services union, because I think they have particular and unique sorts of problems and environments within which they operate. But I do not think it would be beyond the wit of men and women if the feeling was there and it was strong enough, to work out circumstances in which a union could both be beneficial to the interests of the people concerned, and not be inimical to the interests of the community, but I repeat, it is not something that I would want to be imposing. I would rather see — if the desire for it developed, then I would respond positively to it.



His Excellency the Governor General, Sir Zelman Cowen on arrival at the seminar. Commodore Berlyn is being introduced to His Excellency.

THE INDUSTRIAL FOUNDATIONS OF MARITIME DEFENCE

by Admiral Sir Anthony Griffin, GCB

Introduction

As those of you who have degrees in philosophy will know the course starts with lectures on logic. A favourite beginning is for the Don to write up on the blackboard $2 + 2 = 4$. He then goes on to show that this statement is riddled with assumptions which should be argued. He spins this process out for two hours.

Consequently in addressing this daunting subject for no more than forty minutes in front of this terrifyingly distinguished audience I have drawn comfort from some of the recurring themes voiced at the Institute's first Seminar in February 1979 by such eminent speakers as His Excellency the Governor General, the Transport Minister Mr Nixon, Commodore Robertson, Professor MacGwire, Mr Gough Whitlam and Admiral Zumwalt.

Between them they stressed the growing importance to this island continent of everything to do with the sea; the need to move as rapidly as possible towards greater self reliance whilst recognising that this could never be total; the growing tensions around the rim of the Pacific Basin and the threats they hold for Australia; and finally the interdependence of the various elements of sea power namely maritime trade, defence and industry.

Whether the pursuit of these strategic themes and their industrial implications in an Australian setting can be based on either assumption or argument is of course a matter which only Australian can decide.

In the British context maritime defence strategy has to be argued continuously and becomes frenetic every time Ministers change. We now have our 17th Secretary of State for Defence since the end of World War Two. By contrast, and until a few years ago, this argument had always been happily coupled with the assumption that there would always be an industry to provide the ships. It is this assumption which has recently been challenged because shipbuilding — the cornerstone of our industrial foundation for maritime defence — had got into such serious financial trouble that many thought it should be left to die the death of a lame duck.

Consequently the pursuit of these strategic themes in Britain has become all argument and every single one of what we had previously

regarded as self evident truths, except possible that Britain is a lump of coal surrounded by fish, has had to be argued almost as thoroughly as a philosophy Don would argue that $2 + 2 = 4$.

I therefore thought you might like to know, at least in outline, how we have fared over these arguments. To put them into perspective I have first sketched in an historical background and briefly described the industry which the new Corporation of British Shipbuilders inherited. I have then addressed four of the main percepts we had to argue on the national political front and concluded with the principal changes we believed we had to make if the industry was to survive.

Historical Background

Ever since the Industrial Revolution the fortunes of British shipbuilding have followed a sine curve with deep troughs occurring on average every forty five years — 1840, 1884, 1930 and 1975. In 1932 only two merchant ships were launched from amongst over a hundred British ship yards. On the other hand in 1900 the industry was building 80% of the world's merchant fleet and had provided whole navies for China and Japan. It was all privately owned except for the

THE SPEAKER

Admiral Griffin joined the Royal Navy in 1934 and saw war service in the Far East, Mediterranean, Atlantic and Russian theatres during his 42 years in the Navy. The Admiral specialised in navigation in 1944, as a classmate of a former CNS, Vice Admiral Sir David Stevenson.

Admiral Griffin's sea service was spent on destroyers, cruisers and no less than 9 different aircraft carriers, including command of Ark Royal. His shore service included postings as Flag Officer Plymouth and Admiral Superintendent of Devonport Dockyard. His last service appointment was Controller of the Navy, a post which he held for five years and during which time he was responsible for fleet construction. He was also closely involved in the setting up of the Procurement Executive and became the first Sea Systems Controller.

Since his retirement from the Navy in 1975, Admiral Griffin spent 4½ years as Chairman of British Shipbuilders. He has since been involved in activities directed at increasing awareness of the need for industrial talent. He is President Elect of the Royal Institution of Naval Architects.

Commodore P.R. Sinclair, ANI Vice President, introduced Admiral Griffin.

Royal Dockyards which not only repaired but also built warships.

These private firms had operated for decades with a nearly captive home market and little competition from abroad over exports. They dealt with slumps in demand by shedding their workforce with little if any notice or compensation. They competed fiercely amongst themselves and as the quality and sophistication of the demand increased only those firms with sound design ability survived.

The scene changed dramatically after the Second World War when Japan decided to make shipbuilding a major plank in her economic recovery programme. In 1956 she overtook Britain and soon afterwards adopted the slogan '80 by 80', meaning she aimed to secure 80% of world shipbuilding output by 1980, thus effectively putting the whole of Europe out of business. For the British and some other European shipbuilders both home and abroad, export markets were shattered. Years of bad industrial relations made matters worse and the cost of overmanning and demarcation caused many firms to collapse. They would probably have failed anyway even in a fair market which of course was not the case.

The Government's growing concern led to a series of reports such as Geddes in 1966 followed by Patton, and Booze Allan and Hamilton, together with support from various Industry Acts. All involved taxpayers money so Treasury fingers have been stuck in the industry's till ever since.

Some respite resulted from these measures but as usual they were too little and too late and the industry continued to decline.

Some companies, like Cammell Laird, Appledore and Sunderland, were taken into public ownership, well before general nationalisation, to save them from collapse. Others, like Denny, were left to go out of business altogether.

Worse followed. The oil crisis of 1973 had wrecked the world market but, despite this, shipbuilding capacity, especially in Japan, the Developing World and COMECON, continued to expand dramatically until it soon amounted to over three times the demand. Ship prices fell well below the cost of building them even in Japan, South Korea and Poland, and this situation generally prevails today.

In Britain organised labour and the Labour Party clamoured ever more loudly for nationalisation. In the autumn of 1975 the Labour Government launched their Nationalisation Bill and appointed an Organising Committee to plan the nationalised industry. There were two of us and we set out to put our plans into effect within six months, that meant by mid-1976.

However, we were dogged by dogmatism. The Tories, clinging to Adam Smith's free market theories of 1776, were fundamentally opposed to

nationalisation since in their view it could only mean inefficiency and the featherbedding of the workforce. They were quite prepared to get out of merchant shipbuilding altogether in favour of the apparently thriving industries in the Developing World. The Labour Government on the other hand, with a majority of only one in the House of Commons, and a minority in the House of Lords, were still largely driven by the clamour of their supporters for job security. 'No redundancies' was their slogan and that meant of any kind, including voluntary. The Bill had a very rough passage, and in our view the arguments between the two political parties were irrelevant and time-wasting.

Eventually though the seriousness of the world crisis and the consequent difficulties of the industry became so stark that both Parties agreed to compromise and British Shipbuilders was formally established on 1st July 1977. We had lost an invaluable year.

The Inheritance

We inherited some 120 companies, including subsidiaries, and about 86,000 people. They formed only part of Britain's maritime industry. The rest, most of which was privately owned, included about a hundred firms building small craft and vessels amounting to less than 5% of national output; between 300 and 400 firms making marine equipment including special weapons and equipment for warships; and about half the national ship repair capacity other than the Royal Dockyards.

The Corporation's companies operated in six main fields namely merchant ships, warships, marine diesel engines, general engineering, ship repair and offshore vessels and structures.

The warship-builders had already been largely reorganised in 1971 to deploy design effort to best advantage and rationalise production so as to provide capacity, on a specialised basis, to meet all the shipbuilding requirements of the Royal Navy together with about a 30% margin for exports where demands would help to keep a competitive edge. Thus Vickers, Yarrow and Vosper Thornycroft were nominated as 'lead yards' whose design staffs specialised in particular classes of ship. They were thus able not only to guide the lead yard, which invariably built the first new ship of a class, but also other yards which might be required to build repeat ships. For example Vickers acted as the lead yard for all submarines, both nuclear and conventional, as well as Type 42 destroyers. Under Vickers guidance repeat submarines or destroyers are being built by Cammell Laird, Scott Lithgow, Swan Hunter and Vosper Thornycroft.

Whilst the design authority for all RN ships remains with the Navy the design expertise of the

lead yards was such that they could design and build to the special requirements of the export market without technical assistance from the RN — for example Vosper Thornycroft's Mark X frigates for Brazil and Vickers small conventional submarines.

Three yards, Swan Hunter, Cammell Laird and Scott Lithgow, acted as the so called 'follow on yards' whose production capacity could be deployed with some flexibility between RN and civil work. For example Scott Lithgow, in addition to being the follow on yard to Vickers for conventional submarines also acts as the lead yard for special civil vessels and structures in the offshore market.

The lead yards were, and still are, operating profitably.

As for the rest of the industry, the main problem area, because it was the largest and most affected by the severe slump in the world market, was merchant shipbuilding. There were about 42,000 people in that division and they had very little work in prospect. With few exceptions the companies were either bankrupt or heading that way. The engine builders and ship-repairers were in similar plight.

With both the market and the industry in such disarray urgent and drastic action was needed. It was bound to cost money whether the industry was saved or shut down, and over a period of a few years there was little to choose financially between these two alternatives.

Against that background I would now like to rehearse four of the main percepts we had to argue on the national front in order to keep the industry alive as what we had always assumed to be a vital national asset.

PRECEPTS

The more a Country depends on the Sea the greater its Need for a Maritime Industry

Few if any of us here today would doubt that a maritime country, almost by definition, needs sea power. It was a recurring theme of the Institute's first Seminar and the subject of Admiral of the Fleet, Lord Hill-Norton's talk to us yesterday. Its acceptance is spreading outside the traditional maritime countries. President Houphouët-Boigny of the Ivory Coast put it succinctly last year when he said 'The way to economic emancipation is the sea'. This dictum is being followed increasingly in Africa and elsewhere. Even Nepal has recently been in the market for merchant ships.

In Britain no serious doubts are voiced about our substantial merchant fleet so long as it remains a net earner of national revenue. Similarly the case for maritime forces continues to be sustained by the military threat argument. However we met serious opposition to the idea

that sea power should also include the wherewithal to build and repair ships. Of course the full inventory for a comprehensive maritime industry is formidable since apart from shipyards one has to consider training, research and development and marine equipment including weapons. It was therefore very easy to pillory the costs, especially as practically all types of civil and naval ships, complete with their equipment, could physically be bought from abroad at acceptable prices.

Our rebuttal was based mainly on the argument that Britain, with its crucial dependence on the sea could not sensibly rely totally on economic competitors to build all our ships when, how and where we wanted them. Many of those competitors, notably Japan, South Korea, Taiwan, Brazil and COMECON had for years been pursuing global loss leader commercial strategies for economic or political reasons or both. Admiral Gorshkov spells it out in his book 'The Seapower of the State.' ALL COMECON shipyards work to a Soviet five year loss leader plan with prices which undercut not only Japan but also even cut-price South Korea.

Such government sponsored loss leader strategies have come very close to extinguishing shipbuilding in Europe altogether. Fortunately we have been able to persuade both British ship-owners and our Government that once that had happened they would have no option but to pay the new going price, take their place in the queue, accept standard models or pay extra, put up with whatever quality was dished out and of course pay for the countries abandoned resources in terms of both people and capital installations.

We also pointed out that the survival of the industry depended more on the quality of its design and production skills than the quantity of its facilities. It was not therefore necessary to pay for a full inventory and in any case complete self reliance had long gone by the board. For example Western Europe can now obtain crankshafts for slow speed marine diesels only from Italy or Japan. The French and Dutch navies depend on Rolls Royce for their main propulsion engines and Britain depends on Australia for Ikara. We foresee the need for even greater interdependence in the future and believe this makes it all the more important to have selected, worthwhile and continuous contributions to make to the exchanges.

In this connection I would put offsets in a somewhat different category since they usually relate to specific contracts and exchanges in the defence field. We find this is often a very frustrating business unless a much wider field than defence equipment is brought into play, for example barter deals in raw materials.

These arguments eventually prevailed and both political parties have now declared a national need for a viable shipbuilding industry.

Turning now to another political hot potato my next precept is, **A viable Shipbuilding Industry needs a broader Base than Warship-building.**

The Conservative Manifesto of April 1979 promised to offer back to private ownership the profitable parts of British Shipbuilders and these consisted mainly of the three specialist warship-builders. The promise stemmed from pure dogma and to rebut it took us sixteen months.

Our main arguments were first that such a move would seriously disrupt the whole process of coordination and restructuring which we knew was the only basis for survival. This process involved extremely delicate industrial relations which, if upset could very quickly cause the civil sector to collapse carrying with it the 'follow on' yards which incidentally had more naval business on hand than the three specialists. Second, following such a collapse, the specialist yards could not long survive since their prices would have to rise to meet all the infrastructure and equipment costs which had previously been spread across the industry as a whole. This would put an even greater strain on the Royal Navy budget and severely reduce our chances of winning all important export orders. Third we pointed out that we would lose the great benefit of cooperation between the specialists and the remaining yards which was a two way affair. For instance Cammell Laird had developed a revolutionary method of building Type 42 destroyers and had cut the normal construction time by a year. Vickers' nuclear submarine technology had been invaluable to Scott Lithgow in their very demanding off-shore work; and many thousands of people had kept their jobs because we had been able to switch work amongst the different sectors to keep in line with changes in naval and civil demand. Fourth we pointed out how important it was to coordinate naval marketing and so present a united response to customers not only for warships but also for a wide range of other maritime needs. Finally we suggested that with the cuts in civil service numbers the Royal Navy's task, in having to deal with an uncoordinated industry would be much more difficult.

It took about two months after the Tories were elected in May 1979 for these arguments to prevail. However, we had failed to make them stick and, even though market conditions had become even more difficult, the whole subject was resurrected four months later and gathered much more momentum. On this second, and hopefully final occasion, much the same arguments were deployed but this time more widely in the Press and we had to lobby at least eight

cabinet ministers. The process took a further ten months and we could ill afford the time.

This leads to my third precept which is that — **A country which is fundamentally dependent on the Sea must coordinate its Maritime Policy.**

There are at least three sides to this precept and the first is political. The Party arguments, initially over nationalisation and subsequently over hiving off the profitable warship yards, have cost us dearly. Some 40% of our top management effort had to be devoted to them. We lost about two years worth of work and momentum and many talented people who ran out of patience. We also lost hundreds of millions of Pounds worth of orders since customers were naturally uncertain of our reliability as suppliers.

The politicians pitched from the dogmatic extremes of job security at any price on the one hand to Adam Smith's undiluted philosophy on the other. We argued that in a market place where Adam Smith's theories lay trampled under Gorshkov's sea boots and other loss leader threats, the only survival course was towards full commercial viability coupled with Government subsidy so long as those threats persisted. We hope this has now been settled but we will continue to need a consistent, coherent and, above all a unified political setting for our business and this can only come if shipbuilding, like our problems in Northern Ireland, is taken out of party political controversy.

A second side to coordination concerns the many different elements of sea power. These include a maritime force, a merchant navy, a fishing fleet, a hydrographic service, maritime surveillance and control, navigation aids, pilotage, rescue and salvage, pollution control research and development, shipbuilding, and shiprepair both in the public and private sectors. These elements talk to each other in a desultory way if at all and the result is that chances of saving large sums of money are squandered and combined operations are often blighted by incompatible policies or equipment such as communications. An informal body in Britain, called the Greenwich Forum, has been trying for years to sell the idea of maritime coordination but so far with little success. For example, not long ago the Government gave British shipowners £600m to rebuild the British merchant fleet. As there was no coordination between departments no strings were attached and about £400m worth of business was given to Japan at a crucial time for both Japanese and British industries. A more recent example was the argument between two British fishery protection authorities about payment for new off-shore patrol vessels which both authorities had agreed were essential. The shipyard concerned, one of the best in the



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country, stood eagerly by to get on with the job but were kept waiting by the argument so long that they only got the contract when they were within forty eight hours of having to be closed down altogether.

Some countries, for example Argentina, have attempted to deal with this problem through a powerfully placed Minister for Maritime Affairs, but with only limited success since he has been unable to reconcile the widely differing attitudes and style of government agencies on the one hand, such as defence, with those of commercial interests such as private shipowners on the other. We are very far from finding an answer to this problem but I believe the idea of a two man committee of the Cabinet, charged with maintaining a unified national maritime policy, would be worth a close study.

The third side to coordination concerns the vast array of authorities whose policies can have a major effect on shipbuilding. On the international front there are the OECD, the Common Market, the International Marine Consultative Organisation, and at least twenty others. In Britain we have to deal with thirteen Government Departments and numerous national authorities outside Government such as the General Council of British Shipping and the Trade Union Congress. There are many private sector bodies too such as trade associations. Most of them bear on our business continuously, and all have to be monitored constantly.

So complex had these linkages become that it was impractical for any individual company to spare the time or the people to find out what was going on. We have therefore taken this on as a major task for Headquarters and aim not only to tap in to what these authorities are saying but also to try to influence them into saying the right thing, for example for a Common Market subsidy policy. Based on what we can discern from all these national and international linkages we have been able to work out reasonably robust policies which can be handed to individual companies to execute, such as designing for international pollution control.

It was in this general area that we found very few people who understood the meaning of sea-power and its relevance to the prosperity of an industrialised island like Britain.

Talking about government leads me to my fourth precept which is **Government Support for Industry must be at Arm's Length.**

Despite everything said in our nationalisation Act about decentralisation, this is not how things have worked out in practice.

Tolstoy summed it up when he wrote 'I sit on a man's back, choking him and making him carry me, and yet assure myself and others that I am very sorry for him and wish to lighten his load by all

possible means — except by getting off his back'.

The Government machine, however ably staffed, and regardless of political party, treats any support for industry as a total licence to manage it. The results are almost invariably catastrophic because government methods are incompatible with commerce. They require consensus amongst departments and this is usually achievable only at the level of lowest common denominator and lowest risk. The process usually lasts longer than a customer's patience. We lost many who soon gave up even trying. Furthermore Government officials, being personally answerable to parliamentary committees, especially the Public Accounts Committee, require minute details of every transaction to be explained and recorded in case they are called into question, possibly some years after the event. For a long period every one of our potential orders which involved subsidy had to be vetted in detail and this process normally took weeks of haggling and explanation of esoteric points. It became even worse when the Government itself became answerable to the EEC Commission in Brussels since the average time for clearance was thereby extended by a further four months. Customers fell away like autumn leaves. All this was in marked contrast to the demands of an exceptionally difficult market where survival often depended on quick reaction to a telephone call by a shipbuilding Director who was prepared if necessary to take risks in pursuit of fleeting chances.

Our arguments have had too little effect and decentralisation is still not working out as it was intended. We therefore aim, whilst keeping the Corporation as a strongly coordinated commercial enterprise, to shed government subsidy altogether and invite support from private capital as soon as we become profitable. We believe the arrangements adopted by British Petroleum provide us with a useful model. They certainly keep the Government at arm's length and out of reach of the Public Accounts Committee.

Meanwhile the crippling hand of the Public Accounts Committee should be loosened by raising the threshold of its concern to at least £5m.

So much for the broader precepts relating to politics and Government. I would now like to turn to the industry itself and what we have been doing about it.

THE INDUSTRY

I have divided this section into two parts. The first gives my reasons in writing for the policies and structures which we have adopted. The second, which I have left till last for special treatment, is probably the most important issue of all, namely industrial relations.

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Policies and Structures

From the outset, and being ourselves convinced, despite all the doubts in high places, of the vital need for a maritime industry, our aim was commercial viability.

Just what viability meant was a matter of judgement as to the size and shape of enterprise which could soon be at least self sustaining in a reasonably fair market.

We judged this to comprise a warship division with very much the same quality and capacity as we had inherited. Most of it was needed because of the special nature of the RN's strategic requirements. Hence the changes we made initially were mainly in marketing and productivity. However, further changes are now in hand to reflect the RN's strategic shift away from an exclusively high threat level fleet to one which, for the sake of maintaining numbers on a tightening budget, will now include some less costly ships and submarines matches to less demanding operational requirements. For example the new Type 2400 conventional submarine is being introduced to a programme which for years had been exclusively nuclear. Similar moves are being made in the light frigate field, hopefully on a combined NATO basis.

In the civil field we judged that survival lay in exploiting the considerable design and production skills available by going for the high value added end of the business and abandoning the building of large tin boxes like VLCCs. Having carefully gauged the market, and the amount of subsidy the Government might provide to deal with our competitors loss leaders, we reckoned we should be able to win about half the new ships required by British owners and to match this with a similar tonnage in exports. The upshot was a merchant shipbuilding workforce of about 18,000, and this meant we had to reduce by about 24,000 or 55% as quickly as possible.

On the other hand the offshore market was a growth area with as much demand in the North and Norwegian Seas, which would amount in five years to as much as all previous work in those areas during the previous twenty years.

The net result of all these pluses and minuses was an overall reduction of the workforce from about 86,000 to about 70,000.

Our general approach therefore owed little to any purely job saving concept. Rather we subscribed to nationalisation because it provided not only the money available, namely the taxpayer's, but also the instrument by which we could restructure the industry by coordinating its strengths and discarding its weaknesses. In doing so we found a useful pattern in the successful warship division. It should all have been done about twenty years earlier when the Japanese mounted

their own coordinated attack on the traditional shipbuilders.

Our managerial concept was based on that of a holding company which decides broad policy and monitors results, but otherwise leaves companies to get on with their day-to-day business. However, especially at the formative stage, and with rigorous accountability to the Government, we had to intervene quite substantially. For example we had to introduce centralised marketing, and a production reporting system so that both work and resources could be deployed and if necessary redeployed to even out peaks and troughs which threatened delivery dates. We had to rationalise the very extensive R & D capability which was scattered amongst fifty two centres around the country. We also, as I mentioned earlier, had to sense what was going on in the world outside the industry so that we could work out sensible corporate policies for individual companies to follow. They themselves have all kept their names and been grouped in product divisions — for example warships, medium sized merchant ships, offshore and engineering. Each division is run mainly by the senior members of the companies concerned, backed up by one or two senior people from Headquarters. (We are keeping Headquarters staff to about 50 below the complement of a Leander Class frigate.) We regard the industry's design capability as one of its most important assets and we have sought to encourage and develop it in conjunction with the Country's substantial R & D resources. However, we recognise that no country can cover the entire design field hence the need to be selective and to work with partners. We also believe that a respectable, even if limited, design capability is essential both to provide a contribution to partnership and to provide technical advice nationally. This in turn means that the designers must have adequate opportunities to prove their skills through production.

I would now like to turn to what is probably the most important aspect of the industrial base, namely industrial relations.

Industrial Relations

We inherited an unhappy scene. In the majority of companies management and workforce had been embattled for decades. White and blue collar workers were loosely organised amongst seventeen different unions and a new union for managerial staff had just emerged. Industrial disputes had on average over the previous ten years cost over two million man hours per year. Productivity was low and delivery dates were rarely kept. The influence of trade unions was such that shop stewards had far more say in affairs than foremen and hence there was no sound chain of command or authority.

Wage bargaining amongst different trades in different yards amounted to a continuous leap-frogging marathon involving 168 different negotiations spread throughout the year. These took more management time than actually building ships and were not eased when the Government super-imposed its own wage bargaining policies.

There was severe overmanning throughout.

A major change of attitude was required. We had to persuade people that nationalisation's aim was to create and maintain a viable industry, not to preserve jobs at any price. The real enemy was international competitors, not the management. Government support was bound to be limited by other priorities and if the control and interference that went with it were to be avoided the sooner it could be dispensed with the better.

Our main weapon was involvement at all levels, without undermining management's ultimate responsibility for managing. It led to a kind of industrial democracy very different to that put forward in the ill starred Bullock Report.

Our first step was to recruit a highly experienced and respected former trade unionist as Deputy Chairman of the Corporation.

We next sent a substantial questionnaire to every yard and invited the views of anyone at any level who had ideas to offer. We followed these up in the yards and in the course of 162 meetings not only gained some extremely useful ideas for Corporate policy but also spread a genuine feeling that times had changed.

We initiated regular monthly meetings at top level with national trade union officials.

Perhaps most significant of these top level measures, and it is certainly unique in British industry, we invited three national trade union officials to join the Corporation Board as part-time members. As such they have full access to Board papers and information, except during the annual wage round, and take part in all Board discussions and decisions. However, as they are part-timers, most of their activities are concerned with the business and people of their respective trade unions. They thus retain the links which sustain their authority and the respect of their members. Since also they serve on the Board by invitation and are neither elected nor mandated by their members they enjoy considerable freedom to exercise their own judgement based on full information from both sides. This arrangement has served us exceptionally well and has the full support of both Labour and Tory Governments.

In the yards a new agreed set of rules for the avoidance of disputes was adopted. Joint management/trade union committees were established to monitor progress in such a way as to allow problems to be dealt with quickly or pre-empted altogether. There is now practically no

demarcation problem and individual trades have adopted a new spirit of flexibility. Productivity has increased dramatically.

The 168 wage bargaining sessions throughout the year have been reduced to one annual negotiation for the entire industry.

We have also made an encouraging start in adopting the device of 'Quality Circles' to re-establish the status and authority, let alone the morale, of foremen.

The overall result of these industrial relations policies has been a dramatic reduction in the time lost on account of disputes and this has been in spite of the major surgery to which I have already referred. Man hours lost have been reduced to about one seventh of the average over the previous ten years, and the figure for the last quarter of 1979 was the lowest on record.

Everyone now realises that their future depends on delivering good quality ships on time and at a competitive price.

In other words involvement has made reality of enlightened self interest.

SUMMARY AND CONCLUSIONS

To summarise I have concentrated on shipbuilding as the key industry and hence the cornerstone of the industrial foundations of maritime defence.

I have tried to relate how some of the main themes expressed during the Institute's Seminar in 1979 have had to be argued in Britain.

A summary of the Industry's history, especially over recent years, coupled with a brief description of the Industry itself, provides background to the intense political debate which attended nationalisation. In this debate the Left favoured protection in order to save jobs. The Right favoured exposure, even if it proved fatal. In the face of a world market grossly distorted by the loss-leader strategies adopted by economic competitors or political opponents, the debate was irrelevant and time wasting. It not only severely damaged the Industry's recovery programme but also put in question the assumption that maritime industry, particularly shipbuilding, is an essential element of sea power.

I have rehearsed how four of the main precepts in support of that assumption had to be argued.

These precepts covered Britain's need for a maritime industrial base and the exclusion of that base from party politics.

The need for the industry to have a broader base than warship-building since the latter on its own is too inflexible and uneconomical especially if design and production overheads cannot be shared amongst other elements of the business.

The need for coordination of maritime policy amongst politicians, amongst the many different

national elements of sea power; and amongst the large number of authorities, both national and international, who have any influence on maritime affairs.

The need for Government to avoid trying to manage a commercial enterprise.

Finally I described how, with the aim of commercial viability, the industry was reorganised and restructured on the generally successful pattern of the warship sector, coupled, so far as possible with the management approach of a holding company. Accepting that full self reliance was unattainable and taking advantage of design and production skills, business has been concentrated mainly at the high value added end of the market. Marketing and financial control have been centralised as has the sensing of the complex national and international scene so that

comprehensive and reasonably robust corporate policies can be established. The execution of policy is a matter left primarily to the managers of individual yards.

All this has had to be achieved against an extremely difficult industrial relations background. The key has been the cultivation of a new attitude and the adoption of fresh ideas which can be summed up in the word 'involvement'. The surpluses and weaknesses have been practically eliminated and the assets concentrated and co-ordinated. With the continued use of its undoubted skills, coupled with its new found motivation, the industry can confidently offer both its partners, and its customers excellent value for money.

It was hard work proving the maritime industrial equivalent of $2 + 2 = 4$, but worth it.

DISCUSSION

Chairman: Commodore P.R. Sinclair, RAN

Mr Colin O'Malley: from Dimet Marine. Sir, I think your talk was very enlightening here this morning. However, I think it is about six years too late.

We heard last night from Mr Hawke regarding offsetting and you made mention of it earlier, I refer to the 35 hour week and the need for offsetting. My question is, sir, in offsetting in the Australian shipbuilding and repair industry is it practical to offset by means of lowering the number of unions we have in our shipbuilding and repair to say two or a single union. There is a supplementary question, do you now in hindsight with your experience in Great Britain in building ships, see Australia once again becoming a ship building nation?

Admiral Griffin: The first question: We too have been faced with pressure to reduce the working week and there is quite a strong move in favour of 35 hours or a 70 hour fortnight and in certain areas, the engineering industry I think have come down to a 39 hour week, and we too are exposed to the same pressure. We said of course this is going to cost 6% or whatever it was, the choice is yours gentlemen because with that price level, the business will be reduced by this and it comes out to roughly 1000 men discharged for every 1% higher price and so they withdrew.

So it was that sort of argument that we found most useful in dealing with that sort of claim. It is connected to, but a separate issue from the question of the complexity of the trade union front, which is something which embarrasses them as much as anyone else. They are as keen as we are

to simplify it. I would not necessarily force the pace on this one. We first thought it would be a very sensible thing to go for one trade union for the shipbuilding industry but having looked at where this has been adopted in certain areas, for example Poland — there is only one trade union and I am not talking about Solidarity — you find you are very much hooked with one man and his personality and his style and so on and it is useful to have a few more around to disagree with him.

So by letting this evolve and in fact most of our negotiations are done with no more than eight unions and in fact the three we invited to join the board each represent a separate trade union and they cover the waterfront. One was a boiler maker who reckoned he was the aristocrat of the industry. The other extreme was a manual trades and then the third in the middle was the finishing trades so it is gradually coming down. I think I would be quite content to deal with only three unions, adding to which a lot of the unions are broke and are quite keen to merge. Even the boiler makers and the manual workers from opposite extremes were quite keen.

The answer to your second question is yes, this was, should Australia have a substantial shipbuilding industry. I have been asked that question and the answer is yes — in spades.

Commander Grazebrook: Naval Institute. Sir, recognising that you reduced your labour force quite considerably on the one hand but on the other hand you described and most of us know of some considerable changes in technology in-

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volved in shipbuilding and associated industries, how are you going for supply of skilled labour. Secondly, you described some very interesting methods on industrial relations and so forth. I would be interested to hear whether those are being applied in the Royal Dockyards and if yes, with what degree of success?

Admiral Griffin: There was a danger that in, for example, taking 24,000 people out of merchant shipbuilding that we would lose some very talented people and we were not able to safeguard ourselves completely there but we did to a very large extent because the people who retired, who left, did so voluntarily with the management's approval and so the management generally was able to retain the quality and balance the workforce that it wanted. So it was not so much of a problem.

As to the Royal Dockyards, no, they have not adopted these ideas and I think they are gradually coming around to them but the sooner they do so the better.

Captain Stuart Rodgers: Shell Company. Sir Anthony, I have listened with great joy to your speech this morning and come to one conclusion very quickly that when an industry is bankrupt there is one solution — put a retired admiral in charge. However, I do have a question. We sought to replace our coastal tanker some years ago and Shell International Marine acting as our consultants went out to 26 yards to invite tender. Very few British yards bothered to even offer to tender, they have no time factor on delivery and their price was quite outside the other tenders. We ended up in Japan with four yards on the short list and when we did sign the contract to build, they told us the vessel would be launched at 10.30 a.m. on 31 July and delivered by 9.30 a.m. in March 1981. They did not only make the day, gentlemen, they made the time.

I have just recently heard of another well known company who ordered a fairly simple crude carrier from a British yard, which shall remain nameless, and their delivery time was given as something between September of one year and March of the other. Realising your problems, I would like you to comment on that. Incidentally, the ship built in Japan was built with a profit to the builders.

Admiral Griffin: This has been very much the form we had to deal with and in talking to the management and the trade unions in the yards, we said the natural consequence of this is another

5000 people out of a job and it will not be voluntary redundancies. It will have to be compulsory. We will have to close down. So the quality of the competition, especially from Japan and it is not only Japan now, but South Korea — South Korea incidentally do not have any pricing experts in their yards. When you go to Hurundi for a ship they simply say: "What is the Japanese price?" and without using a pocket calculator they say: "Knock 10% off".

The question of responding to bids, I hope we are getting better and I hope people are realising that in the restructuring of the industry and the specialisation of the merchant ship sector to follow the pattern of warships, there are certain things that we no longer bid for. There are certain yards now which have full order books to the end of '83, and a lot of people go to Austin-Pickersgill and say "for Heaven's sake can I have a ship next year" and they are told, "sorry, you cannot". So I think there is a new spirit. People are going out for business and trying to get it done and they are sometimes unable to respond, either because the yard is full or because we have abandoned that type of ship to concentrate on ones we reckon we are best at. The second point about the crude carrier which was delayed, that yard has now closed down — are we talking about Dundee? There have been 10,000 redundancies on the Tyne and when we placed the Polish order incidentally — 24 units, 2 cranes, we went around all the yards including Swan-Hunter with a list of guarantees which we had worked out with our Polish customer, BZM. We put these to all the yards at the yards that might have a cut at this order and we said: "Here is the contract, we are just about to sign it within the hour, if you will sign this piece of paper".

All the yards concerned, and there were six, signed with the exception of Swan-Hunter. Within the hour — there were six ships I think allocated to Swan-Hunter — those were re-allocated to other yards, to Govern, Sunderland and Smith's dock — and Swan-Hunter I think suffered 5000 redundancies on that count almost within the hour. So this was quite effective but it was done with the full support of our trade union board members. They said: "You have given them a chance. You have put it on the table, they have not picked it up — curtains".

As to delivery times, I am glad to say that quite a number of ships are now delivered ahead of time.



THE FUTURE OF AUSTRALIAN INDUSTRY AND DEFENCE

by Professor Wolfgang Kasper

The 1970s were not a happy period in the life of this nation, nor for that matter of the other developed industrial countries in the West and — what we must not forget — also in the East. Whereas the 1960s had worked out roughly as we had expected at the beginning of that decade, the 1970s presented us with a number of unexpected, shocking surprises:

- On the demographic scene, we had to cope with slowed-down population growth. In the Australian case, this adjustment was reinforced by dramatic changes in immigration policies.
- On the political-strategic scene, we saw the military defeat of the United States in Vietnam, which gave rise to doubts in the solidity of the post-war "Pax Americana". The US-dollar-centred world monetary system was shaken up in the process. And the end of an era of U.S. dominance was more of a shock because of the full development of the Soviet-Chinese conflict and the development of many armed conflicts on the periphery in less developed countries.
- On the economic scene, we were faced with oil and food price rises, inflation, growing unemployment and an exploding bill for the welfare state, whose benefits were becoming increasingly doubtful even to its beneficiaries.
- On the industrial scene, there were new challenges from new industrial countries. Australia's well-sheltered industries and unions made the often unwelcome discovery that there were efficient new competitors to our not-so-distant north. We also discovered that an ineluctable consequence of the mining-export boom was that we had to import more. Cheap and well-made industrial products from overseas were seen as a disturbing threat to our established, through often somewhat senescent industries. In the new circumstances, the tariff gave insufficient protection in view of our home-made industrial mismanagement and union cantankerousness.
- On the technological scene, we were confronted with many new technologies and the need to take entirely new and very massive risks, for example in nuclear power generation, in utilising microprocessors, or in biotechnology.

When societies get confronted with so many, concurrent trend breaks and challenges to set patterns of thinking, expectations easily become uncoordinated; people lose confidence. This is what happened in the 1970s when old strategies of political management or business behaviour came to grief under the changed circumstances. We got disoriented. We lost heart. Our fears often only reinforced our sad predicament.

Experience shows that — in such a situation — the only solution is to re-examine one's basic aims, objectives and capabilities, to develop a new strategy which suits the new circumstances, and then to act boldly on it, even if it implies unexplored risks. The worst type of reaction is to cling to preconceived ideas and to try to secure past structures, privileges and positions; in such a situation, this amounts to a recipe for prolonging the agony of doubt, inactivity and stagnation...

What the nation needs after the unhappy 1970s is a bold new approach to national strategy. We need decisions and vision that will galvanise us into unifying, constructive action, free us of the fears of the 1970s, and open new opportunities for our disgruntled children.

Before you find this general proposition all too plausible and appealing, I better hasten to state that such a strategy is risky and demands uncomfortable adjustments — and we do have a less demanding alternative to recasting our national economic and industrial strategy. This may well be politically more "realistic": After all, Australia is a lucky country, and Australians do not have to slaughter holy cows. We can muddle on, as we did in the 1970s. We can continue to produce shoes, textiles and an inefficient diversity

THE SPEAKER

Professor Kasper is a distinguished economist who has acted as consultant for the Coombs Royal Commission, the Crawford Study Group on Structural Adjustment, and the Myers Inquiry into Technological Change in Australia. He has also served as a visiting economist at the Reserve Bank of Australia. He is co-author with Dr Robert O'Neill of Australia at the Crossroads. He also contributes articles on economic policy to the magazine Australian Business.

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of steel products and car models behind a government-held tariff screen. We can go on antagonising our ambitious Asian neighbours by petty protectionism of industry and of high-cost shipping firms and airlines. We can build bureaucratic empires, and allow many non-innovative, anti-competitive industries to keep their snout in the government trough. We can go on striking with gay abandon. And we will be as unaware as Britain was a generation ago that this island country is being overtaken economically and industrially by self-assured and increasingly unsympathetic neighbours...

The Present and Future Malaise of Australian Industry

In the first half of the century, manufacturing industry was the main engine of economic growth in Australia. The industry share in national output peaked about 1960 at a level of 28% and has declined steadily since, and we became more and more aware of a "deep-rooted industrial malaise".¹ The de-industrialisation of Australia accelerated in the 1970s despite many new government supports, so that manufacturing now only contributes 23% to the national product. Despite a proliferation of public reports on industry, policy makers seem no nearer to a solution than we were in 1975 when the Jackson Report came out.

The rise and fall of Australian industry is to some extent in line with international experience: once societies pass the income level that Australia reached in the early 1960s, growing income is spent less and less to buy manufactured products, but instead on more and better services. We enter post-industrial society. However, on average this turning point occurs with a much higher industry share of GDP, over 40%, and the decline tends to be less rapid than has been in Australia.²

That Australia never reached a degree of industrialisation which other countries attained is, as such, not surprising. A land- and resource-rich country can be expected to have a high share of agriculture and mining and a correspondingly smaller industry share. But the big and widening Australian shortfall below what is internationally normal cannot be wholly explained by this, nor Australia's extremely and abnormally large service sector which now covers no less than 60% of production. We have to look elsewhere for factors which stunted previous industrial growth and which now accelerate the industrial decline.

Such explanations are not hard to find:

- Whilst most advanced Northern-hemisphere countries liberalised their international trade after the second world war and facilitated international capital flows, Australia (and New Zealand) tried to preserve the industry

structures that had grown under the emergency conditions of the war and the quasi-blockade of trade. Northern-hemisphere industries specialised and imitated large-scale, high-speed US technologies by selling in world markets. They innovated to keep pace with international competition and reaped very handsome benefits from "economies of scale". By contrast, Australian companies felt encouraged to lobby successive governments for protection of their small production runs and of production techniques that often fell more and more behind best-practice standards overseas.

- Protection from the stimulus of world-market competition protects poor management practices and aggressive trade union behaviour. The longer it lasts, the more deeply engrained become habits that retard the progress of industrial efficiency.
- Protection in Australia was granted on a needs basis, i.e. to the industries with the smallest growth potential, whereas many potential growth leaders were starved of skills, capital and managerial talent and did not blossom in the turgid atmosphere of regulation.

As a result, we have an industry structure, which is, by international comparison, often — not always! — inefficient, distorted, strike-ridden, artificially diversified, non-innovative and rigid. The way to a profit is often not so much by innovation, creativity, risk-taking and hard work, but via the lobbies of Canberra.

What are the prospects for the future?

The old ailments will not go away if we persist with old policies (such as the government's recent decision to grant the textile, garments and footwear industries another seven years' grace from the market forces). Protection from international competition will only induce firms to maintain the inefficiencies of small-scale production runs for a market of 14 million consumers, that is a market the size of Holland, Bavaria or 2/3 California.

As a matter of fact, the trend breaks and challenges of the 1970s and the 1980s will aggravate the ailment:

- The Asian industrial revolution will create ever more competitive products. These will push into the high-income markets of Australia, which is at their doorstep. Some of the new industrial countries of Asia are rapidly catching up with Australian standards of industrial technology, skills and income. We should also not overlook that these countries go not only through an industrial, but a social revolution, which creates insecurities and the wish to assert oneself by confronting outside adversaries (as Japan



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did when it felt economically frustrated in the 1920s and 1930s). This may have severe long-range implications for defence needs. A policy of little protectionist pinpricks against Asian exporters — a quota here, a tariff there, a new European-Australian airline cartel elsewhere — gradually pieces together a selfish, petty image of Australia in the minds of the dynamic young leaders of Asia. This might become a precondition for a slide into a military crisis. We are squandering essential goodwill by petty trade policies.

- The second mining boom of the late 1980s and the capital inflows that will precede it, will create a bigger adjustment to more imports than the one that surprised us in the first mining boom of the late 1960s and early 1970s. Will we again be caught unprepared? We still have some little time left to sort out our industries, to rationalise and specialise, including for export, but time is getting desperately short. If we waste it, the industrial malaise will multiply — whatever band aids we'll patch on later.
- The tariff has fostered too many labour-intensive consumer-goods industries in Australia, whereas the share of the (unprotected) investment goods sector is rather small. This lopsided structure is now hit by technological change, especially micro-processor technology. We get new, more efficient capital goods which destroy jobs in labour-intensive industries making consumer goods and services. But the new technology also creates new jobs in making and servicing microprocessor-aided capital goods. Unfortunately for Australia with its artificially created, lopsided industry structure, many of those new jobs are in Japan, America or Europe from where we import our capital goods because of the distorting effect of trade protectionism. The net effect of new technology is a job loss, not because this is inherent in technical change but because we distorted industry structures in the past.

All these vexing prospects for Australian industry contrast with those numerous unexplored opportunities for new, highly innovative industries in Australia. Despite the overall impression of malaise, there are numerous promising ventures. Despite the over-regulation of markets, Australian enterprise is often strong and vigorous and ready to exploit the resources with which this country is so well-endowed. We have plenty of land, energy minerals and other natural resources, industrial skills,³ a reasonable average education, capital and an appropriate infrastructure for industry. Australia is politically stable and in the dynamic Asian neighbourhood — an increasingly important factor for inter-

nationally mobile investors who were shocked by "accidents" like Iran, but who find New York too distant from the booming markets of East Asia. Indeed, there are impressive growth opportunities for selected, specialised Australian industries if one investigates them on the assumption that domestic markets will be opened up to international competition and free capital flows and that policy becomes innovation-oriented. Such policies are in line with traditional liberal philosophies, to which the tide of international opinion is again turning and which have stood the test of time again and again since 1776, when Adam Smith published the "Wealth of Nations". I participated in a study group — the group which published the aforementioned "Crossroads Study" — which did just that.

Without being able to go into detail, let me give you some of the conclusions of the "Crossroads" study:

- (a) Per-capita incomes will rise between 1973 and 2000 by 1.7% p.a. if we try to conserve present structures and by 3.8% p.a. if we embrace innovation and competition. This means, according to our estimate, that per-capita incomes in the year 2000 could be 70% higher if we play our cards right, than if we rigidly defend present economic structures.
- (b) We found a formidable growth potential for manufacturing if only we sacrifice long-protected sacred cows, get bureaucratic impediments out of the way and latch on to the rapidly growing Asian markets. In a recently published analysis of Australia's industrial growth potential under a new industrial strategy, I identified the following industries as some of the most promising industrial growth leaders:
 - coal refining and chemicals;
 - basic metals and metal processing, engineering activities;
 - agricultural, mining and industrial machines suited to rough Australian conditions.
 - metal- and technology-intensive car components, and
 - food processing.⁴

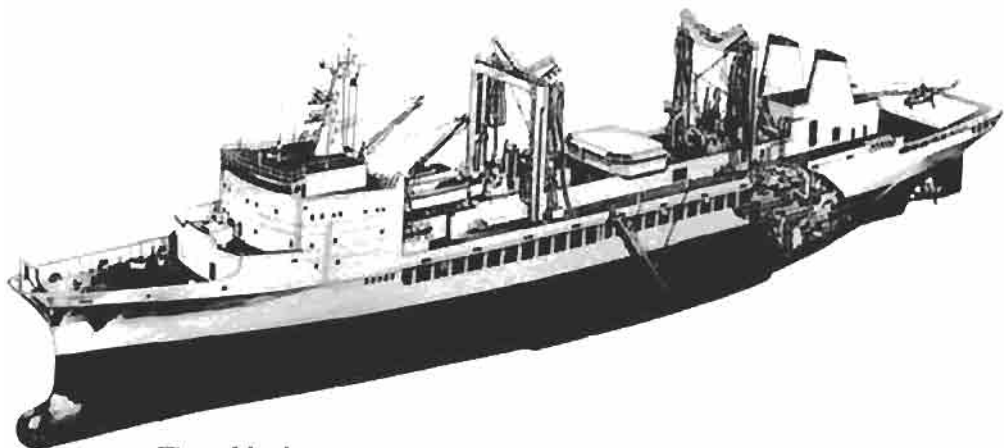
The "Crossroads Study" estimated that the manufacturing sector would — under a strategy of liberalisation, innovation and rapid structural change — grow by about 5% per annum in real terms as against a bare 1½% if we continue to believe that bureaucratic interference and protectionism can postpone change and can underpin industrial success.

- (c) We identified a considerable number of new technologies that could create new growth industries and new jobs in Australia, es-

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pecially in micro-chip technology, in biotechnology (both for agriculture and medicine), in materials technology and energy substitution. Let me select a few exciting prospects that emerged from a survey of the members of the Industry and Science Forum of the Australian Academy of Science which we conducted for the "Cross-roads Study" and which may have naval applications.⁵

- We are likely to get new energy sources for propulsion, possibly the use of coal dust, coal slurries or coal gasses, new fuel mixes in combustion engines, new types of batteries and fuel cells.
- Electronic devices will revolutionise information processing and the control of production processes. Many routine tasks will be done by "smart machines", electronic-mechanical devices that do not go on strike, do not get tired and can operate in unpleasant environments.
- In materials technology, we may see the use of fibre ceramics, new alloys and new metal-plastics compounds that could have similar effects on a wide range of activities which synthetic fibres had on anything from sailing to the wool industry. We may get harder and more light-weight armour and new hull-building materials.

Pioneers who utilise these new technologies will reap great commercial benefits, and Australians seem well-placed, because of their resource endowment, to participate in the next wave of industrial creativity.

- (d) Paradoxically enough, the rate of job creation would be about twice as high under a scenario of change than if we try to protect jobs from change.

Different from many Northern-hemisphere countries that suffer from similar industrial adjustment problems, Australia has rather promising starting conditions. Or will we yet again be the "lucky country" which can get away without a bold choice, never mind the opportunities foregone???

Implications for Defence

What are the defence implications of the prospect of a continuing industrial malaise versus the potential of a structurally changed, specialised, internationally integrated and vigorous industrial sector?

The first long-term economic precondition for strong defence is a healthy economy and solid industrial growth. As defence becomes inevitably more expensive, it is obvious that vigorous economies will be able to foot the security bill much better than stagnant economies and societies. In the long term, therefore, we have to label policies and social attitudes that hamper

economic and industrial growth openly what they are: policies that weaken the nation's *defence capability*. If we lock our economic development into a pattern of protected industrial rigidity, whilst our neighbours to the north boom ahead, we create poor security conditions in the very long term. Stagnant economies also create poor social conditions for defence. Industrial vigour and enterprise does not only steel the moral fibre of society, but also offers the young opportunities so that they can identify more easily with the society in which they live.

A second economic-industrial precondition for sound defence is a versatile, flexible and modern industrial infrastructure, preferably broad-based to supply our forces with as many inputs of equipment and material as possible. But if we can only maintain this at great cost to long-term economic growth, we must rely on imports and accept the cost of greater dependence. If there is a conflict, we should not hamper economic growth and long-term security interests by giving priority to medium-term defence procurement interests.

With regard to this criterion, the choice between a strategy of protected muddling on and a strategy of opening up and innovation has two-sided defence implications which need careful scrutiny:

- (a) On the one hand, defence would gain from the presence of those highly specialised, flexible and enterprising industries which free international competition would generate with Australia's factor endowment. The way specialised military technology develops, it will probably be more and more important to have versatile engineering and electronics industries and a strong investment-goods procuring sector, which I expect to develop under free trade. It is true that many of these industries will be too specialised to make complex defence equipment, but they would develop the skills and the infrastructure on which we could rely for adjustments of equipment, for repair of battle damage or for quick redirection towards defence needs in an emergency. Such versatile, competitive industries might also be more capable of producing high-usage components and spares for defence equipment.
- (b) On the other hand, trade liberalisation would do away with industrial diversification and self-sufficiency in many industrial products. We would become more exposed to disruptions of international trade. In the "Cross-roads Study" we estimated that the import share in total supply could be as high as 17% by the year 2000 (as against 13% now). Although this is a trade dependence which is

low by international comparison, it is a prospect many Australians dread after the experiences during two world wars.⁶

We must be careful not to revive the defence argument for the tariff, which may have been valid one or two generations ago and which government policy does no longer adhere to.⁷ We ought to ask:

- whether we should prepare for the last war and a protracted quasi-blockade of trade, or whether a quick-shot war as described in the book on the "Third World War" is not much more likely,⁸
- whether localised military conflicts and regional harassment cannot be bypassed by our trade if we appropriately protect our sea and air trade, and
- whether the eternal, artificial maintenance of inefficient industrial capacities for a distant defence emergency is worth the cost of slow economic growth and foregoing potentially vigorous, specialised metal and electronics industries, which can only develop under open trade specialisation.

We, of course, only need a broadbased industrial structure for a long world war. My own feeling is that Australia will in the very long term have no real choice but to adjust, to accept and soften the consequences of industrial adjustment for defence, even in the contingency of a long war. The decision on industrial policy will, of course, ultimately not be taken on the grounds of national security, but of economic welfare. Both are national objectives of equal rank, but we have to scrutinise the trade-offs between economic well-being and security.⁹ But we ought to scrutinise decisions on economic strategy for their long-run defence implications. In my opinion, the defence aspects of alternative industrial strategies for Australia are basically between a heavily government-controlled, diversified, inefficient and inflexible industry sector of the present Australian style and a competitive, versatile but narrowly specialised industry sector of the Swedish style, which is technologically modern and engineering-oriented, but which of course can neither support a complex, diversified defence machine any longer.¹⁰ However, a Swedish-style industrial sector can do more for defence than Australia's present industry structures.

To think that any country with 15 million inhabitants can support a modern defence apparatus, even irrespective of the cost, is an illusion! It is also an illusion that such a country can maintain an industrial base for even a satisfactory degree of independence in procurement. Not even France can be that independent of political boycott — let alone Australia. Defence planners have to be more modest in their demands on industry — or reduce their tech-

nology to underdeveloped-country standards, which would deprive this thinly populated country of much of its defence punch.

Reappraising Defence-Industry Policies

Our reappraisal of industrial strategy will, of course, also have to include the often very high, hidden protection to Australian defence-goods manufacturers, both the government factories and the private firms that benefit from "buy Australian" policies, costly offset agreements and Australian Industry Participation. If we lower protection all round, we must ensure that we do not — out of old habit and because of the force of well-organised supplier lobbies — continue unnecessary protection, inefficiency and industrial rigidity in defence-goods industries. Many protective devices for defence industries will not be necessary when tariffs and other interventionist devices cease to artificially raise the overall cost-level of Australian industry. In defence industry, many of those protective devices seem to lack credibility anyway. Whilst we hear much resounding political rhetoric on local purchases for defence, there has been an inevitable trend towards relying more on overseas supply. This trend will go on.

A re-examination of our policy on defence industries will have to be based on whether defence requires from each particular industry:

- (a) specialised big-ticket military hardware and software for which there is no competing civilian use,
- (b) services and production facilities to modify and maintain equipment, to repair battle damage, and to provide munitions, or
- (c) supply goods and services that are ongoing inputs into defence and that have either competing civilian uses, or where switching from civilian to military usage can be done quickly and rather inexpensively.

Although the dividing line between these categories is fluid, a rational use of the limited defence dollar and our long-run national interest in the flexibility of a vigorous industrial sector, dictate that we pursue different policies for these different categories of industrial input into defence:

- (a) Big-ticket items are typically so sophisticated and subject to such big cost-savings in large-scale production runs that a small country like Australia will have to rely on imports. The highly specialised and changing technology to make these items is often beyond the reach of Australian industry. Where feasible and cost-competitive, participation in multinational production along the lines of the proposed "world-car concept" should of course be envisaged. It is well known that, in some areas of specialisation — like the

Jindivik, the Ikara, the Nomad and wing-rib infrastructure — Australian manufacturers have come near world performance standards as far as technology is concerned, but not always as far as cost competitiveness is concerned. If industry opens up and becomes more efficient all round, one might expect more such specialised ventures to prosper, including probably components manufacture for military uses. We may then be confronted with the difficult political and ethical problems that face arms exporters.

However, such specialised contributions by Australian industry will be limited and insufficient to support the entire defence effort. There is no economic reason to oppose such specialisation where it occurs without the need for subsidy or protection. But there is also little reason to go on wasting resources by perpetually subsidising the manufacture of military hardware against market forces and industrial realities. The only criterion for production of military capital goods in Australia should be competitive quality, price and delivery capability.

- (b) By contrast, modification and repair facilities will have to be maintained in Australia, even if small scale and high costs weigh against it. This can be done in most cases without going into the manufacture of entire systems of hardware. In such cases, open, visible subsidies out of the defence budget — as are sometimes given — are a politically more honest way than hidden cross-subsidies through "buy Australian preferences" or offset arrangements which have the same vile effects on industry as tariff protection.
- (c) Other inputs — including high usage spares — should be competitively priced and costed and bought by the military at competitive prices, wherever they are cheapest. The calculation of what is cheapest must of course include an allowance for higher transport and storage costs for imports and include allowances for the risk of possibly greater down-time of foreign-supplied equipment. In addition, a good case can be made for making military plans for the contingency of industrial mobilisation that openly subsidise certain industrial facilities to overcome critical supply bottlenecks during national mobilisation. For example, if we foresee a bottleneck of a certain type of fuel at times of military alert, we can justify a subsidy for extra stock-keeping, or for installing refinery equipment that could overcome this bottleneck.

Overall, we should critically assess how much featherbedded, tax-nourished defence industries really contribute to defence preparedness in an open dynamic economy. A naive outsider like myself can often not fend off the heretic thought that a highly subsidised government shipyard, controlled by Australian unionists, is a lesser defence asset for the country than an efficient one in California, and that the assembly of fuselages by methods employed otherwise only by Oriental bazaar craftsmen is not a rational or feasible way of keeping up an industrial infrastructure for modern defence.

Conclusion

Let me summarise by repeating that the concurrent trend breaks of the 1970s and 1980s have put us into a situation in which we have to re-examine preconceived ideas on social and economic policies, as well as individual plans and strategies, including defence planning. This is a vexing situation, as any need for choice will vex us. But we must look beyond the immediate plans of decision-making and realise that choice is also opportunity. After all, this lucky country can exploit more tantalising opportunities than most developed, northern-Hemisphere nations.

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- 4 W. Kasper, "Where Will the Jobs Come From?", *Australian Bulletin of Labour*, Supplement, (Dec.) 1980, p. S37
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- 6 This attitude is reflected in various reports by Parliament of Australia, Joint Committee on Foreign Affairs and Defence, for example — *Australian Defence Procurement*, Canberra, Nov. 1979, mimeo. This report appears to adhere nostalgically to the lessons of 1939-1945, arguing the case for protection of defence industries even at every high cost, and often appears somewhat unrealistic with regard to cost, technology and industrial capability
- 7 The 1976 White Paper on "Australian Defence" makes it quite clear that technological gaps cannot be overcome and that costs of small-scale production can often not be justified (Chapter 8, paras 24-28)
- 8 J. Hackett et al., *The Third World War* (London: Sphere Books, 1979)

References continued after discussion.

DISCUSSION

Chairman: Captain W.S.G. Bateman, RAN

Mr Ray Brown, Commonwealth Steel Company: I would like to put this to you: Our competitors are subsidised and tariffs do not arise very much in trying to sell manufactured items into the EEC or Japan. You just do not get an import licence. Two of our speakers have said that overseas ships are sold at less than cost and 100% depreciation in the first year is allowable. I would like you to comment on that.

Professor Kasper: I should start with something a bit provocative by saying that if someone subsidises the things I buy I do not mind it, I benefit from overseas subsidies frequently by being able to buy more cheaply, but that of course is only the very short term consideration and we know that the price later may be much higher. We do not want to be in the hands of monopolies but with regard to the world steel industry, there will be no monopoly. I see monopoly possibly in ship hulls and things like that. There will be enough competition for the next couple of hundred years and I would like to enjoy the subsidies of the Japanese steel industry as much and as long as I can.

I thought I had made the point with regard to the tariff that the tariff is not in the Australian interest. Never mind what the others do. You vaccinate yourself and protect yourself. It would be in the Australian national interest to remove the tariff, irrespective of what the others do. With regard to depreciation, I think that our tax laws and other treatment of capital in this country are fairly stingy and as part of the strategies we discuss in the Crossroads study we certainly make a case for much more depreciation. As long as the word "interest rate profit" is a dirty word, you do not get enough capital into job creation and modernisation and I would certainly favour much more rapid depreciation rules than are embedded in Australian income tax legislation. Mind you, the income legislation was framed during the heyday of Fabian thinking in the immediate post war period.

Mr Graham Raymond, EMI and C3: I want to draw on some remarks of a speaker yesterday which really comes in at the user aspect. Lord Hill-Norton spoke of the 8-10 year lead time involved in purchases and he also drew some identification of the need for surveillance, communications and command and control, as contrasted with some more traditional need

aspects of platforms. The theme of the present speaker is most important to the development of the industry in defence. There is no doubt about that, but what I want to ask him is that given the fact that government has direct control over half the market in high technology, irrespective of whether it is the customer or not, government controls half the market for high technology. That is a statement I draw from Dr Simon Raymer who founded TRW and Bunker-Raymer, quite a well known free market capitalist, but he made that accommodation.

My question is: Would it not be a more desirable thing for industry in defence to decouple systems from platforms, to develop by policy modular concepts that enable the unbundling of technology. When you are working in the 8-10 year lead time, technology can be bundled into a ball that just cannot be taken apart for the benefit of the user over the lives of the equipments. My perspective is that the industry will be best served by policies to decouple systems from platforms and to unbundle technologies so they can be fairly deployed over the lives of the systems.

Professor Kasper: I should almost claim, Mr Chairman, that I am not terribly well qualified to make a comment, but I will make an ill-qualified comment just the same.

We do have very long lead times indeed, over a period that is unknown and where we will have lots of surprises. Hence the importance of trying to look ahead and make guesses about the future, as we did in the Crossroads study. It is a factor that in these national policies you have to shoot at a target frequently that will only be there in 20 years time, and that you live in a democracy where politicians and the public react to yesterday's blunders. The importance of flexibility in such a situation is certainly very big. You quote the example of decoupling systems from platforms, building modules, plugging them together in different ways, it is certainly one way of doing it. But building modules frequently is done in grade series and you get that flexibility frequently if you operate in export markets.

If you have a world of different uses for your bundles of technology that has great variety, you are more induced to go for modular concepts. You can put them together differently and modify those if you are confronted with international

competition and international challenges to your imagination and industrial creativity more easily than if you are locked into a once-off custom made government demanded system cum platform.

Captain Hughes: Professor, you spoke of the need for industry to take risks in new innovative ventures. The recent announcement by Esso not to proceed with the pilot shale oil conversion plant raises in my view a number of issues. The involvement of a major multinational company which has already got much at stake in the energy field, the role of government in high risk new ventures and the importance of fossil fuels to Australian defence for the future. I wonder if you could comment on what you see the role of the government and the sort of investment policy it should adopt in such major new ventures and projects which have long term security and defence implications.

Professor Kasper: I could answer with a four letter word "none" but that would be a bit too crisp. There are risks involved. There will be about turns. Whenever you explore the unknown, whenever you explore new conditions for example of energy supply, of course it is not an easy course to chart. I would rather leave it to Mr Gosper to say something specific if he wants about the Esso-Rundle area but more generally, yes, there are high risks. If you are confronted with the unknown and with high risks, what is a better strategy — to send out lots of independent search parties that try to find the right solution and test one solution against the other, which is basically the process of the market approach, the competitive approach? Or to have a big government corporation that concentrates all the search party in a bureaucratic framework and then goes out. It may, of course, hit the right solution but history has taught us again and again that if governments go out in a concentrated approach, they are likely to have a concentrated blunder, or a concentrated failure perhaps.

We know that the situation we are now confronted with has uncertainties, trend breaks etc. which have led again and again to a crisis of the capitalist system. Karl Marx described that in a classical book, but we also know that the capitalist market system has always overcome those crises and uncertainties, by developing new sources of supply in a competitive way, pitching one man's brain and one man's guts against the other. But we have never had so far any experience as to how such a trend breaks and how these challenges are overcome by a centrally planned economy. Indeed, it will be very interesting for an economist to watch over the next 20 years the Soviet Union, which is faced with the same industrial problems which we have in the West, with their rigid party controlled central system that will come to grips with innovation, with slaughtering holy cows etc. There is one advantage certainly in the market system and that is that it cuts out losses before they become too bad, and it is for that reason that I would always stake my own money on competitive innovation in the market system and would not see too much government role in it.

References (continued)

- 9 It has long been recognised by economists that security costs sacrifices in economic well-being. Indeed, the father of modern economics, Adam Smith, stated quite categorically that it was the "first duty of the sovereign, that of protecting society from the violence and invasion of other independent societies, can be performed only means of military force". In modern war the great expense of firearms gives an evident advantage to the nation which can afford that expense. *The Wealth of Nations* (London: Dent, 1971), chapter V, part I which constitutes the classical economic justification for a strong defence.
- 10 Until the 1970s, Sweden had never protected its manufacturing industries which often developed into the most efficient producers anywhere and which have lent much support to Sweden's defence industries, although now there usefulness is getting less because of the rising complexity and specialisation of defence equipment and increasing economies of scale.



DEFENCE ORIENTED RESOURCES

A group of presentations by: Mr R.K. Gosper, Sir David Zeidler CBE, Mr A. Sharpe

Speakers introduced by Commodore P.G.N. Kennedy, RAN

ENERGY

by Mr R.K. Gosper

Let me start off by saying that the events of the past decade have profoundly changed the international energy scene creating new and pressing priorities in our energy outlook. However, despite some erroneous forecasts which predict the world's impending demise through shortages of energy and resources, we can be confident of our energy future. I believe that with sound management and realistic policies we can make the transition from an oil based economy to one based on a broader mixture of energy resources although I do not underestimate the difficulties which will be involved.

May I remind you briefly of the continuing importance of oil in the world's energy supply and of the pivotal role played in that energy supply by the Middle East. Despite a 5% decline in consumption last year, oil continues to supply over half of the non-Communist world's energy requirements. We are especially dependent on oil for our transport fuels which account for something like 30% of the world's energy consumption and two-thirds of oil consumption. In Australia, transport accounts for an even higher proportion of crude oil consumed, a reflection of our greater dependence on long distance transport.

The massive investment already made in our existing transport fleet systems and the high costs and technical difficulties which would be associated with any switch either to new methods of transport or alternative fuels for transport mean that any radical change in this consumption pattern is unlikely over the next 10-20 years. OPEC countries in 1980 provided about three-fifths of the oil consumed, of which the Middle East members of OPEC supplied two-thirds. Of course, I am talking about what we regard as the world outside Communist areas. The dominance of the Middle East is even more pronounced when looking at oil reserves. OPEC countries control more than two-thirds of the non-Communist world's known recoverable reserves of almost 600 million barrels with by far the lion's share being in the Middle East.

While large oil discoveries have been made in non-OPEC countries such as Mexico and the North Sea, these are not large enough to affect the world's reliance on OPEC at least in the medium term. Unfortunately, political instability and changing attitudes towards depletion of a finite resource mean that we can no longer rely on the Middle East countries to increase production to match potential demand. Since the end of World War II the Middle East has in fact, and I do not need to tell you, been accident prone. That is to say, it has been an area where revolution and war have become almost sadly commonplace. There have been three Arab-Israeli wars, governments in different countries in the region have been overthrown by force and fighting between neighbouring states occurs constantly.

In the past few years there has been a resurgence of fundamentalist Islam as a reaction to what is seen by many in the Middle East as the pernicious influence of Western materialism upon their traditional way of life. This religious element was the mainspring of the Iranian revolution and could remain one of the most potent factors influencing events in that region and indeed, other parts of the world. Another uncertainty is the extent to which the Middle East might well become embroiled in east-west block rivalries, particularly if the eastern block countries become major competitors for the limited amount of Middle East oil available for export.

The other major policy development within OPEC has been the related steps to increase prices dramatically while at the same time restricting production. The price of crude oil, as

THE SPEAKER

Mr R.K. Gosper is currently chairman and chief executive of the Shell group of companies in Australia. He has had twenty two years with Shell in management positions, both in Australia and overseas. In parallel with his distinguished career in business he has also demonstrated outstanding qualities in athletics and has won medals at both Commonwealth and Olympic games. He led the Australian Team at the Rome Olympics in 1960 and is at present a member of both Australian and International Olympic Federations.

most of you know, has risen by a factor of 15 since 1970. The effects of such a large increase on oil supply and consumption while painful indeed, have established a more realistic energy market. For the early 1980s at least, I expect the price of oil to move approximately in line with inflation because of the weakness in demand. Production cutbacks by exporting countries are a partial reflection of falling world demand but they also signify a redirection in the long term strategy of producing countries. OPEC members are currently questioning the long term wisdom of producing a scarce and valuable commodity such as oil in return for financial assets, the value of which is being rapidly eroded by the high levels of inflation which persist in our Western world.

Countries such as Libya and Kuwait have decided to limit production to extend the life of their petroleum reserves. While these developments have caused some adjustments among the oil consuming nations, we need to maintain more perspective. The desire of consuming countries to obtain reliable supplies of oil at reasonable prices must be balanced against the concern of producing countries to protect the value of their oil which in some cases is a nation's sole source of wealth. We must accept that producing countries are taking a longer term horizon with respect to their oil and this adds a further dimension to the complexities of the Middle East oil supply situation.

In essence, the energy outlook is governed by the following factors: There is no realistic alternative source of energy to replace oil in the next 10-20 years and there is little prospect of finding sufficient oil outside the OPEC countries to meet more than part of our oil needs. Equally, we can no longer rely on the Middle East to play the balancing role in meeting the world's energy demands. That is to say, increasing production easily to meet sudden jumps in demand and easing production at times of economic downturn, which was part of the history of that region in the 50s and 60s.

Given this prospect, what is to be the response of oil consuming and oil importing countries? Clearly one essential response must be to reduce or restrain oil consumption and to lessen reliance on Middle Eastern oil. There has been marked progress in this direction. The growth in world oil consumption has been halted and there has been a substantial decline in oil imports in major consuming countries such as for example the United States. Economic recession has undoubtedly been an important element in this change, although not a happy one, but just as important has been the effect of sound and courageous pricing policies by consuming countries in the industrialised world.

The price mechanism is without doubt the most effective means of insuring that scarce and valuable resources such as oil are used as efficiently as possible. There is ample evidence that higher prices which reflect the scarcity and replacement cost of oil are having a restraining influence upon demand. Oil consumption in Australia dropped by over 4% in 1980 and our latest forecasts dropped by over 4% in 1980 and our latest forecasts point to a likely plateauing or even a slight decline through the 1980s. There are some of us who believe that the decline will even be dramatic. This is a new experience for Australian who have traditionally looked forward to growth in oil year by year up until 1980.

The second response should be a more vigorous oil exploration program outside OPEC. Here again pricing is the key incentive, particularly in the more expensive offshore areas and in remote locations. Winning new oil from the North Sea for example requires an investment of about \$8,000 per barrel per day, many times greater than in low cost areas such as the Middle East. We used to talk about, as I recall, \$100 a barrel a day oil in the Middle East about 15 years ago. On shore drilling costs in Australia vary according to a number of factors but as an example in Queensland's Sarat Basin the cost of drilling wells is between one-half and \$1 million whereas in the barren isolation of the Officer Basin in Western Australia, the figure is around \$5 million. Offshore drilling costs normally range between \$5 and \$15 million per well, although in deep water such as the Exmouth plateau in Western Australia the cost can go beyond \$30 million per well.

Clearly, oil exploration is not for the financially fainthearted or those not prepared to take big risks. My advisers told me you would either get up and walk out at that or chuckle underneath. The resurgence in exploration in Australia, 109 wells drilled in 1980 and 140 forecast for 1981, is a striking illustration of the efficacy of Australian oil pricing policy. Although I have indicated that there is little prospect of non-OPEC oil being available in sufficient quantities to displace OPEC as the major supplier of oil, it is important that we find and produce every single barrel possible since this will lessen our dependence.

The third response of oil consuming nations should be the development of alternative energy. Higher prices combined with supply uncertainty have provided a very big stimulus to work on developing alternative sources of liquid fuels, such as oil shales. A realistic attitude towards petroleum pricing provides both the yardstick against which we can measure the economic cost of developing these unconventional sources and the incentive to take the large financial and technical risks involved. I would like to come back

to this in a few minutes on a comment on alternative energy.

Whilst these measures are working to secure the long term energy future, in the short term there is a need for mechanisms to cope with unexpected supply disruptions. Oil importing nations responded to the events of 1973 and 1974 by establishing the International Energy Agency, the IEA. Comprising 21 member countries, including Australia, it has drawn up plans to build up strategic stocks of oil and share supplies in an emergency. The question of strategic stocks is also the subject of debate at national level in this country. The average level of stocks held throughout Australia is approximately equivalent to two months' normal supply and this does not include stocks of crude or petroleum products which we classify as being on water coming into the country. Nor in particular does it include Australia's biggest strategic storage which of course is the Bass Strait oil.

In any emergency, government would naturally ration available supplies in accordance to national priorities which would have the effect of greatly extending the life of these present stocks. The IEA has suggested that member countries which have oil production should increase stocks to about 75 days normal supply. In Australia's case, this would mean putting another 10 million barrels of crude and products into strategic storage. This would cost approximately \$600 million, including storage facilities. They are not small numbers for an economy our size. Obviously, if the government decides that such a step should be taken in the national interest, then the nation has to pay for this with strategic storage. The role of the oil companies is to provide administration and technical support. This is recognised in the IEA group and countries like West Germany for example have a national crude oil reserve equivalent to 65 days consumption, financed entirely by the government.

Forgive me, I did not want that to sound as much like a commercial as it is sounding as I am reading it out from my notes now but comparable schemes operate in other countries such as Australia, Denmark and the Netherlands and it is a subject which must be taken very seriously by any government of the day.

The last main point I would like to make is that resource rich countries such as Australia have a major role to play in helping to reduce world dependence on crude oil as an energy source and reliance upon the Middle East as a major source of that crude oil. We can do this by exporting surplus energy and by co-operating in the commercial development of new technologies. The recently released world coal study concluded that between now and the year 2000 coal can play a key role in the world's adjustment to constrained

oil supply. The study found that even with only moderate growth in energy consumption, coal will have to supply between one half and two thirds of the additional energy needed by the world during the next 20 years. Spectacular increases from 5 million tons in 78/79 to 200 million tons in 2000 were seen for Australian steaming coal exports. Bearing in mind our present consumption for domestic use and the expected sharp rise in that figure over the next 20 years, Australia's coal production would have to quadruple to meet these forecasts, a truly formidable task in two decades given the environmental and infrastructural constraints which are holding back the further development of this industry in Australia.

With uranium the outlook is more difficult to predict. Power utilities and electricity generating authorities face formidable problems of social acceptability, centering on doubts about nuclear plant safety and concern over disposal of nuclear wastes. These problems have retarded the rate of development of nuclear power plants but they cannot alter the fact that in the long run nuclear power is likely to offer a reliable and economic source for electricity. Demand for uranium can be expected to increase, particularly in the late 80s and 90s. When this occurs, Australia which has 25% of the known uranium reserves, will be well placed since we have high grade uranium ores in easily minable ore bodies that require relatively low capital.

With our large deposits of coal and oil shales Australia is also in a good position to play a leading role in the development of non-conventional sources of liquid fuels. However, we must be very careful not to underestimate the technical and commercial difficulties which surround the manufacture of liquid from shales and coal. Of the two, I believe that coal conversion offers the better prospect for Australia. There are considerable environmental problems associated with the mining of oil shales. To produce 100,000 barrels of liquids per day, equivalent to about one-sixth of our present consumption of oil in Australia, would require the mining of 1 million tons of solids per day. There are also many unknown factors about the technology required to produce commercial quantities of suitable products and feed stocks for the Australian markets. The problems associated with scaling up from the laboratory bench to the pilot plant and then to a full commercial proposition cannot be underestimated as this week's statement by the Rundle partners makes very clear.

I believe that we can and will overcome these difficulties but I caution against overoptimistic assumptions about the ease with which it can be done; the costs involved and the time required to make an impact on the pattern of energy supplies. Our success in this area will be a valuable

contribution to reducing the world's dependence upon oil and reliance upon traditional sources of supply.

To summarise, and I think I have gone over my time, despite uncertainties about supply and price, oil will remain a vital source of energy for the next two decades and probably more. The Middle East with its vast reserves will continue to be an important exporter of oil, although the probability of supply disruption is very high indeed. If the non-OPEC oil consuming and oil producing countries get their policies right, their priorities right particularly in pricing, we can progress towards a more diversified energy base, both in terms of sources of energy and sources of supply.

STRATEGIC MATERIALS

by Sir David Zeidler CBE

First I would like to pass to you Mr Chairman my appreciation for the invitation to be present today and so to express some surprise at this very substantial gathering. I understand that there are a fairly large number of people representing industry and I am pleased about that for it is an obvious indication of a growing interest, a developing interest, between industry and the defence forces — a matter which has been a considerable concern for a number of years to me and my colleagues on the Defence Industry Committee.

It has been customary for the Services to see industry in this country as largely disinterested in Service needs. As a consequence, the Services no doubt have felt both impatient and frustrated with what they perceived industry could do for them. I am not going to enlarge further on this aspect other than to comment that while I agree with a great deal of what Professor Kasper said this morning, I nevertheless remain troubled by his reference to, and also the general use of, the term Australia's industrial malaise which has come in recent years to such common usage in this country.

As someone who has been engaged for probably the best part of his life in the development of the chemical industry, I am quite proud of the ways in which Australian industry has been developed. Today it has reached a strong position and contributes very greatly to the nation's needs and economic wellbeing. We need to exercise considerable caution before allowing popular community opinion to denigrate our means of production.

Turning now to the topic of strategic materials which I have been asked to address, I am sure you will agree I do not need to say anything more about that very strategic material, petroleum. Mr Gosper has covered that most adequately.

Before proceeding I think it would be useful to give some definition to the general topic. "Strategic materials" are essentially those materials which if in short supply in a Defence emergency could significantly hamper the nation's ability to defend itself. It is a broad definition and it is not my intention this morning to deal in any great detail with particular materials which we should consider in present circumstances and under this definition. It is important, however, that the Defence Department, the Services themselves and industry develop a good understanding of the sorts of things which could be needed under a defence emergency.

I would like to ask you to take your minds back for a few moments to the years preceding 1939 and the outbreak of the second world war. I expect there are few of us here today who can either remember the details of that period, or were actively engaged as civilians or Service personnel. Let me say from personal recollection that the Australian industry of the day was ill-prepared for the demands to be placed on it despite quite substantial warnings over several years that a major conflict might arise.

However, as always in human affairs a small band of distinguished and able people set to work and quite rapidly major developments were in train. It was a significant period in Australia's industrial development. Much of what was started then has prospered and Australian manufacturing industry is far better developed and equipped to meet the much more sophisticated defence needs of today. It now has a substantial capability as a strategic resource. There are, of course, still significant gaps.

I am recalling this period of 40 years ago and the problems encountered then largely because of the lessons that were learnt at that time. They were sharp lessons and parliamentarians and business leaders took heed of them and, as a consequence, in succeeding years developed more effective policies in relation to manufacturing industry and its role in a developing economy.

THE SPEAKER

Sir David Zeidler has spent his life in the scientific, industrial and business world. After graduating in science from Melbourne University, he spent the next ten years with CSIRO including one year in the United States at the invitation of the Massachusetts Institute of Technology.

He joined Imperial Chemical Industries (Australia) in 1952, and became its Chairman and Managing Director in 1973. He held that position until his retirement from ICI last year. He is also a member of the board of the Science Museum of Victoria.

Of particular relevance to the topic under discussion, Sir David has been a member of the Defence Industry Committee since May 1976.

and from which we are still deriving considerable benefit.

I do not intend this morning to do more than remind you of the benefits which have flowed to this country from, for example, the very strong immigration policies of the fifties and sixties, or to do more than remind you of the government policies relating to manufacturing industry which greatly stimulated industrial development during the succeeding two decades.

It is a matter of grave concern today from a defence preparedness viewpoint that new policies are developing as a result of the widespread discovery of Australia's mineral resources and their exploitation. These new policies may well put in jeopardy some of the industries which are important to defence.

Professor Kasper mentioned this morning that the textile and footwear industries are ones which he regarded as highly protected and which should be restructured. Other industries which he did not mention could also be at risk; for example, basic industries like steel and chemicals. We also need to watch carefully the suggested restructuring of the automotive industry because road transport plays such a vital role in all aspects of the defence services in Australia.

I am sure that in the next session Mr Stevens will talk about industry, but I would like to make one further point, a point relevant I believe to a better understanding between defence forces and industry. There is an important philosophical difference between the approach of people who work in industry and those who have responsibility for defence matters. The difference to which I am drawing attention is that industry, on the one hand, is concerned with producing goods which the community needs, but at the same time it is also concerned to remain financially viable. Defence management, on the other hand, is concerned with convincing people in the community and through them parliamentarians of a need to acquire sufficient financial resources to purchase and employ modern weapons and modern equipment — generally I am sure a frustrating task.

Turning now more directly to strategic materials themselves. It is important to realise that consideration of this aspect of defence preparedness has been studied over a long period, starting as I said in the second world war years when the Directorate of Material Supply controlled rigidly many strategic materials. In later years the Directorate of Material Supply was translated into the National Security Resources Board which was chaired by the then Prime Minister — a clear indication of its importance. During that period the Department of Supply, as it was then called, reviewed regularly some 500 different materials, all considered to be of strategic importance.

However, as manufacturing industry and as the basic resources of Australia were developed this task changed from being a regular review to being a periodic review, and in due course became the responsibility of the Defence Industry Committee, a successor body to the joint War Production Committee, which, as I said, had been formed in 1948. Some of you may remember that Sir John Storey was its chairman for a number of years, and the vital contribution he made. He was succeeded by Sir Ian McLennan, the former chairman of the Broken Hill Proprietary Company Limited. Both these men not only made a great contribution to the development of strategic resources, but also made substantial contributions to industry in general.

The decision of what to place in the category of the strategic material has never been an easy matter for Australia. Possible needs and actual items have changed frequently. During the second world war it was necessary for the country to stockpile items such as nickel, cobalt, manganese, mainly used as steel alloy elements. Also, and perhaps surprising in retrospect, large stocks of hemp and sisal were maintained for the production of rope. Also surprising in retrospect was the stockpile of pig bristles — a particular variety from China — used to make the highest class of paint brush. Stocks of Tung oil, also from China, were maintained to make what in those days was regarded as a very high quality paint. All these items no doubt were of particular significance from a Naval point of view.

A number of important developments occurred during the war period. The manufacture of explosives, as most of you would know, relies on a supply of nitric acid and until the second world war nitric acid was made in Australia from imported sodium nitrate — clearly a major risk. It was overcome when ICI established a number of small ammonia and ammonia oxidation plants based on coke as a raw material. These plants were operated by ICI on behalf of the Australian government munitions plants.

In the intervening years stockpiles of materials which at one time were considered strategic have been disposed of and more emphasis today is placed on the capacity of Australian industry to supply materials which may in times of need be classed as strategic. Industrial capabilities to support this policy are improving all the time. For example, Australia's steel industry is now capable of producing special steels — electro-slag refined steels and quenched and tempered plates. The production of such high quality steels, as a matter of interest, was not possible even as late as 1977 when the Defence Industry Committee undertook a general and thorough review of manufacturing capabilities. The steel industry will no doubt go further in

introducing specialised products and equipment, but it has to be realised that installation in peacetime of costly manufacturing plant is generally only feasible when there is substantial outlet for the product in addition to the defence requirements.

Little has been said during the course of this meeting so far about equipment involving the "higher technologies" from a strategic material supply viewpoint. It seems unlikely that this type of industry will develop rapidly in Australia and, as a consequence, I think we have to consider that most of the higher technology equipment for Service use will be sourced from overseas. This is probably a practical solution for air transport is now a ready means of bringing such items to this country. I am not suggesting, however, that we should not support and encourage development of skills in the field of modern electronics and computer-controlled equipment. I am sure it will develop, but it is a difficult area for a country with a small population in which to be self-sufficient.

Another important aspect in considering the supply of strategic materials is the chain of manufactures from which they derive. For example, most plastic materials are now being made in considerable quantity and good quality in this country, but we must realise that they depend on adequate petrochemical feedstocks. This seems secure enough at present, for, as Mr Gosper has said, the supply of petroleum feedstocks in Australia is reasonably favourable. We must remember that the source from which they come — Bass Strait and later the North West Shelf — are vulnerable to weather, shipping collision or attack. These are hazards to very important basic strategic products.

There are other chains of manufacture of the sort I have just described, but I will not go into them further. One example is perhaps enough. It is a matter to which the Defence Industry Committee pays due regard.

Australia, as I am sure you are all well aware, is fortunate in that it is well endowed with basic materials. It is in a strong position for the production of iron, steel, copper aluminium, zinc and lead. There must be few countries which have such a widespread strength in basic metals. There are gaps of course. Titanium and magnesium are not produced in the country yet. Also, important steel alloying elements such as chromium, cobalt and vanadium are not available. It is nevertheless a very strong basis on which to build further self-reliance.

I would like to conclude with a reference to human resources. Over the years since the second world war a very much stronger educational system has developed and this must be regarded as a valuable resource in relation to defence needs. It would also be wrong if I did not

say from my own background how important the support for Australian industrial research has been. Most companies of any size today spend substantial sums of money each year on just the sort of searching for more effective means to which I think Professor Kasper was alluding when he urged us to look for more efficient — in an economic sense — ways of doing things and more efficient products to make.

Perhaps I should also make a small comment about the transfer of industrial technical knowledge and expertise which has occurred over the years. It is quite remarkable and I suppose Australian and Australian-based manufacturers must be among the world's more expert people in searching out and in transplanting important technical knowledge into a new environment. It is I believe a very valuable strength.

In summary then I would like to emphasise the importance of supporting Australian manufacturing industry, particularly from a defence point of view. I would like to feel we could in future avoid talking about the malaise of industry and pay more attention to its successful achievements. I have touched broadly on the complexities and variations involved in considering which materials should be recognised as strategic and in this context I have drawn attention to the very substantial development of human skills. In more recent times there has been an evolutionary process of understanding between the defence forces and industry. I would like to see it continue and strengthen and feel encouraged by the presence at this seminar of a considerable number of people from industry. Above all else from a defence point of view we need jointly to take an interest in, and be alert to, changes by State and Federal Governments to policies relating to manufacturing industry.

RESEARCH AND DEVELOPMENT

by Mr. A. Sharpe

When asked to speak of the research and development resources of this country oriented to seapower in defence I was concerned that the words "Research and development" have as many connotations and meanings as there are people in this theatre.

Consequently it seemed to me to be necessary to at least define my own understanding of the words. Perhaps you may not agree with me but hopefully you will have a background against which you may judge my later remarks.

I prefer to use the words "Science and Technology" — "Science" being the activity

covering the search for new knowledge and "Technology" the application of that knowledge to a useful purpose. From the very nature of our defence operations there is likely to be more concentration of resources on Technology than Science.

At present in this country Defence Science and Technology is the province of the Defence Science and Technology Organization of the Department of Defence, the technical departments of the three Services, to a limited extent in the munitions factories of the Department of Industry and Commerce and regrettably to a very small extent in Industry.

Industry has been involved in design, development leading to production. Surprisingly all the major activities in this area have been involved with the Sea, Ikara, the antisubmarine weapon system, Mulloka, the sonar system and Barra the sonobuoy.

The role of the Defence Forces is to defend Australia and its interest against aggression.

To support effectively the Defence Forces the function of the Science and Technology resources must cover —

- Knowledge of the physical characteristics of the environment in which the Australian Defence Forces have to operate.
- Operational research studies using data obtained from a variety of sources including the practical experience of the ultimate user.
- Exploratory research and feasibility studies of new equipment.
- Equipment evaluation and development.
- Support to the Defence Force in the selection and through-life support of equipments.

I stress that through-life support is essential in the Australian environment for a number of reasons even because most of our equipment is acquired from overseas sources.

As I mentioned earlier the two main organizations providing the wide range of scientific and technology support are Defence Science and Technology Organization and the technical branch of the three Services. In this audience the Naval Technical Services of Department of Defence (Navy Office).

The Defence Science and Technology Organization carries out research, development trials and evaluation and contributes to the Defence Force in equipment maintenance and development, in selection of equipment, in understanding the environment and general scientific advice — in fact all of those topics I mentioned earlier.

The DSTO's functions are discharged through reference to a strong technological data

base which is built up by background scientific research done locally and by access to overseas scientific data through cooperative arrangements.

Defence Science activities are closely linked with defence strategy. It is an integral part of the Department and there is considerable interaction with the Services and other functional divisions.

About 4800 civilian staff are employed in 13 Establishments and DSTO Central Office whilst 120 Service Officers are attached to the Organization and are an integral part of its resources. Total annual cost is of the order of \$90m.

Electronics Research Laboratory with divisions of Electronic Warfare, Navigation and Surveillance and Radar is responsible for research and development in the fields of electronics, physics, optics and applied mathematics. A significant effort is devoted to the over the horizon radar surveillance project Jindalee. This project has considerable potential for detection of ships. Measurement of sea states and cyclone warning are planned in its development.

Weapons Systems Research Laboratory (WSRL) — its three divisions — Propulsion Weapons Systems and Aeroballistics. Its main contribution has been in the propulsion missile and ship guidance development of Ikara the anti-submarine weapon systems which has been in service with R.A.N. for 18 years and later with RN and Brazilian Navies.

Advanced Engineering Laboratories provides engineering facilities for all the laboratories in the area and undertakes engineering design research and development activities primarily in the fields of electronics and light mechanical engineering. Its main Naval activity has been the design and development of the Mulloka Sonar with industry.

THE SPEAKER

Mr Alan Sharpe served in the RAAF in World War II as a technical officer. After the war he spent a brief period with TAA before being sent as one of the initial staff of the long range weapons organisation for training in the United Kingdom on ramjet propulsion for guided missiles.

Subsequently he spent several years at the aeronautical research laboratories within the Department of Supply on guided missile development and most significantly to this topic, as project manager for the development of the Ikara anti-submarine weapons system and later as the man responsible for the control and direction of a number of defence scientific laboratories.

In 1974 he became Deputy Chief Defence Scientist and following his retirement in 1980 became a member of the advisory committee on the management and operation of Williamstown Naval Dockyard.

Trials Resources Laboratory is responsible for the provision of maintenance of the Woomera Range which as you may know was placed on a care and maintenance basis in mid-1980.

Material Research Laboratories, Maribyrnong, Victoria, has divisions of Physics, Metallurgy, Physical Chemistry and Organic Chemistry. Expertise is maintained in fields such as material aspects of armament and defence equipment, explosives and ammunition protection.

Aeronautical Research Laboratories are by their name devoted to work in the field of aeronautics covering such aspects as Aerodynamics Materials, Mechanical Engineering Structures and Systems. This latter group has been responsible over the years for the system and missile design of Ikara.

Engineering Development Establishment (Maribyrnong and Monegeeta) primarily provides a source of military engineering design and advice principally to the Army. It maintains close collaboration with industry. An extensive Trials and Proving Wing mainly for vehicle trials is located at Monegeeta.

Royal Australian Navy Research Laboratory or RANRL in Sydney NSW covers operations research, ocean science, sonar science and technology and mine warfare. Until early 1975 on reorganization of the five Defence Departments, it was within Department of Navy.

Royal Australian Navy Trials and Assessing Unit (RANTAU) conducts ship and equipment tests, trials, investigations, inspections and evaluations and carries out assessments of weapon practices as required by Navy.

Joint Tropical Trials and Research Establishment (Innisfail, Q'land), was joined in 1977 by an amalgamation of the Joint Tropical Research Unit and Tropical Trials Establishment to carry out tropical trials on equipment and materials. The UK cooperated in forming U.T.R.U. in 1962 and continues to use the Joint Establishment.

Armed Forces Food Science Establishment (Scottsdale, Tasmania) functions include investigating the calorific and nutritive requirements for all three services personnel and developing rations and their associated containers. Its annual program is prepared in cooperation with CSIRO.

Central Studies Establishment Canberra, A.C.T. conducts multi-service and force structure studies. These studies require close liaison with Defence Central divisions, with Service Offices and the above research laboratories. As an illustrative example of their work assessment of sea based versus land based air power over a range of contingencies was carried out.

It also carries out examination of impact of new weapons and technologies on service operations.

Materials Testing Laboratory, Alexandria, Sydney, is a small laboratory maintaining expertise in metallurgical and chemical consulting.

International Co-operation.

Access to overseas technology enriches and enlarges our data base. Co-operation with international organizations is now substantial and is accomplished through multilateral agreements and through direct bilateral arrangements.

Such arrangements have been in progress through the Technical Co-operation Program with United States of America, United Kingdom, Canada and New Zealand Commonwealth Defence Science Organization and specific Memorandum of Understandings on co-operative research and development with United States, United Kingdom and hopefully shortly New Zealand. Collaboration has also been undertaken with Malaysia, Indonesia and Thailand in that Australia has provided assistance to these countries to establish Defence Science and Technology activities.

I have not detailed the contribution that the Technical Services Navy Office play but in addition to seeking considerable assistance from the Defence Science and Technology Organization its own work covers design, development, test and evaluation part of the Science and Technology spectrum using industry to provide post design support activities but principally in production and software support for computer based combat data systems.

I mentioned earlier the Munition Production Factories now of the Department of Industry and Commerce who provide design development and production support in Naval Ordnance. It is most unlikely that this work could be transferred to industry because there is difficulty in providing enough workload to keep the current type and number of factories viable. However, these are the subject of an independent review, the results of which are expected shortly.

Role of Industry.

To date industry has played little part in the acquisition of knowledge phase of Science and Technology but has over the years played an increasing role in the design, development and production of weapons which have adequate effectiveness in our environment. Almost all of these have been for Naval use, viz. Ikara anti-submarine weapon system which is fitted in nine RAN ships, six RN ships and 4 Brazilian destroyers and Muloka, the sonar to be fitted to our FFG's.

Over the years this support has been initially in the production of components, then elements

of the system and in the case of Barra, design development and production.

The Future.

In November, 1979, the 200 mile fishing zone was declared whilst the economic zone has yet to be formally declared. When it is, it will mean that Australia's interest will be an area of seven (7) million square kilometres which is about the same area as the land mass of Australia. Incidentally, this area is only slightly less than that which would become the interest of the United States.

Over the past decade there has been considerable concern that Australian resources to conduct marine science and technology were very inadequate. Such concern has been expressed by the Senate Standing Committee on Science and the Environment and the Australian Science and Technology Council.

The Senate Standing Committee on Science and the Environment has stated that our national effort is inadequate, the range of interest too narrow and that there is lack of co-ordination of the existing effort.

Compared with Canada which has a population of 24.5 million but a smaller coastal zone than Australia, Australia has only 15 physical oceanographers whilst Canada has 2000.

With current effort it is estimated to understand the physical properties of the ocean around our coast it would take 104 years to complete. Whilst some of this work would only be of indirect interest to Defence, the study of the air/sea interaction on low level radar is of importance.

The Australian Science and Technology Council in 1978 recommended the need for greater attention to be devoted to marine science. Following the Australian Science and Technology Councils recommendations to the Government, the Australian Marine Sciences and Technologies Advisory Committee (AMSTAC) was established to provide advice on priorities for and coordination of research and development. In July, 1979, the Government accepted the recommendations from this Committee as regards allocation of funds, concentration on the Great Barrier Reef area and support to CSIRO in the acquisition of an oceanographic research vessel.

Defence has maintained a watching brief on this Committee's activities. With the delivery of H.M.A.S. COOK the policy for time on this ship's cruises for civilian scientists use has been determined. Furthermore, some of the recommendations may involve support from the Defence Force.

This is an area in which additional resources will have to be devoted by Defence though the emphasis of those expressing concern has been on civilian applications. I find it disturbing that for input to the World data base on oceanography

even in our own region, we rely heavily on the Russians. However, we must understand the environment in which we have to operate.

Whilst the function of Defence Science and Technology Organization is to provide the very large majority of Science and Technology support to the Defence Forces there have been since the mid 70's repeated recommendations from Joint Parliamentary Committees, Defence Industry Committee and numerous Industrial Mobilization syndicate reports that more defence science and technology should be done in industry.

In the implementation of such recommendations there are problems of existing capability in industry, provision of continuity of effort, low volume of work that leads to production, the need to overcome the rigid discipline of the open tender system and the increasing preoccupation in political circles of ensuring that all local developments must be of a low risk nature leaning to ultra conservative and cautious approaches to approval of initiatives.

In addition there has been a lack of clarification of Government policy from both political persuasions on the export of weapons to neighbouring countries. However, I understand that the guidelines are now much clearer.

The scale of requirements needed by the Australian Defence Forces are small so that quite often only with exports would local production be economic.

Of course, though we buy most of our sophisticated defence equipment overseas we are compulsive modifiers always ensuring that never do we buy exactly what is offered from overseas. Naturally, it can be claimed that we do not have in our procurement strategy the choice of a supplier who has studied our environment and optimised the performance of his weapons to it.

As we tend to keep weapon systems and major platforms such as ships and front line aircraft very much longer in service than our overseas suppliers it is essential that as part of the procurement of that asset, in addition to the acquisition of material and information we should also obtain details of design concepts so that in-country resources we have be they in Defence, in Industry, will have the data base from which modifications can be developed for production. This need may be more necessary in electronic equipment due to the exponential explosion in capability and complexity in that area.

The evolution of electronics has been so dramatic over the past thirty years that prediction curves of growth are always exponential viz. the number of active electronic elements — transistors if you wish — have grown from a few per silicon chip in 1960 to over a million in the same size predicted for the mid 1980's.

Generally these chips perform two functions — they perform arithmetic or logical functions or store data. The first of such devices is called a microprocessor and with the addition of a memory to store the data a microcomputer. The creation of these devices has had a great impact on the design and development of systems, particularly weapon systems.

The special feature of these microprocessor and microcomputers is that they can be re-programmed even when in use. New operational modes can be added or old ones changed; not by rebuilding the hardware but by modifying the software. Software incidentally now represents an increasing share of the cost of development of a system viz. in the case of modern radar system, figures of 30 to 40% have been quoted.

Whilst we will buy initially the software of overseas procured systems and contract for continuing after sales support for modifications to that software, such a policy is only adequate provided our tactical uses are the same and the overseas manufacturer finds it profitable to continue that support or we pay heavily for sole Australian modifications.

I realise that Navy has foreseen this problem and is building up that capability from local industry but with the great increase in computer based systems on ships does adequate capability exist both in house and from outside contractors?

The concept of involving Australian industry with overseas contractors initially in the design and installation of a system and then ensuring by formal contractual arrangements that a progressive transfer of technology to the Australian Companies is achieved in a short time after completion of the system, is the aim in the defence Integrated Secure Communications Network scheduled for installation throughout Australia commencing in the near future.

Positive steps must be taken, as is occurring in Britain, to have industry involved to a greater extent than previously in such supporting Science and Technology.

Areas of technology which will be of interest in the future are the use of satellites for a range of purposes. Whilst we are users of the information from communication and navigation satellites and have maintained a watching brief on technological developments, more effort may be required to cover defences interest in the Australian satellite.

What of the Future.

It has been said that because we buy most of our sophisticated defence equipment overseas or produce locally to overseas design, that the Defence Science and Technology resources be they in the Department of Defence or in Industry, are adequate. In any case, the problem with more of the work being done in industry is that the volume is low, continuity is difficult to achieve, and the amount of spin off of the technology to non defence application is hard to quantify and in any case is low.

However, because the military threat to Australia and its interests may change in the next twenty years and may be such that those countries from whom we procure equipment may not be willing to continue support in such threat situations, Australian Defence Science and Technology resources are necessary to —

- Research our environment
- Support the development of military strategy which is cognisant of our environment.
- Assist in the choice of weapons that will have adequate effectiveness in that environment noting we may buy or modify overseas designs or carry out selective development.
- Assist in the development of tactics to optimise the performance of those weapons.

The resources within Government who have to carry out the production phases associated with these activities are severely constrained by the Government bureaucratic process and industry which has the flexibility to acquire manpower materials, change organisations, be fully conscious of the necessity to maintain completion dates and adhere to cost estimates, will have to have a part to play.

However, in order to carry out such supporting tasks, industry, like the departmental resources, needs training and exercising to maintain their capability. Whilst it is not necessary that we be competent in all fields, a selective balance must be maintained. Science and Technology resources are a very expensive resource and must be used to their fullest in peace time so that when the imminence of a threat has been foreseen, expansion can take place rapidly from such a core of resources.

DISCUSSION

Chaired by
Commodore P.G.N. Kennedy, RAN

Captain Bateman, Naval Institute: It is a question for Mr Gosper. By sometime later this decade, the only fuel used for propelling Australian naval vessels will be diesel distillate. Unfortunately, in recent years demand for that particular fuel has increased quite significantly with consequent price rises in real terms and concern about availability. Whilst I accept the general propositions regarding the outlook for liquid petroleum fuels, could I ask specifically regarding the outlook for the Navy's fuel?

Mr Gosper: I think the best way I could answer your question is to say, yes, you are right. There has been pressure on demands for distillates and prices have moved accordingly. It is an area of the barrel which is under greater pressure for production than any other area in fact. Having said that, it would still be the sort of fuel which would receive appropriate priority running through to the year 2000.

I was going to make some comment in my speech about the question of alternative fuels for ships, for naval craft. As most of you know, there is something like about 500 odd ships in the world now fuelled by nuclear energy and a big proportion of those are naval, especially submarine craft. The move to put coal into ships because of the worries you are talking about has been looked at. In fact Australia is one of the first countries to move into this and there are currently under construction four very large ships — in the order of about 70,000 tonnes — which are being built with coal as a fuel. I have to say to you though that there is a worry in this area because they are not as economic to run by comparison with traditionally fuelled craft and secondly there are problems of bunkers and logistics.

I am really talking to your question rather than answering it, but what you say is right and I think it is simply a matter of policy within government, concern within industry, that matters of transport particularly relating to strategic needs, shipping needs and so on, have to be kept up to the forefront of everybody's mind.

Commander Grazebrook, Naval Institute: Taking up the question a little further of coal in ships, is it not correct that little resources have been addressed to the development of the use of coal in ships for some decades now and whilst it may not be economic at present, it is possible that something could be done by applying develop-

ment resources to the use of coal in ships, such as handling methods and so on. Could Mr Gosper comment on this?

Mr Gosper: Yes, I did not intend to be negative about the coal aspect of ships. I can assure you that my own company, which runs something like 500 ships internationally, is dedicating some research to using coal for ships to carry oil so we are quite positive about that. It is not quite the reason why a traditional oil company like Shell is moving into coal but it is all part of the energy scene.

The Japanese are also doing work in it. The Japanese are in fact — and you may be better aware of this than I am — even looking again at wind power and the utilisation of sail power in very restricted fashion. One tends to read these things and think it is a panacea but no, I think everyone should be positive about this and we do see a trend towards the utilisation of coal more certainly.

Lieutenant Johnson, Naval Staff College: Mr Gosper has indicated that our strategic reserve of fuel and petroleum products for defence and defence industries has been set at approximately 75 days. Could Sir David Zeidler comment on the apparent inconsistencies of this policy which sets this level and yet demands industry be capable of supporting the defence effort for substantially greater periods.

Sir D. Zeidler: If you are referring to the chemical industry and the plastics industry which I mentioned was dependent upon petroleum feedstock, they are different fractions from the barrel that are required and while it may be that from a policy point of view petroleum feedstocks would be diverted to other uses, I think in general it is unlikely the particular section of the barrel of oil that is used for chemical purposes would be allocated to other uses. Does that answer your question? I do not think it has much to do with the amount of, if you like, stockpiled petroleum products for transport.

Mr Hayes, Department of Defence: Mr Chairman, I would like to put a question to Mr Sharpe. This morning we heard a lot about the virtues of specialisation in the talk given by Professor Kasper. I would like to ask Mr Sharpe if he thinks that R & D activities as carried out by the DSTO organisation in this country might benefit from a

little more specialisation rather than being spread across such a wide canvas as it is presently.

Mr Sharpe: Yes. I speak with personal feeling. Yes, we do need to look at this. We have made some reduction in specialisation. A number of years ago we decided to cut down the effort in chemical and biological defence, though we never did any biological defence. We cut chemical defence because of policy changes in the United Nations and government requirement that we uphold those United Nations policies. We had to raise it up some time later. Yes, we cannot do everything. That is why we maintain our overseas close collaboration with international agencies, particularly the U.S.A. and the U.K. We now have a very good administrative procedure of bringing about such rationalisation in the use of staff ceilings allocation by DSTO central office to laboratories.

Commodore Robertson, Naval Institute: I would like to ask Sir David Zeidler about aluminium. A couple of years ago I was involved with a company and there was a great shortage of aircraft type aluminium. We had the aluminium in Australia but we could not supply because we could not treat it properly. I understand the cost of a plant was not all that high by major standards — about \$60 million at that time — but it seems to me that would be a very important strategic asset for us to have.

Sir D. Zeidler: I think heat treatable aluminium alloy sheet is not yet made in Australia. I do not know very much about the cost of the plant and cannot really, as a consequence, add much to your question. I know it is a lack at the present time. I expect it could be overcome fairly quickly.

Wing Commander Brown, Retired, Associate of the Institute: A question for Mr Gosper, does he think that OPEC will continue in its present form or will it break down from internal conflict? If it does break down, will it give us better or worse conditions for oil supply to Australia?

Mr Gosper: We have no reason to believe that the structure of OPEC will break down. It has withstood some tremendous strains over the last two years of course, with Iraq and Iran at each other's throats. There have been disagreements in terms of policy towards reduction in production and the movement in prices. The attitudes taken by countries like Algeria and Libya on the one hand have been aggressive in terms of pushing prices up and aggressive in terms of conservation and reducing production by comparison with Saudi Arabia at the other end which has sustained levels of production. In fact the Saudis increased production up to something like about 10.5 million barrels a day. They have been the restraining influence, along with some of the other moderates

like the United Arab Emirates and Kuwait, in keeping prices down and perhaps Kuwait is typical of the country sitting in the middle. Yet, most of these countries came together you will remember in Bali just recently at the OPEC meeting and made fairly modest adjustments to prices in terms of real increases.

This organisation has been around for over 20 years. I suggest to you that we should work on the assumption that it will continue to exist. That is the first thing I would say. Its form may change. I am inclined to think it will draw together as a result of the tendency for an over supply of oil to be taking place now and I think we will see quite a lot of over supply, under supply and movement up and down on demand and supply during the 80s. This is more likely to keep that group together.

In the present circumstances, it would be hard to say whether it was better or worse for Australia if there was a break down. I think you must deal with the reality. We have had practice with dealing with this part of the world. Most of our supplies are Australian sourced — as you know we are self sufficient by 70% — so the balance of the 30% mostly comes in from the Middle East. The American importing companies — American based international importing companies bring in oil from the ARAMCO group with the non-American internationally based companies like ourselves, importing from the Persian Gulf. The relationships between this country and many of the Middle Eastern countries which are part of OPEC are good indeed. Saudi Arabia is a good example. The deputy prime minister has worked very hard at this relationship.

We are also, of course, in touch with other OPEC countries which are outside of the Middle East and that should not be lost sight of as well. What I would say to you is that the right policy for this country against that background is that every effort be made in continued exploration and search for traditional oil. There is more oil to be found in this country. The Australian oil parity pricing is a sensible and wise policy for any government to take in present world circumstances and every effort should be put into this area. I think both major political parties believe implicitly in this. I think I have taken a long time to answer your question and that is as much as I should say at this stage.

Commander Johnstone-Hall, Navy: I am addressing my question to Mr Sharpe and possibly Sir David might like to have two cents worth as well. It is on the subject of research and development and I think, Mr Sharpe, you said that a large amount of the research and development in this country tends to be done within government organisations. Taking up Professor Kasper's point that we should be more innovative and I think we all probably agree with this to a lesser or

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greater extent, and taking up Mr Gosper's point about looking at alternative energy resources and how we are going to develop those, it seems to me there needs to be quite a lot of research and development or science and technology as you put it, done in the next few years. Accepting Professor Kasper's point that something done within the government only tends to be not too innovative and perhaps is done within certain limits, how do you think we can encourage industry and people outside the government circle to get into research and development to a greater extent.

Mr Sharpe: The responsibility in government circles for ensuring energy research and development, my memory says rests with the Department of National Development. They have a very comprehensive organisation that goes out and solicits bids from a range of people, be they CSIRO, the universities or industry. I am only speaking from memory now but I think last year there was some \$60 million or more devoted to it.

As far as defence is concerned, we do have with defence, from memory — it is a bit hazy now — a committee that looked at this. There was one thing we would never do, and that is we would never try in defence to repeat work that was being done outside, be it in industry or universities or CSIRO. Coming back to the question of coal in ships, there is a very comprehensive report of an experiment done a number of years ago on burning brown coal in gas turbines. There are some technical difficulties on the life of turbines which makes it slightly difficult.

As far as the range of other questions is concerned, from a defence viewpoint I presume the program is still going on, there is considerable work on the use of LPG in military vehicles — not front line vehicles — within the DSTO, a watching brief on alternative energy sources, work for the army — on local production of certain greases and lubricants but certainly there is a mechanism in government and there is quite a considerable amount of money being spent at the moment on research for alternative energy uses, both in industry and in government sources.

Sir D. Zeldler: Mr Chairman, if I might make just one supplementary remark. As far as research in industry is concerned, it is easy to do more research if industry is more profitable. It might not be a very satisfying answer, but it is a fact of life, a fact of business life, that if an organisation is feeling financially strong it is likely to be more innovative.

I made the comment during the course of my earlier remarks that this really is the basic difference I think between activities which are carried on by defence forces and perhaps governments and activities carried on by business. In business our responsibility is to remain economic-

ally viable and we view that by and large on a fairly short-term basis, I am afraid.

Mr Kingsford-Smith, from Hawker-Siddeley in Australia: My question is to Mr Gosper and concerns fuel from shale oil. We read in the papers today that oil from shale is expensive, complex, a mystery which if it produces anything it will be a synthetic oil which may be usable in our refineries or may not be usable.

This confuses me because to the best of my knowledge we were producing oil from shale in Australia before World War I. We certainly produced it here during World War II. It was no doubt very expensive but during World War II we did produce oil from shale. It was used. We produced an important amount and it could not have been tipped down the drain. It must have been used in our refineries. Could you comment on that please?

Mr Gosper: It is 12.09 but I will do my best. You are quite right. In fact the refinery that my own company took over in Sydney, the Clyde refinery, was originally refining oil from shale and that dates back to the 20s. What we are concerned about with shale these days is size; money, engineering the societal impact, the environmental impact. We have taken a different view in my company from some other companies about the timing as far as shale oil is concerned. We all believe that oil will come from shale oil, the process is there. We estimate that it is about \$50-60 per barrel to produce. That is an estimate that we make. It is not too different from what I think other companies make. We have concentrated I suppose on thinking that coal offers an earlier alternative and a less costly alternative for producing oil and gas than others who have felt that shale oil should get a higher priority.

Why shale oil today is so significant a point of discussion and debate, I come back to the point, is because of the scale necessary to produce even modest amounts of oil. Back in the 20s and 30s, the demand for oil just did not bear any relationship to the demands we are talking about today. The Rundle shale oil project in the event that it goes ahead, and no-one has said yet that it will not go ahead — difficulties have been struck in terms of cost and technology — I do not wonder — but in the event that it goes ahead and we must assume that it will go ahead eventually in this country, is planned to produce something like about 200,000 barrels per day. It plans to provide in the order of something like about 2.6 billion barrels of reserves equivalent. That is about equivalent to the amount of reserves of normal hydrocarbon oils that we assess and are known to be available at the moment. So it is a very important resource that we should not walk away from.

However, the risks are enormous. The technology has not dramatically changed. It is a technology of mining. It is a technology of moving large amounts of overburden. It is a technology of handling large amounts of shale oil. It is a retort technology. You are more scientific than I am, I am the least scientific guy in this audience but I can tell you that in the retort process they use temperatures up around 520 degrees centigrade and it is a process by which the kerogen element in the shale oil is vapourised off and then reduced — brought back to a liquid — and this can be used as a feedstock into a refinery. The shale oil in Julia Creek or in the Rundle shale deposits are estimated to have something like half a barrel per ton of shale oil. We are talking about a project that would probably cost around \$10 billion plus.

These are the formidable elements of shale oil. Shale oil has not gone away. It is bigger in size. Its contribution is more important. The current project has obviously struck technical and financial difficulty. This has caused an enormous amount of emotion which I would like to see go away. It is too good a political football at the moment. If there is a question on the stock exchange, we have got structures to investigate that. There is a Corporate Affairs Commission that can do that in New South Wales. The people in Esso are pretty sensible people. They have got

a good track record and their integrity is high and I think the people in government who have been dealing with them have got high integrity and I think we have whipped up an enormous amount of emotion on this.

It is disappointing that a project that was estimated to go into a scale model costing something like \$700 million — and I say that quickly but it is a very large amount of money, has gone to \$2.1 billion and it does not surprise me that these partners have had to step back but it has not gone away. I am concerned that if there is too much emotion about new efforts to bring in alternative fuels, that other people will be frightened off by the emotion that has been stirred up over this issue. My company for example is very seriously investigating and spending considerable amounts of money on coal conversion to gas as a step to go to oil. This is a coal based country. It is a country where my company might feel inclined to spend more money in research. The present atmosphere is not encouraging for me to develop this sort of prospect. I would just like to see the emotion go out of it. Shale oil is still there. Are we not lucky to live in a country where we are 70% oil self sufficient. We have supplies of uranium and we have enormous deposits of coal. That is what we should concentrate our efforts on at the moment I would suggest.



Admiral Willis, Chief of Naval Staff with Lord Hill Norton during a coffee break.



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AUSTRALIAN INDUSTRY'S PRESENT CAPABILITIES TO SUPPORT MARITIME DEFENCE

by N.F. Stevens, OBE

There are few subjects generating more discussion and differences of opinion than the ability of Australian Industry to support the Defence Forces. There have been a number of reports on the subject over past years and much press comment and criticism, some of it valid but some quite ill-informed.

The Defence Industry Committee (DIC) examined the matter in some detail in 1976-77 and produced a report of substantial size which was presented to the Minister for Defence in 1977. For those of you not familiar with DIC I should explain that its membership includes eight senior industrialists and nine senior Service and Departmental officers from Defence, Industry and Commerce and Finance.

The overall conclusion reached by the DIC was that, while Australia has substantial defence industry capability, there had been serious slippage over the years in our capability relative to the more advanced overseas countries and that the technology gap between the commercial products of our industry and modern military equipment had widened considerably. The situation could be described more as one of failing to match the enormous rate of progress overseas rather than of failure to invest in such activities.

Last year the DIC re-examined its earlier conclusions and found that although there had been progress in some areas the overall assessment remained the same. As a matter of interest I would mention that the DIC continues to monitor changes as well as the implementation of the policy recommendations it has made.

The other main inquiries into Defence Industry have been by sub-committees of the Joint Committee on Foreign Affairs and Defence. The first was under the chairmanship of Senator D.J. Hamer, as he is now, and dealt with "Industrial Support for Defence and Allied Matters" (1977). The second, under Mr. R. Katter, dealt with "Defence Procurement" (1979). Both groups reached similar overall conclusions to those of the DIC.

These reports all dealt with defence generally and not Navy in particular. All were written against a background knowledge of the Government's strategic assessment of a major threat to

Australia being unlikely. This is still substantially the current assessment, although each of the two Parliamentary Committees made its own interpretation as to likely scenarios. Also, each dealt with its topic as at a particular time and while all made recommendations for change they contained little speculation on the course of future trends. Such trends are significant and changes in industry's ability to support Defence are important if we are to have a clear understanding.

The trends referred to in the previous paragraph give a picture that is rather patchy — the technological gap continues to widen generally but in some specific areas it has narrowed. This has usually been the result of some departmental initiative (e.g. the Barra Sonobuoy, Mulloka sonar), although the initiative came from industry in the case of the study at present proceeding into the feasibility of designing and building initial trainers for the RAAF. I should add, that there has been continuing encouragement from the RAAF and Defence for this project.

Before narrowing the field to better fit the subject let me add my support to one of the Katter Committee's recommendations. I would like to see the Defence Department able to take complete charge of its own procurement processes. It does so in relation to overseas items but not for local purchase. My reasons are not only the magnitude of Defence spending and the simplification of procedures which would follow the elimination of the second Department but also because it would bring Defence closer to industry

THE SPEAKER

Mr N.F. Stevens, OBE, has had what might be called an all round public service, industry and academic career. His public service began with five years in the army in World War II. In 1968 he became vice chairman of the Defence Industry Committee and its chairman since 1977. He is chairman of the Commonwealth Aircraft Corporation and a Commissioner of the Overseas Telecommunications Commission. He is a director of two other companies and the chairman of the Stevedoring Industry Finance Committee. Introduced by Commodore J.A. Robertson RAN (Retd) immediate past President of the ANI.

and to assist in keeping industry's development in phase with the evolution of Defence requirements.

Now let me turn more precisely to my subject which is "Australian Industry's Capabilities to Support Maritime Defence". As this could mean many things to many people I think I should give the interpretation which I propose to use.

Firstly, "maritime defence" of Australia could involve participation by other countries e.g. USA, New Zealand and the UK — even perhaps Indonesia and Malaysia — the combinations and permutations are many. For my purpose I have taken the topic to relate primarily to the support of the Australian fleet, its Air Arm and those elements of the RAAF directly involved in maritime defence. We could, and undoubtedly would, assist with the support and basing of fleet units of our Allies but this could not be a determinant of our investment in support capabilities unless it is part of peacetime arrangements.

Secondly, there is the area of operations. Without defining this I have assumed that support would be provided from Australia — through Australian fleet bases and civil and naval dockyards — and of course Australian industry.

Thirdly, "Support" itself needs to be defined. I take it to mean provision of equipment, maintenance, repair and technical back-up for modifications, problem solving and so on — a very broad concept.

Fourthly, I think it is true to say that it is unlikely that the "Maritime Defence" in any situation would be in the absence of Army and Air Force but I do not think it is intended that I would widen my brief to examine the industrial back-up to these other arms of the Services except to the extent that they all utilise the same capabilities and are directly involved in maritime defence. The Orions, which are long-range maritime patrol aircraft, provide an example.

The major Navy support facilities for the Australian fleet are Garden Island Dockyard in Sydney, Williamstown Dockyard in Melbourne and H.M.A.S. Stirling in Cockburn Sound near Fremantle, Western Australia. There primary facilities are backed by a miscellany of other establishments with more specific functions. Special mention should be made also of Vickers Cockatoo Dockyard (VCD) which, while privately run, has a direct support role in refits of submarines and some surface ships.

It follows that the Navy itself through its fleet base facilities provides at least first line support. Its dockyards together with VCD provide full refit and modernisation capabilities and, in the case of Williamstown and VCD, construction capabilities for warships and other vessels. These are areas where there has been continuing heavy investment in recent years. HMAS Stirling is a new

facility, Williamstown Dockyard has been extensively modernised over the last few years and a start has now been made on an extensive modernisation at Garden Island, NSW, to accommodate the new FFG's and to bring the facilities up to the standards required. VCD's capabilities in support of submarine refits are also modern and effective.

The first line support of the Fleet Air Arm is likewise provided from within Navy controlled facilities. Depot level support comes from industry controlled establishments such as Hawker de Havilland and QANTAS. Support of missiles from the Navy facility at Kingswood and the Guided Weapons and Electronics Support Facility at St. Marys.

The role for industry is to support this first line. A multitude of contractors provide equipment, equipment repair and services to the Navy as a back-up to its primary effort. The Government Munitions Factories provide most of the conventional ammunition used by the Navy (and the other services too). From the point of view of the subject I am addressing it is immaterial who provides the support (be it industry, government factories or the services) so long as together the required range is available.

There are gaps in Australian Industry's capabilities to provide this back-up. We are very dependent on overseas sources for much of the installed equipment, spare parts and technical know-how required. In the words of a well known professor "Why is this so?" Why do we not have enough of all the things we want for complete support of the Fleet, be they needed in the Navy's lines of support or in industry? Why cannot they all be made locally? The answer lies in the constraints which operate against this utopian idea. There are several major ones and I list them as I judge in descending order of the lead time likely to be taken to overcome each of them. Needless to say this is pretty subjective and it is more than likely that many of you would list them in a different order. However, in my view here they are:

- Lack of suitable technology
- Unavailability of materials, including components and fuel
- Lack of plant and equipment
- Shortages of labour — both skilled and unskilled
- Financial constraints
- (a) Shortage of funds: and/or
- (b) Economic considerations

Let me now look at each of these in turn. This is not as clear-cut as it might appear because the various constraints tend to overlap — it could be contended for example that shortage of funds or at least the poor economies of a project may well be the basic cause of inferior technology.



The console of the Plessey Marine Fleet Escort Skar Type 2016.

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PLESSEY

Lack of suitable technology is most apparent in fire control and weapons systems and other electronic equipment such as radar and advanced navigational aids. What we are really talking about is sophisticated electronics — an area in which Australia was a few years ago fairly close to the state of the art but in which a large gap has now emerged.

All is not black however in the electronics area. The industry now has much greater system knowledge than previously which is useful in the Defence field. Also, there are several successful projects of Australian design and production. AWA's CRH 11 Receiver is in wide use with Navy; the Mulloka sonar is entering production as is the Barra Sonobuoy; local industry did a very creditable job in the integration of the Barra system to the P3C Orions.

Mr. Goddard will not doubt elaborate so I will content myself by saying that the present position results from the escalation in Australian costs compared with overseas costs, added to the problems inherent in our small production runs. Changes in protection arrangements at the time of the introduction of colour television, coupled with the unavailability of Government funding for the level of research and development needed to match several overseas countries have resulted in the near-demise of what was once a promising export industry.

One thing which should be kept in mind is that there is, either in the Service or in the Dockyards (especially Garden Island, Sydney), or in industry, the ability to repair, maintain, test and calibrate most, if not all, of this electronic equipment. It is extremely important that we ensure continuation of at least this level of capability. Although we may be dependent on overseas sources for much of the original equipment, components and technical know-how, we are able to keep the equipment operating given adequate forethought on stock holdings.

Sir David Zeidler has dealt with materials availability in his earlier talk. I think that all I need say here is that unavailability of materials does provide an incipient constraint on industry's ability to support, especially if (for whatever reason) overseas supplies were cut off. This seems to conflict with our immense raw material resources but we do not process these materials to any extent. Even when we do as with aluminium, we do not have the market in peacetime to warrant production of the specialised defence alloys, sheet and sections.

With materials I also link the smaller components. Here again the electronics industry might be quoted in what we (i.e. Australia) do not manufacture most military standard electronic components. Our capabilities in the modern marvels of micro-electronics are limited and with

the massive investments required and our small market will probably remain so.

Availability of fuels is also another matter which should be mentioned. With the conversion of most of the fleet to diesel fuel Navy's dependence on overseas fuel supplies is much reduced. Mr. Gosper has dealt with this subject in more detail.

Full support for the Fleet can be limited by availability of plant, facilities and equipment. For example, if the accident to HMAS Adelaide had happened in Australia waters there are suitable dry-docking facilities on the east and south east coasts only. A new propeller would need to be imported as, while progress is being made towards casting blades locally, the intricate machinery necessary may well be beyond current capability except for special 5-axis milling machines being installed for the aircraft industry. Also the Department has recently installed at Bendigo a very large lathe to provide reasonably economical machining of large marine drive shafts.

Much of the equipment installed in ships such as propulsion systems and armaments, is not made in the country and must be imported. I will have more to say about these later but mention the necessity for their importation in the context of a constraint on our overall capability.

There are other gaps in our capability where overseas designs make use of facilities available there but not yet commercially needed in this country. Very large closed die forgings are an example.

I might add that the mining boom has had fall-outs for Defence in the area of heavy engineering. Whereas Ordinance Factory Bendigo was once the only capability available in many of the heavier areas, similar capabilities have now been developed to service the mining industry with its enormous scale of equipment which often operates in extreme environmental conditions.

There is presently a shortage of skilled personnel throughout industry including civil employees in the Navy Dockyards. I am sure Mr. Humbley has experienced this at V.C.D. I know my service colleagues on DIC have. So have the Munitions and Aircraft Factories of the Department of Industry and Commerce.

The skills to which I refer range from tradesmen to middle management professionals; the geologists; the chemists; the engineers; virtually the whole range. It is a shortage on a national scale and it is worsening. Many steps are being taken to alleviate the position including increased apprentice intakes and recruitment overseas but it appears that a much wider approach is needed, including possibly a change of attitude by the Trade Union movement, to the training of adults to

become tradesmen. As an aside, I think that to take on and train as many apprentices as possible is a national duty for industry.

At all times there is a shortage of funds to do all the things which need doing and so it is always necessary to make judgements and to allocate priorities. Thus some projects which are desirable cannot proceed for this reason. Apart from noting it as a constraint there is little to be said or done here. It does, however, mean that on occasions industry cannot proceed with highly desirable developments which require Government assistance in funding. I might add that only rarely do the prospects of volume from a particular defence equipment warrant large scale private investment in this country.

Closely allied to the funding problem is the decision whether the cost penalty which must often be suffered warrants the benefits that flow from involving Australian industry. Labour (and other) costs in Australia are high, a position which is exacerbated by the pressure for a 35 hour week. Frequently it is necessary to cope with the relatively small numbers in which we deal. Apart altogether from the need to spread one-off costs over small production runs, the chance of making progress down the learning curve is minimal.

Concerted efforts are being made to foster Australian Industry Participation. I am less familiar with the Navy's overseas purchase of ships than with the aircraft industry but strong pressure is being applied in several areas to uplift Australian technology. There are a number of projects where the Government is prepared to accept the higher cost of local production and to provide plant and equipment where necessary to enable work to be carried out in this country because it will bring with it technical knowledge and skills we do not possess which will enable relevant equipment to be maintained here. Navy examples are the Patrol Craft at NQEA and the more recent decision to build follow-on Destroyers (FOD's) to the FFG basic design at Williamstown. Such projects place greater pressure on the Service technical areas in project control, design and management but the end result is in my view much more beneficial than direct overseas purchase. The offsets policy is also succeeding in upgrading technology in many areas though less easily applied in the naval construction area than against equipment being purchased for ships.

Let me now try to draw some conclusions from the foregoing. Mr. Humbley who is to speak shortly will no doubt tell you that Australian builders are quite capable of constructing the hulls of vessels similar to surface vessels in the Fleet at the moment (but of course more modern). Perhaps there is the ability to design them too, although on economic grounds it is likely that overseas assistance would be sought. I men-

tioned the hull of the vessel because much of the installed equipment including the propulsion unit (of whatever type) would not be built in Australia. We do not have that capability, mainly because our requirements are too small to make local production worthwhile, a situation which effectively shuts us out of a number of areas of technology.

Capabilities exist for guns and gun barrels and the Ordnance Factories made 4.5" mountings for the DE's and hopefully will make 76mm mountings for the FOD's. However, in missile and torpedo technology we are very limited. Ikara was a successful Australian-designed system but we have not attempted to make other missiles or their shipboard equipment. Whilst the Defence Science and Technology Organisation and the Services keep themselves aware of developments, the small requirements of highly complex items make it unlikely that industry will be asked to undertake development and production of this type of equipment.

Similar consideration apply to much of the sophisticated electronics — the fire control systems — radars, navigational equipment and so on.

When it comes to submarines, the hull (which is a pressure vessel) has never been attempted here although a study of the feasibility of such construction is currently under way and Mr. Humbley will no doubt refer to this. VCD through its refitting and modernisation of the Oberons has extensive knowledge of fitting out submarines and much experience of welding the pressure hulls. They may well be capable of taking on the building task.

I would not like to leave the impression that because we can only effectively build hulls and a limited range of equipment that building of naval vessels in Australia should not be continued. I believe we will make immense gains from the building of the FOD's here though there will undoubtedly be difficulties and frustrations also.

A much more satisfying picture emerges when it comes to maintaining vessels and their equipment. A similar picture emerges in relation to the aircraft operated by the Fleet Air Arm. As I have indicated earlier, our capabilities in this area are by no means insignificant. Very little of our equipment goes outside the country for repair and overhaul so that while we are not self-sufficient in the provision of equipment and spares we are nearly so in the repair, maintenance, calibration and putting to work.

Some of our facilities in this area are extremely good. Special reference should be made to those for missile support at St. Marys and Kingswood. The latter enable us to support Tartar, Seacat and other missiles. These facilities are to be extended to cover the key weapons of the next twenty years.

One of the deficiencies encountered at almost every turn is the difficulty of maintaining satisfactory communications between Defence and Industry. The Defence Industry Committee is very much aware of this and has, over the years, made a number of suggestions, most of which have been implemented with, I think, some improvements resulting. But the nut is far from cracked and it is at least as much industry's fault as Government's. An important new development in getting this message across is formation of industry groups and indeed the Australian Naval Institute has a role to play here.

The conclusions which emerge fairly clearly are:

- The Naval shipbuilding industry remains capable of building the replacement hull for any of the vessels in the present fleet, except submarines, even though it must rely on the importation of much of the installed equipment.
- An investigation of the feasibility of building submarines is currently under way with pros-

pects that this could be within our grasp if properly planned.

- VCD is able to carry out the four-yearly refits of "Oberon" class submarines and has updated those vessels successfully with new weapons systems.
- There exists in the country the capability (in both labour and facilities) to overhaul, repair and put to work virtually all the equipment (including propulsion equipment) which is installed in Australian naval vessels and aircraft. However, we remain reliant on overseas sources for many spare parts.
- The "technology gap" is widening so that there is only limited capability in Australia to design and build the "black boxes" which form increasingly the basis of naval action.
- There is no capability in Australia for the design and manufacture of propulsion units be they steam, diesel, or gas turbine.
- The constraints which underlie the present state are substantial and their rectification would take time in all cases but especially in the technology and skilled manpower areas.



Admiral Murray with seminar officials Commander Youll and Captain Cooper.

THE WAY AHEAD FOR MARITIME DEFENCE INDUSTRY IN AUSTRALIA

A Group of Presentations by:
Mr Richard Humbley
Mr R. Kingsford-Smith, DSO, DSC
Mr B.R. Goddard
Mr P. Scott-Maxwell, DSC and Bar

Speakers introduced by Commodore J.A. Robertson RAN (Rtd),
immediate past President of the ANI

SHIP BUILDING

by Mr Richard Humbley

The views express in this paper are my own — and they are not necessarily shared by my Company, Vickers Cockatoo Dockyard Pty Limited, or by the Australian Shipbuilders' Association, of which I am Chairman.

It is my intention

- to recall the role of the Australian shipbuilding industry in our maritime defence — and to say how the industry is seen by Defence in that role;
- to describe the present state of the industry — and briefly say how it got this way. There are some lessons in history;
- to point out some of the current problems — and suggest the need for broader vision in the "ship industry";
- and finally to have a word or two about the government as customer — in policy and practice.

THE ROLE

There has been singularly little controversy or disagreement with the views put forward in the Defence White Paper of November, 1976, when the government of the day called for greater self-reliance in our defence posture — and added it was foreseen that

"... any operations are much more likely to be in our own neighbourhood than in some distant or forward theatre."⁽¹⁾

In that paper also, most importantly, the implications for Australian defence industry were outlined in some detail. These included

"the sustaining of the capability to construct and modernise selected naval vessels"

and

"a basic design and development capability which will permit selective local design and development of equipment, modifications and adaptations to overseas designs, as well as production."⁽²⁾

It has also been well said, in the report of the Parliamentary Joint Committee on Foreign Affairs and Defence (the Hamer Committee, October 1977), that —

"It can be argued that, because there is a naval shipbuilding and repair competence in Australia, it is not necessary to have built a specific warship in this country to be able to keep it in an effective operational state. It is undoubtedly true that there is adequate technical capability in the Naval Dockyards and at Cockatoo to undertake the repair, including that of battle damage, refit and modernisation of combat and support vessels whether built locally or overseas. This does not necessarily mean, however, that the required level of competence can be retained without

THE SPEAKER

Captain Richard Humbley, RAN (Rtd). On graduating from the University of Sydney, Richard Humbley joined the RANVR in 1941 and saw war service in HMA Ships *MORESBY*, *WARRAMUNGA*, *ARUNTA* and *BATAAN*. After the war he transferred to the permanent service as one of the first Electrical Officers, and was promoted to Captain in 1961. He filled a variety of senior technical and administrative posts in the RAN including that of the Director General of Naval Production. Since 1971 he has been Managing Director of Vickers Cockatoo Dockyards Pty Ltd.

a design and construction workload to exercise and develop the wide range of necessary skills."⁽³⁾

This coincides with the realistic view put forward by Defence officials at the Industries Assistance Commission two or three years ago, when they affirmed the need for the commercial shipbuilding industry to maintain its current range of skills and technologies, and to keep improving them in the defence interest.

They spoke of the prospect of allocating defence work to selected yards to maintain essential capabilities; and they were concerned also for the continued viability of support industries and the training of people such as naval architects.

Lack of this kind of infrastructure would limit our capacity to continue with naval shipbuilding.⁽⁴⁾

There is at once a declaration of the role, and a commitment to have regard to its defence significance.

THE STATE OF THE INDUSTRY

How does the industry stand today to discharge this role?

Here it is that we should look briefly back into history, because there are some lessons for today.

Commercial shipbuilding world-wide is still mostly in deep trouble. Completions of new merchant ships in 1980 were at the lowest level since 1965. Japan, Brazil and South Korea were the only improvers. (They were the ones described this morning by Sir Anthony Griffin as "loss leaders".) Save for Finland, helped by Soviet orders, European shipyards were all down, as were completions of merchant ships in the United States.

In Australia we have witnessed the closure of almost all the major merchant building yards during the decade just past. From a total work force of over 8,000 people, mainly in commercial yards, with naval work essentially in Williamstown and Cockatoo, we have now probably not more than about 2,500 people in all, actually engaged in building ships in Australia.

The firms which have withdrawn from the industry were all living, to some degree, on borrowed time during a period when government policy was less than sensitive to the long-term consequences of short-term judgments.

- Whyalla has gone — 2,000 employees including 400 staff.
- State Dockyard has run down from about 1,800 (including 300 staff) to less than 300 engaged in shipbuilding, with rather more in ship repair and general engineering.
- Adelaide Ship Construction has closed — employed about 1,000.

- Walkers Limited ceased shipbuilding, in which they employed several hundred.
- Evans Deakin closed their Brisbane Yard, where they had employed nearly 1,000.

The industry now is reduced only to:

- Vickers Cockatoo, employing some 2,000 people in all, of whom about 400 are engaged in new construction.
- Carrington, with about 400 people plus some sub-contractors.
- State Dockyard, with less than 300 in shipbuilding.
- NQEA, General Engineers and Shipbuilders, with some 600-odd people employed, including about 200 in shipbuilding.
- together with a number of small yards around the coast, each employing less than 100 people, with little capacity to take on any major work.

To this list should be added Williamstown Naval Dockyard, although there would not be very many people there at present engaged in ship construction.

Thus the total engaged in building ships is not more than about 2,500 people in the length and breadth of Australia.

Now, in the long term most of these firms must depend on commercial shipbuilding to survive.

What are the prospects?

There are some advantages:

- those who are left have, in some places at least, invested in modern plant and equipment, and their managements are forward-looking.
- the Bounty system for support of the industry is in place for five years, and gives promise of some stability in policy, in the present climate of government.

But there are some disadvantages and hazards already in the offing:

- the industry is so small that it can have no strength or resilience to resist forces beyond its control.
- it is extremely sensitive to economic conditions. For example, the small yards, which built excellent prawn trawlers (and, indeed, have exported some) are being gravely set back by the depression in the fishing industry from falling demand and rising fuel costs.
- most importantly, the industry is threatened by local escalation of cost of both materials and labour in the wake of militant industrial action — notably in support of the shorter working week.

In this context it should be noted that the Bounty system was calculated to give some sort

of price parity to local shipbuilders against imported new vessels, which are now freely admitted in competition on the local market. It is reported, however, that overseas prices are generally holding about the same as six years ago.⁽⁶⁾ Hence it does not take much imagination to see what could happen on the local scene if the 35-hour week comes in the shipbuilding industry without any real productivity gains; our industry has been a target in the national campaign since last year — and if the Australian dollar continues to ride high on the resources boom.

Additionally, of course, the Bounty, and other support systems, have never really addressed the total picture of import parity, when Australian shipbuilders remain at a grave disadvantage in the face of financial incentives offered to owners by foreign yards, whose governments do see the need to underpin the very existence of their industries in the national interest. (Recall that Sir Ronald Swayne alluded yesterday to some of the financial incentives available overseas but denied to Australian owners.)

This is where there is a pressing need in Australia to address what has been called "the ship industry" — namely, all those interests who have to do with ships; the owners, operators, the shippers, the builders, and the repairers. These interests are scattered through no less than four or five Ministries of the Commonwealth Government, and the State Governments have responsibilities for ports and harbour facilities. Treasury, Transport, Industry and Commerce, Business and Consumer Affairs, Defence — and perhaps Primary Industries for fishing policy — all have an input to the environment in which the shipbuilder has to manage his business and make a profit.

What about naval shipbuilding?

The merchant shipbuilding industry which has now collapsed grew out of the industry which was built up in World War II from the nucleus of naval construction which had existed and deliberately been nurtured at Cockatoo Island during the 1930's.

Also, by the end of the War, in planning for the post-war Navy it had been determined to secure the future of naval shipbuilding in this country. In an imaginative and far-sighted programme, at Williamstown and Cockatoo, the *DARING*-class destroyers were approved and put in hand specifically to ensure that the skills and resources needed for the construction of combat warships were maintained in Australia.

These programmes were followed by six, later reduced to four, Type 12 Frigates.

- All these ships were good ships, and as a matter of considered policy they all had an extremely high Australian content — hulls, hull fittings, main machinery, a high proportion of auxiliaries, and a very large

part of the weapons and communications fits were made locally.

- They all took a long time to build; but this was due not least to fiscal policy, which limited the annual allocation of funds — this was a powerful constraint which, although well understood at the time, was readily forgotten by the critics later.
- They were all costly because they took so long.

Nevertheless they achieved the objective of securing the ways and means to build warships, and kept the people and skills in practice, even though, with wisdom and hindsight it should be admitted that the exercise was not quite as efficient as it might have been.

However, public criticism came only after the completion of *TORRENS* and *SWAN*, a further two Type 12's, which had been approved in 1964 as replacement for *HMAS VOYAGER*. These ships were ordered as identical repeats of *STUART* and *DERWENT*; but soon it was decided to re-design them to take in some of the advances in technology and design then available. This resulted in large over-runs in time and cost which were never adequately explained to government, with the result that the shipbuilders, unfairly in my view, had to bear most of the odium.

As a consequence, it was decided that no future programme would ever be undertaken again in this way — and the over-reaction which followed resulted in the costly and abortive Light Destroyer (DDL) fiasco, where an attempt was made to settle every possible detail, and close every possible loop-hole, before anything was done to start building the ship.

Whilst this was going on, a programme to replace *HMAS SUPPLY* with a locally designed ship was beginning to move; but this project, which was ready to go in 1973 at Cockatoo, who had received steel in the ship-yard, was stopped on the score of changed government priorities. Then followed an accelerating run-down in Cockatoo Dockyard, to its lowest level since the 1930's. Williamstown continued with a slow building programme of *HMAS COOK*, along with naval repair and refit.

THE GOVERNMENT AS CUSTOMER

And now where are we?

Government interest in new ships for the Navy revived in 1975, at a time of change. Commercial shipbuilding was collapsing and crying desperately for government support; and there was a new approach to defence procurement. Open tendering for ships of minimum risk was the order of the day — proven designs and no technical risk.

As a consequence, the Patrol Boats, Landing Ship (LSH), and Fleet Underway Replenishment

Ship (AOR) have all come to pass as new building projects, and these provided workload for a major part of the shipbuilding industry which now remains.

An important facet of these projects is that they are all fixed price contracts, reflecting an approach by government to try to minimise contractual problems and cost over-runs. The achievement of this objective depends ultimately, however, upon how exactly and how adequately it is possible to define the requirement.

Thus the contractual relationship with the Commonwealth is an essential interface. Here, indeed, is a real problem with the government as customer.

In the nature of things, the government is a monopoly buyer of warships in a specialist field which bears little resemblance to the commercial market in which our shipbuilders usually have to make their living. Warships are complex, take longer to build, call for different standards of construction, fitting out, inspection, and trials, and the need to allow for changes and modifications during building must be accommodated. Because of advancing technology a warship is inevitably "out of date" in some respects even when brand new. Thus naval requirements do not always fit readily to the accepted pattern and practice of a commercial shipyard.

At present we have a very small industry, indeed — only two yards, Vickers Cockatoo and Williamstown, have a large technical infrastructure. Generally the outlook of all yards, particularly those who are managing to survive commercially, is innovative, and they are reasonably well equipped. Williamstown is very well set up as a naval yard, and will be even better when the modernisation is finished.

But the financial resources of the remaining Australian shipbuilders, if you exclude Williamstown, are very thin. For Defence projects the industry operates in a very complex contractual environment, whose structure and, perhaps, philosophy are giving cause for concern.

The procurement structure has grown as a sequel to the Scott Committee of Inquiry into Government Procurement Policy, whose Report was submitted to the Prime Minister in May 1974. It will be recalled that at that inquiry the Department of Defence, in evidence, made a strong plea to be responsible for its own purchasing function because of its different, or special, requirements; and because of the essential importance of the user aspects, and of its own knowledge and experience of these.

In the event, the Defence case failed to persuade the Committee, which proposed, instead, that Defence purchasing should not be excluded from its recommendations for an omnibus Purchasing Commission.⁽⁷⁾

Today, although the Commission was not established, the Purchasing Division of the Department of Administrative Services is responsible for the administration of local defence acquisitions. Broadly it acts as the purchasing agent, but additionally it exercises certain powers in its own right which stem from legislative and regulatory constraints laid down by the Parliament. Such constraints are unexceptionable, but the manner of their management creates difficulties, and raises unnecessary boundaries between parties concerned, which, in my experience, can impede the smooth running of the procurement process. It is reported that the contracting function for Defence occupies about eighty per cent of the Purchasing Division's activity, although it has no direct responsibility for achievement of technical or production objectives.⁽⁸⁾

With experience we shall see the consequences of this administrative separation, but already it is clear that in shipbuilding the Department of Administrative Services is breaking new ground.

Indeed, it is a matter of fact that the contracts which it is seeking to obtain for new ship construction locally in Australia are generally substantially more onerous than overseas governments require of their own shipbuilding industries — and certainly more onerous than our own Australian Government is ready to accept when buying overseas.

Which brings me to what may be described as the philosophical function of defence purchasing, that is, the function of serving the Defence need by looking to the well-being of those industries which are essential to the national interest. In the case of shipbuilding, there are a number of projects in the pipe-line, and the value of these projects is growing. Some of them are imaginative and challenging — the GRP Catamaran Minehunter is one, for example. This has potential to produce useful ships for the RAN, and, if handled correctly, it may also lead to export opportunities — and it will certainly provide the means towards improving technology in that particular area of the Australian shipbuilding industry.

There are others, and there will be more. But in every case due weight must be given by those concerned with the procurement function to the fact that the industry which is being addressed is extremely small, and extremely fragile. Indeed, the danger seems to be not sufficiently appreciated that the little flame which still burns, after the fire and collapse of the industry during the past decade, could be very easily snuffed out, not necessarily by any direct action of government, but simply by its own Board-room decisions that the game is just no longer worth the candle.

Now here is the real threat to our area of defence industry — unlike our colleagues in, say, electronics or heavy engineering, or even aerospace, shipbuilders' resources which have to be held, and developed, and tuned to serve the defence need, are not easily diverted to another market. We have nowhere else to go; and our monopoly customer must be sensitive to the judgments which we have to make about reward for risk and effort.

In this context I should like to leave you with a thought from the Report of the Rayner Project Team which some ten years ago set the new pattern for defence procurement in the United Kingdom, and insisted incidentally that the technical, financial and contractual responsibilities should not be separated, but managed within a single procurement organisation.

Mr Derek Rayner wrote:

"Those engaged in defence procurement are often monopoly buyers and have to deal with monopoly suppliers. There is insufficient forward thinking about the responsibilities which are incumbent upon a procurement organisation operating in such an environment. Unless there is a conscious and continuing review of forward industrial needs and strengths and a continual watch on the efficiency and financial stability of its main suppliers, defence procurement can find itself compelled to support inefficient national industries or to purchase abroad when forward thinking would have prepared energetic companies at home to be responsive to new needs. Most important of all, defence procurement must accept, and exercise, a responsibility for the health of those parts of industry whose survival is paramount in the defence interests of the nation."(9)

Perhaps this is the philosophical function which we shipbuilders require to be addressed in defence procurement in the way ahead?

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THE AEROSPACE INDUSTRY

by Mr R. Kingsford-Smith, DSO, DFC

I will possibly confuse the issue by stating that the dividing lines between the aerospace, shipbuilding and electronics industries are becoming increasingly indistinct now that aircraft and ships are sometimes fulfilling similar and often complementary roles, are using common or similar equipment, similar systems and similar construction materials.

Aerospace and electronics manufacturing skills have been used in the development of such naval equipment as the Ikara weapons systems, the Turana navy drone, Barra sonar buoy, the R.A.N. underwater sound range and so on. The general electric marine turbine, the main propulsion unit in the F.F.G. is a derivative of an aircraft engine and if it ever needs to be removed for major servicing, which GE says will never happen, it will, I understand, be overhauled in the aircraft industry. Diesel engine components from Oberon submarines and Attack class boats are overhauled in the aerospace industry and aerospace-developed electron-beam welding techniques are used for salvage of high cost ship borne mechanical components. Aircraft and ships use near identical or similar communications and gyro systems.

There would be many other examples but those I have mentioned indicate the degree of overlapping capability and engineering and trade skills in the three industries today and I think there will be more of that as systems become more sophisticated and more expensive and of course you will see them shared more by particularly the Air Force and the Navy.

Before we look at the way ahead I will very quickly list the main activities of the aerospace industry in relation to maritime defence.

Manufacture by the Aerospace Industry

The Vampire Trainers and Macchi Trainers used by the Navy and the Nomads used by civil operators for in-shore maritime surveillance.

THE SPEAKER

Mr R. Kingsford-Smith, DSO, DFC, is the Chief Executive of Hawker de Havilland Holdings. He has a distinguished record of active service and as a highly decorated Wing Commander, led the RAAF Victory contingent which went to London in 1946. His name of course is synonymous with aviation in Australia and he is eminently qualified to speak about the Aerospace Industry.

Local industry designed and installed the surveillance package in the Nomads.

The flight vehicle for Ikara.

The Turana Drone.

Mechanical components for Barra.

Aluminium ships, boats, R.A.N. harbour craft and lightweight small patrol craft for Australian customs and paramilitary duties in Asian countries.

In peace time the overhaul, repair and modification role carried out by the aerospace industry for maritime defence forces is much more obvious.

Overhaul, repair, modification and refurbishing support provided by the Aerospace Industry for Maritime Defence

Westland Wessex — airframe and engine

Grumman Tracker — airframe and engine

Douglas Sky Hawk — airframe and engine

Macchi Trainer — airframe and engine

Bell UH1B — airframe and engine

R.A.A.F. Orion — engine

Westland Sea King — engine and airframe — major repair.

Design, manufacture and testing of E.C.M. support equipment in the HS 748.

Design and feasibility studies of major life extension work to the Wessex and Tracker including re-engining with more modern power plants.

Refurbishing of radio transceivers, satellite Omega controls, fire control modules, etc.

The Future

The role of industry in relation to Armed Forces is to ensure, within the limits of funds and priorities, that effective hardware is available for maritime defence in peace and war.

The key word here is "effective", ships and aircraft and some of their equipment now have a very long peace time life and the trend is to lengthen these times. In aircraft some equipment in particular stays around for an inordinately long time. The Wright 1820 engine in the Trackers first went into service nearly 50 years ago.

I am not saying the engines in the Trackers that the Navy are flying around now are 50 years old but with that engine, with one or two minor changes, first delivery started in the early 1930s. That is not a terrible thing. The aircraft is old, it still has a very important role and the Australian Navy is not unique in using old equipment. The engines in the Air Force Caribous are nearly as old. The Caribou has a useful role. The Air Force Canberra bomber, I well recollect, is designed to a specification we drew up in bomber command in England before the last war was finished and that aeroplane still has a role and so it goes on.

Without belittling the important role of manufacturing or construction, it is obvious therefore that the procurement stage, particularly in Australia, is a rare event, whereas overhaul, repair or major refit is much more common. To retain the fighting effectiveness of ships and aircraft over their long lives all industry and particularly the aerospace industry will have an essential support role mainly for aircraft associated with maritime defence and their equipment but also for certain ship-borne equipment.

The role of Aerospace Industry to Support Aircraft and Ships as Effective Fighting Units

Basic structures must be kept sound. Structural members corrode, wear or fatigue and their replacement sometimes involving re-design may be expected at least once in the life of an aircraft.

Damage to structures must be repaired. The design of repair schemes is sometimes necessary.

Propulsion units require scheduled overhauls. Incorporation of modifications are inevitable. Some repairs must be expected.

Weapons systems including radar and fire controls will require modernisation and sometimes replacement during life of type.

Electrical, electronic, hydraulic and mechanical systems will require overhaul, repair and modification or replacement during their long life.

Training of technical personnel in new equipment may be expected.

Availability of the right spares at the right time is a constant problem. As well as providing local spares manufacture which is sometimes essential for older imported equipment, the aerospace industry at the beginning of a project can now offer a spares support package including inventory planning, procurement, storage, usage monitoring, and re-ordering.

The aerospace industry is doing this more and more so it can manage its own affairs. It cannot cope with its inventory control now without good computer programs. It has the capability of providing this service.

In a similar fashion the industry can take total engineering support responsibility for a particular piece of equipment or offer such things as a fatigue monitoring programme or reliability and maintainability monitoring programme.

These concepts are variations of the project management approach now widely used by the aerospace industry with the effective utilisation of computers for project planning and control and these particular management skills can be contracted out by industry.

In the past, industry has contracted out trade skills. I think it will be a trend and it is a trend

overseas for industry to contract out management skills.

The most significant aspect of the support services I have just listed is that the Australian Aerospace Industry is more or less constantly engaged in all types of support work for other military users in Australia, a significant number of Asian and Middle East countries plus a very large number of civilian operators. With good communications and understanding between the Australian Maritime Forces and Australian Industry there is potential for a very broad range of deep and economical industry support to be available to the Armed Forces.

I would like to conclude now with some comments on offset. Offset or AIP — AIP means Australian industry participation — it has been mentioned yesterday, it has been mentioned today. It is a subject on which there is great interest and great misunderstanding and I think I have heard a lot of misunderstanding yesterday and today. Let me talk about AIP. AIP to different people has a different meaning and to some people it means putting local Australian content into defence purchases. In other words, you build something here or you put 10% of local content into something you bought from overseas and if we buy one ship or 10 aircraft and put some local content into this one ship or 10 aircraft, it is bloody expensive and time consuming. I surely do not have to explain to you why it would be. The volume is so small; the start up costs are so high, and it is certainly of questionable value.

If you stand off and look at this, we have been building ships in Australia since the last century. We have been building aircraft in Australia since the 1920s. Certainly in the 1939-45 war we built aircraft — fighting aircraft and fighting ships — which by the end of the war were equal to the best the allies had, particularly in areas such as the Mosquito and the Mustang. We had an electronics industry and so on. That was run down and fairly recently, someone invented the in-words AIP. Some people thought this was a new concept and they make quite an issue of it but as I have said, it meant we would be doing something that we have been doing for donkey years. As I said, I think there is a lot of misunderstanding about it.

Let me talk about the other word, offset. To me that is much clearer although there is misunderstanding on that too. It is meaningful, I do not think it is ambiguous. It means that if we buy equipment from overseas, we use that purchasing leverage to get something beneficial back as an offset. There are no Father Christmases in this world. We do not get anything given to us. It means we have an opportunity to bid for work or to contract to acquire technology, usually by paying for it or doing something else. As an offset we do

not get back potatoes and you would be surprised at the number of overseas countries who buy primary products from us and say as an offset we will buy some farm product from you. Obviously as an offset if we are looking at manufacture, we want products of equivalent technology to the products we are buying and we want volume because the curse of our defence industries is that the orders are so small we do not get enough volume.

Let me give some good examples rather than describing it and you will see they are very largely civil products. In the Boeing 727 aircraft, the Australian industry is the sole source supplier for the rudder, the elevator and the wing ribs and there are a lot of wing ribs in that and they are quite complicated to make. We are the sole source supplier. In the DC-9, we are the sole source supplier for the elevator and in a new development of the DC-9, Australian engineers designed the new elevator. In the Airbus 310 which is going into production we will be the sole source supplier of wing ribs. In the new Boeing 757 we will be the sole source supplier of very complex wing ribs which have a rib which you could say is something like a propeller blade that was mentioned. In other words it is curved and twisted and you need a five axis mill to cut it out of the solid.

The production of these components and the sale of them is done on an arms-length export basis. The Australian industry bids, and I can assure you it bids against competition from other countries. It loses some, it wins some. Those we have won where we have put in the best bid. The prime manufacturers who buy from us sell their products in a very competitive market. They are interested, not necessarily in this order but roughly, quality, delivery and price. They lump them all together. They must have delivery, they must have quality and they must have the best price and you really have to be the best in all those to get the contract.

This does bring me of course to some of the comments made earlier by Professor Kasper. I would like to thank Professor Kasper for putting Adam Smith back on his pedestal from which he was knocked so unfortunately yesterday, but I am going to take him to task for some of his other comments. I must speak quite frankly, it is a pity that members of many of our highly protected and monopolistic and very well paid tertiary industries, and our universities is one and there are others of course, who in many cases have never made anything in their life and who in many cases have never faced unrestricted opposition from low priced manufacturing countries can sit in judgment of Australian industry.

Some of the expressions used by our critics take the word "feather bedding" which I heard used. Feather bedding, coming from an Australian university, these are not terms I like to use. It is an argument I do not like to get into but I think I have a responsibility to defend manufacturing industry because this form of criticism is so often made and I honestly do not think it is very constructive. We could, I have demonstrated that Australian industry if it specialises and can get the volume that it needs from exports, it can re-equip its factories with the very best manufacturing equipment and can be competitive. We would be a lot more competitive if we had a lesser taxation load on our shoulders and for example, if our education department and our schools and universities were staffed with academics, administrators and domestic workers from some of the universities in Singapore, Taiwan or South Korea who are prepared to work shifts, take bigger classes and work for about half the pay, our taxation would be substantially reduced.

We have to be reasonable in all of these things but I am glad you appreciate the comments I am putting across. Professor Kasper, and I am sorry to keep at you, I will let you off the hook in a minute, you quite rightly are for innovation and change and I think offset can give us innovation and change but you were against offset. You are for the world car concept, now offset is a world aeroplane concept. To build a modern aeroplane today requires such an outlay of capital that the work is spread over the world. We started off doing offset, we have now gone onto world aeroplane concepts.

You are against local manufacture but you are for local support and I can assure you that a lot of local support could not be carried out unless we had the resources of local manufacture. A bit more about offset — what offset has done for the Australian industry and I have only listed some of the offsets. There are other defence offsets but I have listed some of the most attractive ones. Offset has given the Australian aerospace industry new equipment equal to the world's best, equipment we need to make the new fighter program in Australia. It has given us new methods and it has educated our management immensely. In fact, it has enabled us to upgrade our manufacturing techniques right across the spectrum and management is the limiting factor in today's complex manufacturing world.

It has enabled us to increase our force of skilled workmen. It has given us new processes. It has done a whole lot. It is an excellent example of industry and government co-operation to achieve a desirable aim, both for defence purposes and for the good of the nation. Without offset in the aerospace industry, I can assure you we would be in a very minor league, maybe sticking to defence

work, one aircraft per month. With offset the aircraft industry has been able to latch onto overseas production rates and methods. As I said, we have proved that we can gain exports and we have certainly demonstrated some of the good things Mr Hawke said yesterday about the Australian worker.

With the present rate of defence production, one ship every two years or one aircraft per month, despite the high calibre of our workforce, the skill of our managers and our workers, we cannot hope to be as clever and as up to date as the overseas manufacturers who have production rates ten times greater than us. We must take advantage of their greater experience and learn from them. We are stupid to put our heads in the sand and say our graduate is as good as theirs and an Australian worker is as good as an American worker or a French worker or a British worker if those people are engaged in projects that are far in advance of ours usually only because they have more money to spend. We are crazy not to learn from them and the offset program of course has given us the opportunity to do that.

THE ELECTRONICS INDUSTRY

by Mr B.R. Goddard

My presentation in this segment addresses the Australian Electronic Industry and, in the brief time that I have at my disposal, I propose in my address to emphasise two specific areas of mutual interest, namely:—

Research and Development — An Essential Requirement for Future Capabilities and

Maritime Defence Systems — Areas of Main Interest and Directions in which the Industry is Heading

In April of last year, the Australian Electronic Industry Council submitted a comprehensive report to the Minister of Productivity explaining the need for a strong electronic industry for Australia. It is common knowledge these days that the ability of the defence forces to deploy and to fight is more dependent on electronic equipment in one form or another than on any component in its inventory. This point is also stressed in the Hamer Report which highlights the increased importance of electronic technology in all areas of defence force operations.

The Hamer Report states that:—

"In a number of technologies of defence importance, Australian industry, through lack of a proper workload, is

unable to acquire, or sustain, expertise

and

"Because of the range of technologies embraced by electronics, industry has had little or no recent involvement in such widely diverse areas as radars, infra-red techniques, defence application of lasers or the broad field of electronic warfare."

I have, quite intentionally, quoted from a paragraph in the report that is disturbing because it highlights Australia's inability, in the past, to acquire or sustain expertise. In my opinion, this factor is of paramount importance to the electronic industry when examining "the way ahead for the maritime defence industry in Australia".

Electronics is the link-pin in all operational systems and the nation's ability to sustain an adequate work-load with long term prospects is a vital factor towards achieving an adequate level of defence. Electronic signal processing or electro-mechanical applications feature in the majority of equipment used by the defence forces. To name but a few:—

- Our internal command and control systems — in fact our total communications network — be it telecommunications, radar communications, facsimile communications or data networks.
- Surveillance systems, methods of detection, identification and deception — I refer to electronic counter measures and electronic counter counter measures.
- Weapon guidance systems, ranging, control and fail safe systems.
- Control of the parent or launch platform and, if it is mobile, providing the platform with a highly accurate position information system. Electronic energy control systems regulate the motive power driving the platform in the most efficient manner and yet feature redundancy to enable survivability.

From these applications alone it is readily apparent that electronic products — and by this I mean the electronics industry — play a vital role in all aspects of national defence. I submit that this is far too important a role to delegate in its entirety to overseas suppliers — especially when that supplier must offer his Australian customer a lower priority and the order is subjected to unpredictable political constraints. I should stress that I am not advocating that Australia should adopt a "go it alone" policy culminating in total self-reliance. Such a policy could not be sustained by a nation with a population of only 14½ million, and a land mass of 3 million square miles. I do emphasise, however, that far more effort must be devoted to research and development so that the

"know how", the expertise and the ability to expand and innovate during periods of tension, is available to Australia from within Australia.

One avenue available for Australian industry to improve its technological expertise is through greater involvement in the offsets programme and Australian industry participation programmes, as we have already heard.

Since the Government introduced the offsets concept ten years ago, Australian industry has won more than \$350m in offsets orders. Sir Phillip Lynch, in a recent address to an offsets seminar in Adelaide, said that offsets orders worth more than \$1,000m would be available for Australian industry over the next ten years. Projects such as TAA's order for the European Airbus, Ansett's order for a Boeing fleet and offsets work associated with replacement aircraft for the ageing Mirage Squadrons could have a most favourable impact on the electronics industry. During the past ten years, the offsets programme has significantly helped the electronics industry to narrow the technological gap between industry in Australia and that pertaining in the rest of the world.

The most effective offsets work ensures continuing technological development related to imported equipment, the creation of new skills and the most efficient use of resources to boost our industrial base. We are continuing to gain an ever-increasing slice of offset work and the Government must be congratulated on up-holding this policy.

Significant advantages, as firms already participating confirm, include:—

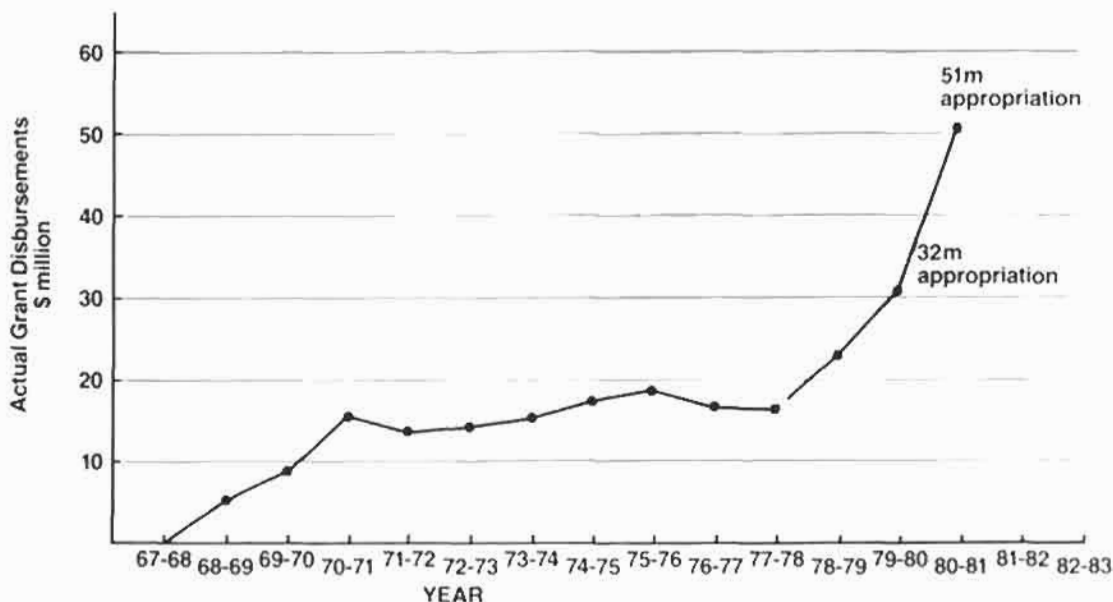
- Improved management techniques, workshop practices and quality control procedures.
- New production opportunities, enabling capital investment in new machines and tooling.
- An enhanced technological know-how for producing goods for world-wide markets.

Work such as this is extremely beneficial to the industry and to the nation. It provides experience in modern technological develop-

THE SPEAKER

Mr Bruce Goddard is well qualified to speak about the Electronics Industry, as the Managing Director of the Plessey Group in Australia and New Zealand. He has previously worked with various electronic companies and at CSIRO, as well as lecturing at the University of Sydney where he has taken his degrees, including that of Master in Radio Astronomy. He has a wide range of activities as Vice President of the NSW executive of the Metal Trades Industry Association and a Deputy Chairman of the national body. He is also Chairman of the Australian Telecommunications Development Association and a member of the Electronics Industry Advisory Council.

LEVEL OF I.R.&D. GRANT AND INCENTIVE FUNDING



Source: Australian Research and Development Board

ment, long term security and, what is most important, a "within Australia" capability for development in the event of a threat to our security.

This leads me on to research and development.

Research and development is the life-blood of the Australian Electronic Industry. The industry is technologically intensive and there is a direct relationship between the level of research and development and the condition of the industry.

The above chart shows us the level of the total I.R. & D. Grant and incentive funding over the past twelve years.

Prior to 1978, the annual grant was not keeping up with the C.P.I. It fluctuated considerably as evidenced in 1971 and 1976, and was not providing industry with any assurance of long term support in product research. I should stress here that the figures in the chart are the total R. and D. grants. They do not relate in any way to the electronics industry.

Investment in industrial research and development involves an investment in skilled personnel. It is useless for the educational system to produce large numbers of highly qualified engineers and scientists if industry cannot justify the investment necessary to employ them to practice their skills. There is little need for highly trained scientists and engineers in an import-oriented industry, or in one which imports its technologies and merely assembles goods incorporating such technology. As this chart shows,

it is difficult for research scientists and engineers to see a satisfying and challenging career in industries that have large fluctuations in the financial support given to R. & D.

This year's Budget gives the manufacturing industry some encouragement for the future. As you can see on the slide the 1978/1979 appropriation provided for a substantial increase in government support for R. & D. with a total of \$24m. being made available to industry as a whole. The Government assistance to R. & D. is of long term significance to industry and we are pleased to note in the Treasurer's Budget speech last August the substantial increase in the grant for 1980/1981 to \$51m. As I have already stated, large variation in funding produces instability. The growth line is now heading in the right direction and I look forward to future I.R. & D. appropriations that are realistic and assist towards stability and the long term growth of the industry.

Most large companies in the industry send selected engineers for training overseas to participate in research and development projects in their overseas organisations. In my company, for example, we have had a number of our people in Europe for varying periods of time to learn, and bring back to Australia, the intricacies of technological developments with foreseeable Australian applications. I.R. & D. grants are not applicable to R. & D. work performed away from Australia, even though the work is performed by Australian companies. This is a situation which I consider merits further examination.

I wish to emphasise that expertise gained by challenges, coupled with job security strengthens the industry and that we can only retain experts by gaining R. & D. contracts, I.R. & D. grant support, as well as offset work and a greater involvement in A.I.P. programmes.

Now let us have a brief look at some specific areas of interest to the Australian Electronic Industry that would enhance the nation's capability for maritime defence.

Radar — Jindalee over-the-horizon radar provided the industry with some research into the development of radars. Part manufacture, maintenance and repair of radar and its associated equipment would provide a good filip to the electronic industry. Modern coastline defence radars can be supplied from overseas complete with data handling, display and communications facilities to cover the full operational requirements for this class of radar. The design of these modern radars has been optimised to ensure high accuracy detection of low-flying aircraft, helicopters and small high-speed craft. Australian industry participation in electronics associated with long range maritime patrol aircraft, or in the development of modern coastal defence radars would be challenging and invaluable to a nation with miles of unprotected coastline.

Sonar — R. & D. into sonars, has led to the production of a long range frigate sonar which is regarded as one of the most important developments in this field of research. The new sonars main features are computer-aided detection and tracking and the use of switchable frequencies — the first time these features have been included in a sonar set. The main function of this design, apart from providing ultra long range detection and classification, is to reduce the load on the operator and the maintainer. As this audience well appreciates, a sonar watch, unlike radar, produces so much tedium that in fact the operators performance falls a long way below the theoretical limits of the equipment. The Australian Electronics Industry could well be associated with developments such as sonar by manufacturing components, transducers or other electronic equipment associated with the complete system.

Over the years, electronic engineers in Australia have amassed considerable experience in the complex and demanding areas of research into the projection of sound in water. Research has particularly been devoted to the development of active and passive sonar and sonar buoy transducers for project "Barra" — a joint Australian/British development in submarine detection — and project "Mulloka" sonar for surface ships.

Communications Systems — Speech traffic is now being overtaken by data as the techniques of telecommunications and data processing converge. Defence today is significantly dependent on the rapid and accurate processing of secure information as any defence force is powerless without communications, intelligence and weapon control systems.

The electronic industries in all major countries throughout the Western world maintain a very close liaison with the military to ensure an up-to-date exchange of the latest technologies. Australia is, of course, no exception.

Command Systems — A group of companies has been formed in the U.K. to carry out a feasibility study on a future command system for the Royal Navy. Current systems, for example, the action data automation weapon system (A.D.A.W.S.), computer assisted action information system (C.A.A.I.S.) and the computer assisted command system (C.A.C.S.) are restricted in terms of time scales, space availability and sensor and weapon fits. The future command system will not be restricted by these constraints and is within the present "state of the art" in electronic technology. I understand that the group is also examining the introduction of a system that will encompass the whole command structure, not simply within an individual ship. Research into this form of systems technology is of tactical interest if Australia is to fulfil her commitments in the defence of Pacific waters. The Australian Electronics Industry must develop and sustain expertise to ensure that such a system is kept up-to-date and retains its operational readiness.

In the past 15 minutes or so I have attempted to highlight the importance of offset work, Australian Industry participation programmes and research and development, including system engineering.

I will conclude by saying that the Australian Electronic Industry must be given every opportunity to develop a "within Australia" capability for the defence of our coastline.

An adequate and comprehensive secure communication network combined with sophisticated surveillance and detection systems is an essential requirement to modern defence and must assume a very high priority in the role of maritime defence. The Australian Electronic Industry must set its sights on attaining a high level of technology needed to provide and maintain sophisticated equipment used by the defence forces. These days, being good enough is not good enough. We must do better. We have the nucleus of advanced technology in the industry and we must be given the opportunity to demonstrate that we can undertake complex engineering projects, that we have the ability for

research and development and are capable of innovation.

Ladies and gentlemen, we must not simply become a nation of importers.

HEAVY INDUSTRY

by Mr Scott-Maxwell, DSC and Bar.

In preparing this address, I was not aware that I would be preceded by an economist, so I will get some points off my chest at the beginning. Economists do not like the heavy engineering industry because we received a modicum of government support. They have a tendency to come out of the woodwork and pontificate from a great height in a position of all care and no responsibility and unfortunately after that they do not return to the woodwork. They hang around and become a perpetual irritant.

As the chairman has said, I spent 40 years in heavy engineering industry. I started with shipbuilding on the Clyde in its hot hey-day but pre-war and except for this interlude during the world war, my picture of industry is rather different to his. You will see later on, Professor Kasper I was not really talking about you. You are a special case who happened to be here. I do agree with some of the comments you made and they will come out.

A word or two for those of you who are not familiar with the heavy engineering industry. It grew up here in Australia with the growth of the mining industry which was the last part of last century in support of that. Naturally, in this process of growth it became fragmented, which it is, and this is a very bad thing for the modern industry to be fragmented. It means you get none of these economies of scale which we should seek and it is very difficult to put this right because you have large assets you cannot shift and put together. On top of it, to make matters even worse, State Premiers still apply state preferences and many of us finish up with manufacturing facilities in virtually every state in Australia to be able to take advantage of local preferences. So in a sense, competing against Japan is one problem, we have to compete against Queensland and Western Australia and this is one of the big nonsenses I do not think you take into account in our industry so I commend it to you.

That is just the background of our industry. We are also receiving a great deal of competition nowadays which has grown up in the last few years from overseas companies, particularly Japan and Germany. We have construction — design and construction — companies in Australia that have no assets, they shop in the open market and if it is a buyers market situation

naturally you can come up with much better figures than companies who have millions of dollars of assets and thousands of employees they have to employ. Some of them even go further than that. I will not mention names, they make a thumping great loss which must be supported from a subventure payment from Europe which is like a form of subsidy and again, Professor Kasper, we find it very difficult to compete with that form of feather bedding.

The title for today is the way ahead for the maritime defence industry in Australia and as far as the heavy engineering industry is concerned that is not just a matter of making hardware. It is a bit more complex than that. I have written down three headings when I made my notes. The first one is the working relationship between private enterprise and the customer, defence, and his contracting cum procurement agency. The second one is in a collective industry sense what is expected of us in support of defence procurement and in the commercial sense are the expectations likely to be rewarding and thirdly, is the heavy engineering industry adequately equipped and willing to make a serious contribution and if so, what.

Now to the main theme and I will summarise first.

"The way ahead for the Maritime Defence Industry in Australia" is not just a question of supplying engineering hardware — it is much more complex than that.

FIRSTLY — the working relationship or *modus vivendi* between private enterprise, the customer and his contracting cum procurement agency, leaves a lot to be desired.

SECONDLY — in a collective industry sense, what is expected of us in support of Defence procurement, and in the commercial sense are the expectations likely to be rewarding?

THIRDLY — is the heavy engineering industry adequately equipped and willing to make a serious contribution and if so what?

At a Defence Seminar in September of last year Mr. Killin is quoted as saying "This country must do everything in its power to establish a substantially bi-partisan policy towards defence" in the setting of industry participation — with which I entirely agree.

THE SPEAKER

Mr Peter Scott-Maxwell, DSC and Bar, qualified as a mechanical and marine engineer in Scotland before September 1939. Throughout World War II he was in Royal Navy submarines — for which distinguished service he was twice decorated. After the war he joined Vickers and came to Australia in 1966 as the Managing Director of Vickers Australia. He retired from that post last year but still retains a close interest in Defence industry.

I believe the biggest stumbling block, and there are others, is that the Department of Defence is not directly responsible for its own contracting and procurement. As the biggest departmental spenders they should be, it would streamline and improve communications generally between the contractor and the customer.

How would BHP, for instance, like to delegate its procurement cum contracting function to an independent body over which it has less than full control. I suggest it would not.

The whole concept of AIP which has been referred to by previous speakers and the way it has failed to meet its authors objectives is indicative of the lack of appreciation within the defence of industry's role as suppliers. It must be about the slowest learning curve on record. There is a lack of sufficient advanced information of Defence requirements.

The present arrangement seriously lacks sophistication and the required degree of commercial, professionalism, due possibly to a lack of understanding of each others positions. Contract conditions should be standardised, agreed with industry and published as such. It should not be necessary to seek Counsels Opinion on occasions as at present. Clearcut provisions for single supplier contracts must be included due to the restricted industrial base in Australia, with more emphasis on pre-qualification of selected suppliers, and more use of incentive type contracts. Wherever possible commercial standard specifications should be applicable, because commercial standards are now much more stringent than they used to be.

The recent Commonwealth Government Purchasing Preference to Australian Goods Bill 1980 appears to go some way only to resolving this problem, but the threshold of \$50,000 is too low and the subsequent procedure too protracted to appeal to industries way of doing business.

Overall I should hazard a serious lack of mutual respect, which given the will could be restored and the initiative must come from the Government Departments concerned, which must include Treasury who stand to benefit from more Australian Industry Participation whereby Defence can receive credits related to local procurement, and if industry makes a profit, as it must, that gets taxed too!

A quotation from the Katter Sub-Committee by Mr. Don Eltringham (Page 1141):

"It could be said perhaps that in some respects the British system is more streamlined than ours in that it can make greater use of negotiated or selective contracting. About 75 to 80% of contracts for Defence in the U.K. are so negotiated. It does not also have

another department involved in the communication of its procurement activities and perhaps these matters are something for the Committee's consideration".

When negotiations become extremely protracted, industry tends to lose interests at the despairingly protracted bureaucratic time scale. So much for the Department of Administrative Services.

My second point — Expectations have got to be in a bi-partisan situation. A nation is entitled to expect a degree of support from any industry sector to which it has given support of any kind. There are strong moral and sound pragmatic reasons for a buy Australian approach where our industry base is small and precarious. Surely, some degree of national self sufficiency is desirable. Does the Government really want a heavy engineering Defence capability? The evidence is not very convincing. In this connection I had a limited survey made of the heavy engineering industries whereby about 2/3 have done some Defence work and consider that their facilities are generally suitable to meet Defence standards, which I doubt. They are continually updating their facilities and would welcome Government assistance to meet the low volume and specialised nature of Defence work. None of the respondents had any Government equipment installed, though in one case only the Government had assisted financially.

I do not want to draw comparisons with the affluent aircraft industry which have lots of government equipment installed. The heavy engineering industry is the cinderella and we have never had any and we get no other financial support in that sense.

Expensive equipment put into Defence establishments where it is under utilized is no substitute for the same equipment in a commercial setting. State enterprises of this sort should complement rather than compete with private enterprise, at the taxpayers expense. There is ample scope for collaborative contracting — which currently happens to only a rather limited extent.

What are the expectations of an adequate reward for undertaking Defence contracts?

Those who have chosen to do Defence work have also to remain commercially competitive and thereby hangs the crunch.

The cost standards required for Defence work militate against those required for profitable commercial work. Defence usually exaggerate the standards required, but that is their prerogative as long as they are prepared to pay for it.

All too often we have to take commercial work at little or no profit, but I see no obligation

whatsoever on the part of industry to subsidise Government procurement.

The third point I wanted to make was, is the heavy engineering industry adequately equipped and willing to make a serious contribution and if so what. In my opinion, industry has not modernised itself adequately, and probably the reason is our cash flow is inadequate. A lot of you may not realise that a modern machine tool, even of average capability is \$1 million and I could cite single machine tools at \$2.5 million and it takes an awful lot of profitable business to buy one of those.

When you do, and I am here to talk about the industry, and not my company, but a lot of companies — I could cite half a dozen — have paid upwards of these figures to put them into the best possible position for commercial work, not for defence work. So if defence wants to take advantage of these machine tools, that is up to them.

We have had some talks but very limited ones on this question of how we can best use this equipment. The expectations in commercial engineering are not good. There has been much talk about a resources boom and let us hope we make a bit of money out of it and then we can buy some more good equipment because we need it. We cannot expect to compete commercially unless we can offer the latest and best, and in my view, just the same principle applies to defence work, only more so, and so it is up to industry to take the initial risks and see to it that they are adequately rewarded. It is up to government to support those who have put themselves at risk, especially the second time around, and not just go and take the lowest option, which is what can happen.

The next point I wanted to make was, is the heavy engineering industry adequately equipped and willing to make a serious contribution and if so what. This is a quotation from a man called Richard Halloran, an American, on why defence costs so much. I got it out of the New York Times Weekly Review about 11 January, which as you know is published in Australia.

"Much of the high and rising cost of weapons in military equipment is rooted in the same industrial weaknesses that

cause high rising costs in civilian products. Outdated manufacturing facilities, low productivity, inadequate quality control and poor workmanship."

Unfortunately, I believe that describes the state of our industry.

To summarise — There are good expectations and it is up to us to grab them. For the actual hardware, the heavy engineering contribution to maritime defence has been the classical victim of technological change. Steam technology has been overtaken by marine cum aero gas turbine technology, although the complex gearboxes and controllable pitch propellers that go with it could, in my opinion be made in Australia but some government assistance with additional equipment and facilities would be required if this is what defence wants. If they just want to build a hull, with all respect to shipbuilders is not difficult, and fit it out with overseas procured equipment then they can go it that way.

Likewise, large calibre guns have given way to missile launchers which again can all be manufactured here either by industry or the ordinance factories. All mechanical components for stabilisers for the FFGs can all be made here. We would have to import some of the control equipment. Looking further ahead, once a submariner always a submariner and I have looked forward to the day when they built submarines here. With the right sort of assistance that one can get this is not difficult and in submarines there is a wide range of mechanical equipment that can be built in Australia. Some of us may not see that at the rate of progress things are going at the moment.

All in all, therefore, there is a substantial contribution which the heavy engineering industry can make towards local procurement and it is now up to defence to declare their position in a much more detailed way and let industry rise to meet the occasion which I trust they will. In conclusion, I would like to say what a staggeringly good job the institute have done in promoting this symposium and I only hope if it does nothing else, it stimulates some of the people up in Canberra that some of us are disturbed about the way things are being done now and that they could be done better.



QUESTIONS AND DISCUSSION ON THE WAY AHEAD FOR THE MARITIME DEFENCE INDUSTRY IN AUSTRALIA

Chaired by Mr N.F. Stevens, OBE

Captain Holmes: Member. Mr Scott-Maxwell, you said, sir, that you saw no reason for industry to subsidise defence. Given that defence will pay its way, would you please comment on whether you see an upper limit on the markup that we should call on the Australian taxpayer to bear in sourcing defence procurement locally?

Mr Scott-Maxwell: Twenty five per cent, that is roughly around the sort of tariff levels. In America I believe they give a benefit of 50%. Less than 25%, 15% if you like but 20-25 is as good a figure and if you actually do your sums correctly on the feed-back to Australia, taxes, rates and all the other things on the cost of placing work in here, it is still cheaper at that subsidy to place it here. The treasury gets a large hunk of it back. Even if we do not make a profit, it takes it off the employees. The sum is worth doing, it is very interesting and no-one ever does it because the Treasury does not get in on the act so to speak. Their only answer to everything is no.

Mr Fry: My name is Fry from NQEA. I recognise that there is a very heavy British contingent here today and I cannot let the opportunity go to say that it is my company which is building the present follow on Fremantle patrol craft and the Australian version, I am happy to say, is lighter and faster. I recognise that there are some many problems in our present system but there are three items which I would like to raise quickly with you and some of these I suggest Mr Humbley might like to either concur with or disagree.

About 12 years ago our company built some landing craft for the army and during that time, I, personally, on the project dealt with one officer at Victoria Barracks, two people in GOSIEAA and two people in AUSPURCOM and that ran the contract for about two years. On the present PTF contract, I now have contractual relations with DAS, DIMP and GOSIEAA and DAS has an office in Brisbane and Canberra, GOSIEAA Cairns and Sydney and on technical matters I am discussing it with DNSP, DGNP, DNQA, GOSIEAA and RANTAU with GOSIEAA having offices in Cairns, Brisbane and Sydney. I would hardly think that is really fair to try and have a contractor do his thing.

I guess you should also all be very terrified of the fact that I, being the managing director and possibly looking a little young, am presently in control of the largest gathered Australian workforce building new naval ships at the present time in Australia and that being in the far north in

Bjelke-Petersen country might even terrify you a little further. I see that we need to do three things and here I am echoing some words made by some other people that the procurement system needs to be radically modified and rather than just say it needs to be modified, I would suggest that it needs to be a direct portfolio of CNM and no other strings attached, including the dismantling of GOSIEAA. I think I will return to Cairns.

I think we also need to take stock and recognise that the other thing that is really crippling the Australian shipbuilding business as well as other commercial activities is our inability over the last period to manage our workforce. We have all, I believe, been guilty of not being able to adequately manage the worker and we have, by individual greed of companies, allowed the unions to gather strength and run over the top of us and under the present 35 hour crisis, I see no other alternative not to totally yield and certainly not to have a blockade as the government would expect but that we must take a responsible move in this and reform the 40 hour week somewhere along the line. But please, we must act very fast and wrap it up as quickly as we can or it will escalate and we will have a 35 hour week.

My third suggestion to the Commonwealth is that we need a future shopping list.

Mr Humbley: I welcome the opportunity to pay tribute to NQEA. I got an unsolicited testimonial on a couple of occasions. I have visited NQEA and I can assure the Navy and the taxpayers that they are getting extremely good value for money from those patrol craft which are being produced up there. But Don Fry certainly is up against it in the administrative processes that he has to submit to. It was said in fact, and we were tenderers for the patrol boats and we saw the papers also, that the papers that were served up to the tenderers for the patrol boats were the most complex and worst set of documents that had ever been offered to shipbuilders in the whole wide world.

Something clearly has to be done about it and I hope that some people will take some messages away from this today.

Professor Kasper: I am not going back on the air waves to tell you that I have not sunk yet. I am also not getting back on to invite Mr Kingsford-Smith to write a joint study with me on leather beds and rationalisation in Australia academia. I think we

have a lot of common ground there, more than you expect. I want to ask a question.

If I heard correctly, we were told first that Australian industry is highly competitive as a supplier with regard to cost and quality under offset agreements but if that is so, how can I explain to my officer cadet students why they then need government enforced offset deals. Why do we not get the work in competitive bidding. Why were we told later that without offsetting there would be a very minor volume of work indeed. I am persisting in these questions because I believe in a word by a famous fellow economist of mine which says there is no such thing as a free offset.

Mr Kingsford-Smith: I guess I asked for some of that. If we are highly competitive, why do we not win offset orders or why do we not win orders without using offset leverage. As I said when I was speaking, the offset campaign is a good example of government/industry co-operation. Principally, we are breaking into an established industry in America. Principally I am talking about the aircraft industry. The big firms there have their suppliers, usually in their own state. They are well established firms and they know it is much easier for them to do business with a firm that is adjacent to their own factory.

Let me say that the large aircraft manufacturers, like the large shipbuilders, do not build the complete product themselves. They might build less than half so they do buy from other sources. All things being equal, they would like to buy locally. We say to them we do not want you to do that. If we are going to buy from you, we will of course — all things being equal, we must get what we want but then we will look favourably at the overseas manufacturer who gives us the best offset package. So the purchasing departments of the large firms overseas have been obliged to come to Australia and see if they can place orders with us, which they would rather not do.

They have maintained that they will not place orders with Australian industry unless they can get the work delivered to them at the price, quality and delivery they can get locally. They of course have rejected many bids. We have found that

once we have used the purchasing leverage of the Australian government to become an established supplier in an area where we want to build up technology because it has defence significance and we have gone partly along the way in delivering goods that we can then stand on our own feet. In other words, we have come down the learning curve and other people cannot get near us when they come to bid and try and take the work away. Particularly in this commercial aircraft work, it is a very competitive environment. You can get an order that will run for a few years and then it is up for bidding again. It will run for a few more years then up for bidding again. There have been times we have lost business back to America, some other supplier who is smarter than we are.

It is a form of government assistance but it is not costing the taxpayer anything because it is the policy. Let us take these commercial airplanes. Ansett, TAA and Qantas are not charitable organisations. They are not going to pay more for an aircraft just because you are buying some of the parts from Australia but I will admit we would find it hard to get offset work if American industry can supply. Let me go back to when my company started on offset. My company started on offset at the height of the Vietnam campaign when we found that the American aerospace industry was overloaded. We went to America and we found that we could get orders then because they were looking for capacity. In those days, we got orders which generally speaking cost us more than we recouped in sales revenue. In other words, we lost money. We were learning the business then and we were rather pleased when that sort of business ran out. We lost a lot of money and fortunately we learnt from it.

If that happened again, if the American industry or any other industry was overloaded again, we of course would be suppliers but I can assure you, we now have people coming to us in certain cases and saying "can you bid, we want to look at your bid, it might be competitive".

The Chairman concluded discussion and further questions due to lack of time.



SUMMING UP

by Admiral of the Fleet The Lord Hill-Norton and Dr. R.G. O'Neill

Lord Hill-Norton

It would be absurd to support that even a giant intellect like mine could sum up a two-day seminar in twelve and a half minutes and I am not going to try. What I am going to do is to draw to your attention half a dozen points which seem to me, not necessarily to be the most important that have been aired at this seminar, but which bear hardest on the theme of the seminar, which is the interface between Australian maritime defence and her industry. I do not intend, much as I should enjoy it to get into the family squabbles about the 35 hour week and whether Canberra is more or less efficient than industry because Poms, even grand Poms, know when to stop.

It seems to me there has been a recurrent theme, especially this afternoon, from those who have spoken from the point of view of industry which might perhaps be summarised very briefly in the following headlines really, rather than coherent speech. How do you keep industry in step with defence requirements, especially in a country which is smallish by world standards of population and volume of defence equipment in the light of the slippages and the widening of the technological gap which is perceived in this country, due to the explosion of technological requirements in the defence field and unmatched by a similar explosion in industry?

It seems to me that going with that we have the point made very cogently I think that a strong economy is a pre-requisite for strong defence and strong defence alone creates the political stability which will lead to a strong economy and I am back on the chicken and egg kick and I do not apologise for it, either. Next, it seems to me that we have got in this general industrial scene the difference in mental approach of defence management and industry management because the former have to meet what they perceive as an operational threat and they know what the weapon systems there are which they need to meet it. On the other hand, the latter — that is to say industrial management — are not in that business at all. They are in business on behalf of their shareholders to make a decent and respectable profit and as has been said this afternoon, there is no reason in the wide world why they should subsidise defence industry

other than by paying duly raised taxes. Further to those points I have just made, has industry in this country whether it be heavy industry which we have just heard about or light industry or aerospace industry or the advanced electronic industry, has it become so small that it is no longer viable for defence purposes? Going with that, what is totally clear to me is that only the government can make its continuation worthwhile in this country. That is a personal view.

Finally, on the general industrial scene, it seems to me that it was a very important point rightly made but not made perhaps as loudly as it might have been, that you can really only do the repair, maintenance, updating of foreign purchased equipment if you are also in the manufacturing business in some respect or another. I think it would be a grave mistake to suppose that Australian defence based industries would be viable if they did nothing but update, repair and keep going non-indigenous defence equipment. You have got to have a manufacturing capacity. I have no doubt of that at all. The size of it will depend on a whole host of considerations which I have not time to go into although I would very much like to. We have heard I think a good deal this afternoon and indeed yesterday too to make us think of what some of those considerations are.

Having said that, there are a few other words I would like to say. I was very struck by quotations which have been made by half a dozen of the speakers in the last day or two on the 1976 Defence White Paper and the emphasis which was there placed on the maritime commitment. But it was rightly pointed out that this should not inhibit the proper and orderly evolution of both the Army and the Royal Australian Air Force because if it did, there would undoubtedly be a crisis of confidence within the country about self defence and I am not so dark blue that I cannot understand that that would be very bad news indeed in the general demographic and political scene.

So while I am here to talk about seapower and its interface with industry, I think it would be a grave mistake for anybody in this room or indeed anybody in Australia to forget that you must have a visible capability on land and in the air, even though in my judgement, and it is a personal view, your gravest threat happens to be a maritime one. I would like to add to that general comment the

fact that there is a considerable lack of understanding by not only the Australian public but all our publics of the changes in the power balances which have taken place in the last five years, never mind the last 10 or 15 or 20 years. I do believe it is the business of everybody who is sufficiently interested in defence to come to this seminar, and the room is full and I could not be more pleased that it is, to go out and about, each and every one in his own circle, to keep on and on trying to get the truth in front of people.

Our people nowadays are quite sharp. They are not nearly so thick as they appear to be if you read the newspapers and watch the television. They are quite able to make up their minds if they are presented with the facts and it is very, very difficult and nobody knows this better than I because I spend nearly all my time trying to do it — to get the facts in front of people. But the point which was made by one speaker that it is this lack of understanding of the change in power balances that makes it quite impossible for our publics to form a sensible appreciation of what the threat is and that is the beginning of wisdom about how to meet it.

My next rather random observation was that I was very struck with the notion that very long established doctrines can no longer be taken for granted in democratic countries. It is partly because of this change in the power balance to which I have just referred that assumptions which used to be taken for granted are now challenged and they have to be justified. You have to make your case and if you cannot make your case to the extent that you will convince the government, then you do not deserve to win it. So it is necessary for all people engaged in the defence business, whether they are in industry or whether they are in government or whether they are in uniform or plain clothes, to be ready now to have things which were previously obiter dicta, challenged and if you cannot make them good, you don't deserve to win and that would be bad news. So it does behove everybody to make quite sure of their facts and be able to argue them properly.

I think, really and truly, I have come to the point where it is necessary to enquire whether seapower does depend in this country on an indigenous industry or whether it does not. I do not think you can answer that question in a two day seminar but you can have a jolly good pop at letting 380 people or however many people there are here, think about it hard in the light of some excellent talks we have had. What it does seem to me to make totally clear is that only political co-ordination of maritime strategy on both the industrial and the military level can bring these two sides of the body politic together so that you go forward in a successful and sensible and viable way. The answer to the question I posed as to

whether seapower depends upon an indigenous industry or not lies in whether or not your government is smart enough to weld together the industrial and military strategies which alone can give realism to the exercise of seapower.

It is my experience and I offer it as a personal view, no more, that governments are, in our countries, put there by people and they do not always remember it. It is up to the people to make sure that the people they send to govern them understand what they want and if they do not get it, kick them out.

Having said that, I conclude and give my mate Dr O'Neill a chance to have a pop for another 10 minutes, by saying that we have, rightly I think and properly, examined on the whole first the strategic possibilities which now face this country then whether we have or have not the means to deal with a threat if indeed there is one. As to whether the threat which I described yesterday is the right threat I would merely say to this audience; I do not believe that it is wise for Australians to be as preoccupied as they are with countries immediately to the north of them.

I think finally, that Australia is an island. It is the sixth largest country in the world but it is still an island and everything that you export and import can only come by sea and indeed, even the traffic within this island continent moves most economically by sea. Therefore, all I would say to you, ladies and gentlemen, is look to your moat.

Dr O'Neill

My predicament this afternoon is rather like that of the celebrated favourite of Catherine the Great, Prince Orloff, when he was summoned to the royal bedchamber one evening. He crossed the threshold with a rather worried look on his face and Catherine said to him: "Prince, what is your problem, why do you look so troubled", and he said: "Your Majesty, my problem is not what I have to do, I know what I have to do and I am confident of my ability to do it. My problem is how to make it seem new".

I think it would be very remiss of me not to extend on behalf of all of those of us here who, until this gathering, were not members of the Australian Naval Institute our congratulations on an excellent seminar. The ANI does not do this sort of thing often but when it does it, it does it well. I do not know what Catherine the Great would think about that.

I wish to comment first on aspects relating to Australia and then to the wider strategic scene. First with regard to our economy and our defence industry, national security like charity begins at home. While there was a great deal of robust tackling going on between the representatives of defence industry and Professor Kasper here

today, I think it important to note that there was a great deal of Professor Kasper's message that does not apply only to defence industry but goes well beyond it. Whatever feelings you may have about the applicability of greater international competition in the defence industry area, I think it is only fair to point out that these wider ideas are not just Professor Kasper's. They are ideas which have underlain the successful economic development of West Germany, of Japan, and now of some of the newer and more dynamic countries of the east Asian region.

If we can sustain an economic growth in this country of something like 3.5% over the next 20 years, we will have an increase in real per capita income of close to twofold and, if defence is able to maintain its share of GDP, and that is certainly not something to be taken for granted, funds for defence equipment procurement will rise to something like \$1500 million per annum in present terms. There would be no question of the adequacy of our defence resources, particularly for the capital-intensive RAN, and there would be no shortage of business for our essential defence industries which have been on short commons for a long time.

If we do not manage better than 1.7%, we will be having continuing restrictions and deficiencies. I noted a good deal of commonality between some of what Professor Kasper said and some of Mr Hawke's ideas. Mr Hawke certainly understands the problem, even if he is not free to take any action which would cause severe dislocation of supply of jobs in the short term but, from what he has put his name to in documents such as the Crawford Report, it is quite clear that he understands the need for some major restructuring of this country's economy. And as a prime minister, if that should ever become his lot, he may have a little more freedom to act than at present, as did Curtin, Chifley and Whitlam. Labor prime ministers before him, although hopefully he may have some better cabinet material and will consult them more. Otherwise he would not be able to look reasonably beyond a three year term.

I share your pleasure that he came and that he, as a newcomer to this field thought it was an area worth putting some personal effort into. I hope that this is an interest that he will sustain.

Regarding our defence oriented resources, Mr Sharpe gave a very able advocacy of the need for increased attention to research and development. This is one of the main engines of growth but because our resources are limited, we have to be selective and tough in our approach in deciding what projects are worth funding and what must be simply left for some time.

The oil panic is over, I feel, partly on the basis of Mr Gosper's remarks and partly when one considers that eventually Iran and Iraq will make

peace and that those two countries between them have the potential to contribute some 9 million barrels a day back on to the market. Obviously, they are not going to contribute that amount or anything like it but I think the outlook in the next few years is at least that there will be a continuing and moderately comfortable surplus in the oil supply. The OPEC countries need to sell oil as well as to conserve it for their future. Many of them have no other sources of income and so I think there will still be appreciable pressures on them to maintain a fair rate of supply.

I was very interested that Sir David Zeidler brought back to our memory the old national security resources board. This is a body which performed an extremely valuable function at a time of high defence crisis in the early 1950s. It was understandably put on the back burner in the mid-1950s and gradually faded out of existence but now that our economy is becoming more complex, now that we are agreed that things can go wrong in the international community with much less notice than they could have in the past, I think it is high time we thought about putting something like that back into effect.

Regarding the external world, Lord Hill-Norton and Sir Ronald Swayne have described for us very well the growing Soviet challenge. I must say until I had heard Sir Ronald Swayne, I had not realised how useful the Trans-Siberian railway is to us in the west, but more seriously, or less comforting, how far the west has become dependent on it. I note from Lord Hill-Norton's introductory address particularly that the Soviets are not 10 feet tall but 6 feet as are we, and the real point to note is that the Soviets have been growing faster than ourselves in a military sense in the past decade. We must not let them outstrip us so that it does become feasible for them at some future time to employ superior force against us.

The most important elements of the western deterrent to the Soviets are first our nuclear strategic weapons and secondly our seapower. I think it is going to be very difficult, if not impossible for the west to get back to the position where it had comfortable nuclear superiority over the Soviets. Their own technology is too well developed now to permit that, but in seapower we must not let the western lead be eroded because it is a very

THE SPEAKER

A graduate of the Royal Military College, Duntroon and a Rhodes Scholar, Professor O'Neill saw service with the Australian Army in Vietnam in 1966-67. Subsequently he returned to Duntroon as a lecturer in History and since 1971 has been Head of the Strategic and Defence Studies Centres in the A.N.U. He is official historian for the Korean War and has written and lectured extensively on defence and strategic matters.

important offset of the unfavourable balance on land, which we cannot hope to overtake. Nor should we, because the nature of labour economies in our society is so totally different to that of the communist societies that we would get ourselves into immense difficulty if we tried to increase our ground forces substantially.

As regards air power, the balance is certainly not favourable to the west at present but, given that we have a considerable qualitative lead in many areas, I am not unduly disturbed by the current air to air ratio. But we must note that the Soviets have some major economic weaknesses. At the recent congress of the Communist Party of the Soviet Union in Moscow at a private session, President Brezhnev set forth that in his next five year plan, which of course he expects to be his last in office, he wanted to end on a high note and see that every Soviet citizen had his own car, that every family had its own apartment and its own aircraft. This was rather puzzling to those present and one member of his Politburo stood up and said: "Comrade President, I can understand the need for everyone to have a car. I of course share your aim that every family should have its own apartment but why does every family need an aircraft?" Brezhnev rose and said: "Well, you know how it is, Comrade, sometimes there is meat in Moscow. Sometimes there is meat in Leningrad. Sometimes there is meat in Kiev".

Not only do the Soviets have their problems at home but of course they have an acute Achilles heel in eastern Europe. The situation in Poland is one of the utmost gravity for them in political and strategic terms and may well become so in economic terms if they are so rash as to enter Poland and be saddled with the enormous administrative and economic liabilities which that step would entail.

When I was in London in December I noted a delightful little cartoon on the front page of the Times which showed two venerable gentlemen seated deeply in their leather chairs in their London club. One of them was holding up a newspaper and the banner headline on the front was "Soviet Union Criticises Solidarity". He lowered the newspaper, looked over the top of it and said to his friend: "I am glad someone at least has the guts to stand up to these unions".

But the Soviets are in a no-win situation on Poland and I do not think it is beyond the bounds of possibility that they will change their tactics. I do not mean necessarily with respect to Poland but with respect to how they are going about handling both the West and the rest of the world towards the end of this decade. In talking about a change in tactics, I do not mean any change of strategy but I think we should be prepared for the former.

What should we do about meeting this external situation? What should be the essence of

Australia's maritime defence in the 1980s? Sir Arthur Tange skilfully outlined some of the key questions which pose difficult dilemmas for our policy makers. How should we balance force structure between the needs to serve with major allies and the needs of defence of our own region? How far should our forces be designed to cope with Soviet high level technology and how far with regional threats? How far should we co-operate with the U.S. in resisting a joint danger and what should be the area on which we concentrate in our defence planning in the future?

I think anyone attempting to answer those questions has to recognise a major change in the external environment. The answers that I would give to those questions five years ago would be rather different to the answer I would give today. I think that it is also worth bearing in mind that our answers might be quite different again in another five years time. This to me points up the need to have some irreducible minimum in our defence conceptual planning which is relatively independent of the effects of these big swings in tension in the external environment.

If I am able to read between Sir Arthur's lines, and I may not have any more success in this than Mr Booker because when one sees the words written in that black stubby pen, they have a marvellous power to concentrate the mind, and there is not much energy left for reading between the lines, I would think that the following might appear there:

First, we must think more seriously about joint deployments in South-east Asia and in the South-west Pacific region. We are going to be called upon by our neighbours to make a greater effort in common defence of our region than we have been in the past few years, but not at the cost of the development of our own logistics system, and our command and control systems. We participate on a very different basis to that on which we participated in the era of forward defence. We will be joining with a number of equals, people who are fully equal in a political sense, if not equal in the straight military dimension, and we will not be there simply as clients or attendants on a larger power. Fundamentally, we can do nothing for the external environment without seeing that Australia is secure first and that is a *sine qua non* which I do not think we adequately discharge yet.

Second, while our forces need to be cognisant of Soviet technology levels, it is more likely that in this part of the world any enemy technology used against us will be of a Soviet second-order nature. Soviet exports to their allies and clients are rarely out of the top drawer.

Third, co-operation with the U.S. is perhaps more important than it has been for quite some time, particularly in terms of flows of information

and technology but also in regional force deployments. But there are limits beyond which we cannot go without distorting our own force structure and without giving other nations the wrong impression of our intentions. I think the existing agreement regarding B-52 access to Australia is eminently in our interests as well as in those of the U.S. Regarding proposals to provide basing in Western Australia for the US Navy in the Indian Ocean, I am entirely in agreement with the notion that base porting should be provided. I would be a little inclined to question the wisdom of going the further step to full home porting because it could place political tensions of a peculiar nature on an alliance which can well do without them. But we must not allow closer relations to be an excuse for the lack of development of our own infrastructure and staying power.

Fourth, regarding our area of strategic responsibility, while we need to be concerned with more than the approaches to continental Australia, our region of effectiveness surely does not extend beyond South-east Asia, the South-west Pacific, part of the Southern Ocean and the eastern part of the Indian Ocean. Provision of forces beyond those limits is beyond our capacity to do well. We have an important enough role in this area. There may of course be need in acute crises for token deployments beyond that region but these contingencies should not be a significant basis for our force structure.

Finally to look very briefly at force structure, the prospects before the RAN improved out of all sight during 1980 with the ordering of the fourth FFG, and the Government's intentions in principle to proceed with six follow-on destroyers and to purchase an aircraft carrier. There are other important needs for the RAN: additional submarines; helicopters; mine counter measures vessels; an AOR; and so on. But until we have

produced the additional wealth that Professor Kasper was talking about, I think that the Navy should be content with that and we should now move into a period of giving a little more priority to the needs of the RAAF: the new tactical fighter force; an airborne early warning system; inflight refuelling; and development of bases and radars in our remote areas. Nor should we forget entirely the problems of the Army, although they are not so urgent. But towards the end of this decade and in the next, if we are to maintain an Army worth the name, it will need quite a deal of money being spent on it.

I would think in the present climate if the Navy were to mount a sustained campaign for a second aircraft carrier, it is likely to be counter-productive, particularly before the first one is in the water. Rather, I would concentrate on widening the base of support for the first and not just cling to the single thread of the government statement couched simply in terms of 'in principle'. In this regard, I would take parliamentary committees and backbenchers very seriously and I would look to the Labor side as much as the Government side of the House. In 1983 goodness knows what can happen.

Finally, this development must all be founded, as Lord Hill-Norton has said, on an educated public opinion. We need to do a great deal more to put a sustained rational argument before the Australian people, on the basis of which we can have the most solid foundation for our defence posture. Much has been made in this conference of the 1976 White Paper. Is it not time we had another, bearing in mind the vast differences in the external strategic situation which have taken place since 1976? I salute the major contribution that the Australian Naval Institute is making towards widening the public debate. Thank you very much.



CLOSING REMARKS

by President of the Naval Institute, Rear Admiral R.C. Swan, CBE, RAN

It now falls to me to close this, our second seminar. I do it with some fear and trepidation because it is quite obvious by the number of questions and the extent of discussion which was taking place at the end of the last session that we may have achieved our aim, and that is to permit discussion and thought.

I do not intend to prolong the proceedings but I would just like to say a few words. I would like to thank on your behalf all our speakers for their contribution to our knowledge of maritime defence and its relation to industry. For busy and learned men from the United Kingdom to give of their valuable time to come to Australia for this seminar is but an indication of the value that they place on the place and contribution of Australia in the world scene of the future.

We are equally appreciative of the attendance and contribution of our valued Australian speakers. I hope gentlemen, both from overseas and Australia, that we have not embarrassed you by making you associate members of the Institute for the next 12 months in token of our appreciation. No doubt it has been my loss not to have met personally a number of those present, especially those from industry without whose support this seminar would not have been possible. I thank you on behalf of the Institute for your valued

support, including the assistance in relation to some of our overseas speakers.

I would also like to thank the Department of Defence for the considerable number of both service and civilian personnel who have attended. In particular, it is noteworthy that the Chief of Defence Force Staff has given up his valuable time to attend all sessions and we appreciate it. Indeed, we of the Institute are also most honoured by Your Excellency, Sir James Mason, that you have also given your time to attend and may I also express our appreciation for your support in accommodating our overseas guests.

May I just mention that in your folders there is information about the Institute. You may join. You are eligible. You obviously all have a sincere interest in maritime affairs, otherwise you would not be here and by joining you may write articles and may contribute to the theme and discussion of this seminar by corresponding in our journal.

Finally, I would like to publicly thank those members of the Institute, their wives and friends and those associated with them who have voluntarily given their time to make this seminar possible. It has been our pleasure to provide this forum for discussion. We look forward to seeing you at our next seminar, thank you.

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Admiral Sir Anthony Griffin, GCB
Sir Ronald Swayne, MC
Sir Arthur Tange, AC, CBE
Sir David Zeidler, CBE
Mr B.R. Goddard
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Rear Admiral G.R. Griffiths, AO, DSO, DSC
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