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Welcome back to “Mighty Mo”. During December and January USS MISSOURI visited Sydney and Fremantle.

The brigantine YOUNG ENDEAVOUR, which arrived in Australia in November, 1987.

The opinions or assertions expressed in articles in “The Navy” are those of the authors and are not necessarily those of the Federal Council of The Navy League of Australia, the Editor of “The Navy” or The Royal Australian Navy.

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THE NAVY has always had an educational content in the form of articles on maritime developments, mainly in navies, but for many years it was basically a low-cost "house" publication (consolation among members when the price leapt from 20 to 30 cents in 1971!) of limited public interest.

In more recent times, particularly during the last four or five years, THE NAVY has developed into a magazine of quality — better presentation, better paper and print, more variety and wider coverage of the maritime scene and interesting photographs. Not the least important, the magazine has some fine writers who know their subject, don't hesitate to express sometimes controversial views and who in every way provide support for the League's claim to be an organisation of educational value to the community.

The prevailing economic climate (it seems to have prevailed for several years and shows little sign of improving) and the absence of any perceived threat to the security of the Australian mainland have tended to cause too many Australians to be disinterested in defence matters and the wider interests of our country, particularly a maritime nature; with some exceptions the media has shared this disinterest, indeed it could be suggested that the media has contributed to this state of affairs.

THE NAVY has 50 years of promoting the maritime cause behind it but is it still has a long way to go before it could be said that Australians think as we maritime people.

A DECADE AS EDITOR

It so happens THE NAVY attains its fiftieth birthday at the same time Ross Gillett celebrates this at the right word to say his tenth year in the Editor's chair.

It will surprise many to learn that Ross Gillett, who is the RAN's Fleet Public Relations Officer, edits THE NAVY in his spare time; this means he has no spare time.

Ross has done a splendid job for THE NAVY and the Navy League of Australia: We congratulate him and commend him with his family.

TRADE/SHIPPING SEMINARS

Publishing deadlines preclude a report on the seminars organised by THE NAVY League in Melbourne and Sydney recently titled "Our Trade and Our Defence — Do We Need Australian Flag Shippers?"

The seminars were addressed by representatives of the Departments of Foreign Affairs & Trade, Transport and Defence, and the Australian National Maritime Association representing local shipowners. The Company of Master Mariners and the Seamen's Union also took part.

The interest of the various involved was very good and the addresses thoughtful. One thought remaining in the writer's mind is, that in the event of an emergency requiring naval use of merchant shipping, it is not unlikely that ships comprising the present Australian merchant fleet would either have to continue in their trading role or be unsuitable for naval requirements.

It is hoped a full report of proceedings can be included in the next issue of THE NAVY.
Three contributors who stand out in this era were, and in two cases remain, the Federal President Geoffrey Evans, Tony Graetzel and the late Marty Adlam. As a result of the efforts of this trio and the other contributors, "The Navy" grew and developed from half topical and half historical content to a publication now concentrating on the former.

Now the magazine provides the effective means by which the Navy League can voice its opinion, both inside and outside the senior service.

In recent years "The Navy" has plainly decreased in its number of pages per issue, but not in editorial or interest; the number of advertisements reduced to the point now that the magazine is composed of 90% articles and 10% advertisements.

Only time will tell how and when this trend will reverse.

Despite some gloomy forecasts as to its future in years now past, I'm confident "The Navy" will still be read widely in the year 2038.

"He who has his obituary published prematurely shall live long and happily ever after." (Anon)

What of the future? As long as membership of the Navy League remains strong and there is a continuing demand in both magazine and paper shops, "The Navy" will survive. For unlike other 'naval type' quarterlies, our magazine is not 'given away' en-mass to an uninterested audience, but money outlaid to procure a high-quality and well written publication.

For 1988, "The Navy's" Golden Jubilee, we have redesigned our front cover and will feature special commemorative issues including October, to mark the Bi-centennial Naval Review.

ROSS GILLET.
On January 11, 1986 the British Government offered the Australian Government a 31 metre Sail Training Ship as a bicentenary gift.

The Australian Government, accepting the gift, said that the ship would be named, maintained, and operated by the Royal Australian Navy (RAN) on behalf of the nation for the benefit of young Australians.

Supervision of the design and building of the ship was the responsibility of the British-Australian Bicentenary Committee. The designer, Colin Made, internationally renowned naval architect, designed the 24-metre brigantine, "Royalist", the training vessel for the Sea Cadet Corps of Britain. The similarity of its route to Australia that of the First Fleet was coincidental.

Like thousands of ships before her setting out on voyages from Britain to Australia, "Young Endeavour" was planned to take account of wind, weather and currents and the advantage of friendly sailing ports on the way.

Until she is handed over in Sydney on January 25, "Young Endeavour" will wear the flag of a British merchant ship. From her handover on January 25 in Sydney she will be entitled to wear the Australian White Ensign.

She sailed from Britain with a combined British and Australian crew under the command of Commander Christopher Blake, holder of a Masters Certificate for Squared Rigger Ships and winner in 1984 of the Cutty Sark Trophy. Besides Captain Blake, the Royal Navy provided a bosun/shipwright, cook and two watch leaders.

Six young men and six young women from the UK were selected for the voyage. The Royal Australia Navy contingent comprised Commander Frank Allica, Master, Commander Gary Sprague, Chief Officer, Lieutenant Louise Scullion, Watch Leader and Chief Petty Officer Rod Wells, Engineer.

In addition, the contingent included six young women and six young men plus four others in reserve. The contingent arrived in Britain in January 1987 to undergo sail training in similar type vessels to the "Young Endeavour" to prepare them for the delivery voyage to Australia. These ships included, "Winston Churchill", "Malcolm Miller" and "Lord Nelson".

The training of the contingent in Britain, transport, accommodation costs and return passage on "Young Endeavour", with the exception of the four reserves who returned by air, was paid for by the British Government as part of its Bicentennial gift.

**"Young Endeavour"**

A Description

"Young Endeavour" is a brigantine, fore and aft rigged with square sails on the foremast.

**SAIL PLAN**

1. Main Mast
2. Main gaff Topsail
3. Main Gaff
4. Main Sail
5. Main Boom
6. Main Topmast Staysail
7. Main Staysail
8. Foremast
9. The Yard
10. Fore Toppallant
11. Fore Topsail
12. Fore Course
13. Jib
14. Staysail
15. Fisherman

She has a steel hull and a round bilge designed to give a full sailing performance on all points of sailing.

Under sail she has a designed speed of 14 knots. Under power her twin main engines produce a maximum speed of ten knots.

She has two brass saluting guns which are fired on ceremonial occasions.

The vessel is expected to have a service life of at least 15 years.

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**DIMENSIONS**

- **LDA**: 42.0 metres
- **LOA (hull)**: 31.0 metres
- **Breadth**: 8.3 metres
- **Displacement**: 200 tonnes
- **Ballast (approx.)**: 10 tonnes

**ACCOMMODATION**

Crew:
- Commanding Officer
- Executive Officer
- Two Watch Officers
- Two Watch Leaders
- Engineer, CPO
- Spare Engineer
- Spar Cook
- Spare Executive Officer
- Spare Watch Officer
- Spare Engineer
- Spare Cook

The vessel carries 24 young men and women between the ages of 16 and 18 as Youth Crew and a permanent Naval crew of eight and accommodation for two RAN trainees.

The approved scheme of complement provides for one and a half crews and a Shore Support Office of two.

Seagoing billets include:
- Commanding Officer
- Executive Officer
- Two Watch Officers
- Two Watch Leaders
- Engineer, CPO
- Spar Cook
- Spare Executive Officer
- Spare Watch Officer
- Spare Engineer
- Spare Cook

"Young Endeavour" is designed to be...
sailed by her Naval crew of eight, the minimum RAN manning level.

Whenever female Youth Crew members are embarked, at least one member of the RAN crew is female.

Two berths are reserved for RAN crew under training.

Officers are required to hold a Certificate of Competence relevant to their rank. In addition the certified must be of the RAN crew is female.

The ship is part of her Naval crew is female.

The selection process for candidates is based on physical fitness, initiative, temperament and the ability to work as a team member in situations of stress.

The Youth Scheme is the Government's aim that "Young Endeavour" and its Youth Scheme operate on the basis of cost recovery. In order to comply, it is proposed that Youth Crew will pay a voyage fee at a level within their means, their school (sponsors) or community.

"Young Endeavour" will operate on training voyages of up to 10 days duration and at least one, two-day voyage for disabled youth.

Training voyages will begin from a number of ports around Australia. Although the ship's home port is Sydney, the concept of taking the ship to other ports to embark Youth Crew has been decided on to emphasise that "Young Endeavour" belong to the whole country.

She will spend over 10 months in her training role, the remainder of the time being for maintenance.

The remaining two voyages are short cruises of one to three days, public open days and a one day turn around for preparation for the next cycle.

The proposed programme for "Young Endeavour" first year, 1988, begins on Tuesday February 16.
The Indian Navy is a second such major force, with much greater overall capacity than the PRCN to operate on our ocean trade routes and in our coastal waters. The Indian Navy is much more sophisticated than the PRCN in weapons, sensors and command, control and communications.

The expansion in Indian maritime power takes ten forms:

1. A much larger industrial base in both quantitative and qualitative terms.
2. Larger and more numerous naval base in India itself.
3. Larger and more numerous forward operating facilities outside continental India.
4. Much increased maritime airpower in number, size and capacity of aircraft and naval air stations.
5. Increased personnel training capacity and higher standards of training.
6. More numerous, more modern and larger ships, submarines.
7. Sea Development of an increasing diversity of her own weapons and sensors.
8. An expanding merchant service.
9. A rapidly growing para-military Coast Guard.
10. A developing satellite communications and intelligence capability.

MORE SHIPS

India now has in service two aircraft carriers each with a carrier air group of Sea Harrier STOVL aircraft and Sea King helicopters. These two carriers are supported by four Russian built Kanyak II area defence anti-aircraft missile destroyers, and two under way replenishment ships. Other ships already in service include three Indian built 4000 ton anti-submarine frigates (each with two Sea King helicopters), six Indian built improved Type 12 ASW frigates (each with one helicopter), 11 other frigates, one Indian built and four Russian built SSGW and SAM armed corvettes, four support tankers, eight ocean mine-sweepers, ten inshore mine-counter-measures vessels, an ocean going submarine depot ship, one assault tank landing ship and 15 other landing ships and craft.

By 1995, this force will have been increased by three guided missile armed modified K versa II class cruisers, five Indian built 6000 ton SSGV/SAM armed destroyers, two more Kanyak II Russian built DDGs, three more Indian built anti-submarine frigates, 11 more Indian built 1200 ton corvettes, nine more Russian built corvettes, ten gp PHIBS and minehunter-sweepers, a third under way replenishment ship, another assault LST, four more medium landing ships and more LCUs.

Turning to submarines, India has had eight Russian built Foxtrot II class submarines for some years. In the past 12 months or so, these have been joined by two Russian built Kilo class diesel electric submarines (the Kilo is Russia's new generation SS) and two of the latest and most capable West German built diesel electric submarines. By 1991, there will be a total of six Kilos and four Type 1500 submarines in service with the Indian Navy. It is planned to build up to 15 type 1500 submarines. Further ahead, the submarine building programme with West Germany provides for the establishment of an Indian submarine design capability which is to be used to develop a local 2000 ton design.
number of guided missile cruisers and under way replenishment ships in service and building suggest that there are no carrier task forces are planned.

**AIRCRAFT STRENGTH GROWS**

The increase in maritime airpower is impressive. There are 49 Sea Harrier fighter/STOL aircraft in service or on order. The number includes four Sea Harrier trainers. There are 15 ASW Sea Kings in service with a further 20 Sea Kings configured primarily for anti-ship operations. Surface targets of ship borne SSGW and air to surface missiles. Six vertical replenishment and four Sea Kings and three AEW Sea Kings are on order. The first of 15 Russian built Helis Ka225 Russian built ASW helicopters are in service. The remainder will serve from the three new Kresta II guided missile cruisers and the Kashin II DDGs. There are also להק ASW and ASR helicopters in service. The first of eight Russian built Bear F long range maritime patrol aircraft has already joined the five Russian built 11.38 May aircraft in service. New training aircraft are expected to be ordered shortly. Twenty-six smaller Dornier D222/20 maritime patrol aircraft are now entering service. Air stations will total seven when current construction programmes are complete. These will include a major new air technical training establishment and the new air station at Karwar, adjacent to the new major naval base south east of Bombay.

**NAVAL BASES**

Both the current major naval bases, at Bombay and Vishakhapatnam, are being upgraded. Bombay will receive, inter alia, a second dock capable of taking carrier sized ships. The programme at Vishakhapatnam is being undertaken with Russian assistance. A major new fleet base is being built at Karwar, south east of Bombay. It is expected that the headquarters of Western Fleet will move to Karwar in due course. The forward operating base at Port Blair, Andaman Islands, has recently received a floating dock. Further small bases are being built in the Nicobar Islands and Laccadive Islands. Under the recent agreement with Sri Lanka, India has the right to develop Trincomalee. Sri Lanka is effectively prevented from offering base facilities to any power other than India.

**INDIA'S GROWING NAVAL INDUSTRIAL BASE**

The largest shipbuilding establishment, Bombay's Mazagon Dock, is currently building a 6000 ton destructor, corvettes and diesel electric submarines. The destroyer is to be CODAG driven with both gas turbines and diesels being built in India under licence. Garden Reach, in Calcutta, has built a tank landing ships, patrol craft and hydrographic ships for some years. Garden Reach is now building the third under way replenishment ship and is being uprated to build corvettes and the second trio of Godavari class ASW frigates. Goa builds auxiliary craft and tank landing ships and will be provided with the capabilities to build a ship housed mine counter-measures vessels. Goa has been mentioned as the site for Indian construction of the new aircraft carrier, but this is far from certain. Local manufacture of weapons and sensors is growing. A locally improved version of the A244 surface launched ASW torpedoes is already being produced.

**INDIA'S MERCHANT NAVY**

The number and total tonnage of India's merchant fleet has increased steadily. In the 10 years from 1976 to 1986, the total gross registered tonnage rose from 3.9 million to 6.6 million tons. Of course, a merchant marine is primarily for national and international trade — not for military purposes. However, in time of military necessity a merchant marine imparts vitally important additional naval capabilities. A glance at the history of the Falklands campaign testifies to that.

**INDIA'S PARAMILITARY COASTGUARD**

The strategic purpose of the Indian maritime power build-up has mystified western observers. This is well expressed by the Editor of Jane's Fighting Ships in his foreword to the 1987 RUSI Jacks: "India's build-up is, by any standards short of the super powers, a formidable force and the main quarry for an outsider observer is "why?" The threat to Pakistan is obvious and another neighbour, Sri Lanka, is being told what to do in her own territory . . . There has been a long tradition that India's future lay on the sea but this very considerable fleet must cause apprehension among the littoral countries of the Indian Ocean.

This writer leaves it to his readers to ponder this question for themselves.

**Two firms to negotiate for Williamstown Dockyard**

The Minister for Defence, Mr Kim Beazley, announced that two organisations which submitted tenders for the Williamstown Dockyard have been selected for further negotiations. The firms are: The Australian Marine Engineering Construction Corporation (AMEC) comprising ASL of Perth, Ergo of NSW, and ICAL, Sydney, and Technav, in association with Byvest, of Sydney.

Mr Beazley said the original five tenderers have been cut to two as the next step in the contract development. "Selection of the two companies to continue in the sale process has followed detailed evaluation of the tenderers' proposals and the degree of compliance with our requirements", Mr Beazley said. "The two companies have been invited to hold competitive negotiations with my department. "The Government will make a decision on the new owner of the dockyard and completing the sale as soon as possible." Mr Beazley said this will enable completion of two FFG-7 class destroyers, on which about $300 million worth of work remains.

"We will also expect the successful tenderers to compete for the new $3.5 billion Anzac Ship Project. "I am looking forward to the dockyard operating under commercial management and the opportunities this will present", Mr Beazley said.

The forward operating base at Port Blair, Andaman Islands, has recently received a floating dock. Further small bases are being built in the Nicobar Islands and Laccadive Islands. Under the recent agreement with Sri Lanka, India has the right to develop Trincomalee. Sri Lanka is effectively prevented from offering base facilities to any power other than India.
An Economy Commando Carrier for the Royal Navy

by Rupert Pengelley

THE British debate concerning the maintenance and re-equipping of its amphibious landing forces has spawned a proposal for a new type of Aviation Support Ship. Overhastily intended as a cheap vessel, it is built largely to commercial standards, for use in commercial helicopter operations. The basic design is clearly versatile enough, however, to serve as a platform for anti-submarine warfare (ASW) operations or, through the employment of Harrier-type VSTOL aircraft, for air defence and strike operations.

The origins of the proposal stem from contacts early in 1985 between Britain's Royal Marines and the major international container leasing organisation, Sea Containers. This civilian company formerly owned the 26,000 ton container ship MV Contender Beguins, built by Caledonia Shipyard in Sweden. She was requisitioned during the Falklands conflict to serve as an aircraft ferry, and in 1985 was bought outright from Sea Containers by the Royal Navy, for permanent conversion as an aircraft ferry, and in 1985 was bought outright from Sea Containers. This civilian company then became a member of the civilian moulded ship building organisation. Sea Containers. Sea Containers also owns the sister ship 26,000 ton container ship M/Sea Containers, which might similarly be converted.

that sister ship was to be renamed in September. Suffice it to say, a suggestion was made that sister ship Contender Argent might similarly be converted.

Hughes type 1006 or 1007 1-band radars for navigation and helicopter control. Sea Gnat and IR decoy launchers were to be fitted for passive defence against anti-missiles, and a Type 182 noisemaker as a torpedo decoy.

**DESIGN EVOLUTION**

Unsurprisingly, the potential customer progressively refined his thoughts on the optimum equipment and performance levels for the ASS and, after the formal Naval Staff Requirement was raised in the latter half of 1985, the consortium had to modify its design. The most significant innovation was the introduction of a SeaWolf GWS 26 Mod 2 point defence missile system, which included two trainable quadruple SeaWolf missile launchers with a Type 911 missile tracking radar mounted on the island superstructure. This in turn dictated the introduction of a more sophisticated search and target designation radar.

The length of the flight deck was increased from 162m to 170m, in order to allow the six helicopter landing spots (necessary for a complete company lift) to be positioned in a line down the length of the ship. The flight deck was also widened from 30m to 34m, in order to allow the four LCVPs, mounted on davits towards the stern, to be parked on deck including one with its rotors turning, ready to pick up the next company once the first had emplaned.

**CAPACITY**

In principle, the 1,300 m² hangar deck of the ASS provides space for 12 Sea Kings or for its successor in the ASW role, the Anglo-Italian EH101 helicopter. Alternatively, an equal number of Sea Harriers could be carried (the lift dimensions have in fact been enlarged to accommodate the larger wingspan of the RA1's newer Harrier GRS variants), and the deck would be strong enough to permit the operation of Chinook medium lift helicopters. These, too, could be stowed below if the rotors were to be removed. Up to 1000L of aviation fuel may be carried aboard the ASS to support air operations.

On two decks in the stern of the ship, there is a total of 1,550 m² of space for landing craft. Typically, commando inventories are restricted to air-portable vehicle types. However, the ASS is designed to be able to embark or disembark larger trucks of 4–8t capacity. Also located towards the stern are the four LCVPs, mounted on davits immediately below the flight deck.

Accommodation is provided for a standard complement of 558 persons, including ship's company, aircrew, permanent Royal Marine detachment plus an Admiralty drafting margin of 50. The requisite fitted accommodation for 803 Royal Marine commandos is designed to be installed in the recreation spaces and it is said that it would be possible to house another 200 personnel, using hammocks. The ASS design also incorporates Class 2 sickbay facilities similar to those aboard the Invincible class ASW carriers.

The operations room is sized to accommodate whatever level of combat system sophistication might ultimately be thought necessary. The basic ASS proposal featured a comparatively simple action information organisation (AOI), based on a Racal CANE 200 or equivalent Smiths Industries computer system. However, with SeaWolf fitted, there might be a case for a more integrated combat suite utilising digital highways and a version of the standard Ferranti CACS 4 AID. A digital highway has the merit of incuring lower support costs than a hardwired electronics installation, and, though not necessarily a characteristic desirable in a minimum cost design such as this, would give greater scope for upgrading of the ship's electronics suite. As with the search radar, the choice of AID has been left open for the time being.

**SURVIVABILITY**

The basing of the ASS on an existing commercial hull has economic advantages, but it could be disadvantageous in terms of
of noise and infrared signatures, radar cross-section (RCS), and damage resistance. Nonetheless, the widening of the flight deck has had a beneficial effect on RCS since the hull sides have been flared. The fitting of LR attendants in the funnel serves to reduce the ship's thermal signature.

Noise is perhaps a greater problem than (given sufficient funds) it would be possible to remount the ship's twin-shaft diesel propulsion system. Careful design does allow the vessel to be divided into five autonomous power zones, each with two high-pressure salt water pumps, conforming to naval standards for the use of common pump arrangements. Overall, ASS keeps to the required two-compartment "flooding" or buoyancy standard. A more desirable three-compartment standard exists forward of the engine room.

In one significant respect, the design is likely to exceed the standards to be expected in a normal warship. The ASS modifications take up only a part of the design carrying-capacity of the original hull and, in order to slow the rolling motion when at sea, some 1,000 lbs of additional top weight would have to be added to the rebuilt vessel. This margin could be usefully be applied to improvement of the ballastic protection level of the flight deck, either by filling it with concrete or by using double plates in its construction.

**ORDERS**

Within its cost and performance limitations, the ASS appears to offer an extremely flexible platform for differing forms of naval operation. The Royal Navy has reportedly expressed a desire to acquire two ASS-type helicopter carriers, in addition to the new assault ships required to replace the existing LPDs. HMS Fearless and Invincible, for command and control of the new ASW warfare groups and the 13 groups which have registered interest in the project, the Ministers said.

"We will be contacting them all and inviting them to reconsider their original arrangements. From their final proposals, two consortia will be invited to tender for the construction of the ships in Australia. We hope to announce the two selected by the end of the year." Mr. Beasley said the Australian Government is anxious to create a balanced, competitive environment for the project, consistent with the Royal Navy's Defence Shipbuilding policies announced last April.

"The New Zealand Government support this approach as a way of enabling New Zealand companies to become associated with the project," Mr. Tizard said.

"The other important side-effect for our industry will be the acquisition of technology and familiarity with quality systems and defence work." The Ministers said important considerations in the selection of the consortia will be their finance, technical and managerial strengths and access to suitable shipbuilding facilities. The two designers will be chosen in January and the Request for Tender for the construction should be launched in March.

The Ministers expressed their preference for designers and builders establishing a one-to-one relationship but agreed there would be consultations with the organisations finally selected.

"My New Zealand colleagues and I are most conscious of the need to conduct this large and important project for our Defence Forces," Mr. Beasley said.

"A strong and competitive environment is an essential factor in achieving our goals of industry participation and timely delivery of the ships."

---

**Consortium arrangements for the ANZAC Ship Project**

The Australian Minister for Defence, Mr. Kim Beasley, and his New Zealand counterpart, Mr. Keith Tizard, announced the preferred arrangements for the new ANZAC warship.

"We have noted that developments in the ANZAC Ship Project and more widely within industry have encouraged reconsideration arrangements amongst the 13 groups which have registered interest in the project," the Ministers said.

"The New Zealand Government support this approach as a way of enabling New Zealand companies to become associated with the project," Mr. Tizard said.

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**Greek victory at sea**

A reconstructed ancient Greek trireme, (a kind of galley), was commissioned into the Greek navy last year at a ceremony on the ancient docks of Phaleron.

This is the spot where, 2500 years ago, the famed Athenian navy housed its fleet of potent warships on to the beach after its defeat of the much bigger Persian navy at the battle of Salamis.

Perhaps surviving the tension of the past 12 months and seeing the graceful Olympias edge out into the main harbour of Piraeus — pulled by its 170 strong Greek and British rowers — was victory enough for the force behind the trireme reconstruction, Cambridge don Professor John Morris and former British naval architect John Coates.

The commissioning ceremony was also especially significant for the Greek Government and people.

As cameras and telephones flashed almost in unison, the high-profile Greek Cultural Minister, former Actress Melina Mercouri, poured the traditional libation of olive oil and wine on the trireme's bow and named her, majestically, Olympias.

The name somewhat obscured the Cultural Minister's message. The trireme is set to be the masthead for Athens determined bid to host the Golden Olympic Games of 1996 — a century to the time and place since the recommencement of the modern Olympic Games.

The commissioning of Olympias on August 25 was the fulfillment of a dream that had haunted Professor Morrison since 1941.

**TANTALISING**

He had long pondered the possibility of reconstructing ancient history's tantalising jigsaw puzzle. Could a trireme be reconstructed from piecemeal evidence which had survived the ravages of time and the Goths, perhaps surviving the Goths and the Vandals? There was, in fact, three parts of a trireme that could be reconstructed from piecemeal evidence which had survived the ravages of time and the Goths, perhaps surviving the Goths and the Vandals. There was, for one thing, a reconstructed ancient Roman trireme. But the cumbersome product could not be rowed and instead of being the main attraction at the 1864 Palace Exhibition, the French Navy used it for target practice. But the cumbersome product could not be rowed and instead of being the main attraction at the 1864 Palace Exhibition, the French Navy used it for target practice.

Until this decade, Professor Morrison's trireme was a paper tiger, which had promised a war of winds in the letters page of the Times of London. The academic world seems to pounce on theories like a bored cat on a mouse.

But Professor Morrison and his research collaborator, R.T. Williams, stood firm with their theories. The controversial issue was the arrangement of the oars.

Dr Boris Rankov, of the University of Western Australia's department of classics and ancient history, who has been involved in the project since 1985 as editor of The Roman Trireme, explained: "The secret of building these ships had been lost by the 5th century AD. All manner of theories were suggested."

"In the 16th century it was thought the name indicated a ship which had three oarsmen to a bench on one level, each pulling his oar like the contemporary Venetian alla senzale system. Others thought that the trireme had three men to one oar.

But the cumbersome product could not be rowed and instead of being the main attraction at the 1864 Palace Exhibition, the French Navy used it for target practice. But the cumbersome product could not be rowed and instead of being the main attraction at the 1864 Palace Exhibition, the French Navy used it for target practice.

It was Elizabeth I's Greek tutor, in 1571, who deduced that the ship must have had three levels or banks of oars. The other important side-effect for our industry will be the acquisition of technology and familiarity with quality systems and defence work."
OUTRIGGER

"Then Morrison, in 1941, argued that a three-level system with oars of the same length at all levels could be made to work with the aid of an outrigger", Dr Rankov said.

Perhaps the essential element of the entire project was the effort of Professor Morrison to turn an academic possibility into a living reality.

It seems certain that, had Professor Morrison not visited John Coates that auspicious day in 1981, the academic argument would have ground to a grinding halt.

The two collaborated and Mr Coates drew up the plans.

The reconstruction project was launched publicly in Britain in 1982 and the Trireme Trust set up. On a trip to Greece in 1984, Mr Coates inspected construction work on a replica of an ancient merchant ship found off the coast of Cyprus.

It led to an offer of more than $1 million from the Greek Government to the trust for the reconstruction in the trust, in turn, paid for research and development and provided the technical direction.

A trial section was built in Britain in the winter of 1984-5 and was put on display at the elegant Henley Royal Regatta where Dr Rankov, an Oxford rower famed for having rowed six times in the annual Oxford-Cambridge boat race, became involved in the project.

As coach, Dr Rankov's duties were to school 170 rowers in the not inconsiderable art of rowing a trireme — together.

The initial crew was all-British, but later there was more than 50 per cent Greek involvement as the ship, under construction in the shipyards of Tzakakos Brothers at Piraeus, came nearer completion.

ENTRUSTED

The Greek Ministry of Defence accepted the Tzakakos tender and they were entrusted with the task of breathing life into Olympias.

While political wrangles developed as to which Greek Government department should be custodian of the project, Mr Coates and the builders were having their own worries with materials and long-forgotten techniques.

In the Greece of the fifth century BC, the pike was to be used for the specification of the triremes, but today, the local pike was found to be inferior to the project's needs. Oregon pine was substituted.

As well, the Tzakakos Brothers had to take out building voyage back in time, where the planking of the hull was accomplished before the frame was fitted, and where 20,000 successive planks were wedged with specially-designed beech pegs. More than 25,000 hand-made bronze nails, coated with plastic as a rare modern concession for durability, were used as fastenings.

As the July 1987 launching day approached, the doubts and anxieties were to turn to elation. The trireme not only floated, it could be rowed, no doubt awkwardly at first as the crew found its straits.

The official chronicler of the project, former London banker Frank Welsh, said at the launch that the next big event would be the four-month cycles beginning in November next year.

The project is one of three Beancly announced in September to improve the capability of the Naval Hydrographic Service and involve the ASP new design by ASD Marine of Perth, WA.

Crewed by two officers and 10 sailors, the catamarans will have the latest maritime survey equipment, including the new hydrographic data logging and processing systems, "HYDLAPS", which is subject to separate contract negotiations.

The catamarans will be launched in four month cycles beginning in November next year.

SECOND PATROL BOAT FOR PAPUA NEW GUINEA

Papua New Guinea received its second Australian designed and built Pacific Patrol Boat from the Chief of Naval Material, Rear Admiral Barry West, as an official hand-over ceremony near Fremantle, Western Australia, on 31 October.

The $3 million HMPNGS Drager, was presented to PNG's Acting High Commissioner, Mr Evou Lalutute, during a formal ceremony at the Australian Shipbuilding Industries shipyards where the boats are being built.

Drager is the third patrol boat completed under the largest Defence Co-operation project undertaken by Australia.

Up to 14 of the 31.5m long vessels displacing 165 tonnes, with an operating speed of at least 20 knots and an economical operating range of some 2,500 nautical miles, will be built at a total project cost of $61.7 million (at December 1986 prices).

The project followed a pledge by the Prime Minister, Mr Bob Hawke, at the 1983 South Pacific Forum meeting in Canberra, to provide specially designed vessels to patrol the exclusive economic zones (EEZs) of the island States.

The first patrol boat, HMPNGS Tarangau, was presented to PNG by the Prime Minister in May. A second boat, RVS Tikororo, was handed over to Vanuatu one month later to form the nucleus of the Vanuatu Police Force Maritime Wing.

In addition to their primary fisheries, customs and quarantine surveillance tasks, the new boats will significantly improve the capability of the island nations to conduct disaster relief, search and rescue and medical evacuation as well as police and inter-island VIP transport tasks.

The project also enhances the Australian Government's objective of boosting regional maritime surveillance capabilities.

An important aspect of the patrol boat project is that Australia will provide a two-year spares support package for each boat, advisors and regional maintenance support facilities to assist the countries to bring their boats into service. The project also provides intensive crew training in Australia for the boat's complement of base staff as well as a crew of three officers, two seamen and nine junior sailors.

The project will strengthen Australia's practical defence links with regional countries and help encourage a sense of regional co-operation between island States, especially in the surveillance of their EEZs.

A fourth patrol boat, Nafemua, is scheduled to be handed over to Western Samoa next March.
SOVIET UPDATE — A PICTORIAL

Zubov class intelligence gathering ship SSV-458.

Jupiter, a Moma class intelligence collection ship.


Naval research ship IVAN KRUZENSHTEIN in February, 1986.

Kashin class DDG (modified) SLAVNY under way.

Moma class, SELIGER.

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THE NAVY

January-March, 1988

Page Twenty-one

THE NAVY

January-March, 1988
BAKAN, a Morn class intelligence ship.

Oceanographic research ship BALIKASH in November, 1986.

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The resurrection of the United States Navy's Iowa class battleships heralded a dramatic increase in interest in these 1944-45 vintage capital ships. Armed with a new array of weapons and electronics, the ships were designed to lead Surface Action Groups, to relieve the strain on the larger carrier forces, to provide the marines with a strong shore bombardment capability and to counter the new Soviet Kirov class nuclear-powered battleships.

As one ship, and then two, and three of the class commissioned, naval authors have set their sights on the publication of a number of studies of the world's last active battleships. This particular book is a smaller format publication of 150 pages, which details the origin, service, out of commission, modernisation and current status of the Iowa class.

The book is illustrated by a selection of fine black and white photographs depicting over four decades of history. Despite the age of the four ships, each battleship has only served between 10 to 15 years on active commission and thus have a life expectancy beyond the turn of the century.

As well as the historical descriptions of both war and peacetime activities, the author reports on the technical modernisation aspects of the class, including data related to the main armaments, both past and present.

All in all I strongly recommend "Iowa Class Battleships".


In 120 photographs the author describes and illustrates the gradual development of the Royal Navy cruiser force ships of the period from 1880 to 1917, but completed too late for war service. The Royal Navy cruisers, transferred from and built in Britain, are included with the first SYDNEY, MELBOURNE and BRISBANE -- all depicted. Some of the earlier ships which formed part of the Australia Station are also included.

For a modest outlay of $12.95, readers can obtain this excellent visual and technical publication.


From the striking colour front cover onwards, this latest book of Norman Friedman's contains a plethora of previously unknown or 'misplaced' facts.

An excellent example of the work put into the post-war navies is highlighted by possible Royal Navy missile ship designs. From 1953 to 1955 up to 24 new designs were considered in just three years.

The book is sub-divided into ten chapters, including; Money, Politics & Strategy, Carriers and Naval Aviation, Mine Warfare, plus a selection of five appendices with No IV highlighting the strengths of the major powers from 1939 to 1957.

Well-drawn side profiles of new ships and conversions of war-built tonnage are generally highlighted by adjacent tabular descriptions.
HISTORIC WILLIAMSTOWN NAVAL DOCKYARD

FOR INQUIRIES
Phone: (03) 393 0513

- Major Warship Builders for the RAN
ANNUAL REPORT

The following report of the Federal President was presented to the Annual General Meeting of The Navy League of Australia at the Melbourne College of Advanced Education, Carlton, Victoria, on Friday, 13 November, 1987.

Ladies and Gentlemen,

I commenced my 1985 report to the League by saying the preceding 12 months had been a period of consolidation, and my 1986 report by remarking that the corresponding period had been the busiest I could recall so far as the Navy League was concerned.

I look back on the last few months of 1986 and 1987 to date, the period covered by this report, with mixed feelings.

On the one hand there are positive things to note; on the other one must express disappointment at the lack of public response to the effort the League and other organisations and individuals put in to promotion of the maritime cause.

STATEMENT OF POLICY

In the early part of the year under review maritime defence policies agreed by the Council at the 1986 meeting in Canberra were printed and circulated to those most concerned with defence matters and subsequently published in the April-June issue of THE NAVY. They were republished virtually in full by PACIFIC DEFENCE REPORTER and noted in part by some newspapers but without comment (it would be nice to think this was due to total agreement with the League's aims but I think it is more likely that apathy about defence was the real reason).

The Statement of Policy, 27 items in all, is comprehensive and quite specific about the League's objectives. Some objectives have been actively pursued during the year, a very considerable amount of attention being given the question of Australian Flag merchant shipping. Because the objectives are so comprehensive and the League's administrative resources are limited, I intend to ask the Federal Council tomorrow to establish a list of priorities.

DEFENCE WHITE PAPER

The Government's defence policies were decided and published about twelve months after Mr. Paul Dibb completed his review of Australia's capabilities. There were no real surprises, the most notable change (from the Dibb review) being a re-statement of Australia's close defence ties with the United States. My review of the White Paper is contained in the July-September issue of THE NAVY.

Although THE NAVY is eagerly sought by Navy League members and Cadets, few Divisions have organised themselves to feed NLA and NRC items to the Editor — either that or they miss the deadline and the item becomes outdated. It is up to the Divisions if they wish to read about their own and other Divisions' activities.

The quality of THE NAVY today is due very largely to the work of the present part-time editor, Ross Gillett, who with the next issue will have held that important office for ten years. Congratulations Ross and many editorial returns of the day!

OVERSEAS VISITS

Last year you will recall, Vice-President Andrew Robertson attended the Navy League of New Zealand's Annual Conference in Auckland. This year we are very pleased to welcome the President of the New Zealand League, Mr. Denis Jagger-Smith, to our Melbourne Meeting. Mr. Jagger-Smith will be accompanied on the visit by his wife.

COMMUNITY AWARD AND
NRC MOST EFFICIENT UNIT AWARD

These annual awards were won by HMAS COONAWARRA (Darwin) and TS FLINDERS (Pt. Pine) respectively. The administrator of the Northern Territory (Commodore Eric Johnston) presented the shield to COONAWARRA and the Chief of Naval Personnel (Rear Admiral Tony Horton) presided at Pt. Pine. The League was represented by the Divisional Presidents in the Northern Territory and South Australia. Don Schrapel and Milton Morris.

EDUCATION PROJECT

This important project is progressing, largely due to the efforts of a NSW Division Sub-Committee consisting of Andrew Robertson, John Grover, Bob Myers and Ian Thomas. Estimated to cost $100,000 eventually, one major sponsor has provided $30,000 and the Australian National Maritime Association has agreed to sponsor a segment which will cost $16,000. The project and the need for more financial support will be discussed by the Federal Council at its Melbourne Meeting.

NAVAL RESERVE CADETS

The Director of Naval Reserves and Cadets (Captain Tim Lewis, RAN) has provided a brief on the current state of the NRC, a copy of which is attached to this report.

It is hoped that a unit, supported by the League, will be formed in Darwin in the not-too-distant future. A great deal will depend upon the availability of funds.

FINANCIAL

While the Council's funds are reasonably healthy, too much of the financial weight of pursuing the League's objectives is being borne by the NSW and Victorian Divisions. It is unsatisfactory to note Divisions with subscriptions in arrears. The Honorary Treasurer will report on this matter.

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THE NAVY, about to enter its 50th year of publication, is undoubtedly the League's greatest asset in the sense it is our channel of communication, not only among ourselves but between the League and the public. Not many organisations have a "quality" publication to publish its views.

According to the NSW Division's Magazine Management Committee, the magazine is currently on a sound financial footing despite increased publishing costs, and it is worth mentioning that during the RAN's 75th Anniversary fleet review week, Naval Reserve Cadets sold no less than 3600 copies of a special run and earned the NRC $1800 in so doing.

THE NAVY LEAGUE OF AUSTRALIA

OFFICE OF THE FEDERAL PRESIDENT

THE NAVY LEAGUE OF AUSTRALIA

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THE NAVY LEAGUE OF AUSTRALIA
ADMINISTRATION

The growth of the Navy League and extent of its activities in recent years have placed a very heavy burden on office-bearers and committee members, particularly in the amount of time they contribute; so far as the Federal administration is concerned the limit has been reached. I will therefore be asking the Federal Council to establish a sub-committee to look to the future of the League and recommend appropriate administrative reforms to enable the League to continue its work in what I believe is the national interest.

COLLEAGUES

I once again acknowledge the support of my colleagues, the Federal Vice-Presidents, Divisional Presidents and the Honorary Secretary-Treasurer in particular. I also wish to express the Council's and my personal appreciation of the support provided by the Deputy Chief of Naval Staff, Rear Admiral Neil Ralph, AO, DSC, RAN, who for the third year in succession has been nominated as the Chief of Naval Staff's representative at the Federal Council meeting. No other serving officer has had this experience and one can only hope it has done Admiral Ralph no harm!

F. G. EVANS
Federal President

Text of the brief provided by the Director of Naval Reserves and Cadets for inclusion in the Annual Report of the Federal President.

Complements Manning Levels

A review of all NRC Unit complements was undertaken earlier this year and resulted in a majority of Unit complements being altered to reflect their current manning levels. The review also released sufficient vacancies to allow two new Units (TS CARPENTARIA, Thursday Island and TS STUART, Elizabeth SA) to be formally recognized by the Chief of Naval Staff to date 1 September 1987. Complements for these Units are 60 Cadets and 40 Cadets respectively. In addition, approval in principle has been granted to a group in Beenleigh, Qld and, subject to meeting all criteria for formal recognition, it will become a Unit of the NRC with a complement of 40 Cadets on 1 March 1988.

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The distribution of Units throughout Australia and the current total complements are:

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As the total number of members is within the allowed manning level, there is scope for growth in existing Units and possible recognition of a further Unit in the future.

Administration

A conference of NRC Senior Officers from each State was held in Navy Office in May 1987. This conference allowed each State to discuss proposed policy changes and other matters affecting the Units in their areas.

Sail Training

Whilst the Corsair Sail Training Craft is the official craft used by Units for sail and boat pulling training, many Units have obtained other craft so that more members can undergo training at one time. The purchase of suitable craft for formal training and the necessity to obtain a suitable safety boat involves Units and Unit Committees in many fund raising activities.

NRC Bicentennial Training Camp

A NRC Bicentennial Training Camp will be held in Sydney 17 - 27 January 1988. Approximately 550 Cadets from all States will participate in the training activities and in other planned events including visits to the Tall Ships.

Bicentennial Events

Members of the NRC are expected to be involved in the many Bicentennial events planned for 1988. Units in and near Brisbane will also be supporting the Australian Expo 88 and are in much demand for ceremonial events.

The Navy League of Australia Annual Efficiency Trophy

The most efficient Naval Reserve Cadet Units selected by the respective Local Naval Authorities in each State will be inspected by DNRC in October-November. The Units are:

- TS BARWON
- TS BUNBURY
- TS EMU
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The decision concerning the award of the Trophy will be made by CNS in December 1987 and it is planned that the Trophy will be presented during the NRC Bicentennial Training Camp in Sydney in January 1988. The Navy League of Australia will be advised further when the selected Unit and details of the presentation are known.

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- TS PIONEER
- TS TOBRUK

The decision concerning the award of the Trophy will be made by CNS in December 1987 and it is planned that the Trophy will be presented during the NRC Bicentennial Training Camp in Sydney in January 1988. The Navy League of Australia will be advised further when the selected Unit and details of the presentation are known.

T E. LEWIS
Captain, RAN
Director of Naval Reserves and Cadets
The Navy League of Australia

APPLICATION FOR MEMBERSHIP

HISTORICAL

In 1950, encouraged by the Australian Commonwealth Naval Board, the Navy League of Australia was established as a means of facilitating the development of the Australian Sea Cadet Corps.

Since that time, Divisions have been formed in every State, the Australian Capital Territory and the Northern Territory.

The Navy League of Australia is now one of a number of independent Navy Leagues formed in countries of the free world to influence public thinking on naval matters and create interest in the sea.

The Navy League of Australia cordially invites you to join us in what we believe to be an important national task.
MEMBERSHIP
Any person with an interest in maritime affairs, or who wishes to acquire an interest in, or knowledge of, maritime affairs and who wishes to support the objectives of the League, is invited to join.

OBJECTIVES
The principal objectives of The Navy League of Australia are:

• To keep before the Australian people the fact that we are a maritime nation and that a strong Navy and a sound maritime industry are indispensable elements of our national well-being and vital to the freedom of Australia.
• To promote, sponsor and encourage the interest of Australian youth in the sea and sea-services, and support practical sea training measures.
• To cooperate with other Navy Leagues and sponsor the exchange of cadets for training purposes.

ACTIVITIES
The Navy League of Australia works towards its objectives in a number of ways:

• By including in its membership leading representatives of the many elements which form the maritime community.
• Through soundly-based contributions by members to journals and newspapers, and other media comment.
• By supporting the Naval Reserve Cadets, and assisting in the provision of training facilities.
• By encouraging and supporting visits by recognised world figures such as former United States Chiefs of Naval Operations and Britain's First Sea Lords.
• By publishing "The Navy", a quarterly journal reporting on local and overseas maritime happenings, past, present and projected.
• By maintaining contact with serving naval personnel through activities arranged during visits to Australian ports of ships of the Royal Australian and Allied Navies.
• By organising symposia, ships' visits and various other functions of maritime interest throughout the year.

Member participation is encouraged in all these activities.

JOINING THE LEAGUE
To become a Member of The League, simply complete the Application Form below, and post it, together with your first annual subscription of $12.00 (twelve dollars) (which includes the 4 quarterly editions of "The Navy"), to the Hon Secretary of the Division of the Navy League in the State or Territory in which you reside, the addresses of which are as follows:

VICTORIAN DIVISION: c/o 9 Collington Road, Camberwell, Vic, 3124.
QUEENSLAND DIVISION: c/o 42 Gilligan Street, Indooroopilly, Qld, 4068.
AUSTRALIAN CAPITAL TERRITORY DIVISION: c/o 42 Skinner Street, Cook, ACT, 2614.
SOUTH AUSTRALIAN DIVISION: GPO Box 1529, Adelaide, SA, 5001.
TASMANIAN DIVISION: c/o 42 Amy Road, Launceston, Tas., 7250.
WEST AUSTRALIAN DIVISION: c/o 25 Cowper Road, Attadale, WA, 6155.
NORTHERN TERRITORY DIVISION: GPO Box 2512, Darwin, NT, 0801.

Subscriptions are due on 1st July in each year, and your membership will be current to 30th June immediately following the date on which you join the League, except that if your first subscription is received during the period 1st April to 30th June in any year, your initial membership will be extended to 30th June in the following year.

THE NAVY LEAGUE OF AUSTRALIA
Application for Membership

To The Hon Secretary,
The Navy League of Australia

Division

Sir or Madam,

I wish to join the Navy League of Australia, the objectives of which I support, and I enclose a remittance for $12.00 being my first annual subscription to 30th June next.

Name (Mr) (Mrs) (Ms) PLEASE PRINT CLEARLY
(Rank)
Street Suburb State Postcode

Signature Date

Subscriptions are due on 1st July in each year, and your membership will be current to 30th June immediately following the date on which you join the League, except that if your first subscription is received during the period 1st April to 30th June in any year, your initial membership will be extended to 30th June in the following year.
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NAVAL RESERVE CADETS

If you are between the ages of 13 and 18 years:

The Naval Reserve Cadets provide for the spiritual, social and educational welfare of boys and girls and help to develop in them character, a sense of patriotism, self-reliance, citizenship and discipline.

Uniforms are supplied free of charge.

Cadets are required to produce a certificate from their doctor to confirm they are capable of carrying out the normal duties and activities of the Cadet Corps. If injured while on duty, Cadets are considered for payment of compensation.

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The interesting syllabus of training covers a wide sphere and includes seamanship, handling of boats under sail and power, navigation, physical training, rifle shooting, signalling, splicing of wire and ropes, general sporting activities and other varied subjects.

Instructional camps are arranged for Cadets and they are also given opportunities, whenever possible, to undertake training at sea in ships of the Royal Australian Navy.

Cadets, if considering a sea career, are given every assistance to join the Royal Australian Navy, Mercantile Marine or the Royal Australian Naval Reserve but there is no compulsion to join these Services.

For further information, please contact the Senior Officer in your State, using the addresses provided below.

NEW SOUTH WALES: Staff Office Cadets, HMAS Watson, Watsons Bay, NSW, 2030.

QUEENSLAND: Staff Office Cadets, HMAS Moreton, Box 1416T, GPO, Brisbane, 4001.

WESTERN AUSTRALIA: Staff Office Cadets, HMAS Leeuwin, PO Box 58, Fremantle, WA, 6160.

SOUTH AUSTRALIA: Staff Office Cadets, HMAS Encounter, PO Box 117, Port Adelaide, South Australia, 5015.

VICTORIA: Staff Office Cadets, HMAS Lonsdale, Rouse Street, Port Melbourne, Vic, 3207.

TASMANIA: Staff Office Cadets, HMAS Huon, Hobart, Tas, 7000.

AUSTRALIAN CAPITAL TERRITORY: Commanding Officer, TS Canberra, PO Box E52, Queen Victoria Terrace, Canberra, ACT, 2600.

THE NAVY

All enquiries regarding the Navy Magazine, subscriptions and editorial matters should be sent to:

The Hon. Secretary, NSW Division
NAVY LEAGUE of AUSTRALIA
GPO Box 1719, SYDNEY, NSW, 2001
THE NAVY

The magazine of
THE NAVY LEAGUE OF AUSTRALIA

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Our Cover Photograph
Australia Day, Sydney Harbour. 1988 Three
RAN Fleet units were photographed by navy
photographer CPO Bob Ferrall during the
departure of the Tall ships.

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ON THE SURFACE
THEY APPEAR IDENTICAL

Deep down, you'll find the differences. Because inside the new hull, VSEL's Type 2400-Patrol class submarine can be matched exactly to your operational requirements.

A totally new design, silent in operation and with a capability well in advance of other diesel electric designs, the Type 2400 concept is flexible enough to accommodate a wide range of operational requirements.

Machinery, equipment, armament and sensors can all be matched to specific requirements. VSEL's ultra-modern 24 acre warship site will be able to handle anything from a minor modification to a complete custom build. The very latest production technology and build strategies are on call.

Far from being a "paper boat", the Type 2400 is already on stream. Four are on order from the Royal Navy and the first of these went in the water on 2 December, 1986.

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"Fitted for but not with . . ."

For those unfamiliar with naval parlance, this means that a warship has been built with space or certain facilities provided which enable particular equipment to be installed at a later date - when the item becomes available, is considered necessary or can be afforded, quite often the latter, in the meantime the ship operates without the equipment and has a lesser capability than it might otherwise have.

AWARDS the end of 1987, the Navy League issued a statement supporting the Government's decision to make available an RAN Mine Clearance Diving Team to assist in mine clearance operations in the Persian Gulf. The Navy acted with commendable rapidity and since February, a 20-man team, including eight members specially trained in Britain by the Royal Navy to deal with the types of mine found in the Gulf, has been standing by in Australia ready to go into action if required.

In the same statement the Navy League expressed doubts about the wisdom of sending surface warships to the Gulf, a suggestion that had also been put forward. The League pointed out that the most suitable ships, the guided missile destroyers and frigates, were not properly equipped to operate in an area where mines were causing loss of life and damage to warships and merchantmen alike. The destroyers lacked a close-in-missile system and the frigates appropriate helicopters, essential equipment in a hostile environment. In a practical sense the Government lacked this option, although it has to be said that political considerations not infrequently override practical reasoning.

The question of what equipment to install from the outset in the new surface combatant (the ANZAC Ship Project) will no doubt soon arise if it has not done so already. Although described as a "second tier" warship (destroyers and frigates being the first tier and patrol boats the third) given the number of ships planned, eight for the RAN and possibly four for the RNZN, and the published project cost of $3.5bn for the Australian group, it seems likely the ships will enter service with much less than a full outfit of equipment - "fitted for but not with" - and they will be less capable and versatile than they could be.

Over the years it has not been uncommon for governments to assume and naval authorities to hope that time would be available to rectify deficiencies in warships, so that at the moment of need they would be in a proper state of readiness and not required to perform tasks beyond their known capabilities. Unfortunately the seaboard is littered with the wrecks of ships and the bones of sailors sent on hopeless missions only partly prepared because, in the event, there was no time and there was nothing else to send.

The cost of maintaining the Australian Defence Force is high and it would be even higher if the whole Force had been kept at anything like instant readiness. Some elements however must be "ready to go" at very short notice and among those is the Navy's surface combatant force. It must also be ready to go anywhere where Australia's interests can be served and not restricted to "safe" areas. However, before a Government exercises the option a naval surface force can often provide in a wide range of circumstances, there are many things to consider; the establishment of a special team, for example, would be necessary - and that, too, would be costly.
NEW NAVAL HYDROGRAPHIC SHIPS

Monday 1st February, witnessed the beginning of construction in Port Adelaide of four Australian designed survey motor launches for the Royal Australian Navy.

The four ships, worth $187 million, will form a new class of hydrographic ships to be known as the Paluma class. The first ship, HMAS Paluma, will be commissioned in November, this year, to be followed by HMAS Ships Mermaid, Shaparton and Benalla by November, 1989.

The new vessels will be specially designed catamarans fitted out for work in the shallower and often restricted waters of northern Australia where they will assist HMAS Ships Moreby and Flinders.

These waters are presently poorly charted except for recognised shipping lanes. Most of the information in the present charts of Australian waters are based on surveys carried out last century.

The local design of the new launches is expected to attract considerable overseas interest. They will be outfitted with the latest marine survey equipment and will be capable of conducting surveys in the waters of neighboring countries and the south west Pacific islands.

The new vessels will be seen as a major expansion of the Royal Australian Navy's capability for conducting surveys in the waters of neighboring countries and in the shallow and often restricted waters of northern Australia.

The four vessels will be based in Thursday Island until taken up by the Royal Australian Navy for survey and patrol work in PNG and through to the Philippines during World War II. Other work in areas ranging from Fremantle across northern Australia to Moreton Bay was conducted in the aftermath of the war until they finally decommissioned in 1946.

Description and Role — SML

A twin engine vessel capable of making ocean passages is required. It is to provide a stable platform for hydrographic surveying and to develop a capability for conducting surveys in Australian waters. The vessel is to be capable of operating standard hydrographic surveying equipment and will be equipped with the latest marine survey equipment and will be capable of conducting surveys in the waters of neighboring countries and in the shallow and often restricted waters of northern Australia.

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The names chosen have great historical significance in the development of hydrography in Australian and Papua New Guinea waters in both peace and war spanning from 1918 to 1972.

Paluma will be the fourth survey ship to bear the name. Paluma I was a Queenslander's colossus made for survey work in the Great Barrier Reef in the Great Barrier Reef region between 1918 and 1924. Other distinguished early Austra-Ians to serve in Paluma during this period were Lieutenants John Smyth and waterfront, later Lieutenants General of Western Australia and John O'Reilly, Surveyor General of New South Wales and leading light in the exploration for and settlement of the Great Barrier Reef.

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MURPHY'S LAW
From the memories of a seaman called MURCHIE

The Prime Minister of Australia, Joseph Aloysius Lyons, had died, and after due ceremony in Sydney, was to be transported to his home town in Devonport, Tasmania. His relatives wished him to be buried in the local cemetery, and to get the body there the ship was put to work readying the vessel for the trip to Devonport. Joe Lyons, was our late erstwhile leader resplendent in full evening attire, and. since all eyes were upon us for the trip, the ship's company was put to work readying the ship for the trip to Devonport. The wretched thing sagged alarmingly as he walked across the gangplank, which bordered on being gigantic. As he walked across the gangplank, it became evident that, if he didn't step clear of the gangplank before the weight of the coffin and the pallbearers arrived, an unnecessary accident would be inevitable.

I have often wondered since that day if any of the thousand of people who lined the streets from St Mary's Cathedral to Circular Quay, to watch the funeral procession, gave even the slightest thought of the possibility of anything happening which could jeopardize the dignified proceedings, either in Sydney or on the way to Tasmania. I think not! Most people would be disinclined to the view that any or all of the carefully thought out arrangements could be put at risk. That very wise Irishman by the name of Murphy laid down an indelible rule which clearly says that anything that can go wrong, will go wrong. Thus, at any rate, is the way it is usually understood. In, together with the entire population of Australia, would have from the very outset had such a man, if Murphy's Law held (and would not hold true for this most solemn of State occasions. It would have been preposterous to have suggested otherwise, and yet, as it happened, all went well and the coffin was placed on the quarter deck, as far as it was possible to do so. As so easily could have been the case, there were so many of these floral tributes that it would be more (heir way of thinking to believe that my audience will be adept not only of the proper running of the ship, but also of the retaining of it is something about which I have always exercised the greatest degree of caution, the reason being that there are a number of people who have vertical trouble with things in life, and would not be capable of slotting this story away under the heading of TRUTH. This would be more their way of thinking. And so, when it seems appropriate that the story should be told, I always hope that my audience will be adept not only of thinking horizontally, but also of appreciating the delivery. After all it seems to me not to be too cynical to hold that so many of the realities of life are, in fact, pure absurdities!
The Navy officially welcomed another mine warfare vessel to its Fleet in a ceremony at Brisbane on 10th February, 1988.

Mrs Anne Townsend, wife of the Naval Officer Commanding Queensland, cracked the traditional bottle of champagne across the vessel’s bow at HMAS MORETON at New Farm on the Brisbane River.

Originally built by the Australian Shipbuilding Industries in Fremantle, Western Australia, as the lighthouse maintenance vessel LUMEN in December, 1975, the former Department of Transport and Communications vessels was purchased for $410,000 having been laid up since April, 1987. She was officially handed over to the RAN on 2nd February, 1988.

BROLGA sailed for Sydney on 24th February, arriving at Pyrmont in Sydney Harbour on 25th. After brief maintenance she will act as the trials vessel for the Phase 1A and part of 2A development of an Australian Minesweeping Capability.

AM BROLGA was named after one of the first fishing vessels taken up in 1917 for service as an Australian Auxiliary Minesweeper during World War I.

As MV LUMEN, BROLGA was a lighthouse tender based at the Navigational Aids Section, New Farm, Brisbane, and worked mainly in Torres Strait and North Queensland, supporting both manned and unmanned lights. Her major task was the re-supply of acetylene for the lights. As solar technology developed many of the lights were converted from gas to electricity and she became redundant.

The Department of Transport and Communications offered LUMEN for disposal, having been found no longer cost effective in her role. The minesweeping project was intending to lease vessels over the next two years to trial various minesweeping and surveillance development equipments. Thus, when MV LUMEN appeared on the market, she presented a far more cost effective solution.
THE NAVY

April/June, 1988

BROGLA

1917-1918

The first BROGLA joined the RAN in October, 1917, having been built in Great Britain as a Castle class trawler. With her sister ships GUNUN-DIAAL and KORAAGA, the trio swept for mines laid by the German raider WOLF along the NSW and Victorian coasts. All three vessels were manned by the Naval Brigade. Post-war BROGLA was sold to New Zealand in 1923 and again in 1925, to the Coastal Trading Co Ltd of New South Wales. On 13th August, 1926, BROGLA was lost after striking a reef off the Victorian coast.

BROGLA is a 28.45 metre-long, steel-hulled, fishing-type vessel with crew accommodation for 17 personnel. Her top speed is 10.5 knots and at dead slow can make 7 knots. She is powered by a Minless Blackstone 8 cylinder, 4 stroke diesel, developing 540 bhp.

BROGLA displaces about 263 tons gross. She features a large block forward for accommodation and the bridge, while aft are twin funnels.

In her role as a trials' vessel she will be Sydney-based and normally, will be crewed by considerably less than her 17 personnel capacity.

The crew will be drawn from the minesweeping project development team which is based at the Material Research Laboratory (Sydney) at Pyrmont.

As a temporary acquisition for the RAN, BROGLA is expected to continue as a trials vessels only, until late 1990.

BROGLA, a sister ship of the first RAN auxiliary mine-sweeper BROGLA.

HMAS DURRAWEEN, a sister ship of the first RAN auxiliary mine-sweeper BROGLA.


Bridge

Stern view at Brisbane, prior to her departure.

N187
From Western Australia, the Sail Training Ship LEEUWIN II
(Photograph - John Mortimer)

JUAN SEBASTIAN DE EL CANO with HMAS Canberra, sails down the River Derwent towards the race start

USCG Cutter EAGLE sailing towards Sydney
(Photograph - John Mortimer)

Poland's majestic tall ship contribution DAR MŁODZIEŻY

The compact GUYAS, complete with ship's band

Another harbour scene of 25th January, 1988. HMAS CANBERRA occupies the centre with HMAS COOK, and patrol boat to the right. The sailing ship above CANBERRA is the Japanese NIPPON MARU

The Spanish JUAN SEBASTIAN DE EL CANO in Sydney Harbour.
ANZAC SHIP PROJECT
NEW FRIGATES FOR NAVY

by A. W. Grazerbrooke

Naval has selected two basic designs of light frigate for detailed study prior to choosing a new type of vessel to replace the existing River Class ships in the Tier II role. It is planned to build eight ships, due to replace Rivers and three to replace Fremantle class patrol boats.

The Royal New Zealand Navy is participating in the selection process with a view to ordering four ships to replace their existing Type 12 frigates.

The types selected for detailed study are:
- West Germany's Blohm and Voss Meko 200PN
- The Netherlands Royal Schelde Yard's M Class

The project is an option to acquire, within rigidly fixed budget constraints, the eight ships initial armament is specified for both types:
- One gun
- One vertical launcher point defence missile system
- One close in weapon system
- Fitting for but not with surface launched ASW torpedoes
- Fitting for but not with cannister launched surface to surface guided missiles
- Capability to house and operate one Seahawk S70B2 helicopter

For selection both types were required to meet specified speed and range minimums.

As the armament, sensor speed and range capability are at the same minimum for both ships, the decisive factors of difference are likely to be:
- Cost
- Extent of risk in design, hull, machinery and combat systems
- Commonality of weapons systems and machinery with equipment already in service with the RAN/RNZN
- Survivability
- Feasibility of adaptation to the needs of both the RAN and RNZN

COST

As always, this aspect is vitally important. Naval has been given a fixed budget and are seeking the best value for money. Emphasis is likely to be on initial cost as governments are notoriously three year minded regarding cost. Through life cost should also be important.

Very little information is released about costs of specific types, for obvious commercial reasons. The general belief is that the M Class is more expensive than the Meko 200PN.

It is important to recognise that total project cost, not the purchase cost of each ship, is the cost that is considered when comparing two proposals.

RISKS

The risks considered are those of the ship type selected costing much more than expected, or failing in performance when the ship actually enters service.

In general, it is said that the more innovative the design, construction method, weapons systems and/or propulsion systems the greater is the risk that something will go wrong. It is for this reason that Naval has declared a preference for proven designs.

In terms of risk, both contenders are well placed.

Royal Schelde and their predecessors have built continuously since World War II frigate sized warships for the Royal Netherlands Navy. Their M Class design has resulted from a "stretch" between a previous generation of frigate, the F123, the West German Navy has specialised the Meko type modular concept and most features. The modular concept has been specifically for the NATO NERVO frigate, which is being designed to fill the frigate needs of up to eight NATO navies.

In overseas construction, Blohm and Voss are strong. They have their current Turkish and Argentine experience and, through their sister company TNSW, submarine experience in Argentina. Their involvement in the Meko 200 project for Portugal will be particularly beneficial as it requires the integration of combat systems from several different nations.

BVA claim that their modular concept is particularly suitable for the ANZAC ship project as it facilitates New Zealand industrial participation in production. In summary, although somewhat different ways, both the M Class and the Meko 200PN offer the RAN and RNZN both proven construction methods, strong naval input and overseas experience. The risk element is not great with either contender, but is highest possibility in the combat systems integration area.

COMMONALITY

The commonality requirements of the RNZN and RAN differ. The ANZAC ship project will replace the entire RNZN surface warship strength. The RNZN is free to choose a new generation of hull, machinery and combat systems. They have no commonality problem.

The RAN ships need to maximise equipment with that already in service with the FFG7s, and, to a lesser extent, the DDG.

This suggests that the successful contender for the ANZAC order will have:
- The OTO Melara 76mm or 5 inch gun
- A Phalanx or derivative close in weapons system
- Harpoon surface to surface guided weapons facility

MEKO 200PN frigate

Gun: 1 30mm Mk45
Missiles: Harpoon
Smoke: 1000 rounds
ASW: Seaguard
Torpedo tubes: Mark 32
Helicopter: AB212
Propulsion: MTU diesel
Full load: 2750 tons
Complement: about 140
Helicopter cap is an influential factor. The RAN must have a hangar big enough for the Seahawk S70B2. The RNZN is free to choose their own. Wasp will exceed life of type by the time the ANZAC ships enter service.

Although the Turkish Meko 200 is designed for AB212 helicopters, the Portuguese version of the Meko 200 is capable of housing two helicopters. The Meko 200 PN can be modified to handle the S70B2.

SURVIVABILITY

It is difficult to compare two ships' survivability. There is no common measure for comparison purposes. However, the British Falklands experience demonstrated the importance of survivability. This experience was made available to other NATO navies and the RAN/RNZN. It can be assumed that survivability will receive appropriate priority in the ANZAC ship selection.

RAN & RNZN

Although the two navies are very close friends, and there has been extensive co-operation at operating level over many years, only limited commonality of equipment has been achieved in the last two decades. Although the RNZN's Type 12 frigates look very similar to Australia's Rivers, their armaments and sensors are very different.

The ANZAC ship project is the opportunity to achieve this commonality, which has enormous benefits — both financial and operational.

That is not to say that it will be easy. However, the fact that both navies and both governments perceive the enormous benefits is a big advantage.

“M” Class frigate

The Dutch yard is strong on design and building skills, with excellent user input from one of the world's professional major shipyards.

Although Royal Schelde have built frigate sized ships for foreign navies (including Greece), they have not provided design and management services for building overseas. However, the Dutch design agency CEVIBUS, in which Royal Schelde have an interest, have provided weapon design services for overseas navies (including India's current project 15, Jaguar). Further, another Dutch company—Verolme—is currently building warships in Brazil. The Netherlands' shipbuilding industry is well backed up with design and research services and works very closely with the Royal Netherlands Navy's naval technical services.

Blohm and Voss (Australia) Pty Ltd who are making the West German proposal for the ANZAC Ship Project, are majority owned subsidiary of Blohm and Voss in Hamburg and Thyssen Rheinsaft Technik at West Germany. BVA's Meko 200PN has been built in West Germany and is now performing well on trials with the Turkish Navy. Two further units are building in Turkey with orders for further ships under negotiation.

For West German Navy user input, the West German F123 frigate experience being used by Blohm and Voss. For their next generation of frigate, the F123, the West German Navy has specialised the Meko type modular concept and most features. The modular concept has been specifically for the NATO NERVO frigate, which is being designed to fill the frigate needs of up to eight NATO navies.

In overseas construction, Blohm and Voss are strong. They have their current Turkish and Argentine experience and, through their sister company TNSW, submarine experience in Argentina. Their involvement in the Meko 200 project for Portugal will be particularly beneficial as it requires the integration of combat systems from several different nations. BVA claim that their modular concept is particularly suitable for the ANZAC ship project as it facilitates New Zealand industrial participation.

In summary, although somewhat different ways, both the M Class and the Meko 200PN offer the RAN and RNZN both proven construction methods, strong naval input and overseas experience. The risk element is not great with either contender, but is highest possibility in the combat systems integration area.

Dutch “M” class

Gun: 1 5 inch Mk45
Missiles: Harpoon
Smoke: 1000 rounds
ASW: Seaguard
Torpedo tubes: Mark 32
Helicopter: AB212
Propulsion: MTU diesel
Full load: 2750 tons
Complement: about 140
Helicopter cap is an influential factor. The RAN must have a hangar big enough for the Seahawk S70B2. The RNZN is free to choose their own. Wasp will exceed life of type by the time the ANZAC ships enter service.

Although the Turkish Meko 200 is designed for AB212 helicopters, the Portuguese version of the Meko 200 is capable of housing two helicopters. The Meko 200 PN can be modified to handle the S70B2.

Survivability

It is difficult to compare two ships' survivability. There is no common measure for comparison purposes. However, the British FALKLANDS experience demonstrated the importance of survivability. This experience was made available to other NATO navies and the RAN/RNZN. It can be assumed that survivability will receive appropriate priority in the ANZAC ship selection.

RAN & RNZN

Although the two navies are very close friends, and there has been extensive co-operation at operating level over many years, only limited commonality of equipment has been achieved in the last two decades. Although the RNZN's Type 12 frigates look very similar to Australia's Rivers, their armaments and sensors are very different.

The ANZAC ship project is the opportunity to achieve this commonality, which has enormous benefits — both financial and operational.

That is not to say that it will be easy. However, the fact that both navies and both governments perceive the enormous benefits is a big advantage.

Mark 22 surface launched torpedo tubes with the successor to Mark 44 torpedo

A naval combat data system fully compatible with the RAN's FFG7s?

As the RAN's existing Point Defence Missile System (Seacat) is obsolete, a new one must be identified. This may well be Sea Sparrow, which has some compatibility with planned RANH equipment.

The propulsion system requirement is less clear. Ideally, the RAN would like both gas turbine and diesel (CODAG or CODOG) but this would be expensive. The RNZN is understandably happier with diesel alone. Neither the RAN nor the RNZN have standardised on any particular make of diesel, so the competition for diesel for the ANZAC ships appears to be open.

Both the Meko 200PN and M Class are well placed on commonality with equipment already in service in the RAN. As this shows:

Meko 200PN

- 20mm OTO Melara
- 76mm OTO Melara
- 77mm OTO Melara
- 100mm OTO Melara

M Class

- 20mm OTO Melara
- 76mm OTO Melara
- 77mm OTO Melara
- 100mm OTO Melara

For selection both types were required to meet specified speed and range minimums.

As the armament, sensor speed and range capability are at the same minimum for both ships, the decisive factors of difference are likely to be:
- Cost
- Extent of risk in design, hull, machinery and combat systems
- Commonality of weapons systems and machinery with equipment already in service with the RAN/RNZN
- Survivability
- Feasibility of adaptation to the needs of both the RAN and RNZN

MEKO 200 frigate

THE NAVY

April 1988

"M" Class

THE NAVY

April 1988

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Page Seventeen
A Lesson in Maritime Co-operation

by Captain HUGH HARKINS, Master Mariner, Brisbane

The Falkland campaign demonstrated to the British Nation its reliance on the Merchant Navy. It also showed that when the nation has a crisis how well they cooperate and the mutual respect each has for the other.

This lesson must be developed in Australia.

In all, Britain deployed 51 warships, 171 naval aircraft, 22 Royal Fleet Auxiliaries and 50 merchant ships, giving a ratio of 1/3 merchant ships to every warship.

THE BEGINNING

At 1800 on Sunday, 4th April 1982, Her Majesty the Queen approved an Order in Council at Windsor Castle setting in motion the operation of retaking the Territory of the Falkland Islands.

It was the start of an event which has no recent maritime parallel. Some 50 merchant ships were taken up in the ensuing weeks in support of the Royal Navy, in Operation Corporate with a speed and urgency which had not been seen since World War II.

Extraordinary personal initiative were taken and responsibilitie accepted in order to get ships adapted quickly to their new roles and this was the key to the success of the project.

No one in Britain had ever, in recent years, envisaged mounting an opposition amphibious assault 8000 miles from home without allies or friendly bases in close reach. Nevertheless, the operation could not have been undertaken, and I hope this message is clearly understood by the British Nation.

Official defence policy had indeed ruled it out entirely since 1960 and the Fleet itself was reducing its surface warship strength following the Government's 1981 White Paper.

Thus from the outset the merchant fleet was being used at least in part to make good the lack of warships in a way that had never been tried before and for which there was little experience on which to draw.

Merchant ships taken up from trade (STUART) performed the following roles:

Tugships and Assault Ships
Tanks
Repairs
Aircraft Ferries
Ammunition and Stores Ships
Support Vessels
Minewarmer Hunters and their support ships
Tugs
Hospital ships

MORNING VESSEL
Royal Fleet Auxiliaries

EXTRAORDINARY SHIPS

With the possible exception of the Aircraft Ferries the most interesting vessels to be taken up from trade were the Repair Ships. The modern Merchant Navy has some remarkable and strange vessels and nowhere more so than in the offshore oil industry. It quickly became obvious that the Royal Navy would need major repair facilities for battle-damaged and damaged vessels, and nowhere more so than in the offshore oil industry.

Temporarily enabled them to move forwards, backwards, or sideways. They have a maximum forward speed of 16 knots and a range of 1,000 miles without refuelling. A computerised dynamic positioning system enables them to keep their position automatically with an accuracy of three metres in winds of up to Force 9 under the control of a taut wire dropped to the sea bottom, a microwave line of sight bearing and distance system, or a radar acoustic transponder bearing and distance system.

They are very robustly built to the highest first class specification and with a tank stabilising system which can reduce roll by three metres in winds of up to Force 9 under the control of a taut wire dropped to the sea bottom, a microwave line of sight bearing and distance system, or a radar acoustic transponder bearing and distance system. The Falkland experience demonstrated that with absolute precision and accuracy. Their efficiency was eloquently demonstrated by the way HMS Plymouth's crew spontaneously cheered Stena Seaspread when she had completed her repair.

Both repair ships became a byword: steamng sideways at 4½ knots and positioning themselves alongside, but just clear, they found a mass of steel of all varieties useful for future repair jobs. They are very robustly built to the highest first class specification and can be repaired by a team of ship repairmen.

The Stena Seaspread dealt with 11 warships which had received battle damage, 24 warships, REAs and merchant ships on routine maintenance or repairs and worked on 4 captured enemy vessels. The Stena Seaspread was replaced by sister ship the Stena Inspektor on 16th May.

The Stena Inspektor, apart from mundane repairs, carried out some very specialised work including replacing a main aerial in the destroyer HMS Birmingham in 39 knots with a 100-ton crane. The Dockyard at home, it was said, could only be done in calm conditions. That it was possible at all was due in part to the extraordinary skill of the Merchant Navy crane drivers. Another job involved changing the Olympus gas turbine in HMS Sheffield. Both repair ships contributed fundamentally to the success of the Task Force in action and to its continuation in the Falklands after the Argentine surrender.

It was the start of an event which has no recent maritime parallel and with such results the Royal Navy and Merchant Navy perform, how well they cooperate and the mutual respect each has for the other.

CONCLUSION

Admiral Sir John Fieldhouse, CCB, Commander-in-Chief of the Fleet during Operation Corporate, put the case clearly: 'I cannot say too often or too clearly how important has been the Merchant Navy's contribution to our effort. Without the ships taken up from trade the operation could not have been undertaken, and I hope this message is clearly understood by the British Nation.'

REFERENCE

Merchant ships at war. The Falkland Experience. Captain Roger Vila DSC (ret.)

APPENDIX 1:

TOTAL SHIPS TAKEN UP FROM TRADE

Tugships and Assault Ships

Tankers
Repairs
Aircraft Ferries
Ammunition and Stores Ships
Support Vessels
Minewarmer Hunters and their support ships
Tugs
Hospital ships

FIRST WOMAN COMMANDING OFFICER OF RAN BASE

The Minister for Defence Science and Personnel, Mrs Ross Kelly, has welcomed the appointment of the first woman to command a Royal Australian Navy establishment.

Lieutenant Commander Elizabeth Coles was appointed Commanding Officer of the Reserve Training Establishment HMAS Lonsdale in Melbourne from February 15, 1988.

Lieutenant Commander Coles takes over from Commander Warren Hamlyn, who is retiring after 25 years in the Navy.

She joined the RAN as a nursing officer in 1975 and will be promoted to Commander in June, this year. She has been the base's Executive Officer since last September.

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the numbers of ships constructed over the years. This is followed by technical sections outlining the various vessels. The third part contains an introductory narrative covering the ships of the RAN, then producing it to the same standard as the previous volume. The book is divided into three basic parts: (1) Australia and New Zealand during the First World War, 1914-1918, (2) Australia and New Zealand during the Second World War, 1939-1945, and (3) Australia and New Zealand since 1946. As with the first book, a number of appendices give a brief career of the units so far commissioned.

In this review, I will concentrate on the Royal Navy's submarine fleet of 1939-45. Many naval aviation books concentrate solely on the air battle, but this volume also gives a good account of the submarine fleet. The information is given in a typical "Jane's" format, supplemented by notes describing the ships, their armament, and operational and recreational areas. From 1939 to 1945, the British fleet was given a new type of submarine, the Type 21. This was a small, fast, and very capable vessel, armed with a 4.5-inch gun and equipped with anti-submarine weapons. The British submarine fleet was the largest in the world, and it was able to operate in all parts of the world. The book gives a detailed account of the construction, operation, and destruction of the Type 21 submarines.

MODERN COMBAT SHIPS — TYPE 22
by Lee Marriott
Published by Ian Allen
Review Copy from Lothian Books

A 112 page book, retailing in Australia for $35.00. "Modern Combat Ships — Type 22" is a technical, but very readable, appraisal of the Royal Navy's highly successful Type 22 frigate class, the largest yet built for the service. The book describes the evolution of the Type 22 frigate, the design of the ship, and its operational characteristics. It is illustrated with many detailed drawings and photographs, and contains a comprehensive list of the ships built and under construction. The book is well researched and well presented.

WARSHIP CONSTRUCTION
by Bernard Ireland
Published by Arms & Armour Press
Review Copy from Lothian Books

This book is the third in a series of books on warship design and construction. It is well researched and well presented, and contains many detailed drawings and photographs. The book is recommended on its own or as a companion to the previous volumes.

US WARSHIPS SINCE 1945
by Paul H. Silverstone
Published by Ian Allen
Review Copy from Lothian Books

In 1965, Paul Silverstone released his book "US Warships Since World War II" and in 1970 the 354 page World War II edition. In 1980, these were followed by this new volume describing the ships in service at the end of the second world war and those completed in the years since. All types and classes of vessels are presented in "yellowjacket" format, supported by a large selection of black and white photographs. The data provided is at the best sparse, with little attention given to describing the ships, their careers or alterations affected. However, this lack of commentary could be warranted as the number of ships described is in the thousands, comprising over 600 classes. As well as listing United States Navy ships, the author has included craft of the USMC, USCG, and other US naval forces. The book is well researched and well presented, and contains many detailed drawings and photographs. The book is recommended on its own or as a companion to the previous volumes.

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NEW PAPUA NEW GUINEAN PATROL BOAT HMPNGS DREGER IN JANUARY 1988.

REPORTS ON THE NAVY

April/June, 1988

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NEW FRENCH CARRIER
The CHARLES DE GAULLE

At the end of 1986, the French Navy named its new aircraft carrier after Charles de Gaulle. The carrier was the country's largest single warship and the world's largest nuclear-powered, aircraft carrier. The ship was 315 m long and had 40 m wide, with 167 m of flight deck, and a tonnage of 46,000. It had a complement of 2000 men and was capable of operating up to 100 aircraft. The carrier was designed to operate the Super Etendard and the Rafale fighter jets, and it was equipped with two nuclear propulsion systems, which allowed it to operate around the world without refueling. The carrier was also equipped with two steam catapults and two arrestors. The carrier was built at the Chantiers de l'Atlantique shipyard in Saint-Nazaire and was launched on 16 April 1988. It was commissioned on 26 September 1994 and entered service on 19 October 1994.
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