

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

ELECTION
2016 ISSUE

SACRE BLEU! SOUS-MARIN

CHINA ASYMMETRY: PREVENTING THE DRAGON'S TEARS

**DESIGNING AND BUILDING 21ST
CENTURY AIRCRAFT CARRIERS**

**THE CREATION OF
THE RAN COLLEGE**

THE PROBLEM OF THE KONIGSBERG

\$5.95 INC.GST

ISSN 1322-6231



9 771322 623000

AUSTRALIA'S LEADING NAVAL MAGAZINE SINCE 1938



STRANG ENGINEERED LOGISTICS

is the tailoring of **purpose-built logistic solutions** which deliver the most effective, efficient and sustainable outcomes for our clients. Our engineered approach is built on STRANG's **90 years** of experience, expertise, dedication and innovation.

STRANG engineers world-leading solutions encompassing Supply Line Logistics, Project Freight Forwarding, Advisory Services and Port and Terminal Operations.

We Engineer these Logistic Solutions globally, for example at Port Ehoala Madagascar depicted above, where we provide cargo handling, logistics, stevedoring and port services.

Contact us

www.stxgroup.com.au

+61 2 9669 1099



STRANG
ENGINEERED LOGISTICS



Volume 78 No.3

FEDERAL COUNCIL

President: Graham M Harris, RFD

Senior Vice-President:
John Jeremy, AM

Vice-Presidents:
LCDR Roger Blythman, RFD,
Mark Schweikert

Hon. Secretary: Philip Corboy
PO Box 128, Clayfield, Qld 4011
Mob: 0421 280 481
Email: prc@prcorboy.com

NEW SOUTH WALES DIVISION (Incl. Australian Capital Territory)

Patron: His Excellency,
The Governor of New South Wales.

President: R O Albert, AO, RFD, RD

Hon. Secretary: Elizabeth Sykes
GPO Box 1719, Sydney, NSW 2001
Telephone: (02) 9232 2144
Email: lsykes@albertmusic.com

VICTORIA DIVISION (Incl. Tasmania)

Patron: Her Excellency,
The Governor of Victoria.

President: LCDR Roger Blythman, RFD

Hon. Secretary: Ray Gill JP

Correspondence:
PO Box 2340, Mt Waverley Vic 3149
Email: raydotgill@optusnet.com.au

QUEENSLAND DIVISION

Patron: His Excellency,
The Governor of Queensland.

President: Harvey Greenfield

Hon. Secretary:
LCDR Adrian Borwick RAN (Rtd)

Correspondence:
PO Box 2495, Chermside Centre,
Qld 4032

State Branch:

Cairns: A Cunneen,
PO Box 1009, Cairns, Qld 4870
Telephone: (07) 4054 1195

SOUTH AUSTRALIA DIVISION (Incl. Northern Territory)

Patron: His Excellency,
The Governor of South Australia.

President: Dean Watson, RFD

Hon. Secretary: Miss J E Gill
PO Box 3008, Unley, SA 5061
Telephone: (08) 8272 6435

WESTERN AUSTRALIA DIVISION

Patron: Her Excellency,
The Governor of Western Australia.

President: Peter Jarvis
Email: peterjarvis46@hotmail.com

Hon. Secretary: Trevor Vincent,
3 Prosser Way, Myaree, WA 6154
Telephone: (08) 9330 5129
Mob: 0417 933 780
Fax: (08) 9330 5129
Email: chebbie_rjnt@primus.com.au

CORPORATE MEMBERS

The Australian Shipowners' Association
Strang International Pty Ltd

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

06 SACRÉ BLEU - SOUS-MARIN

By Dr Roger Thornhill

08 CHINA ASYMMETRY: PREVENTING THE DRAGON'S TEARS

By Dr Jonathan Hemlock

13 FROM CONCEPT TO COLLEGE CREATION OF THE RAN COLLEGE

By Greg Swinden

23 DESIGNING AND BUILDING 21st CENTURY AIRCRAFT CARRIERS

By John Jeremy

27 THE PROBLEM OF THE KONIGSBERG

By David Rees

REGULAR FEATURES

- 02 From the Crow's Nest
- 03 Letters
- 04 The President's Page
- 18 Flash Traffic
- 32 League Policy Statement

All letters and contributions to:

The Office of The Editor
THE NAVY
Navy League of Australia
GPO Box 1719
Sydney, NSW 2001
E-mail to: editorthenavy@hotmail.com

All Subscriptions, Membership and Advertising enquiries to:

The Hon Secretary
Navy League of Australia, NSW Division
GPO Box 1719, Sydney NSW 2001

Deadline for next edition 5 August 2016

The opinions or assertions expressed in *THE NAVY* are those of the authors and not necessarily those of the Federal Council of the Navy League of Australia, the Editor of *THE NAVY*, the RAN or the Department of Defence. The Editor welcomes correspondence, photographs and contributions and will assume that by making submissions, contributors agree that all material may be used free of charge, edited and amended at the Editor's discretion. No part of this publication may be reproduced without the permission of the Editor.

Front cover: Australia's Future Submarine-Shortfin Barracuda.
Image provided by DCNS

GIRT BY SEA; NOT BEACH*

This issue continues a number of current and emerging themes taken forward by *The NAVY Magazine* in recognition of The Statement of Policy regarding the maintenance of the Maritime wellbeing of the nation, page 32 – all girt by sea. Paper 1 looks at the recent submarine decision; Paper 2 continues amphibious and geo-strategic themes developed previously by Professor Michael Wesley (Apr-Jun '16) and Dr Peter Dean (Oct-Dec '15), regarding maritime network dynamics; Paper 3 examines the development of the RAN College at HMAS CRESWELL; Paper 4 looks at 21st Century Aircraft Carrier designs; and Paper 5, lessons to be learned from the German WWI Raider, SMS KONIGSBERG.

John Strang's two papers on Australia's 21st-century submarines (Parts I and II, *The NAVY* Sep-Dec 2015 and Jan-Mar 2016) broadly set out the needs of Australian Industrial Maritime Strategy (AIMS) for the rest of the century. Strang's emphasis was on seeking and delivering the best decisions for Australia that will keep our shores safe and deter war during tumultuous and uncertain times. The strategic design intent conveyed in these two insightful papers have largely been met in the selection of DCNS to build Australia's Future Submarine. However, the next steps – including maintaining a strong relationship with our fellow pivot-ally Japan – will be crucial. This will require a degree of disciplined, in depth research and adroit strategic thinking that Australia has not always demonstrated. As John Strang noted:

How Australia goes about defence procurement will depend very much on the people involved in the decision-making process.

Many knowledgeable commentators have pointed to a lack of overall vision and a paucity of knowledge of what is at stake.

The selection of DCNS also opens up a number of opportunities, not least of them being that the final batches could be nuclear powered – based on modularised systems currently fitted to French submarines, see Paper 1. It is the maintenance of effective decision-making processes over the longer term, which should concern us most – applying specifically to leading and managing our submarine and amphibious task groups. Ultimately, the submarine is a deterrence weapon of first political choice – with or without nuclear weapons or propulsion. John Strang went on to say:

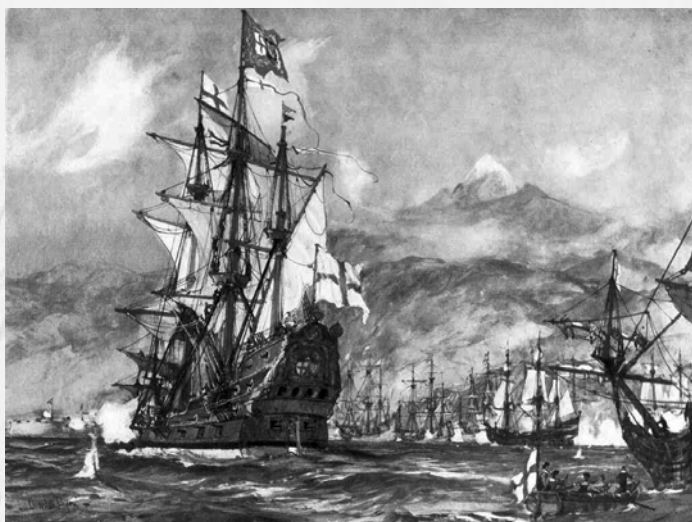
The average research standard of our current top five universities lags well behind that of Japanese, Chinese, British and other countries' seats of learning. Hence Australia should develop a high-powered research lyceum tasked with providing the engineering and strategic thinking skills necessary to develop and support Australia's own nuclear energy and propulsion industry. Such an institution should be new and quite separate from the existing university system, and not based in Canberra.

Putting the \$AUD 50B budget in context, if Defence is to successfully deliver twelve submarines and avoid costly re-work, two-thirds of the budget will need to be invested and spent in the first one-third of the program's life. Even including the Snowy Mountains Scheme (\$23B in 2016 prices), this rate of investment, up to 90% in Australia, is without precedence. To successfully leverage this program, Australia will need sovereign independence of thought and action in its decision making processes. The danger – as per 9/11 – lies in close-closed type reporting and narrow mind-sets. It is in the complex variety of thinking and discourse – appropriately challenged – that innovation and change lies. International perceptions of Australia's delivery of the future submarine will act as a deterrent. Hence the urgent need for cross-disciplinary, high-powered, strategic systems thinking. The Statement of Policy, p.32; Paper 1; previous editorials and John Strang all argue for just such a disciplined research lyceum; providing for cross-faculty, postgraduate, strategic level, critical systems thinking.

On decision making and identity, the Chiefs Letter of 13 April and *The Australian* (Editorials 8 and 13 April) raised issues of Defence media-messaging processes, specifically in Navy. The paper identified potential hypocrisy; misapplication of policy and the Commonwealth dollar where it saw it – as might be expected from an independent free press. The response may have been to get Defence and Navy's house in order; eat some humble pie; repair bridges and, above all, keep stumm. Instead, with one notable exception, the Letter seemingly opened Defence up to further criticism; while transferring what high ground there was back to *The Australian*. By not using ranks, the response also appeared to blur the essential distinctions between position, position and profession [/ discipline]; public and private. As if any old Tom, Delia or CEO could become Vice Chief. A significant omission was Chief of Army, begging the question 'Why?'



HMAS DECHAINEUX (SSG 76) and HMAS WALLER (SSG 75).



General-at-Sea Blake in his Flagship Commonwealth Navy Ship ST GEORGE (previously HMS ST GEORGE (I)) at the Battle of Santa Cruz, 1657, by Charles Dixon.

Perhaps, as one of the most educated Chiefs and given his service in the PM and Cabinet Office and Borders and Customs, he had more sense than to sign? Perhaps he was simply away and so delegated his signature to Acting Chief of Army? In any case, he did not sign. Also, why did the Chief of Defence feel it necessary for the other chiefs (or their actors) to sign – when he too had reportedly been disconcerted by initial reports? In Old Navy, three or more sailors whistling constituted a potential mutiny. The inference of five signatures, rather than one, is that the Chiefs did not feel sufficiently comfortable to sign individually; rather reinforcing the glaring absence of Chief of Army and raising questions of process. Who scripted it – and were the Chiefs asked, tasked or ordered to sign? Seemingly at the heart of the matter lie the decision making capabilities, fundamental to a disciplined Defence Force.

On just such discipline and identity, a Pakistani Brigadier asked a bemused NATO Officer 'why the colonial soldier fought'. The officer came up with some post-modern, psycho-babble, PC type response to be told 'NO! The colonial soldier fought for their regiment'. The revolutionary construct of the British Civil Wars, was the New Model Navy [and Army]. They created a common identity, in which the ship or regiment became clan and one fought for it – the ship would covenant their family. For ship or regiment, read Commonwealth – that loyalty to the common weal or good that underwrites Navy, Army, Air Force and APS. It is a common identity that binds and holds service personnel together when facing the uncertainty and sheer terror of war. And it is the '[decisions], orders and directions [lawfully followed] according to the Rules and Disciplines of War, in pursuance of the Trust...reposed in [ourselves and our superiors]' that binds service personnel together at these times. That is what makes ANZACs such effective sailors and soldiers – for they fight as a disciplined force for 'an idea, an ideal, a Commonwealth and Country'. Decisions that detract from the common identity and common good, therefore also detract from our most tangible of capabilities – our people.

We need our disciplined forces to fight for a common identity, not for a particular sect, group, party or religion. Anything that diminishes from a common, disciplined, unified identity makes Navy, Army and Air Force, and thereby Australia, weaker. They become more tangibly and perceptibly less capable. More seriously, the decision making instruments necessary to identify, understand, deter and prevent war, become impaired and blinded. Unintentionally and inadvertently, messaging in this way may have divided, rather than united; reducing rather than strengthening Defence. To successfully deliver the future submarine program, Australian political, industrial, Defence and research decision making and taking will need also to act according to; cognisant of; focussed on and deeply immersed in the [First] Principles, Rules and Disciplines of War.

* Attributed to Vice Admiral Raymond James 'Ray' Griggs AO, CSC, RAN, Vice Chief of the Defence Force.

LETTERS

Sir,

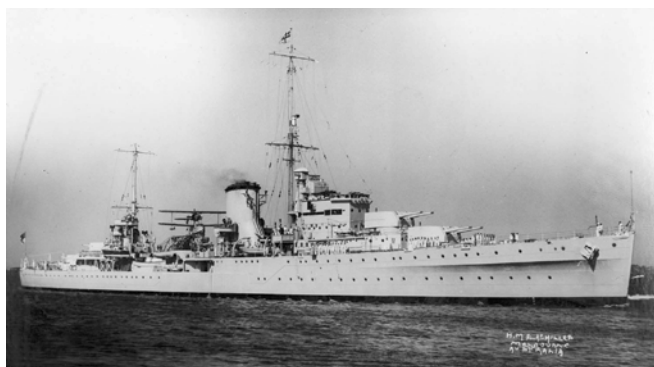
It's great to be in touch with the Australian Navy League as we celebrate the 75th Anniversary of the foundation of the RNZN. As we've discussed, this letter gives a brief outline of the events planned for later this year, noting that Operation NEPTUNE covers a range of events including but not limited to the International Naval Review in November, see <http://nznavy75.co.nz/>.

In June we have a series of events to celebrate the 30th anniversary of the first posting of women to sea (in HMNZS MONOWAI, our then hydrographic survey ship). The highlight will be a two day seminar that will look at the journey thus far and what remains to be done to ensure that women have the same opportunities to serve in our Navy as men, and that all barriers to their advancement to the highest ranks are removed. We are very lucky to have Commodore Michele Miller, RAN, as a keynote speaker, and we feel she will provide invaluable inspiration to our own people. Our Women At Sea programme is sponsored by Westpac, the Presentation Sponsor for Op NEPTUNE, and we are deeply grateful for their generous support.

Captain Bob McKillop, VRD, RNZNVR (Retd.) has been in touch about the NZ Navy League programme of seminars and conferences, which we very strongly support. People currently serving in capability development roles will be fascinated to hear first hand accounts of the debates which occurred at various turning points in our force structure development. I expect that we will see that notwithstanding the science which programme management has theoretically become, there are enduring lessons that we can apply now and into the future. The highlight of the programme is undoubtedly the International Naval Review.

Captain A.G.A. Watts, ONZM, RNZN

Director, Operation NEPTUNE, Royal New Zealand Navy



Then HMS ACHILLES (70) visiting Melbourne, 1938

In the previous edition of The Navy I commented on the then just released Defence White Paper. In what I described as a necessarily quick preliminary view I wrote that though the White Paper had been some two years in the making the outcome was well worth the wait.

Having had more time to consider the White Paper I am happy to say that my initial view is confirmed. There is much in the White Paper that is welcome. It is clearly designed to support Australia's maritime strategy. In particular, the White Paper confirmed that the RAN would be getting 9 anti-submarine frigates, 12 new offshore patrol vessels (OPVs) and 12 "regionally superior" submarines.

The Government followed the White Paper release with the announcement of the tenderers and the locations for the OPVs and Future Frigate shipbuilding programmes.

The OPVs will begin construction in Adelaide in 2018 following the completion of the Air Warfare Destroyers (AWDs). Construction of the OPVs will transfer to Western Australia when the Future Frigate construction begins in Adelaide in 2020.

Three designers have been shortlisted for the OPVs, one from the Netherlands and two from Germany. Damen from the Netherlands and Fassmer and Lurssen from Germany are all experienced in this kind of vessel. It is expected that the OPVs will be of about 2000 tonnes. They will have a helicopter flight deck. Given that the OPVs might on occasion be some way from home the OPV designs ought to incorporate a hangar.

The OPV build programme is interesting. As announced, the build will start in Adelaide in 2018 after the completion of the AWDs. The build will then transfer to Western Australia in 2020 when frigate construction begins in Adelaide. Assuming that the AWD build finishes on time there will be just two years from the start of the OPV build in Adelaide to the transfer of the build to Western Australia. Given that the Adelaide OPV

will be first of type it seems unlikely that more than one vessel would be completed in the time allotted. The need to maintain the workforce in Adelaide is understood, but one wonders whether it would not be better to build the first of type where all the other OPVs are to be built.

Three designers have been selected for the Future Frigate. BAE Systems with the type 26 Frigate, Fincantieri with the FREMM Frigate and Navantia with a redesigned F100. Whichever design is chosen will incorporate the Australian CEA Phased Array Radar. Members of the Navy League Federal Council will remember the Phased Array presentation CEA gave at a Navy League Reception held in Canberra several years ago.

Not long after the shipbuilding statement the Government made a further significant announcement. The Prime Minister stated that the Royal Australian Navy will acquire 12 Shortfin Barracuda submarines, that they will all be built in Adelaide and that they will be built of Australian steel. The new submarine is a conventional variation of the nuclear powered Barracuda being built for the French Navy.

A NUMBER OF QUESTIONS ARISE FROM THE SUBMARINE DECISION. I WILL RAISE JUST TWO.

DCNS, the French builders, apparently suggested that the first 2 boats should be built in France. The government has confirmed all 12 will be built in Adelaide. Though based on the Barracuda, the Shortfin Barracuda will in many respects be a new design. Might it not be worthwhile to let DCNS build the first 2 of the Shortfin Barracuda class in their established submarine building yard at Cherbourg?



F125 Project - Baden-Württemberg Class of Frigates.

THE SECOND QUESTION IS THE NUCLEAR QUESTION.

As is well known, the Navy League has for many years argued for nuclear propulsion for future RAN submarines. The choice of a submarine derived from a nuclear boat has led to a wider interest in the nuclear propulsion option. Media commentary is increasingly supportive of the idea.

In our submission to the Defence White Paper we accepted that before nuclear propulsion can be a viable option for Australia a number of steps must first be taken, including:

- Gain political acceptance;
- Negotiate a deal for nuclear technology transfer;
- Establish a Naval Nuclear Regulatory framework for Australia;
- Decide on base location and complete all environmental and security assessments;
- Define the nuclear specific facilities required for the build location;
- Achieve local acceptance of a nuclear presence;
- Commence training for civilian and naval nuclear engineers.

These tasks can be progressed in parallel with the construction of the first batch of Shortfin Barracuda.

It is to be hoped that by 2030, about the time the first Shortfin Barracuda enters service, the necessary steps will have been taken to enable the Royal Australian Navy to then progress to nuclear propulsion.

Williamstown Dockyard dates from 1858. It has a long history with first the Victorian Colonial Navy and then the Royal Australian Navy. Early in World War II Williamstown came into Commonwealth hands as HM Naval Dockyard Williamstown and remained so for some decades thereafter.



HMAS CASTLEMAINE (J244M244A248) built in Williamstown dry docked in the Alfred Graving Dock.

Between 1942 and 2010 approximately 40 ships were built at Williamstown for the RAN and the RNZN. In 2006 Williamstown completed the successful 10 ship Anzac frigate programme for the RAN and the RNZN.

It was thought (hoped?) that the future frigate programme might go to Williamstown. However, not to be. The recent shipbuilding announcements make it clear that the future is elsewhere. Indeed, the Prime Minister has said that naval shipbuilding will be in Adelaide and Western Australia.

The dockyard is now a development site of great potential. If Williamstown is finished as a dockyard it is to be hoped that any future development will ensure that the heritage listed Alfred Graving Dock, dating from 1868, is appropriately preserved. ■



Dawn Patrol HMAS ADELAIDE (L01) from Garden Island.

SACRÉ BLEU - SOUS-MARIN

By Dr Roger Thornhill

The recent decision by the Turnbull Government to partner with the French firm DCNS for the detailed design of 12 new diesel electric submarines caught many insiders by surprise with the Japanese and Germans thought to be the favourites.

The submarine announced for the SEA 1000 project is expected to be modified from an existing nuclear powered French Barracuda class submarine (SSN), six of which are currently building for the Marine Nationale (French Navy), but with lead acid batteries and a diesel electric propulsion system.

It was tendered as the 'Short Fin Barracuda Block 1A' and is 97m long, displaces 4,700 tonnes, has four diesel alternators to generate electricity, a >7 MW permanent magnet motor and a pump-jet propulsor (in place of a propeller) - combining a rotor and stator within a duct to significantly reduce the level of radiated noise through the effects of wake harmonisation and avoidance of cavitation. The boat's hydroplanes can be retracted to further reduce drag and flow noise.

CONTENDERS

The Japanese were offering an improved Soryu class submarine, the Soryu being their latest and most advanced. While the current version uses an AIP (Air Independent Propulsion) system, along with the usual conventional diesel electric propulsion system, the boat offered would not have. Instead it was thought to have been offered with lithium ion batteries, which have such storage capacity as to make AIP irrelevant.

The smart money was actually on the Japanese and, secondly, the German bids. The South Australian Premier's visit to DCNS HQ in Paris immediately after the announcement could be seen as an indicator of the French company's own belief in its chances – given its somewhat awkward and unprepared reception and hosting of him in its foyer while DCNS madly scurried to plan and enact a media and public relations strategy in the full glare of the South Australian electronic media.

Japan has had a long history of submarine construction. In fact, it has had a constant improvement program with submarines decommissioned much earlier than most navies would in order to make way for new technology. This has been the hall mark of Japanese submarine construction and should have put them in a more agile and technologically advanced position – thus in the driving seat for undersea warfare advances.

Taken with Japan's contact with Soviet/Russian submarines since the beginning of the Cold War and the growing number of recent Chinese submarine incursions into its waters, the JDF Navy has a wealth of experience with which to feed into its constant improvement programme. Consequently, Japan's submarine arm and its associated technology

needs to be considered amongst the best in the world.

Until former Australian Prime Minister Tony Abbott had re-negotiated Japan's long standing military exports ban, no one had considered that Japan's submarine technology would ever be made available to the outside world. On reflection, the only nation that would have ever had a chance to share in this most secret of technologies would have to have been Australia.

The other factor in Japan's favour was its very close relationship with the U.S. Concerns had been raised in the past about technology transfers of sensitive U.S. equipment fitted to Australia's new submarines. In this respect, the fact that Japan has not previously exported its technology meant that this was not a limiting factor. In fact, quite the opposite – with it rumoured that 'tacit approval' had been given by the U.S. for its sensitive equipment to be installed into Japanese designed submarines.

To understand why this is the case, it needs to be recognised that Japan's strategic relationship with the U.S. is stronger than almost any country; including Five Eyes and Israel. This is most evident by the basing of a U.S. nuclear powered aircraft carrier and its associated battle group escorts in Japan. No other nation has this distinction.

The other contender thought more likely than the French bid was the German Type 216. While the 216 suffered from only being a design, nearly all of its components and systems were already at sea in the Type 212 and 214 class submarines. It was being marked as a case of super sizing to meet Australian needs – although not without its risks.

On the other hand, the Type 216 has been a major influence on the Type 218SG which has been ordered and is building for Singapore and would have been in the water and operational before Australia started building its Type 216 design derivatives. The Germans have also had far more experience in technology transfers and building offshore than the Japanese and were considered in a good position from an industrial perspective.

Concerns were raised though that the Germans had never integrated U.S. technology or weapons into their submarine designs and that their prolific exporting of submarine technology could represent a threat to protecting Australian and U.S. IP (Intellectual Property) with regard to the proposed U.S. combat system and weapons.

But one could argue that Sweden could have been partially put into that category in the early stages of consideration of the Type 471/Collins class.

JDF Navy Sōryū-class submarines HAKURYU (SS-503) Enters Sydney Harbour, 15th April 2016 - Photo by Chris Sattler.



Notwithstanding, Australia was able to successfully manage those issues then and would be considered far more proficient in doing so today.

DOWN-SELECT

In one respect the announcement of DCNS should not have come as a surprise. The French have a great pedigree when it comes to naval ship building. They have been building submarines for over 100 years and currently produce and support a wide range of submarines from large nuclear powered ballistic missile submarines to smaller diesel electric submarines. The latter are in service in many navies around the world, including the host nation's navy itself.

The Barracuda is the latest in Marine Nationale's line of submarines, with the Short Fin Barracuda Block 1A being the beneficiary of much of the work that has gone into the larger SSN program.

By the time steel is cut for the first RAN Short Fin Barracuda all six French Barracuda SSN will have been commissioned. Many of the lessons of their introduction into service should have been captured and be able to be shared with the RAN for any design modifications needed. Re-work and featurism should consequently be minimised.



German Built Type 214 -
Portuguese Submarine NRP
TRIDENTE (S161) alongside
Naval Base do Alfeite in 2010

Readers may remember the issues related to the first two-three Collins sounding like "rock concerts" at certain patrol speeds, given the Swedes different operating profiles and environments being suitable for them, but not the RAN or its operating environment. This required some detailed assistance from the USN in a get well program to adjust hull shapes to avoid and ameliorate certain flow noise issues, which the Swedes were unable to assist with given the 471/Collins design was much bigger than anything they have ever built or experienced.

SOVEREIGNTY

This brings us to the important topic of sovereignty. Technology transfer and IP are very important issues and are the heart of why Australia needs to build submarines. Without it there is no point to building here. While short sighted political objectives about shipbuilding jobs may enter the debate, supporting the capability tends to produce more jobs and wealth creation. However, without a sovereign capability over the asset even the ability to support and maintain the programme – which is where the real money lies – is in jeopardy.

Some will recall the damage to Swedish–Australia relationships when the sovereignty issue was first tested with the Collins class. Part of the get well program also involved sending a submarine propeller to the USN for detailed analysis. Sweden felt quite aggrieved over this and felt that a significant IP breach had occurred. So much

so that many Memorandums of Understanding with Defence and the RAN were cancelled and the Swedish Defence Attaché to Canberra, a senior submariner (sent to help with the Collins program), recalled.

With France having a larger submarine industry, and a significant standing in the world engineering community, there should not be a need to seek U.S. support for submarine issues, so avoiding inflicting serious damage to our relationship with France and support for the submarine through life. The lessons of Collins will need to be understood by the French and avoided at ALL costs – noting that recent experience with French Defence acquisitions has not been 'entirely smooth' e.g. Tiger attack Helicopter and Mu-90 Torpedo.

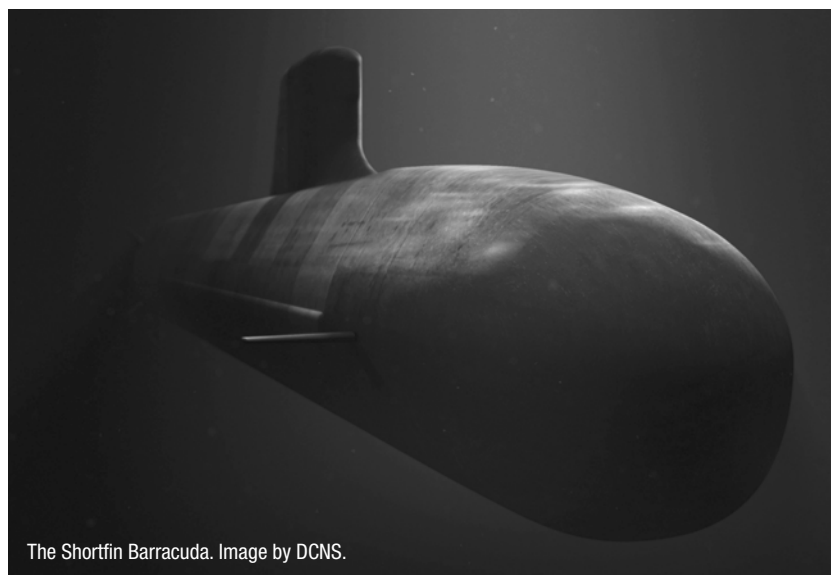
SEA 1000 IN PERSPECTIVE

The real issue that needs to be understood by the Australian public with the SEA 1000 decision is that all three submarines tendered were actually the wrong boats. The French boat is the closest to the right boat in that its heritage is that of an SSN.

The vast distances and diverse missions Australia requires of its undersea fleet demand SSNs. The French realised this and modified an existing nuclear design to meet a very flawed Australian domestic political position adopted by both sides of politics to panda to an ill-informed and unenlightened media and vocal fringe groups.

Part of the argument against nuclear powered submarines is that Australia has no means to support them. So it may come as a shock to some but Australia already has a nuclear industry. It mines uranium and exports it for a pretty penny. It has a government run expert nuclear regulatory safety commission in place to manage a full-blown nuclear industry. Its universities produce nuclear physicists at the doctoral level every year. The next step to supporting a fleet of 12 SSN's, with French support, is a relatively small one. As is often the case, getting the engineering and technology right is the easy bit – creating the knowledge enterprises and political economic bases for exercising such a capability (nuclear power), much harder.

The next three years of 'detailed design' negotiations with the French may allow the Australian Government to see the light and join the growing number of nations who use nuclear power submarines – U.S., U.K. France, India, China, Russia and, shortly, Brazil. ■



The Shortfin Barracuda. Image by DCNS.

CHINA ASYMMETRY: PREVENTING THE DRAGON'S TEARS

By Dr Jonathan Hemlock

Early Chinese myths tell of pearls falling from the sky when dragons fought and that pearls were the tears of the gods, often themselves dragons in Chinese mythology. Japanese folklore shares the association, after a lovelorn Dragon shed tears that became pearls for the human female he loved – knowing he could never be with her. More recently, the term ‘China’s Pearls’ was used in a 2005 U.S. DoD report entitled ‘Energy Futures in Asia’, which stated that ‘China is adopting a “string of pearls” strategy of bases and diplomatic ties stretching from the Middle East to southern China’ [1]. This paper examines the maritime positioning of Australia with emerging regional states and connected network city states – increasingly coming to a head in the South China Seas.

BACKGROUND

Strategy is therefore about dealing with uncertainty, complexity and the dynamic. It is not a plan or a paper...it is about ensuring that the whole of government identifies and acts effectively upon the national interest. [2]

The string of pearls strategy describes the network of Chinese political, sûreté (combining assurance, safety and security) economic (PSE) relationships running along China’s south and western sea lines of communication (SLOC), from Shanghai and Hong Kong, around India, to Pakistan (Gwadar), Iraq and Sudan. The ‘near SLOC’ also forms part of China’s 1st and 2nd Island Chains – a defensive network based upon the South China Sea. The 1st Island Chain includes Shanghai, Hong Kong, Hainan; ‘twinning’ Taiwan and China’s northern claims in the South China Sea. The ‘2nd Island Chain’ is an extended deterrence network, seeking to envelope the Koreas, Japan, the Philippines, Malaysia, Vietnam and

the South China Seas; including Singapore and the Straits of Malacca. In this respect Singapore and Tokyo may be considered as being China’s ‘extended Pearls’.

This paper seeks to address in part the question:

Should Australia, the U.S. and our Allies be concerned about Chinese designs in the South China Sea?

MARITIME CYBER NETWORKS

With the acquisition of [HMA Ships ADELAIDE / CANBERRA and CHOULES] Australia has committed the ADF to the path of developing an amphibious warfare capability that’s relevant and ready for the challenges of the future. Our strategic position as an island nation in a rapidly changing littoral region reinforces the need for an amphibious capability that can continue to improve and adapt in the years to come. [3]

Figure 1: HMAS CANBERRA (L02) with Landing Craft (type LLC) and Army MRH90 during Operation Fiji Assist, Mar-Apr 2016 .



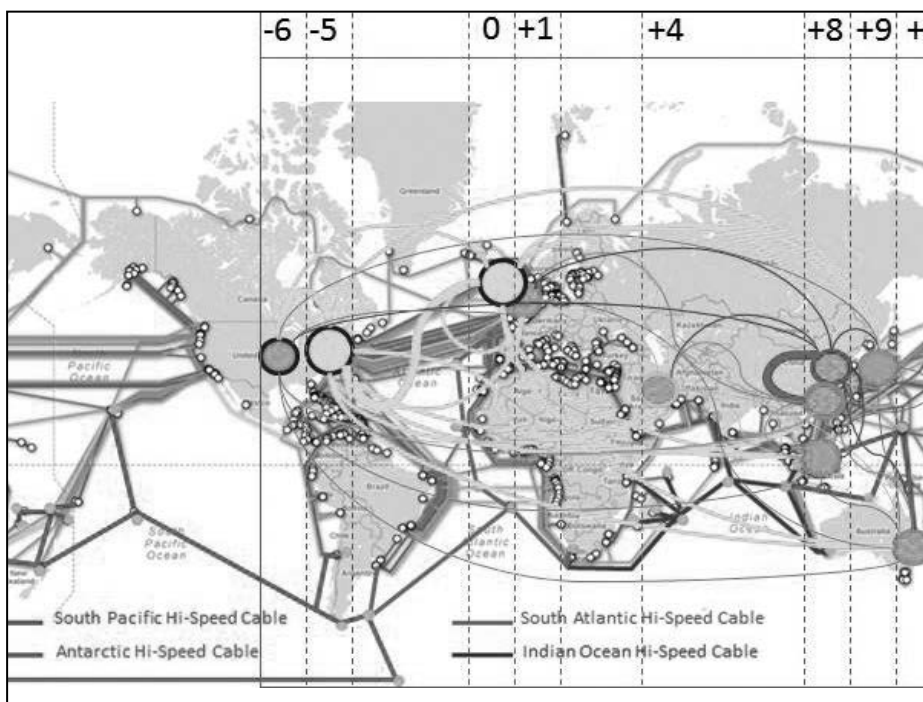


Figure 2: The Global Network of Alpha++/City States Comprising (left to right): ChicagoA++; New YorkA++; LondonA++; ParisA++; DubaiA++; SingaporeA++; Hong KongA++; ShanghaiA++; TokyoA+ and SydneyA+ superimposed on International Time Zones and Proposed Southern Hemisphere, Hi-Speed [maritime] Cable [SH2C] System, adapted from TeleGeography Submarine Cable Map, <http://www.submarinecablemap.com/>

As the U.S. increasingly recognises Australia has much more [network] geostrategic maritime influence – than it does by placing coalition bombs and boots on the ground, alone. This is the not-so-subliminal dynamic articulated in the Defence White Paper 2016; finding expression in 12 Future Submarines and an Amphibious Task Group (ATG). An ATG consisting of HMA Ships ADELAIDE / CANBERRA / CHOULES; an embarked military force (including tanks, boots and bombs); a Tailored Air Group; a replenishment ship; a Frigate or Destroyer; and, a Submarine. Submarines and the ATG are political [influence] network enablers (PNEs), of first choice. As such, ADELAIDE and CANBERRA need to be seen as National Strategic Assets (NSAs). Already, HMAS CANBERRA's recent deployment to Fiji to provide much needed Humanitarian Aid & Disaster Relief (HADR) has created a positive influence on relations that no amount of jaw-jawing or UN resolutions might do.

There is a perception that Cyber is about space and that it is within space that Cyber is dominant. This is not necessarily reflected in the current infrastructure in place and could be challenged; leading to consideration of the Cyberscape (something we populate and design as in a landscape), as opposed to being simply a space [4].

Cyber actuality is terrestrial, maritime and only marginally space-based. In this respect, Cyber is far more a part of the existing permissible, regulated maritime commons [5] than it is a part of the new, more prohibitive space commons [6]. Despite sub-maritime cables costing several hundred million dollars to lay, important facts include [7,8]:

- Overseas satellite links carried only 1 per cent of international traffic, while the remainder was carried by sub-maritime cable [9].
- This percentage is unlikely to increase given the continued expansion of cables – for example the Italy-India mega-speed cable.
- The reliability of sub-maritime cables is high, especially when multiple paths are available in the event of a cable break.
- The total carrying capacity of sub-maritime cables is in the terabits per second while satellites typically offer only megabits per second with much higher latency.

Yet, despite changes in design and cable construction, the number of hi-speed transoceanic submarine cables connecting the U.S. to Australia remains in the low handful. More significantly, there is not one dedicated super, hi-speed cyber Southern Hemisphere cable connecting Australia with Latin America, Africa, New Zealand and Antarctica with each other and with the Northern Hemisphere [7]. A proposed Southern Hemisphere, Hi-Speed [maritime] Cable (SH2C), bridging between Northern Hemisphere East-West links and the emerging markets of the Southern Hemisphere, including in Africa and Latin America, may comprise the following:

The South Pacific SH2C connects between Chile and South America, via French Polynesia to New Zealand (Auckland); thence to Fiji and to existing hi-speed cables to Sydney.

The Indian Ocean SH2C connects between Perth and the Cocos Island, Perth and Diego Garcia (U.K.), thence to Mumbai [10].

The South Atlantic SH2C this is potentially the most sensitive of the proposals connecting, as it might, between the Falkland Islands / Malvinas and Latin America, via Punta Arenas in Chile to the South Pacific SH2C and to Las Toninas in Argentina. From the Falkland Islands, the cable connects to Jamestown, St Helena (U.K.), and from Jamestown to the Indian Ocean SH2C via Cape Town, South Africa. The cable then connects with the Ascension Island (U.K.) and, via a northern riser, to Praia, Cape Verde (now facilitating an important strategic U.S. Base); Ponta Del Gada, Portugal (Azores) and finally to Goonhilly Downs, U.K.. In 2014 the new Brazilian, Russian, Indian, Chinese, South African (BRICS), SAex and WASACE hi-speed cables, connected Cape Town with Lagos, Nigeria and Fortaleza, Brazil [10].

The Antarctic SH2C (New Treaty Pivot) is believed to be commensurate with The Antarctic Treaty [11], namely: Article 1 (used for peaceful purposes only); Article 2 (Freedom of scientific investigations and cooperation); Article 3 (free exchange of information and personnel in

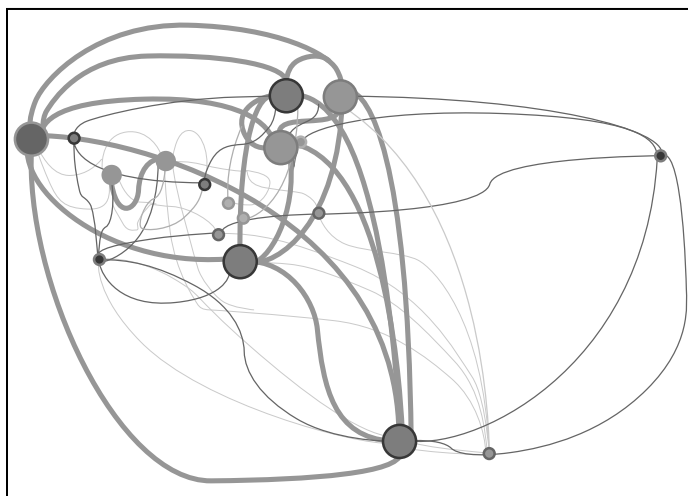


Figure 3: The Three Peninsulas and Three Bays Network (3PB) comprising (left to right): DubaiA++; SingaporeA++; Hong KongA++; ShanghaiA++; TokyoA+ and SydneyA+ and incorporating Gwadar, Diego Garcia (U.K.), Mumbai (Bombay), Kolkata (Calcutta), Rangoon, Bangkok, Kuala Lumpur, Singapore, Jakarta, Phenom Penh, Hanoi, Taipei, Seoul, Manila, Auckland and Hawaii (U.S.)

cooperation with the United Nations and other international agencies); Article 4 (it does not make any new territorial sovereignty claims); and Article 7 (Treaty-state observers have free access, including aerial observation, to any area and may inspect all stations, installations, and equipment).

THE RISE OF NETWORK CITY STATES

Britain may increasingly need to be understood as a network system, with the Network City State (NCS) of London at its centre. And London may not be understood other than as a Network comprising eighteen nodes: the City; Westminster; Whitehall; North; South; East & West London and eleven air, rail, road and maritime corridors - extending directly to Scotland, Wales and into France to Paris and Brussels. The London NCS primarily defines its Political Sûreté Economic relations with the other Alpha++ network city state (New York); connecting (in order) with Hong Kong, Paris, Singapore, Tokyo, Shanghai, Chicago, Dubai and Sydney [12]. Scotland, Ireland, Wales, England, Brussels, the E.U., Germany and NATO do not feature in the Alpha++/+ network. Germany's highest ranking city is Frankfurt (an Alpha city), after Moscow.

The Market has essentially spoken and although there will be changes and other rankings and new cities coming into the space, the top 10 are likely to remain. Of the ten Alpha++/+ NCSs, all bar potentially Paris, Tokyo [13, 14] and Shanghai were conceived, designed and shaped by / in London, noting:

- France's 3rd Constituency for Overseas Residents covers all French citizens living in ten countries in Northern Europe: Iceland, Norway, Denmark, Sweden, Finland, Ireland, the United Kingdom, Estonia, Latvia and Lithuania. In 2011 it contained 140,731 registered

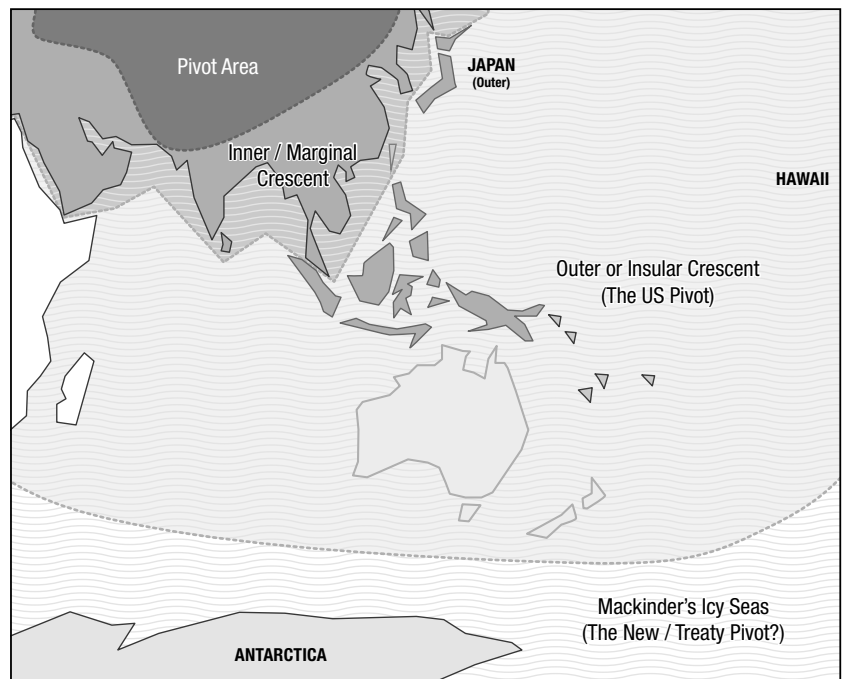


Figure 4: Mackinder's Panglossian Heartland Theory showing the Three Peninsulas, and Three Bays (RCB)

French voters, over 80% of who were living in the U.K., mostly in London. An estimated 300,000-400,000 French residents live in London, making it France's 6th largest city.

- Tokyo was substantially rebuilt and redesigned by the occupation powers under MacArthur, along Westminster / London lines, after WWII and was able to take advantage of the devastation to reshape and reconfigure itself anew. The prevailing view is that Japan was re-modelled along Keynesian lines. However, others like Folsom & Folsom [13], argue that the post war boom was largely the result of

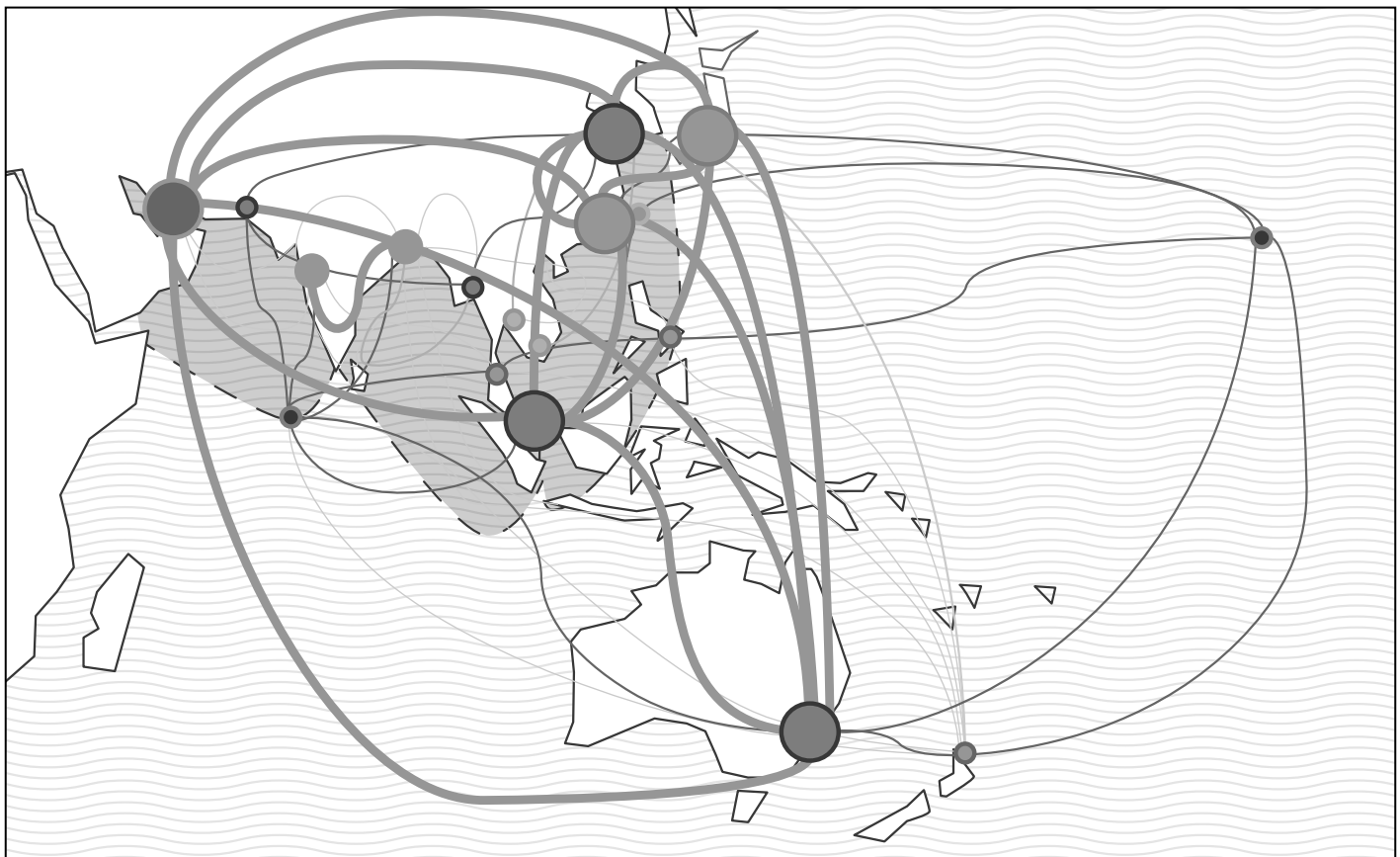


Figure 5: The Three Peninsulas and Three Bays with the 3PB Network Superimposed

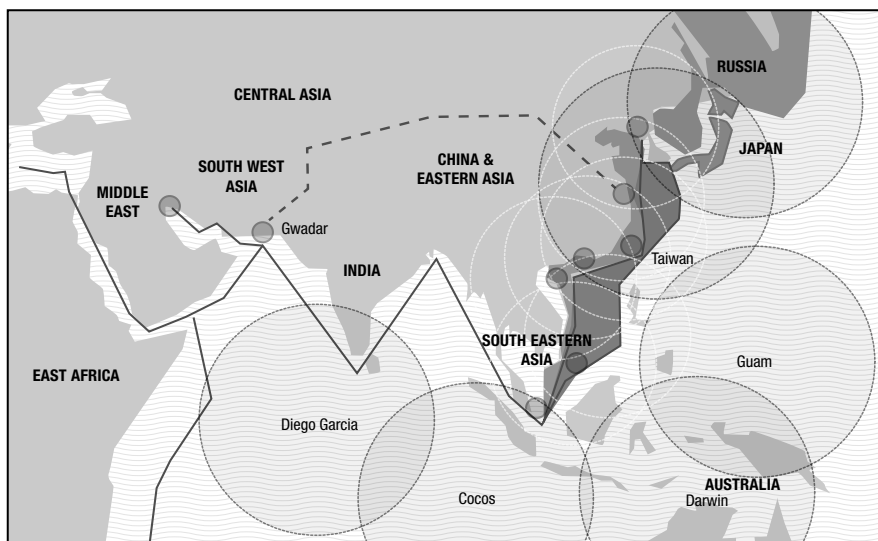


Figure 6: The Chinese Motte, Keep, Bailey, Great Sand Wall and Dragon's Spear Strategy. See *The NAVY Magazine Flash Traffic*, Vol. 78 No.1, Jan-Mar 2016, (RCB).

inadvertent / 'unplanned' / emergent Hayekian free market reforms and deregulation and that these 'libertarian policies stimulated economies and created near full employment'.

- The exploration of the Yangzi River and identification of Shanghai as a trading centre for tea, silk, and opium by the British East India Company in the 1830s and the subsequent [First] Opium War, led to the Treaty of Nanjing (1842) and the opening up of Shanghai to British, American, French and, subsequently, Japanese merchants. The creation of the modern city, the area of the Bund and its subsequent development – coupling with Hong Kong and Singapore – owes much to this genesis. After the Communists took over, many companies moved to Hong Kong but have subsequently returned. Shanghai exists as it is today largely because of three factors:
 1. London investment and British merchant expansion in the 1830/40s;
 2. The twin / networked developments of Hong Kong and Singapore (which kept the entrepreneurial Chinese free spirit of enterprise alive from the 1950s to the 1990s), and;
 3. The; return of these merchant and banking houses and their expertise to Shanghai in the 1990s, enabled also by the smooth transition of Hong Kong to a Special Administrative Region of the PRC (from Britain) in 1997.

Just as Britain today exists because of London's maritime networks, so too are the U.S. and Canada defined by their relationship to New York and Chicago, as is the Peoples' Republic of China (PRC) by its 'extended Pearls'; influenced by Hong Kong; Shanghai, Singapore and Tokyo. Similarly, Turkey, the Middle East, Iran, Pakistan and India are defined by their connections to Dubai, London, Singapore and Shanghai; while Sydney 'bridges' [15] uniquely (in time proximity, space and distance) between Australasia, the Americas, Africa, India, China and Europe.

1980s Deregulation of the City [of London] set in play a displacement process as London sought to reconnect its global networks, free from national (and E.U.) obligations. The classical and mediaeval City States that defined the Nation States of the 17th Century, in the late 20th Century began to reform as even more powerful Network City States. By the 1990s, London was already beginning a process of divesting / discounting Scotland, Northern England and the E.U. The role in the Global Financial Crisis of two 'northern banks' (Northern Rock and the Royal Bank of Scotland) – with echoes of the 17th Century Scottish banking failures that led to Union in the first instance – simply hardened views. Scotland

was no longer relevant to the City and, simultaneously, an existential *sûreté* threat was posed to the City by proposals for E.U. banking regulations; combined with systemic Euro weakness, and the tiering of the E.U. under an eastward facing, increasingly powerful Germany. Combined, these caused London's emergent influence networks to dynamically coalesce about withdrawal from the E.U. – noting that London essentially subsumes and brokers Paris (for Berlin). Both the Scottish and E.U. (BREXIT) referendums need to be seen in this light. The [network] immune response is overwhelming the nation state mutations, and its governance mechanisms are no-longer fit for purpose. Politics, *Sûreté*, Economies, Finance and Banking are all disjoint – and the bifurcation diverges rapidly. Related examples include the Global Financial Crisis, Great Recession, Wiki and Snowden leaks and the recent Panama Papers revelations – linking the ruling celebrity-elites in the major national economies (including China), often through London.

SOUTH CHINA SEAS

Considering Alpha+ Network City States and their regional networks, from Dubai to Hawaii and Shanghai to Sydney, a new 3PB (three peninsulas, and three bays) network emerges – comprising the South Asian Peninsula, the Indo-Pacific Peninsula, and the West Pacific Peninsula (and their associated bays). This network contains six of the Alpha+ Network City States – five of them connecting through the South Asian Peninsular (Shanghai; Tokyo; Hong Kong; Singapore and Sydney). These five Alpha+ NCSs are all within two time zones of each other; unlike New York and London, which are 5 hours apart.

Professor Michael Wesley, writing in *The NAVY* [16] uses the three peninsulas and three bays to develop a Mackinderian formula for addressing the challenges posed in the South China Sea: 'the Peninsulas hold the key to the Bays; the Bays hold the keys to the Peninsulas'. He further suggests:

Two of the Indo-Pacific's peninsulas – the South Asian and West Pacific peninsulas – hold the key to India's and China's strategic claustrophobia. Each are held in full or part by rival entities; each contain parts of India's and China's historic sense of wholeness; each are sites of strategic footholds by major rivals. For China to gain control of the West Pacific Peninsula; or for India to become supreme on the South Asian Peninsula, would represent major advances in their regional and global power capabilities. The Indo-Pacific Peninsula, running from northern Thailand through the Malay Peninsula and the Indonesian archipelago to northern Australia, is just as crucial: as the land divide between the Indian and Pacific Oceans, it is a vital frontier between American power and Indian and Chinese ambitions. Any one or combination of powers that gained supremacy over the Indo-Pacific Peninsula would hold the key to the broader Indo-Pacific. [16]

It is no longer possible to consider the bays and peninsulas in isolation to their associated networks – be it the high-speed cables, their switches and choke points concentrated through the Straits of Malacca, Singapore, the South China Sea, Hong Kong and Tokyo (and Hawaii), or the NCSs, see Figure 2. The key to the peninsulas and control of the bays is the maritime; the key to cyber high-speed cable networks is the maritime; the key to China's near and extended Pearls is the maritime; the heart of the 3PB Network is the South and East China Seas (and Sea of Japan). In this networked reconfiguration of Mackinder and Corbett, the situation we

find ourselves in is that: '[no] side has the command of [(maritime, cyber, NCS and SLOC) networks]; that the normal position is not a commanded [scape], but an uncommanded one.' [17] This is not to confuse command and its associated influence, trust and agility networks with control, rules, time and fidelity. The uncommanded 3PB Network can still be influenced and trusts / alliances formed to steer it benignly. It can also be controlled in part, as the Chinese are currently attempting to do in the South China Sea. But these controls are symmetric to an, essentially, asymmetric network phenomena. The more China attempts to control, the less it can command. The more the networks—be they Cyber, NCSs or SLOCs—by-pass the constraints; concomitantly, the weaker will be China's political sùrète economic positioning. Maginot line-like, such great sand castles are more a sign of political sùrète and economic weakness than of strength (see *The NAVY*, Flash Traffic, 'Who Command and Controls in China', Vol. 78, No. 2, Apr-Jun 2016: pp. 18-19). As significantly, in Confucian terms acts of such symmetric-immorality risk China losing face.

From Australia's perspective, Sydney (not Canberra) can be both peripheral and central to the network – depending upon the perspectives we design. This provides Australia with a unique ability to influence emerging network strategies and to build alliances that will act to strengthen, rather than weaken, its regional, SLOC and Network City State, PSE networks.

At the apex of each of the three bays are the islands of Diego Garcia (U.K.), Cocos (AS) and Singapore. These islands, with Guam (U.S.) and Darwin (AS), provide asymmetric network-pivot axes that can influence, monitor and impact each of the three bays – without getting one's feet dry. Similarly, the juxtaposition of Singapore with Jakarta (and Indonesia) and Darwin, allows for permissive pivot networks to form that will naturally draw in, rather than exclude those impacted by prohibiting rules of maritime and cyber practices, and crude physical attempts to control the flows.

CONCLUSIONS

In answer to the research question 'should we be concerned about China and the South China Sea?' – Yes and No. The real politick that is going on, largely unrecognised and unseen, is the re-assertion of Global [Alpha++/+] Network City States upon national PSE identities. The substantive negotiations are to be had by knowledgeable / connected politicians (representing, very often, the hinterlands) and the NCSs that

eclipse, if not own the contiguous nation states. This is as true of the United Kingdom and Scotland as it is of the U.K. and the E.U.; the U.S. and New York (& Chicago); China and Shanghai (Hong Kong & Singapore) and Australia with Sydney. The 17th Century Westphalian Nation States – significantly defined by Venice and the Netherlands' and networked maritime companies, such as the Dutch East India Company / Vereenigde Oost-Indische Compagnie (VOC), based in Batavia (modern day Jakarta) – have been eclipsed by [maritime] Network City States. Earlier mutations, such as the nation state, are essentially being rejected by the underlying networks that formed them in the first place. The basic unit of international political sùrète economic currency has become the network and its associated Network City States. Core to the network and its City States is the maritime – as it was in times of antiquity and in the 17th Century.

There is a need for politicians to re-negotiate with the Network City States that will define the nation state and their political sùrète economic futures well into the 22nd Century. Already, the NCSs have more in common with each other – in terms of populations, language, industries, needs and infrastructure – than they do with their hinterlands. If the hinterland and its politicians cannot or will not provide the infrastructure and skills necessary to serve their needs (for example, 12 submarines in less than 15 years), they will simply go elsewhere. And the politicians and hinterlands will become even less relevant.

By acting to seize control of the South China Sea, Canute-like China is attempting the impossible – going against the network. Ultimately, the networks will envelope their attempts – just as the sea will their great sand castles. How long this takes and how painful it may be, is yet to be determined. There will be symmetric break-out attempts – such as at Gwadar – that may temporarily stymie network positioning. But the keys to the Three Peninsulas and Three Bays lie in the pearls and the power of the network of City States to form new asymmetric alliances and networks, in collaboration with like-minded entities. An influential maritime arm; combined with the asymmetry provided by Australia's unique geo-spatial positioning and historic, cultural, sùrète, political, Common Law and economic networks, provides it with a real opportunity to peaceably influence both China and the U.S. – and so the Three Peninsulas and Three Bays – in uncertain times. The last thing the world needs right now, is Dragon's fighting and pearls falling, like dominoes.

Jonathan Hemlock is a nom de connaître. ■

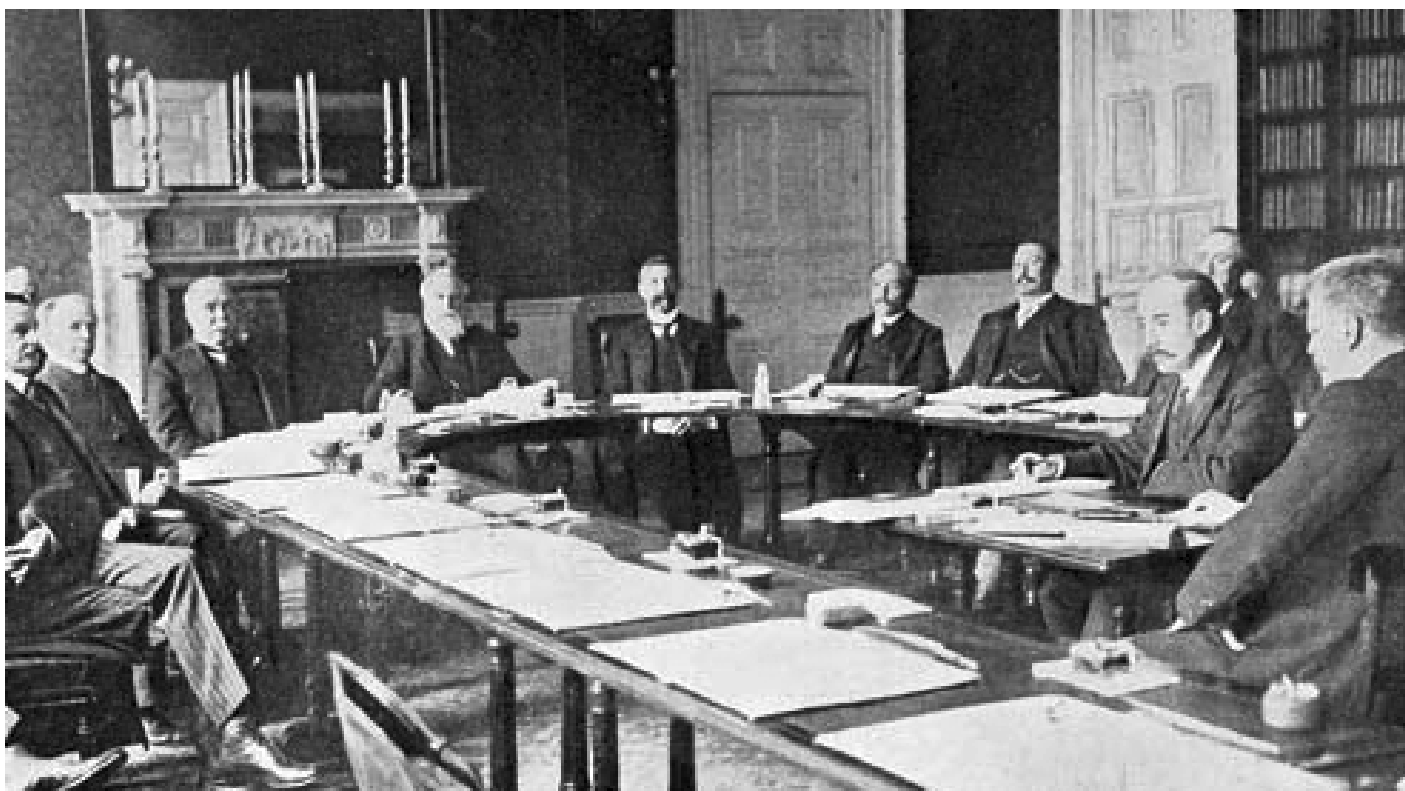
FOOT NOTES / REFERENCES

1. See Washington Post, Washington, *China Builds Up Strategic Sea Lanes*, 17 Jan 2005, <http://www.washingtontimes.com/news/2005/jan/17/20050117-115550-1929r/>, accessed Apr 2016.
2. UK-PASC., *Who Does UK National Strategy?*, in *Public Administration Select Committee (PASC)*, 12 Oct 2010, House of Commons London.
3. Gleiman K, and P.J. Dean. *Strategy, the ADF and Amphibious Warfare: Past, Present and Future*. The Navy - Magazine of the Navy League of Australia, 2015. Vol. 77, No. 4, Oct-Dec: pp. 24-27.
4. *Cyber-: Envisaging New Frontiers of Possibility*. UKDA Advanced Research & Assessment Group, 2009, Occasional Series, 03/09.
5. Convention for the Protection of Submarine Telegraph Cables, 1884. Signatories of the extant agreement reached included Great Britain, Argentina, Austria-Hungary, Belgium, Brazil, Colombia, Costa Rica, Denmark, The Dominican Republic, France, Germany, Greece, Guatemala, Italy, The Netherlands, Persia, Portugal, Romania, Russia, El Salvador, Serbia, Spain, Sweden, Norway, Turkey, the United States, and Uruguay. It made it a 'punishable offence' to damage submarine communications cables. In addition, all ships were to be regulated to staying a distance of one nautical mile away.
6. UN Committee on the Peaceful Use of Outer Space (COPUOS), 1959. The 1967 Outer Space Treaty: 'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies'.
7. Hemlock, J., *Cyber / Maritime Security*. The Navy - Magazine of the Navy League of Australia, 2012. Vol. 74, No. 4: pp. 21-23.
8. *The Cyber-Tortoise and the Cyber-Hare*, in *SDSR Think Piece*, 2010, UK-Mod Naval Staff: London.
9. Bryan Gardiner. (2006). Google's Submarine Cable Plans Get Official. Wired February 25, 2008.
10. Hayes, J., *Connected Continent - Africa Special*. E&T (Engineering and Technology), Institute of Engineering Technology (IET), 2013. Vol 8, Issue 5: p. pp. 42-43.
11. The Antarctic Treaty and Antarctic Treaty System, signed 1 December, 1959 and effective from 23 June, 1961.
12. *The World according to the Globalization and World City Rankings* (GaWC) <http://www.lboro.ac.uk/gawc/>, Loughborough, Globalization and World Cities Research Network, accessed Mar 2016.
13. Folsom, B.W., & A., Folsom, *FDR Goes to War: How Expanded Executive Power, Spiraling National Debt, and Restricted Civil Liberties Shaped Wartime America*, 2011, New York: Threshold Editions.
14. Hopper, K., & W., Hopper., *The Puritan Gift*, 2007, London: I.B. Taurus and Co. Ltd.
15. *A 21st Century Pacific Bridge*, in Version 2.2, 28 May. *Think Piece*, 2013, The University of Sydney: CISS, FASS.
16. Wesley, M., *Asia's Restless Giants: The Challenges to Asia's Maritime Commons*. The Navy - Magazine of the Navy League of Australia, 2016. Vol. 78, No. 2, Apr-Jun 2016: pp. 6-10.
17. Corbett, J.S., *Julian S. Corbett, Some Principles of Maritime Strategy*, 1988 [1911], Annapolis: Naval Institute Press.

FROM CONCEPT TO COLLEGE CREATION OF THE RAN COLLEGE

By Greg Swinden

On the shores of Jervis Bay stands one of the Royal Australian Navy's oldest shore establishments; the Royal Australian Naval College (RANC). For 100 years the College has produced RAN officers who have served with distinction in both war and peace. The creation of the College was one of the major achievements of the fledgling Australia Navy and began with a concept, as early as 1906. By 1909 the idea was firmly entrenched in Australian naval thinking and was fully supported by the Henderson Report of 1911.



1907 Imperial Conference on the Naval and Military Defence of the Empire from left, New Zealand's Joseph Ward, Canada's Wilfrid Laurier, Britain's Henry Campbell-Bannerman, British Secretary of State for the Colonies Lord Elgin, Australian Prime Minister Alfred Deakin, Cape Colony Prime Minister Leander Starr Jameson, Transvaal Prime Minister Louis Botha and Australian Minister for Trade and Customs William Lyne.

COLONY VERSUS EMPIRE

In 1906 the first tentative step towards an Australian Naval College was taken when the Council of the University of Melbourne approached the Minister for Defence, Senator Thomas Playford, with the concept of establishing a school of Naval Science at the University. Creswell investigated the idea during a visit to England in mid-1906 where he consulted the Royal Navy's Director of Naval Education, Professor James Ewing [1], regarding the matter. Eventually Creswell reached the conclusion that there was little value in proceeding with the University's proposal and the concept of a Naval College was shelved for the next three years. In reality the CNF as it stood required few new officers as the force had begun to stagnate as many politicians and defence commentators, both in Australia and England, saw little need for the force as the naval defence of Australia at the time rested quite comfortably with the Royal Navy Australian Squadron.

At the April 1907 Imperial Conference on the Naval and Military Defence of the Empire, Prime Minister Deakin and Captain Creswell put forward their plans for an independent naval defence force for Australia. They met with substantial opposition from the British Government and in particular the First Sea Lord, Admiral Sir 'Jackie' Fisher. Admiral Fisher saw little benefit in an independent Australian Navy and pushed the Australians to obtain only coastal destroyers and submarines, for local defence, and leave the main defence of Australia to the RN Australia Squadron. Deakin further upset the British Government, in January 1908, when he directly invited the US Government to send its Great White Fleet to visit Australia later that year as part of a planned world tour. Only after the invitation had been sent did Deakin use 'normal channels' via the Governor General to advise the British Colonial Office of Australia's intentions.

The visit of the US Fleet, of 16 white painted battleships, to Australia took place in August/September 1908 with the fleet visiting Sydney

and Melbourne with great pomp and ceremony. Overall the visit was a great success and further enhanced the debate for Australia to form her own navy. It also came at a time when there were increasing concerns regarding Japanese and German expansion in the Pacific. In November 1908 Deakin's government fell and he was replaced as Prime Minister by Andrew Fisher.

IMPERIAL DESIGNS

The matter concerning the future of the Australian Navy came to a head in July 1909 at the Imperial Conference in London. The outcome was a change of heart by the British Government which was now more concerned with maritime defence of the Pacific region. There had been a growing belief amongst British policy makers that each colony in the Empire needed to be part of the general defence of the Empire. Basically the naval arms race between Britain and Germany was now well under way and if the Australians were prepared to fund their own navy, as part of the ultimate defence of the British Empire, then they should be allowed to do so. Germany maintained a squadron of six cruisers at her colony in Tsingtao (China) and there were also concerns that Japan's naval might was also growing and that Britain's naval strength in the Pacific might be challenged.

In August 1909 discussions between both Governments ensued. The end result was the Australian Government agreed to fund the construction of a Fleet Unit consisting of a battle cruiser, three cruisers, six destroyers and three submarines at a cost of nearly 4 million pounds. The Australians would also pay an additional 750,000 pounds for maintenance, training costs in England and pay and allowances for loan personnel from the RN. In December 1909 orders for the construction of the battle cruiser (AUSTRALIA), two light cruisers (MELBOURNE and SYDNEY) and two submarines (AE 1 and AE 2) were placed with British shipyards while one light cruiser (BRISBANE) and three more destroyers (HUON, SWAN and TORRENS) were to be built at Cockatoo Island.



HMAS AUSTRALIA (I) leading the ships of the Australian Naval and Military Expeditionary Force (ANMEF) into Rabaul Harbour 12 Sept 1914.

The Naval Defence Act was passed in 1910 and this was effectively the agreement that the Australian Government would assume full responsibility for the naval defence of Australia. Once the decision had been made to create a naval college the next issue was the location. Creswell preferred the site at Mona Vale as it was far enough away from the city of Sydney so that the bright lights of the metropolis would not be a distraction to the cadets and staff, but close enough to the city that the cost of building the college would be reduced due to proximity of building materials and skilled labour. The location of the Naval College was to prove to be a stumbling block for the next three years. Creswell asked the opinion of the Vice Admiral Sir Richard Poore, who commanded the Royal Navy Squadron based in Sydney.

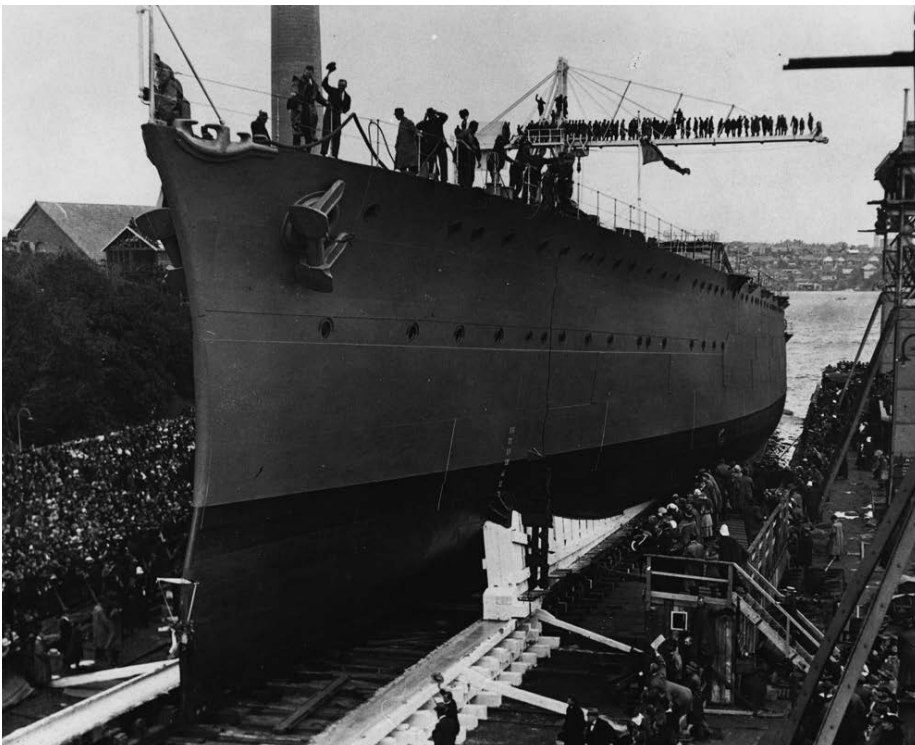
CONSTRUCTION BY COMMITTEE

Poore inspected the sites at Mona Vale, the Middle Harbour Government Reserve (Long Bay) and Middle Head. He provided Creswell with a report on 14 February 1910 recommending the Middle Head site; Creswell did not agree with this finding but did forward the report to Joseph Cook the Minister for Defence. Cook accepted Admiral Poore's report recommending Middle Head; mainly as the land was already owned by the Commonwealth and this would reduce overall costs in building the

college. On 8 March 1910 Cook wrote – 'There seems to be a consensus of opinion as to the pre-eminent suitability of the Middle Head site. And I therefore think the interests of the College will be served by placing it there. I accordingly so decide'.

This decision was to be short-lived as soon after the Deakin Government fell from power and on 13 April 1910 the Labor Government of Andrew Fisher was sworn in. By late 1910 the construction of the Australian Navy fleet unit in Britain was well under way and the Fisher Government was keen to man its new fleet with as many Australian officers and men as possible. Pearce was proactive in seeking expert advice on the future navy's long term structure, bases, manning and training and as a result he invited a retired British Admiral, Sir Reginald Henderson, to visit Australia to undertake a review.

The portion of the report regarding the naval college advised that 30 cadets, aged 12 or 13, be brought into the college each year for a four year course of instruction followed by six months in a training ship and then service in the Fleet. Thus when operating a full capacity the college



HMAS BRISBANE (I) on the slipway at Cockatoo Island, Sydney.



1913: Royal Australian Navy Cadet midshipman entry from 1913 at RANC North Geelong – JB Newman, EA Feldt, PH Hurst, AJB Watts, EB Howells, FE Getting, LL Watkins, OE Albert, FL Larkins, ES Nurse, HB Vallentine, WL Reilly, HB Farncomb, JCD Esdaile, JA Collins, HA Mackenzie, PJ Kimlin, NK Calder, RMB Long, CAR Sadlier, GWT Armitage, J Burnett, LF Gilling, ES Cunningham, HA Showers, HJJ Thompson, JVS Lecky and AD Conder.

would have 120 cadets at any one time with a small leeway for 'wastage' due to medical discharge or unsuitability. Henderson stated that the establishment of an officer training college was part of the strategy for the development of the Australian Navy. He also briefly mentioned that the college could be located at Middle Head which was also still Creswell's preferred option.

At this stage the proposed location of the College was still considered to be in Sydney and the Lord Mayor of Sydney, Allen Arthur Taylor [2], was particularly keen that the college was built in Sydney due to the prestige that this would bring as well as the financial advantage to the city. The Lord Mayor was also the Chairman of Trustees for the Dreadnought Fund which had originally been set up to enable Sydney citizens to contribute towards the purchase of a capital ship for the Royal Navy. The Dreadnought Fund was no longer required after the Imperial Conference of 1909 when the decision to build an Australian Fleet Unit was made. Taylor then discussed the matter of the Fund with Prime Minister Deakin in 1909 and gained an understanding that the College was to be constructed in Sydney and thus £40,000 was offered by the trustees, to the Commonwealth Government, to assist with building the college. The only stipulations were the college was to be built 'within the precincts of the city of Sydney' [3] and constructed within a reasonable time frame. In May 1911 Taylor again approached the Commonwealth Government regarding the location and construction time frame for the college.

In May 1911 Captain Bertram Chambers, RN arrived in Australia on loan as the Second Naval Member of the Naval Board. Despite the previous studies made, Pearce directed him to conduct a study of the various sites proposed to assess their suitability. The few stipulations Chambers was given was that Tasmania could not be considered as a possible site and that Jervis Bay was to be considered due to a new found desire to have the college built on Federal Territory. Sydney was also to be considered due to the offer of financial assistance by the Lord Mayor.

Chambers commenced his study of eight sites in mid-1911 and his initial report of 20 June 1911 proposed that, in order of merit, the prospective sites were Barrenjoey (northern Sydney beaches area) as first, Jervis Bay

as second and Sutherland House (on the southern side of the George's River) as third. Chambers was to later change his mind regarding the Barrenjoey site and he also advised that while Jervis Bay was suitable the fact that it was a green field site, with substantial road works and construction required which meant that it would be at least three years before the college was ready for the training of cadets. The site at Sutherland House thus suddenly rose to the fore and could be ready to accept the first cadets as early as the beginning of 1912.

TO JERVIS BAY

Captain Chambers then suggested, in his Supplementary Report of 9 November 1911, that a site at Burraneer Point in Port Hacking. He was effusive regarding its potential stating the site was 'one not excelled by any existing college' [4]. The time though had come for the location of the Naval College to be discussed in the House of Representatives and the pledge of £40,000 by the Lord Mayor of Sydney, towards the college construction, came in for stiff condemnation. Several Parliamentarians including Austin Chapman (member for Eden-Monaro) [5] were adamant that the college should be erected on Federal land while others opposed use of the money from the Dreadnought Fund as another example of the 'Sydney Octopus' reaching out to stunt growth in non-metropolitan areas. Eventually in order to get the matter resolved and also secure funding for the construction of the college, Pearce and Prime Minister Fisher acquiesced and on 16 November 1911 the site of the naval college was announced as Jervis Bay.

While Jervis Bay might have been chosen the reality was that the construction of the college would take several years. The area was remote with virtually no roads, limited local infrastructure and the workforce and building materials required to build the college would need to be shipped in from other regions. Additionally all food and other essential materials would have to be imported further increasing costs. A planned rail link from Canberra to Jervis Bay, which was to be the sea port for the capital, never eventuated and the railway line from Sydney, to this day, terminates

at Bomaderry just north of the Shoalhaven River and some 35 km north of Jervis Bay.

The Naval Board reported to the Pearce, on 16 January 1912, that the site at Jervis Bay was inappropriate but were curtly advised the decision had been made and that the college would be built at Jervis Bay. Meanwhile Senator Pearce called a meeting on 7 February 1912 which was attended by the Minister for Home Affairs (King O'Malley, MHR), his secretary Colonel David Miller, the Director of Works within the Home Affairs Department (Colonel Percy Owen), the secretary of the Department of Defence, Sir Samuel Pethbridge [6], and Captain Chambers who by now had been selected to be the Superintendent of the naval college. A variety of plans and specifications that had been created by Colonel Owen's staff were discussed as were concerns that the NSW Government was being somewhat recalcitrant in transferring the land at Jervis Bay to the Commonwealth; and it was 1915 before this issue was resolved.

The construction of the RAN College commenced at Captains Point, Jervis Bay, in mid-1912 but it would be late 1914 before sufficient classrooms, accommodation blocks, staff accommodation and dining facilities and other supporting infrastructure was sufficiently progressed to allow training there to commence. Even after training began, in 1915, the building continued on well into 1916 before the college was fully completed. As a side issue the Lord Mayor of Sydney still transferred the 40,000 pounds from the Dreadnought Fund to the Commonwealth to assist with construction of the College and a large bronze plaque was erected in the foyer of the Gymnasium/Clock tower at Jervis Bay to commemorate this.

With a suitable building for the first intake now secured, Captain Chambers devoted his efforts to obtaining staff and advertising for boys to become the first entry. Amongst the staff chosen was Lieutenant Commander Duncan Grant, whose name was to become synonymous with the early days of the College as Executive Officer (second in command), and later as Commanding Officer, and Mr. F.G. Brown BA, BSc as the first Director of Studies.

ROYAL AUSTRALIAN NAVAL COLLEGE

Examination papers typical of those which will be set for the qualifying examination to the Royal Australian Naval College and amended application forms to the college for the first entry of boys to the college from those whose 13th birthday falls in the present year, i.e. from those who were born in 1899, are now available on application to the District Naval Officer, Naval Office, Brisbane. The number of boys, who will be entered at the temporary Naval College at Osborne House, Geelong, in February next, is 24, of whom 3 will be selected from Queensland. An interviewing committee will sit in each State in September, and those boys who are chosen as suitable candidates will present themselves for examination in November. Applications for admission to the Naval College will be received by the Naval Secretary, Navy Office, Melbourne, until 31st August next.

The RAN had already decided that entry to the college was open to any suitable applicant and that social position and family finances were not to be taken into account, nor would tuition fees be charged as was the case with the Royal Navy College. This would enable a wide cross section of 13 year old boys from Australian society to apply and that those selected would be on merit only [7]. There was also a state quota to be met as follows; New South Wales (9), Victoria (7), Queensland (3), South Australia (2), Western Australia (2) and Tasmania (1). But if a state failed to meet its quota of suitable applicants then these positions went into a pool for re-allocation. The Naval Board decided for the first entry to accept 28 boys instead of the proposed 24. The 1914 entry was 30 boys and 32 boys were selected for entry in 1915.

Once selected the boy's parents, or guardians, were required to indenture the boy for a period of twelve years in the RAN, from the age of 18. If the boy was withdrawn before completing that period of service then a penalty of 75 Pounds for each year of training might be imposed by the Naval Board. The boy could of course be discharged at any time for unsatisfactory performance (both academic and naval studies), medical reasons or misconduct.

A total of 138 applicants passed the first examination and following interviews 60% of these were allocated as Class A passes. Following the final examinations and interviews there were 33 suitably qualified boys for 28 positions. On 4 December 1912, the Minister for Defence and the Naval Board met at its main office in Lonsdale Street, Melbourne to decide on the 28 names by ballot. A representative of The Argus newspaper was also invited by Senator Pearce to assist. In some cases, such as for NSW where the quota of nine had been met by nine suitable boys there was no ballot. Each other boy was allocated a number written on a slip of paper and that was then placed in a hat and the representative from The Argus drew the numbers out.

One of the last names drawn out was that of John Collins from Tasmania. Tasmania had a quota of one boy but two had qualified. By sheer luck for Collins, and the RAN, his name was drawn as he went on to become the first RAN College graduate to reach the rank of Vice Admiral and become the First Naval Member of the Commonwealth Naval Board and Chief of Naval Staff. The names of the five boys who missed out and what became of them in later life is not known.

Those chosen to become the first Cadet Midshipmen at the naval college came from a wide cross section of the Australian community. Otto Albert was the son of a millionaire Sydney businessman, John Collins was the son of a doctor, who had died before Collins was born, Joseph Burnett was only seven when his father died, Elmer 'Ben' Howell was the youngest son of a mining company manager whose last mine was a financial disaster [8], Eric Feldt was one of several sons of a Swedish born Queensland sugar cane farmer [9], James Esdaile was the son of a New Zealand born mining engineer, Harold Farncomb was the son of timber surveyor, Henry Showers father was a hotel keeper and Rupert Long was the son of a school inspector. What they all had in common was a very good education, a keen mind, physical fitness and a desire to succeed.

The 28 boys all arrived at the temporary college at Osborne House, Geelong on 13 February 1913, although their seniority in the RAN was backdated to 31 December 1912. The boys completed two years of training at Geelong before the college moved to Jervis Bay in early 1915.



Cadet Otto Albert RAN. The Albert family is amongst the founding Families of the Royal Australian Navy with distinguished service to this day.



HMAS CRESWELL hosted the first ASEAN Defence Ministers Meeting in 2013 and Maritime Security Field Training Exercise.

The curriculum was based on the Royal Navy system of education with studies in mathematics, physics, chemistry, engineering (both practical workshop training and mechanical drawing), English, French, German, history, geography, religious instruction, seamanship, gunnery, drill and navigation. Sport was also a major activity with rugby, cricket, hockey, tennis, athletics and swimming the main activities; thus leaving little time for the boys to partake in other pursuits.

At the end of 1916, 23 Midshipmen of the 1913 entry (often known as the Pioneer Class) graduated from the RAN College. Midshipman Wynn Reilly of Geelong was awarded the Kings Medal for exhibiting the most exemplary conduct, performance of duty and good influence among his fellow [10]. Wastage from the original 28 Cadet Midshipmen was low with one death (Otto Albert in 1914 from Meningitis) and three were withdrawn. In early 1917 these first graduates were sent to join the British Grand Fleet, in the North Sea, for further training. Two were to die as a result of war

service: Ernest Cunningham on 31 January 1918 when HM Submarine K17 was accidentally rammed and sunk in the Firth of Forth (Scotland) and Frank Larkins was washed overboard from HMA Submarine J2 in the Carimata Strait, near Borneo, on 20 June 1919 when the vessel was enroute to Australia [11]. The remainder had varied careers with three, Collins, Farncomb and Showers achieving flag rank and several others reaching the rank of Captain.

In 1906 the concept of an Australian Naval College was first proposed and within seven years the first Cadet Midshipmen had commenced their training. Those first graduates of 1916 were the forerunners of thousands of Australian men and women who have been trained at the RAN College in both peace and war. The site at Jervis Bay caused some angst for the early naval planners but with the benefit of 100 years of hindsight it has proven to be a wise decision. ■

FOOT NOTES

1. James Alfred Ewing (1855-1935) was a Scottish physicist and engineer who was selected in 1903 to be the inaugural Director of Naval Education at Greenwich. During World War I he managed the Admiralty Intelligence Department for Cryptanalysis known as Room 40.
2. Sir Allen Arthur Taylor (1864-1940) was Lord Mayor during the period 1909-1912. He was knighted in 1911.
3. See Eldridge page 17.
4. See Eldridge page 22.
5. Sir Austin Chapman (1864 – 1926) Protectionist/Liberal member for Eden-Monaro from 1901 until his death in 1926. He was born in Bowral, educated at Marulan and operated hotels in Bungendore and Braidwood before entering politics. He served as Minister for Defence 1903-04, Post Master General 1905-07 and Minister for trade and Customs 1907-08. He was a staunch advocate for the Federal capital to be built in the Eden-Monaro area and lobbied successfully for this thus earning the title 'Father of Canberra'.
6. Due to a short of trained personnel several military officers were loaned to the Department of Home Affairs to assist with capital projects especially the creation of the Federal capital in Canberra.
7. See Eldridge page 35.
8. See Howells J.C. *Ben and Dorothy: A portrait of my Parents*, Privately Published, Camberwell Victoria, 2012.

9. Eric Feldt arrived a couple of days late to the college. The steamer and train he was travelling in were delayed by the effects of a cyclone.
10. See Cunningham I.J. *Work Hard – Play Hard: The Royal Australian Naval College 1913 – 1988*, AGPS, Canberra, 1988, page 152.
11. Three more of the 1913 Entry died during World War II. They were Captain Joseph Burnett who was killed in action when HMAS SYDNEY was lost on 20 November 1941, Lieutenant Commander Llewellyn Watkins who was killed in action when HMAS PERTH was sunk on 1 March 1942 and Captain Frank Getting who died of wounds after the loss of HMAS CANBERRA at the battle of Savo Island on 8/9 August 1942. Lieutenant Alfred Conder died of cancer on 8 June 1932.

FURTHER READING

Cho G., Georges A., *Jervis Bay: A place of Cultural, Scientific and Educational Value*, Stoutjesdijk R. (Ed.) University of Canberra, 1996.

Connor J. *ANZAC and Empire: George Foster Pearce and the Foundations of Australian Defence*, Cambridge University Press, Port Melbourne, 2011.

Coulthard-Clark C. *Duntroon: The Royal Military College of Australia 1911-1986*, Allen & Unwin, North Sydney, 1986.

Cunningham I.J. *Work Hard – Play Hard: The Royal Australian*

Naval College 1913-1988, Australian Government Publishing Service, Canberra, 1988.

Eldridge F.B. *A History of the Royal Australian Naval College: From its inception in 1913 to the end of World War II in 1945*, Georgian House, Melbourne, 1949.

Gilbert G.P. (Ed.) *Australian Naval Personalities: Lives from the Australian Dictionary of Biography*, Sea Power Centre – Australia, Canberra, 2006.

Hyslop R. *Australian Naval Administration 1900 - 1939*, The Hawthorn Press, Melbourne, 1973.

Jose A.W. *The Royal Australian Navy, The Official History of Australia in the War of 1914-1918*, Volume IX, Australian War Memorial, Canberra, 1928.

Lambert N.A. *Australia's Naval Inheritance: Imperial Maritime Strategy and the Australia Station 1880 -1909*, Maritime Studies Program, Canberra, 1998.

Nicholls B. *Statesmen & Sailors: Australian Maritime Defence 1870 – 1920*, privately published, 1995

Stevens D. (Ed.) *The Royal Australian Navy, The Australian Centenary History of Defence*, Volume III, Oxford University Press, South Melbourne, 2001.

Veale R.S. *Autobiographical Recollections of a Naval Reserve Officer 1893-1987*, privately published, 2006.



TWO SPANISH-MADE NAVAL SUPPLY SHIPS FOR RAN

Overshadowed by The Election and the \$AUD50 Billion SEA 1000 Submarine, Australia government signed an \$AUD 640 million contract with Spanish shipbuilder Navantia to construct two replenishment ships in Spain for the Royal Australian Navy (RAN), under Project SEA 1654 Phase 2. The two supply ships will be built in Spain and include a replacement for the 25,016-tonne tanker HMAS SIRIUS and an additional \$AUD 250 million, five-year sustainment contract.

30TH BIRTHDAY PARTY – A SUCCESS

HMAS SUCCESS celebrated her 'pearl' anniversary – 30 years' service to the Royal Australian Navy, on 23 April 2016. The ship hosted an informal reception that included current serving members, partners, and previous commanding officers, members of the commissioning crew and ship builders. Construction on Success began in 1980 at Cockatoo Island, Sydney. She was the last warship built at the Naval dockyard. Commanding Officer Captain Justin Jones said the ship had an extensive history straddling peace, war and the spectrum of operations in between: Since commissioning in 1986, Success has deployed on 17 operational deployments, six Fleet Reviews and has held the Duke of Gloucester Cup, the fleet's highest honour, on two occasions. He went on to note that 'the ship could be christened the RIMPAC 'guard ship', having participated in ten RIMPAC exercises throughout its commission and has deployed overseas in every year of its commission, except for two'.

The Auxiliary Oiler Replenishment (AOR) vessel has steamed 909,670.34 nautical miles and should achieve one million nautical miles prior to decommissioning. Her Excellency Lady Stephen, wife of the then Governor General, His Excellency Sir Ninian Stephen, launched SUCCESS on the 3 March 1984.

PARRAMATTA UNDOCKED

HMAS PARRAMATTA IV (FFH 154) undocking on 19 April at the BAE Systems Henderson Shipyard in Western Australia is the latest milestone to be achieved under the program that includes the addition of a 'cupola' mast to house the CEA Phased Array Radar; upgrades and maintenance of combat; propulsion and electrical systems and painting in the new Royal Australian Navy 'haze grey'.

HMAS PARRAMATTA moved to Henderson from Fleet Base West and was docked and placed on the hard stand in April 2015 before vital maintenance work, involving some 600,000 hours by 250 employees and 30 local subcontractors. The undocking was accompanied by a ribbon cutting ceremony by Mrs Jill Green who is the daughter of the late Lieutenant G.W.A. (Bill) Langford who was the Executive Officer of HMAS PARRAMATTA II, lost in 1941 when she was torpedoed and sunk between Alexandria and Tobruk by German U Boat U559.

A change of command ceremony was also conducted on 21 April at Henderson Shipyard with Mrs Green, the Lord Mayor of Parramatta, Paul Garrard, and Commander Australian Fleet,

Rear Admiral Mayer attending. Command of the ship was officially handed over to Commander Simon Howard and the ship's company of HMAS STUART, swapped their ball caps and ship's patches over to represent HMAS Parramatta, marking the transition from one hull to the other.

LAST ANZAC UPGRADE

HMAS STUART III (FFH 153) is the last of the Anzac class frigates to enter the Anti-Ship Missile Defence (ASMD) upgrade. STUART docked at the BAE Systems Australia Henderson shipyard in Western Australia on 3 May. During the upgrade, the ship will have both mast modules removed, modified and replaced, be blasted back and repainted, and have significant sections of the combat system replaced by the upgraded Saab Systems Mk3E system and CEAFAAR Radar. Upgrade Program Delivery Manager Lieutenant Commander Felicity Petrie said STUART's docking marks an important milestone:



A drone image of Aurora Australis in ice - photo by Australian Antarctic Division.

This represents the completion of a significant body of work by a number of Navy personnel and civilian contractors across the Anzac fleet. STUART's upgrade will signal the end of the 'classic' configuration and herald a new era in Navy capability.

STUART will be docked at the Henderson shipyard until early March 2017.

RAN IN REGIONAL COUNTER-TERRORISM EXERCISE

HMAS ANZAC and BATHURST, along with Australian Special Forces and headquarters staff, provided Australia's contribution to a regional maritime security and counter-terrorism exercise in Brunei and Singapore. The exercise includes simulated 'vessel of interest' boardings from sea and air, officer exchanges with other Navies and beach landings.

Commanding Officer HMAS BATHURST, Lieutenant Commander David Shirvington, said the exercise improves interoperability and fosters mutual understanding between nations:

The exercise provides a valuable opportunity for ship's from the Australian Navy to integrate with other Navies to enhance procedures for maritime

security and counter-terrorism cooperation in the busiest and most complex maritime zone in the world.

Australian joined the ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) forum in 2010, which now has six priority areas of cooperation; counter terrorism, humanitarian assistance and disaster relief, maritime security, military medicine, peacekeeping operations, and humanitarian mine action. The exercise is a result of Australia and Singapore's work as co-chairs of the ADMM-Plus Experts' Working group on Counter Terrorism, and demonstrates the maturity of the ADMM-Plus as a regional institution.

DRONES TAKE TO AURORA AUSTRALIS

After the successful use of drones to guide the Aurora Australis icebreaker on its annual resupply voyage to Casey Station in December 2015, it seems UAVs are to become an Antarctic fixture. Australian Antarctic Division future concepts

manager Matt Filipowski reported 'this is the first time the division has used drone technology to assist ship operations, and it is a valuable addition to existing ice navigation tools'. A hovering quadcopter made five flights of eight minutes each during the nine-day voyage to Casey.

Ground Effect Aviation was the first Australian UAV training organisation to be accredited by Australia's Civil Aviation Safety Authority. Australian UAV has more than 100 clients and is one of more than 400 registered UAV-related businesses.

NAVANTIA BUILDS TURKEY'S LHD

Turkey began construction of the nation's first amphibious assault ship with a steel cutting ceremony on April 30. Based on the Spanish Navy's landing helicopter dock (LHD) JUAN CARLOS I (L61) and designed by Navantia, the Turkish version of the ship will be named TCG ANADOLU (L408). Turkish Under Secretary for Defence Industries, together with the Sedef shipyard which will construct the ship, on September 18, 2015, signed an agreement with Navantia under which the Spanish company will act as a technology partner. Navantia has built three ships of this type:

the JUAN CARLOS I and two similar LHDs for Australia, HMAS CANBERRA (L02) and ADELAIDE (L01). Interestingly, the Turkish version of the ship will be registered as a light aircraft carrier by the Turkish Lloyds and is scheduled to be delivered to the Navy in 2021.

KONGSBERG CCTV FIT FOR ARCTIC OPS

Kongsberg Maritime announced in February 2016 that it has been selected by L-3 MAPPS to provide the CCTV system for the Royal Canadian Navy's new class of Arctic Offshore Patrol Ships (AOPS). The CCTV system will provide the crew with real time video surveillance to assist with mission critical operations as well as providing safety, security and situational awareness on board the new build AOPS vessels.

AOPS is a Government of Canada procurement project for the RCN. The project is expected to equip the Canadian Forces with six naval ice-capable offshore patrol ships. The first Arctic Offshore Patrol Ship is scheduled to be delivered in 2018.

Earlier in 2016, Kongsberg Maritime has landed another contract to supply its camera systems to the U.S. Coast Guard vessel Polar Star.

VARD MARINE DESIGN ANTARCTIC ICEBREAKER FOR CHILEAN NAVY

U.S. and Canadian Vard Marine has won the design for a \$AUD 2 million Antarctic icebreaking vessel for the Chilean Navy. The vessel will be capable of operating throughout the Southern Ocean with services to include logistic support, search and rescue missions, scientific research, and resupplying bases in the Chilean Antarctic Territory. The new vessel is 125 metres long, with a displacement of over 13,000 tonnes, a complement of 155, and installed power of 14.5 MW to permit breaking one metre of ice at two knots.

RUSSIAN NAVY PROJECT 23550 ARCTIC COMBAT VESSELS

The Russian Ministry of Defence (MoD) has ordered two Project 23550 ice-class Arctic Combat Vessels (ACVs). The corvettes are described by the MoD as being 'without analogues in the world; combining 'the qualities of tug, ice-breaker, and

patrol boat'.

Two vessels will be built by Admiralty Shipyards in St Petersburg and are scheduled to be delivered to the Russian Navy by 2020. The combat vessels are armed with a medium-calibre main gun on the foredeck (probably a A-190 100 mm naval gun), a helicopter deck and hangar, and two aft payload bays each fitted with a containerised missile launch system (similar to the Club-K system) armed with four erectable launch tubes - for either Club anti-ship or Kalibr-NK land-attack missiles. These ships mark a distinct step-change in the militarisation of the Arctic.

KALIBR MISSILES FOR RUSSIAN 971 SUBMARINES

Project 971 Akula-class submarines are to be armed with the Kalibr missile system.

The weapon proved itself during trials and recent strikes on Syria, conducted by the Project 636.3 Improved Kilo-class diesel-electric submarine ROSTOV-ON-DON. The 'DON' conducted Russia's first-ever submarine-launched cruise missile strikes on 8 December when it fired four 3M-14 land attack variants of the Kalibr missile from the Mediterranean into Syria. The Russian Navy operates a fleet of 11 Project 971 submarines.

INDIAN AKULA LEASE

Four Akulas belonging to the Pacific Fleet (KASHALOT (K-322), BRATSK (K-391), MAGADAN (K-331) AND SAMARA (K-295) are at shipyards for repairs, with KASHALOT expected to be leased to India later in 2016.

USN BUDGET CONTINUES TO STALL

US Navy nuclear-powered aircraft carriers undergo mid-life Refuelling Complex Overhaul that takes them out of service for four years. Currently, the Navy has 10 nuclear aircraft carriers and 10 carrier air wings, one for each flattop — but one carrier is always in refit at any given time, and one wing, CVW-14, kept undermanned and underused since its last deployment in 2011.

An additional problem is the Navy has 10 carriers, today, but is required by law to have eleven. Congress waived this requirement while the fleet built back up. Members of Congress, including House of Representatives Sea Power

subcommittee chairman Randy Forbes, are increasingly suspicious of and fear proposed cuts will lead to a permanent 10-carrier fleet. Meanwhile Navy planners are calculating that the U.S. won't have 11 active carriers and won't need 10 air wings, until 2025 at the earliest. A junior officer spokesperson LEUT Kara Yingling USN confirmed: 'the proposed plan matches the number of complete carrier air wings to the number of operationally available carriers (nine) through 2025...The Navy will continue to assess requirements based on Global Force Management Allocation Plan (GFMAP) changes in coming years...if requirements change in the future and we need to reactivate a 10th air wing, it will require a less rigorous administrative process'.

There is a sense of military spin to defuse political directive, which may not be enough. The US Navy is already struggling to reset the force, while maintaining presence, poise and influence with 10 active carriers — at a time when less Liberal nations are flexing their muscles. Hope is not a Plan...

F-35 LIGHTNING II QUESTIONS REMAIN

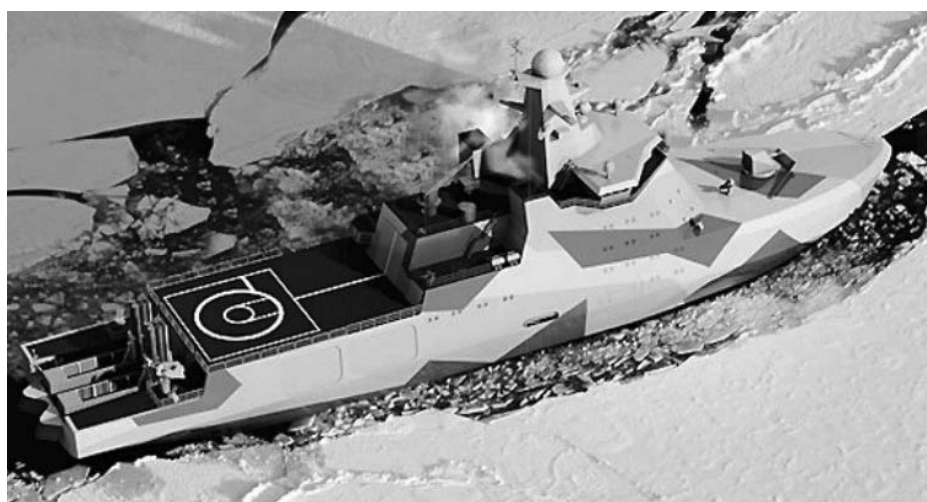
The F-35 Joint Strike Fighter program is the most expensive military programme in the world and as such the most political, yet, of the military industry complex (MIC). Yet doubts remain — the guns don't fire, and the computers do not yet function safely and securely, in hostile cyber ecologies.

A Pentagon release detailed a large list of deficiencies that still plague the troubled F-35 fighter jet; noting that USAF is to announce that its version of the aircraft will be operational by the end of the year. The report clearly states that the aircraft should not be flown in 2017 given the number of bugs that need to be fixed. Specific bugs are particular to the variant of the F-35 that the Marines are using; including, 'in fusion, electronic warfare, and weapons employment result in ambiguous threat displays, limited ability to respond to threats, and a requirement for off-board sources to provide accurate coordinates for precision attack'.

Dr Keith Joiner, former head of test and evaluation for the ADF, speaking to ABC Background Briefing commented, inter alia:

- The JSF is a completely software-driven aircraft, but is yet to be properly tested.
- The [aircraft] hasn't done any cybersecurity testing yet,
- The only system that has done cybersecurity vulnerability and penetration testing is the logistics software, so ordering spares. And it didn't go very well.
- Since the decision is to rely on the US, we don't do a lot with those test reports, in my view,' he says.
- My understanding is that they're not formally put through our test agencies for comment or feedback.
- Testing on the jet is still unfinished, but jets are being produced anyway, meaning some of our JSFs will need to be retrofitted after they've been built.

Joiner concluded: 'we might end up with 72 of them and then find out what they can't do or can do'. Chris Mills, a former wing commander with



Concept Image of Project 23550 Arctic Combat Vessel (ACV) - By Russian MoD.



F-35 Lightning II Joint Strike Fighter - Australia intends to purchase 72 of the planes. Photo by USAF.

the RAAF, says the JSF has a nickname among the top guns of the US Air Force: 'the little turd (TLT)'. At a press conference with the head of the American JSF program, Lieutenant General Chris Bogdan,, the Australian program manager for the JSF, Air Vice Marshal Chris Deeble, was asked how many of the 58 fighters approved for purchase in 2014 are currently in production, Bogdan whispered to Deeble: '...there's probably somewhere between zero and 16', to which Deeble responded: 'Yeah, it'd be somewhere between zero and 16...'. Pressed to identify exactly how many were in production, Bogdan (the ventriloquist) again whispered, 'no more than 16', and Deeble responded accordingly.

At the same time, questions are being raised by the U.S.'s other close Ally, Israel, which may put the F-35 Lightning II into service in Israel as early as 2017. As debates rage over the virtues of the aircraft, Israeli pilots left for the United States in early 2016 to begin training – the first two F-35 fighter jets are projected to start their journey to Israel in December 2016, according to the IDAF. The F-35 stealth fighter is designed to perform multiple varieties of missions – bombing runs, close air support to protect troops on the ground, air-to-air combat and reconnaissance. For this reason, supporters refer to it as a multi-role fighter, while detractors call it 'an ugly mutt' or TLT: 'it doesn't do one thing or another thing; it does many things', F-35 chief test pilot Alan Norman commented. Previously, the F-35 was found to be 'substantially inferior' to a 40-year-old F-15 fighter jet with which it had skirmished – a leak confirmed by Lockheed. In response to the criticisms of the F-35 an un-named IDF air force official rhetorically asked The Times of Israel: 'this is a plane that can do things that no other planes can do. Are there challenges? Are there complexities? Or are they just labour pains? Israel has agreed to purchase 33 F-35 stealth fighters from Lockheed Martin, with the option of buying an additional 17.

NSM/HARPOON CRITICAL FOR PROVING LCS

Kongsberg's Naval Strike Missile (NSM) system will be installed on board USS FREEDOM (LCS 1) for a demonstration in 2016. USS CORONADO (LCS-4) will demonstrate Boeing's Harpoon missile while USS FREEDOM will demonstrate Kongsberg's NSM. The demonstrations will help the USN decide which Over The Horizon (OTH) weapon to incorporate onto its LCS and frigate fleets

ASW DRONE SHIP, SEA HUNTER, DEVELOPED BY USN

The US Navy has developed an experimental self-piloting, robotic ship designed to hunt for enemy submarines. The 40-metre-long unarmed prototype, named Sea Hunter, is designed to cruise on the ocean's surface for two or three months at a time – without a crew or anyone controlling it remotely.

Costing just \$AUD 26 Million) to build and \$AUD 30,000 a day to operate, makes it a cost effective alternative to crewed vessels.



The Sea Hunter, pilotless ASW ship - Photo by DARPA.

TO 'UCLASS OR CBAR', THAT IS THE QUESTION

U.S. Defence experts and senior politicians, including Senate Armed Services chairman John McCain and House sea power and projection forces subcommittee chairman, James Randy Forbes, want the UCLASS UAV to be a carrier-based stealth bomber.

The UCLASS's proposed successor, CBARS — the Carrier Based Aerial Refuelling System — will be lightly armed, according to Rear Adm. William Lescher — and unable to undertake long-range strike or reconnaissance into defended airspace. Its key missions will be refuelling manned aircraft; conducting intelligence, surveillance, reconnaissance, and targeting in permissive airspace; and conducting limited strike. At a quarter the cost of UCLASS (\$AUD 130M compared to \$AUD 500M), CBARS will also get UAVs (drones) onto carriers deck quicker and cheaper than UCLASS, 'precisely because it's much less technologically ambitious', according to Lescher.

PM ADMITS TO SOUTH CHINA SEA CONCERNS

Prime Minister, Malcolm Turnbull raised the subject of the South China Sea with China during recent discussions – as the U.S. stepped up its 'Exercise of Innocent Passage' (EIP) operations. There is a fundamental difference and worrying incoherence in the U.S. approach. Since EIP is a customary right under the norms of freedom of navigation, it is distinct from the Rights of Freedom of Navigation (RFON) provided for by the UN Convention on the Laws of the Sea (UNCLOS) – of which China is a signatory, but the U.S. is not. So, while the U.S. may be exercising its rights of innocent passage (in support of the norms), it is not doing so in terms of asserting Rights of Freedom of Navigation (RFON), under UNCLOS. This may appear immaterial but in terms of Coalition Rules of Engagement (RoE), while Australian or Allied RFON operations (Japan is also a signatory) may exercise rights established under UNLCOS, U.S. EIP Operations may not. China could legitimately argue that, in allowing RFON and denying EIP, it was simply upholding international law. Moreover, such an approach would make an attack on a U.S. unit, say, differentiable from an attack on an Allied vessel. This could pose a challenge providing for



Construction at the Fiery Cross Reef - Photo from Asia Maritime Transparency Initiative.

interoperable RoE, necessary to safeguard Force Protection of the whole (task group); rather than individual units.

Coincidentally, the U.S. announced that it was sending more troops and combat aircraft to the Philippines and will conduct more joint sea and air patrols with Philippine forces in the South China Sea.

Mr Turnbull indicated in his discussions with Chinese Premier Li Keqiang '[that they had] a very honest and open relationship as two leaders who can speak to each other candidly and frankly about all of these issues and of course many others as well'. Mr Turnbull, having previously admitted that 'China's actions in the disputed waters were counterproductive', reiterated Australia's clear position 'was all claimants should settle the disputes peacefully and in accordance with international law'. In other words, under UNCLOS. The Chinese Foreign Ministry response was to say that powers outside the region should not 'support a few countries in challenging China's sovereignty and security, inciting regional contradictions and sabotaging regional peace and stability' – in other words established under UNCLOS.

The fact that the U.S. is not a signatory to UNCLOS and China is, may be making the situation in the South China Sea less stable; while reinforcing the legitimacy of China's position over that of the U.S.

REBUKE FOR ADMIRAL HARRIS

The White House has sought to damp down a heated debate between senior officers, Pentagon advisers and the President by imposing a gag order on military leaders over the disputed South China Sea. Admiral Harry Harris USN, Pacific Commander (PACOM), was the intended recipient. Previously Admiral Harris has:

- Proposed a more confrontational approach to counter and reverse China's strategic gains in the South China Sea,
- Waged a persistent campaign in public and in private over the past several months to raise the profile of China's Great Wall of Sand 'before it extends within 140 miles from the Philippine's capital'.

- Pushed an aggressive plan to contest China's expanding island-building in the South China Sea.
- Lobbied the National Security Council, Capitol Hill and Pentagon leaders to send a clear message 'that they won't tolerate continued bullying of neighbours'.
- Stepped-up patrols and of the South China Sea like the one conducted by the carrier USS John C. Stennis (CVN-74) and her escorts in March 2016.

The approach may have been counterproductive, since PACOM must now gain the White House's permission for all EIP operations 'in close proximity to China's islands'. More significantly, analysts and legal experts argue that the patrols, to date, have been incoherent exactly 'because they have been conducted under the right of innocent passage' – giving 'tacit acknowledgment that China did in fact own the islands and were entitled to a 12-mile territorial sea around them'. During EIP operations, warships are not permitted to fly aircraft, illuminate anti-air systems or fire weapon systems — only to proceed directly from point 'A' to point 'B' – whereas, all these activities are permitted for RFON Operations in international waters.

At the same time, Admiral Harris appears to be pushing for more assertive freedom of navigation operations that include military operations such as helicopter flights and signals intelligence within 12 miles of Chinese-claimed features. Such patrols, unlike for EIP operations, would indicate that the U.S. does not acknowledge Chinese claims. In effect, Admiral Harris is signalling both the White House and the Senate indicating that he wants to undertake real Rights of Freedom of Navigation Operations, under UNCLOS. Echoing concerns, Jerry Hendrix, a retired USN Captain and defence strategy analyst with the Center for a New American Security, commented inter alia:

[Failure] to stop China's expansion in the South China Sea ... is only heightening the chance of getting into an armed confrontation. The Obama administration has tended to take the least confrontational path but in doing so they

created an environment where it's going to take a major shock to re-establish the international norms in the South China Sea. Ironically, they've made a situation where conflict is more instead of less likely.

AVOIDING WAR?

Politically, the U.S. and China have competing goals that come together forcibly in the South China Sea – with neither side yet willing to cede to the other. According to some analysts, China is not behaving according to the U.S. script. Admiral Harry Harris claims China has militarized the South China Sea, thus changing the 'operational nature of the area'. Political figures, academics and journalists have called for tougher actions by each side, forcing the respective political classes into a 'cocked hat'. Australian analyst Dr. Hugh White has cogently argued that the U.S. strategy in the South China Sea is failing. The U.S. assumes that it can increase pressure on China with relative impunity until China 'blinks and backs off'. China has so far not been cowed by U.S. diplomatic and military warnings, and shows of force. Instead it seems to be signalling by its actions – or those of some of its PLA / PLAN commanders – that it will risk a military confrontation to defend individual positions (and weaken those of President Xi Jinping). At the same time, China's essentially 'land-to-maritime' tactics look eerily familiar to the way in which the PLA seized the Yangtze in 1949 and defeated the Nationalists – except this time at sea. Dangerously, U.S. political wishes to avoid an escalation at all cost (appeasement even?) – may simply weaken President Xi's position further; while emboldening those forces opposed to him and making them push yet harder. This is where Australia can and should assist – post its elections – in providing a back door means by which the New U.S. President and President Jinping (assuming he is still in power by 2017) can negotiate discrete terms for 'network de-escalation'. The real danger is that interstitial pressures – both in the U.S. and China – will make such compromise increasingly difficult. Much criticised, the so-called lame duck 'Obama approach' suitably engaged may in fact provide some much needed space for reflection – while taking the foot off the escalatory pedal.

THAAD MISSILE SYSTEM MAY ESCALATE – NOT DETER

Shortly after North Korea's long-range rocket launch South Korean and U.S. military officials announced they would begin formal discussions on placing the Terminal High Altitude Area Defence System (THAAD) on North Korea's doorstep. Speaking to US Secretary of State John Kerry Chinese Foreign Minister Wang Yi expressed Beijing's opposition to the deployment of the THAAD systems, demanding 'the US side must act cautiously, not use the opportunity to harm China's security interests and not add a new complicating factor to regional peace and stability'. Wang also repeated China's stance that sanctions 'are not the aim' and that everyone should think of ways to restart talks on the North Korean nuclear issue.



The experimental X-47B drone lands on the USS ROOSEVELT (CVN-71).

KIM JONG DEMANDS NUCLEAR WEAPONS 'GO LIVE'

North Korean leader Kim Jong Un has ordered nuclear weapons to be readied for use, the state-controlled Korean Central News Agency (KCNA) reported. The shift in military posture would allow North Korea to carry out pre-emptive attacks, and deprive 'the enemies to sleep in peace till the moment they meet their final end in their land', KCNA reported, citing a speech by the country's leader, Kim Jong-un.

The statement, announced in an article about missile tests, followed the U.N. Security Council's unanimous approval Wednesday of tough new sanctions against North Korea in response to its recent nuclear and missile tests. The sanctions require North Korean cargo ships and aircraft to be inspected before entering and after leaving the recidivist country.

SINGAPORE-AUSTRALIAN TRAINING ACCORD

In a sign of growing inter-dependence and co-operation between fellow Pivot-Ally's (PAs), such as Japan, Malaysia, Singapore and Australia, Singapore will invest up to \$AUD 2.5 Billion on much needed military training facilities in Australia and increase its number of troops in the region from 6,000 to 14,000. The investment will double the capacity of its military training facilities in northern Australia under a new bilateral deal. The PM, Malcolm Turnbull, said that the investment should be seen as a natural development of a close strategic relationship between the two countries. The Singaporean military upgrade is part of a comprehensive strategic partnership pact agreed by Turnbull and his Singaporean counterpart, Prime Minister Lee Hsien Loong. It comes at a time when tension is rising in the disputed South China Sea. The two Allies will also enhance military personnel exchanges; initiate civilian personnel exchanges; and, strengthen intelligence and information sharing, such as counter-terrorism.

Under the agreement, Singapore will fund the cost of expanding the Shoalwater Bay Training Area and the Townsville Field Training Area in return it would gain expanded access to Australian military training areas over a period of 25 years.

CHINESE ROC NAVY EYEWITNESS AT D-DAY

A journal that could be the only surviving first-hand account of Chinese involvement in the Normandy landings in 1944 has been discovered in a rundown flat in Sai Ying Pun, Hong Kong. The diary of Lieutenant Commander Lam Ping-

yu, was one of 21 officers sent to Britain by China's then-Nationalist government in 1943 as they tried to rebuild China's naval forces following the Japanese invasion – according to history enthusiast Kelvin Hang Yun-kuen. A black notebook, believed to be from a diary Lam kept throughout his life, detailed his days at the Royal Naval College, Greenwich, as well as his observations on board HMS RAMILLIES (O7) when the Allies landed at Normandy in June 1944. In his entry on June 5, the day before the Normandy landing, Lam wrote:

In the morning, [we all] gathered at the hall of officers, and were briefed the details of the mission ... The objective is to cover the landing of ground forces and open the second front. At around 9pm, everyone was at their position, and was expected to arrive at the spot where we would bombard the shore. The minesweepers would clear the way for the fleet.

Later, describing his new friendships with Australian officers en route to Sydney, via Hong Kong, Lam wrote:

There are also quite a number of woman [Australian] officers I know, among them, I am closest to Eileen, who sometimes would mend clothes for me.

After the Communist takeover of China, Lam decided not to go to Taiwan like many of his contemporaries, probably out of fear of political persecution by a commander of a battleship of which the captain had defected (possibly HMS AURORA – PLAN Ship CHUNGKING, see The NAVY, APR-MAY 2016 VOLUME 78 No.2, pp. 28-30). Mr Hang further comments:

The [Chinese] Communist Party has always tried to paint a picture of the so-called "old society" as the origin of all evils. What I try to do is to restore the facts.

USMC CALLS FOR 'DISRUPTIVE THINKERS' TO FIX U.S. [MILITARY]

Commandant General. Robert Neller USMC has sought to identify disruptive thinkers – Marines who live outside the box, love to challenge the status quo, and are often viewed as trouble makers:

It's time they step up and speak out and it is time for leaders to listen.

The commandant is seeking a new age in which Marines are encouraged to come up with solutions, and leaders serve as advocates to accelerate those ideas to decision makers.

General Neller addressed the issue at an innovation symposium hosted by the Marine Corps

Warfighting Lab in February. USMC leadership is looking to bypass the bureaucracy and harness the cognitive, creative, innovative abilities of rank-and-file Marines. It could involve the development of new technology, or adoption/adaptation of a commercial technology. It may follow the example of one of the Corps' most famous trouble makers, General Holland Smith, the World War II military leader considered by many to be the father of modern amphibious warfare.

Lieutenant General Mike Dana USMC, Deputy Commandant for installations and logistics, called for innovative ways to deal with anti-access / area-denial (aka mines). While a high-end overmatch capability is needed, the three-star said simple things, such as a swarm of drones, are equally as important. He advocated the use of barges as sustainment lily pads, and the ability to convert commercial ships to military platforms along Versatile Modular System (VMS) designs – as the U.K. did during the Falklands war. He asked:

If the Marine Corps didn't exist, what would it look like if you had to form it?

Military historian Williamson Murray, the Ambassador Anthony D. Marshall Chair of Strategic Studies at Marine Corps University, believes the war colleges 'are strong indicators of how the culture of innovation has faded'. He described a time when innovation was embraced. Fleet exercises were followed by hot washes that included hundreds of officers who would watch admirals ruthlessly critique one another, and even invite the perspective of field grade officers. Murray pointed to people such as Admiral William Sims, who took a demotion to lead the Naval War College because it was the only agency looking at future of war; and Admiral Raymond Spruance, the 'Admiral's Admiral', who went from unprecedented successes in the Pacific during World War II to serve as President of the Naval War College.

Such commitment to innovation is not the attitude of today's military:

The lack of participation by the [US] Navy in its own war college is stunning, Murray said.

The Commandant went as far as ordering staff officers to challenge the status quo.

If you are not inquisitive as a staff officer, you are not doing your job...you are derelict in your duties.

SPAIN APES UK [AND US SUBMARINE] OFF GIBRALTAR

In a worrying sign of the disintegration of norms within the E.U. and between NATO Allies, the Captain of USS FLORIDA (SSGN-728) made it clear that if the Royal [British] Navy did not act to prevent a Spanish cutter blocking his [rights of] passage into Gibraltar, he would 'sort the situation out himself' – so forcing the CO of an RN Patrol Boat (HMS SABRE) to fire flares across the bow of the Spanish vessel. Later SABRE's CO concluded that 'if our patrol boat had not fired flares, there is no question...that [he] would have rammed the Spanish vessel'. It is unclear if the UK's tenuous global maritime position can sustain its pretence to places like Gibraltar and the Falkland Islands much longer. ■

DESIGNING AND BUILDING 21ST CENTURY AIRCRAFT CARRIERS

By John Jeremy

A new weapon, available in 1945, was to greatly influence the design of the post-war carrier. At that time, the atomic bomb weighed something like 5 tons and required an aircraft with a take-off weight of about 100,000 lbs (45 tons) to deliver it. Between 1945 and 1950 US carrier operations were refocussed from strategic strike to tactical strike as lighter atomic bombs and aircraft to deliver them became available. In the 1950s and 1960s, the large carrier design was revived, resulting in the construction of the Forrestal-class aircraft carrier of which eight were built, four of an improved design, all completed between 1955 and 1968. This paper examines the changing dynamics of building and designing Aircraft Carriers and its impact on 21st Century construction and capabilities.

OLD WARS: NEW DESIGNS

Larger carrier designs drove the development of the super carrier intended to be USS UNITED STATES. This design was notable in that the island superstructure was dispensed with – although this gave enormous problems with the disposal of funnel gasses which adversely affect flying operations. As the design proceeded the size of the ship grew and another restriction came into play – the size of available docks for her construction and later docking. As finally developed the ship had an overall length of 1,090 feet, a moulded beam of 130 feet and a flight deck beam of 190 feet. The ship was to be powered with steam turbines of 280,000 SHP for a speed of 33 knots. The first US carrier design with an armoured flight deck (CVA 58, as she was designated), was defeated by the development of heavy land-based bombers, and she was cancelled on 23 April 1949. The fact that the US already had a large number of new ships which were capable of modernisation was also a factor. [1]

The design of the Forrestal-class carriers owed much to the design of CVA 58 and incorporated the angled flight deck and steam catapult. The new ships had a full load displacement of 75,870 tons, an overall length of 1,039 feet, waterline beam of just-under 130 feet and a flight deck beam of 250 feet. They could carry about 70 aircraft, depending on the mix, and were designed to achieve 32 knots at 260,000 SHP. The complement comprised a crew of 2,641 and an air group of 1,675 for a total of 3,316. [2]

Today it would seem inevitable that nuclear power would be considered for these large aircraft carriers, but in the 1950s it was their escorts which

had priority. The first US nuclear aircraft carrier was USS ENTERPRISE, completed in October 1961. Her full load displacement was 85,480 tons with an overall length of 1,093 feet, waterline beam of 133 feet and extreme beam of 255 feet. She could carry about 70 aircraft of up to 80,000 lbs (36 tons), launched by four steam catapults. Enterprise was powered by eight reactors delivering 280,000 SHP for a speed of about 33 knots. Her total complement was 4,980 men. [3]

The value of nuclear power in these large ships was not really appreciated until a task force comprising ENTERPRISE, the nuclear cruiser LONG BEACH and the frigate BAINBRIDGE demonstrated the power-projection capability of the group by completing a round the world cruise in 1964 – it was during this voyage that ENTERPRISE visited Sydney.

These large and very costly ships are regarded by many as a vulnerable target, but there has been at least some evidence to prove just how tough they can be. Fire is an enormous risk in an aircraft carrier with large quantities of aviation fuel and munitions are being handled constantly and many important advances in fire-fighting technology have been developed in aircraft carriers. A major fire occurred in USS FORRESTAL in 1967 during operations off Vietnam. An aircraft started 'hot' – shooting a long tongue of flame into parked aircraft, setting off a missile and starting a chain reaction with bombs cooking off and blowing seven holes in the flight deck. The fire burned for 13 hours and left 134 dead and 64 injured. There was a similar fire in USS ENTERPRISE in January 1969. Bombs blew five holes in the flight deck, which sagged under the heat. Remarkably the ship was able to resume flying operations within four hours. [4]

SPIRAL IMPROVEMENTS

Between 1975 and 2009 the US completed ten nuclear carriers, the Nimitz class, but this design is now very old. Early this century design work was begun on a new class of carrier which would incorporate many new technologies and become the standard for construction into the 21st century. The design was generally based on the Nimitz-class hull but the ship is substantially a new design.

Improvements in the design of CVN 78 include new reactors and propulsion plant, an all-electric ship, a new, smaller island moved well aft to maximise space on the flight deck which is larger, electromagnetic catapults (EMALS) instead of steam catapults, advanced arresting gear which is lighter than the present system and software controlled to reduce wear and tear on aircraft, major internal rearrangement, electromagnetic weapons lifts and a manpower reduction of about 500 people. Other new technologies include dual band radar which helps to reduce the size of the island.



USS ENTERPRISE (CVN-65) burning, January 1969.



Artists Impression of USS JOHN F. KENNEDY (CVN-79).

CVN 78 will have about 2.5 times the electrical generation capacity of the Nimitz class and is planned to have a 25–33% increase in the daily sortie rate. Aircraft capacity will be similar to the earlier ships — about 75 aircraft.

The US Navy expects a reduction of the through-life maintenance cost of the new design ship of about \$4 billion. This is to be achieved by the elimination of steam-driven auxiliaries and steam service throughout the ship, fewer overall components — a third to half as many valves, the elimination of 70 sea chests, three instead of four aircraft elevators and two instead of three hangar bays. High-efficiency lighting will be fitted throughout the ship and the air-conditioning system will be improved. There will be one half-life refuelling and the ship is designed for a 43 month maintenance cycle with the interval between dry-docking periods extended to twelve years. [5] Considering that the life of the new ships is expected to be fifty years, the saving is surprisingly small.

All US aircraft carriers ordered since 1958 have been built by Newport News Shipbuilding at Newport Virginia. Now part of Huntington Ingalls Industries this is the only shipyard in the United States capable of building nuclear-powered aircraft carriers. The first order for CVN 78, now named GERALD R. FORD, was placed with NNS in May 2004 for detailed design, long lead procurement and advanced construction. Cutting of steel and fabrication began in August 2005 but the full construction order was not placed until September 2008. USS GERALD R. FORD was launched on 19 November 2013 and the first of the crew moved on board last year. She is expected to be delivered in September and commissioned by 2018. [6]

DEFENCE COSTS

The cost of these new carriers is very high. GERALD R. FORD is expected to cost about \$US13 billion, about 20–30 per cent more than originally expected. Much of the cost increase has been due to problems and delays with the new technology incorporated in the design. The cost in manhours is equally sobering. Ford is costing some 55.8 million manhours. The cost of maintenance of these nuclear-powered carriers is also staggering. USS DWIGHT D. EISENHOWER (CVN 69), the second oldest of the Nimitz-class carriers, completed a 23-month 'dry-docking planned incremental availability' on 28 August 2015. The workload, which grew by 50% during the availability, required about 10 million manhours to complete. [7] The mid-life refuelling and complex overhaul of USS ABRAHAM LINCOLN (CVN 72), expected to be completed in 2016, will have taken 44 months and consumed 23 million manhours. [8]

Not surprisingly the US Navy is under great political pressure to reduce the cost of these ships. At least two more Ford-class carriers will be built, USS JOHN F. KENNEDY (CVN 79) and USS ENTERPRISE (CVN 80) planned for delivery in 2023 and 2027 respectively. To meet US Congressional requirements for eleven carrier battle groups to be maintained further ships will need to be commissioned in 2032, 2037, and 2042 — and that is perhaps far enough to look ahead. Each ship will take about nine years to build. The keel of USS JOHN F. KENNEDY was laid on 22 August 2015. The other large 21st century aircraft carrier approaching completion at present is the largest ship ever built for the Royal Navy — HMS QUEEN ELIZABETH.

In 1952–53 some work was done to develop a new 55,000 ton carrier design for the Royal Navy more suitable to operate modern jet aircraft. First steps to acquire a new ship began in 1958, initially intended to replace VICTORIOUS, but by 1963 both VICTORIOUS and ARK ROYAL, with two further ships to replace HERMES and EAGLE in due course. By early 1963 a sketch design had been selected which was



Russian aircraft carrier ADMIRAL KUZNETSOV (CV 063-01).

developed into the final design by December 1965. [9]

CVA-01, as the ship was known, had a full load displacement of 54,000 tons and an overall length of 963 feet. Her waterline beam was 122 feet and the overall beam was a little over 231 feet. The flight deck was to be constructed of 1.25 inch thick QT 35, a high-strength notch-tough steel used for the pressure hull of nuclear submarines, and QT 35 was also used for the hangar deck and part of the longitudinal under-water protection scheme. The amount of QT 35 was reduced late in the design process to make the ship easier to build.

The final design was approved on 27 January 1966 but the project was cancelled on 14 February, just before the tender documents were to be issued. CVA-01 had incorporated many risky innovations and the project leader, Professor Louis Rydill, said in 1966 that 'cancellation was the happiest day in my life'.

British carrier aviation waned in the following years. After 1966 the carrier was seen more as a means of operating helicopters in an anti-submarine or commando carrier assault role. The successful development of a VSTOL aircraft, the remarkable Harrier, reprieved fixed-wing carrier aviation with the design and construction of the Invincible class, initially described as 'through-deck cruisers'. The first ship, HMS INVINCIBLE, was ordered in April 1973, although the decision to incorporate Harriers was not made until May 1975. The operational payload of the Harriers was greatly increased by the development of the ski-jump and the first was fitted to Invincible when she was completed in July 1980. [10]



CVA-01 Also to be named HMS QUEEN ELIZABETH (1965) Image RN.

ROYAL NAVY RE-BIRTH?

The British Strategic Defence Review of 1998 identified a requirement for two new aircraft carriers to replace INVINCIBLE, ILLUSTRIOUS and ARK ROYAL. A project team was established to develop and assess the various options for the new ships with the intention of placing a design and construction contract in 2008 with the ships to be completed in 2014 and 2016. Competitive industry studies were begun by BAE Systems and Thales in 1999. In 2001 the Joint Strike Fighter (now known as the F35 Lightning II) was selected and the options were reduced to catapult launch and arrested recovery (CV) or short take off vertical landing (STOVL) versions of the ship. [11]

The ships are being built by the Aircraft Carrier Alliance, which in 2005 comprised the UK Ministry of Defence, Babcock, BAE Systems, Thales UK and the VT Group. Later the VT Group sold its shipbuilding operations to BAE Systems and there are now four members of the ACA. By the time this project had begun, the British shipbuilding industry was even slimmer than that which was asked to consider building CVA-01. The only practical means of constructing the new carriers was for industry to share the work, with large sections of the ship, or modules, being constructed by the members of the alliance in Portsmouth, Glasgow, Appledore and Rosyth with the modules all being brought together in Rosyth for assembly and completion by Babcock.

The design finally accepted is a 65,000 ton ship with an overall length of 280 m (924 feet) and an overall beam of 70 m (231 feet) with a depth to the flight deck of 29 m (96 feet). The ship is designed to carry about 34 aircraft, a mix of F35Bs and Merlin helicopters with the ability to operate up to 40 aircraft for short periods of time. The 13,000 m² flight deck has a runway leading to a single ski-jump. There are two islands, an arrangement adopted for spatial consideration, survivability and sensor separation. The bridge is located in the forward island and FLYCO in the aft island, although there is some degree of interchangeability.

The carriers are the first British warship to be designed from the outset to Lloyds Naval Ship Rules with Lloyds commercial rules applied where appropriate to equipment. Defence standards apply only where essential for survivability, shock and self-defence, for example.

The design of these ships is particularly notable for their design for production and support. The hulls are divided into five vertical zones which are as autonomous as possible to maximise survivability and help the build strategy of assembly from super-blocks as fully fitted out as possible before assembly in the dock. Accommodation is modular to simplify installation and outfit.

The construction of the Queen Elizabeth class carriers has been

controversial, not least because they constitute an enormous proportion of Royal Navy expenditure and resources. In October 2010 the UK MOD decided to change the version of the F35 to be operated from the carriers to the catapult launched version, the F35C. The ships were, after all, designed with such a change in mind. However a considerable redesign of the ships was necessary to incorporate the US electromagnetic catapults and advanced arresting gear, both of which were suffering delays. In 2012 it was decided that the additional cost and delay was unacceptable and the project reverted to the original choice of aircraft. This indecision was expensive and added to the already substantial growth in the cost of the ships and their aircraft.

[12] When completed, the ships will also be able to operate a range of helicopters in a combined operations role, including Chinook and Apache helicopters and the V22 Osprey tilt rotor aircraft.

The first of the carriers, HMS QUEEN ELIZABETH was launched on 4 July 2014. She is expected to be commissioned in May 2017 (three years late) and achieve full operational capability in 2020. The assembly of HMS PRINCE OF WALES is already well advanced and the work is benefitting from the experience with the first ship. She is expected to be completed in 2020 (four years late). The delays and indecision surrounding this project have resulted in considerable cost growth. From an original estimate of £4,085 million in 2007, the cost had risen by 2013 to £6,200 million (about \$10.3 billion). It is realistic to expect that it will rise further before both ships are operational.

FUTURE DESIGNS

It seems inevitable that the construction and operation of the modern attack aircraft carrier is to become the privilege of a select few wealthy nations. In May 2001 France commissioned the nuclear-powered aircraft carrier CHARLES DE GAULLE, a 43,000 ton carrier with the capacity for about 40 aircraft. Designed in the 1980s, CHARLES DE GAULLE was ordered in February 1986, but her construction was delayed by budget cuts and design changes. A second carrier, PA 2, was included in the 2003–08 French defence plan and in 2004 it was announced that the ship was to be built in cooperation with the British programme. Since then a decision to proceed with the ship has been deferred, and it now seems likely that the planned ship may ultimately be built to replace CHARLES DE GAULLE at the end of her service life in the 2040s. Studies for a new ship are, however, continuing.

Russia operates one 59,000 ton aircraft carrier, ADMIRAL KUZNETSOV, completed in 1990. There are plans for a new class, but funding is a problem and any new ships seem a long way off.

China, meanwhile, is learning how to operate a carrier with a Kuznetsov-class ship purchased incomplete from Russia. LIAONING was commissioned in 2012 and China has plans to build a Chinese-designed carrier for completion about 2025.

India has ambitious aircraft carrier plans for its navy. Having operated two British built ships for many years, India acquired a carrier from Russia which was completed in 2013 — the ship had been under construction since 1978. A 40,000 ton Indian designed and built carrier, INS VIKRANT, was recently launched for completion by 2018. All these ships have depended on STOVL aircraft but design work has started on a 65,000



NUSHIP QUEEN ELIZABETH (R08)
IN Build Rosyth Harbour, 2014.

ton carrier with catapult-assisted-take-off and arrested recovery capable of carrying around 35 fighters and 20 helicopters (although perhaps not all at once). India has approached defence firms in Britain, France, Russia and the United States for assistance with the design of VISHAL and nuclear propulsion is being considered. Russian assistance is said to be favoured. As no Indian shipbuilder has the capacity to build such a ship at present, construction may be some way off.

If one looks beyond the larger fixed-wing aircraft carriers, there are many ships in the world's navies which are capable of operating aircraft. They include ships like the US Navy's recently-commissioned amphibious assault ship USS AMERICA (LHA 6). In addition to helicopters, this 45,000 ton ship can operate and support the MV22 Osprey and up to 23 F35B STOVL aircraft.

On 27 August 2015 Japan launched the second of a new class of helicopter carrier (classified as a destroyer in Japan). KAGA displaces 24,000 tons at full load and in 2017 will join her sister ship IZUMO, completed in March 2015, as one largest ships in the Japanese navy. Two similar, but smaller, ships were commissioned in 2009 and 2011. KAGA and IZUMO have the potential to operate F35Bs but Japan has no plans at present to do so.

In 2007 Korea completed DOKDO, an amphibious ship of 19,000 tons with the capability of operating ten helicopters. As second ship, MARADO, has been funded and it has been suggested that this ship might be fitted with a ski-jump to enable her to operate VSTOL aircraft.

Of course, we must not forget our own ships — HMAS CANBERRA and HMAS ADELAIDE. Whilst these ships are intended only to operate helicopters in RAN service, the ship on which they are based, the Spanish JUAN CARLOS I, is operated by the Spanish Navy as an aircraft carrier with Harriers at present but with the capability to operate F35Bs in future.

UN-CREWED FUTURES?

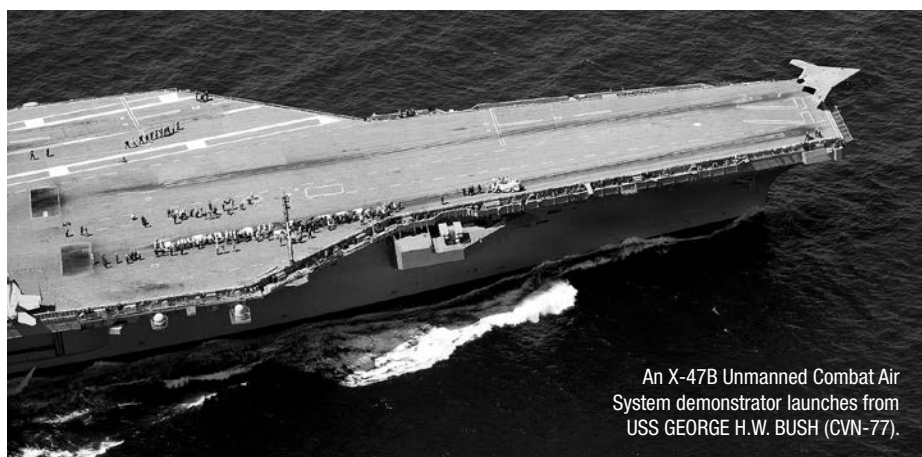
One type of aircraft which is developing rapidly today is the unmanned aerial vehicle or UAV. They have been around for a long while — remember the Australian target drone Jindivik which first flew in 1952 — but today they come in many sizes and are capable of many roles from surveillance to attack. The US Navy recently completed trials with a demonstration unmanned combat air vehicle, the Northrop Grumman X-47B. This aircraft was capable of semi-autonomous operation from a conventional aircraft carrier. Further development of this concept has been deferred in favour of an unmanned airborne refuelling aircraft.

Not all UAVs of the future will be so large and complex. Many will be capable of launching from small ships and the equipment required can be quite simple. Recovery

is a much greater challenge. Rotary wing UAVs can easily operate from existing flight decks but the recovery of fixed wing UAVs by small ships at present is either by ditching or the use of some form of crash barrier. This is an interesting challenge for warship designers in the near future.

Another major challenge for warship designers is how to contain the enormous cost and lead time for the modern aircraft carrier. In 1982 the US Navy developed a portable, modular aviation facility for installation on container ships, known as project ARAPAHO. Sea testing was carried out in late 1982 but by then the concept had been tried in anger by Britain during the Falklands War earlier that year. The rapid conversion of commercial ships proved invaluable but also demonstrated the vulnerability of such conversions when ATLANTIC CONVEYOR was destroyed by two Exocet missiles on 25 May 1982 together with all the aircraft remaining on board at the time.

As today's aircraft carriers are designed for lives up to half a century, perhaps the greatest challenge for the warship designer is to design ships to operate payloads which are not yet even the gleam in anyone's eye, decades into the future. ■



An X-47B Unmanned Combat Air
System demonstrator launches from
USS GEORGE H.W. BUSH (CVN-77).

FOOT NOTES / REFERENCES

1. Friedman, N. (1983), U. S. Aircraft Carriers — *An Illustrated Design History*, United States Naval Institute, Annapolis, pp. 239–253.
2. Ibid, p. 397
3. Ibid, p. 398
4. Ibid, p. 236
5. nns.huntingtoningalls.com/products/ford/tech, accessed on 28 August 2015
6. O'Rourke, R. (2015), *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, Congressional Research Service, 12 June 2015
7. US Navy Press Release NNS150828-06, 28 August 2015
8. Huntington Ingalls Industries press release dated 27 August 2015
9. Sturton, I. (2014), 'CVA-01: Portrait of a Missing Link', *Warship 2014*, Conway, London, pp. 29–48
10. Friedman, N. (1988), *British Carrier Aviation*, p. 352
11. Knight, S. (2009), *The Design of HMS Queen Elizabeth and HMS Prince of Wales*, presented at the Warship 2009 — Airpower at Sea Conference, organised by the Royal Institution of Naval Architects, London
12. House of Commons Committee of Public Accounts (2013), *Carrier Strike: the 2012 Reversion Decision*, Eighteenth Report of Session 2013–14, The Stationery Office, London

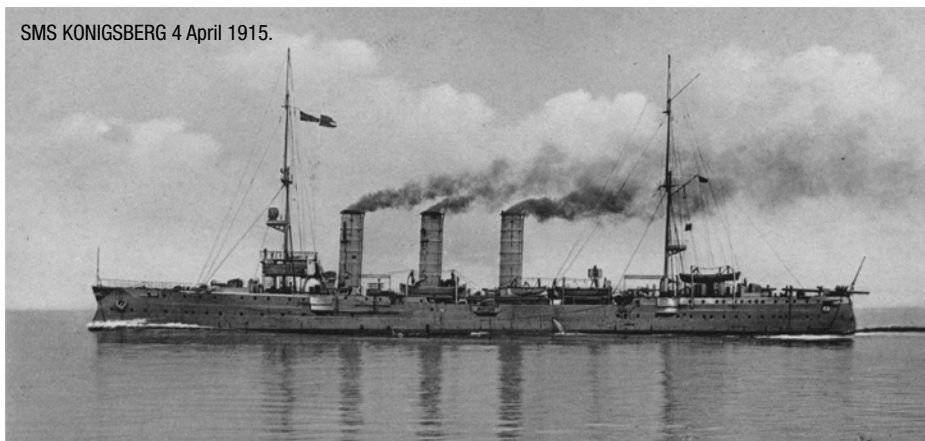


THE PROBLEM OF THE KONIGSBERG

By David Rees

In 1915 a short but brutal engagement in Zanzibar Harbour between SMS KONIGSBERG of the German Navy's East Africa Squadron and HMS PEGASUS of the RN's Cape Squadron ended with the comprehensive defeat of HMS PEGASUS. The action is not well known but the factors that led to the battle and the events afterwards demonstrate much about the broader strategic and material issues facing the German and British navies at the beginning of World War 1.

SMS KONIGSBERG 4 April 1915.



BACKGROUND

The Royal Navy (RN) and German Navy (the Kaiserliche Marine) developed from different historical traditions. The RN was the product of long term need; Great Britain could not have maintained its empire or its own security without a powerful navy. In 1914 the British Isles were a net exporter of manufactured goods and a net importer of food, which meant that Britain was vulnerable to blockade [1].

By way of contrast, the Kaiserliche Marine was the product of a fairly recent combination of strategic thinking (notably that of Thomas Mahan, who placed great emphasis on the need for empires and a blue water navy to defend them) and the working of several personalities (notably Kaiser Wilhelm and Admiral von Tirpitz) who for various reasons (including personal ambition on the part of Tirpitz and a desire to potentially challenge or at least profoundly inconvenience Britain on the part of the Kaiser) decided that Germany needed a substantial blue water navy.

The Kaiser had a considerable interest in both a German empire and in the cruisers that would be needed to patrol it, but Tirpitz (a very determined personality with a more fixed emphasis on challenging or intimidating the RN and a desire to lead a physically imposing navy) pushed for battleships/dreadnoughts and his views tended to prevail.

Arguably the Kaiserliche Marine was not greatly needed in the genuine strategic sense; it did little to preserve Germany's territorial integrity (which was the responsibility of the considerably more prestigious German Army). In theory it could have had a role in protecting Germany's overseas empire, which by 1914 had outposts in places like China, the Pacific and both East and West Africa, but in practical terms this empire was small, of very doubtful economic value and fundamentally indefensible in the long term against the far more powerful RN. In a sense the Kaiserliche Marine had limited strategic responsibility, was more expendable, and so could (at least in theory) take greater risk. As a newer force its ships tended to be more modern

than their British counterparts and sometimes incorporated more up to date technology.

The RN was in a very different position. It had considerable practical responsibilities i.e. protecting a world-wide maritime empire as well as the defence of the British Isles. To accomplish these missions in 1914 it had to balance a number of factors. The RN had to maintain sufficient resources to contain/defeat the German High Seas Fleet in the North Sea, while at the same time deploy sufficient resources to overseas stations to protect British and imperial trade and interests, which were vital to the British economy.

So the RN had to cover a lot of territory. Thus

although it was substantially larger than its German counterpart, it was under far greater pressure to perform and any failure was likely to have profound consequences. As a consequence it was in some ways less flexible and more vulnerable to finding itself both over-committed and under-represented in any one area.

STRATEGY AND DEPLOYMENTS AT THE OUTBREAK OF WAR

The strategy behind British ship deployment has been the subject of considerable debate, between those who believe that (as a result of Admiral Fisher's concerns over German naval expansion) the RN completely changed its strategic focus from Empire to the Atlantic, and those who suggest this alignment of focus has been exaggerated. Concluding that Fisher pressed for greater naval construction because he wanted to maintain Britain's shipbuilding industry, rather than any great concern over German behaviour and that British naval deployment balanced imperial and colonial commitments [2].

Lack of documentation may ensure that this dispute is never completely resolved but the evidence shows that, by 1914, the vast majority of RN capital ships were based in the UK. Whatever Fisher's motivation with regard to some of his actions, he had a very substantial impact on the organisation and material of the RN. By 1914, the material focus of the RN, much of it gathered in units such as the Grand Fleet, was tilted heavily against the German High Seas Fleet and many older warships that had been part of colonial squadrons had been scrapped or mothballed. Both navies had a strong emphasis on European waters. Nevertheless, both navies, particularly the RN, also maintained substantial forces overseas. The RN had a considerable number of overseas stations, although many of them were small and the warships based at them were often old. The RN's overseas stations included the West Indies, the Coast of America, the East Indies and

the Cape (which at the outbreak of war included one armoured cruiser, three cruisers and two armed merchant cruisers under the command of Rear Admiral Herbert King-Hall) [3].

The Kaiserliche Marine had a relatively small number of overseas stations in areas such as East Asia and East and West Africa, and had also established "etappen" i.e. naval organisational and communication centres/coal stations headed by a German naval officer that were based in major cities. At the outbreak of war the KONIGSBERG was the major German warship on the East Africa Station, which was headquartered at Dar es Salaam, then the capital of German East Africa (later to become British Tanganyika and then Tanzania). Under the command of Fregatenskapitan Max Von Loeff she arrived in Das es Salaam in July 1914.

THE CRUISE OF THE KONIGSBERG

In late July 1914 Loeff received orders via telegraph that in the event of war he should put to sea and await further instructions. When the Cape Squadron in the form of HMS HYACINTH, HMS ASTAEA and HMS PEGASUS arrived of Das es Salaam with the intention of blockading Konigsberg she was in fact already at sea. Loeff had received warning via a German merchantman that the British squadron was on its way. All the British ships were slower and older than the KONIGSBERG, and only the HYACINTH had a theoretically heavier main armament than KONIGSBERG (KONIGSBERG's guns were far more modern than the HYACINTH's which both slow loading and slow firing). In the event KONIGSBERG outran the British squadron and headed towards Aden, a port where there was a heavy concentration of British steamer traffic and thus a huge number of potential targets. On 5 August KONIGSBERG was informed via wireless to commence operations against France, Russia and Great Britain. Loeff's main aims were to firstly destroy British shipping and secondly to take up as much of the RN's resources as possible.

On 6 August KONIGSBERG made its first (and only) merchant capture. The British tramp City of Winchester was carrying coal, which was always extremely useful to German raiders, particularly warships who consumed a great deal of it. Unfortunately for the KONIGSBERG the coal in question turned out to be of inferior quality and not really suitable for a warship's engines; poor quality coal caused warships to produce large quantities of smoke and in the long term damaged their boilers. In the short term German merchantmen in the area could perhaps provide some high-grade coal, but such ships were increasingly at risk of capture by the RN. The availability of high grade coal would be the Achilles heel of German raiders, and warships were the most vulnerable because of their high rate of consumption.

As a result of the taking of the City of Winchester the RN either halted or temporarily rerouted merchant traffic around Aden, so for days after her one capture the KONIGSBERG cruised in vain. The RN could not necessarily halt or reroute traffic indefinitely (at least not economically) but in this case it could do so long enough to frustrate the Konigsberg, whose ability to operate with coaling and repair work was limited. KONIGSBERG sailed toward Madagascar with the hope of attacking French shipping but the French had done the same thing.

By 30 August the KONIGSBERG was in need of both coal and boiler repairs, as well as more food. Dar es Salaam was the most obvious location, but since he had been away from the East African for some weeks Loeff was unsure whether the port and the areas around it were still in German hands. So instead he took his ship to the Rufiji Delta which he believed would be a good location to make repairs. The KONIGSBERG's draught allowed her to enter the Delta at low

tide, and she could both enter and leave the delta via a number of routes. By 19 September the KONIGSBERG, with the assistance of the German collier Somali which had accompanied the KONIGSBERG into the Delta, was operational.

On 19 September KONIGSBERG received a signal stating that a two funnelled warship had entered Zanzibar Harbour, about 96 kms from Dar es Salaam. The warship could only be British and Loeff was sure that the Konigsberg could deal with any single British warship likely to be in the area. So he decided to launch a raid on Zanzibar Harbour while he faced only one opponent.

The warship in question was in fact the PEGASUS. During the course of September the units of the Cape Squadron had dispersed on various duties, including convoy protection and guarding against the entry of Admiral Von Spee's Far East Squadron into the Indian Ocean. PEGASUS was suffering from boiler trouble and so put into Zanzibar Harbour for repairs. The ship's gun crews remained at action stations but all the boilers were stripped down. King-Hall had ordered his captains to maintain sufficient steam to run at least one engine, but Ingles was aware of his vulnerability should KONIGSBERG appear and so was in a hurry to finish boiler repairs. He took a risk which in the end did not pay off.

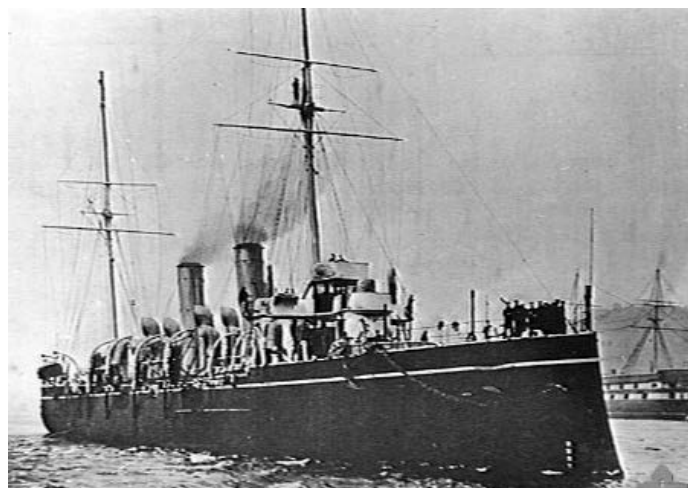
THE BATTLE OF ZANZIBAR

The two eventual protagonists in the Battle of Zanzibar were on the surface not totally dissimilar ships.

The PEGASUS was a Pelorus class armoured cruiser launched in 1899. The Pelorus class ships were never impressive but were still serving in 1914 because of the RN's need for ships. Her most powerful weapons were eight four inch quick firing guns and her top speed was (at best) 20 knots.

The KONIGSBERG, was a substantially newer and bigger ship and was the lead ship of the Konigsberg class. She was laid down in 1906 and had an armament of ten 4.1 inch guns, which were far more modern than those of her British adversaries. Her top speed was 24 knots.

At 04.30 on 20 September KONIGSBERG entered Zanzibar Harbour after evading an armed tug that was on picket duty. She opened fire on the stationary PEGASUS at 05:21 and hit her with the third salvo. The PEGASUS had no steam in her boilers and was incapable of movement. Her fire control, first lieutenant and gunnery officer were all destroyed or killed early in the battle and her return fire was ineffectual. Pegasus was hit at least 60 times. The battle was over by 05:37. The PEGASUS was a total wreck, although her captain was still alive. The KONIGSBERG returned to the Rufiji delta after damaging the



HMS PEGASUS (VI) 1897 Third Class Protected Cruiser sunk 1914 Battle of Zanzibar.



Rear Admiral Herbert Goodenough King-Hall RN National Portrait Gallery London.

wireless station. However, the cable station in Zanzibar, which was not damaged in the raid, immediately started broadcasting details of what had happened. Furthermore, KONIGSBERG had entered the harbour at high speed and in doing had placed further strain on her boilers, which as a consequence needed more repair.

PEGASUS suffered 38 killed and 55 wounded, and she was never repaired. She was left with only her masts showing above the water. Some of her guns were salvaged for use by British land forces. Her wreck was finally sold in 1955, but parts of the ship still lie on the bottom of the harbour.

THE KONIGSBERG CONTINUES THE FIGHT

However, the KONIGSBERG was still very much operational and would go on to cause the RN great frustration. She returned to the Rufiji Delta before the RN could intercept her. The sinking of the PEGASUS (plus the depredations of the German light cruiser SMS EMDEN) shocked Winston Churchill, the First Lord of the Admiralty, who instructed the RN to make the destruction of the KONIGSBERG a priority. In the end over twenty British warships were involved in operations against the KONIGSBERG, including the battleship HMS GOLIATH flying the flag of Rear Admiral King-Hall, which was later sunk at the Dardanelles. Like the KONIGSBERG herself, the RN warships found the operating conditions very difficult, with mud causing damage to ship's boilers at an alarming rate.

By capturing German merchant ships which were still at large and examining documents and charts, the RN soon determined where the

KONIGSBERG was hiding. On 30 October the RN began a blockade of the Delta. It deployed a number of modern cruisers to the area, including the Town class cruisers HMS CHATHAM, HMS DARTMOUTH and HMS WEYMOUTH, although not all of them remained on station at any one time. All of them had too deep a draught to enter the Delta to any great distance. One British warship managed to sink the Somali. In response the KONIGSBERG moved further up the Delta, took down her top masts so they could not be used as aiming points, covered the bow and stern with foliage and deployed crews with machine guns and a torpedo tube to keep the British at bay. They also set field guns and signalling stations to keep themselves informed regarding the movements of the British ships.

In effect the Germans fortified the Delta and managed to stand off several land attacks by British forces deployed from the British ships. Loeff also organised for damaged equipment from the Konigsberg to be transferred overland to Dar es Salaam for repair. Local German planters, who were acting as military officers, plus indigenous Askari forces loyal to Germany, provided further support. This local German force was designated as the Delta Force by Lieutenant-Colonel von Lettow-Vorbeck, the military commander of the German East African colony.

The RN was determined to destroy the KONIGSBERG and deployed aircraft to spy on her movements, a considerable innovation at the time. By way of response Loeff and his crew showed ingenuity in dealing with this threat; they managed to convert 2 guns to anti-aircraft use and shot three British aircraft down. But the Germans also lost heavily. On 14 April 1915 the supply ship Rubens was sent from Germany to resupply KONIGSBERG but she was intercepted and sunk by the HMS HYACINTH; some of her supplies were saved and later used by German forces in East Africa but not of them reached the KONIGSBERG.

Finally in July 1915 two British monitors carrying 6 inch guns entered the Delta. It took a month for the British ships to plan their attack. The



Frigatten Kapitan Max Von Loeff KM.

Wreck of SMS KONIGSBERG Rufiji Delta.



KONIGSBERG used spotting parties to ascertain their positions and then engaged and damaged them both, but in the end KONIGSBERG herself was critically hit. The ship was cannibalised for spare parts and as many of her weapons as possible (including all ten of her main guns, which were repaired in Dar es Salaam and converted into field pieces) were given to the German colonial forces in East Africa. KONIGSBERG was then scuttled and her crew served with German forces until the end of the war as the Konigsberg Detachment [4].

In 1924 John Inglis, the former commanding officer of the PEGASUS bought the salvage rights to KONIGSBERG's wreck. He then sold the rights and salvage work continued until 1965; in 1966 the wreck collapsed. KONIGSBERG still lies in the Rufiji Delta, although today no part of her is visible above water. The wreck of the Somali is still visible and the site can be visited by tourists.

CONCLUSIONS

The passing of the KONIGSBERG marked the end of the German warship raiders. The RN invested huge resources in destroying her, for as much political as practical reasons. One alternative would have been to simply maintain the blockade of the Delta until the KONIGSBERG fell apart but the embarrassment caused by the KONIGSBERG made this unlikely.

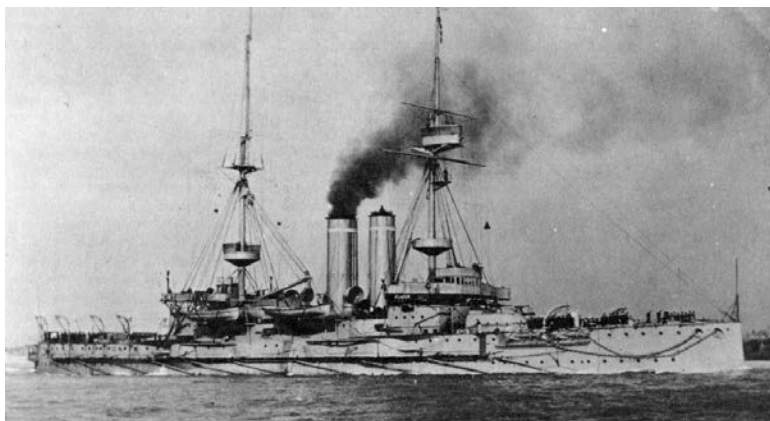
The experiences of the KONIGSBERG demonstrate both the tactical strengths and strategic weaknesses of the Kaiserliche Marine. In terms of material, the Kaiserliche Marine was often superior to the Royal Navy (at least in part because many of its ships were newer). Tactically the Kaiserliche Marine was at least the equal of the RN and its gunnery was often superior. So the KONIGSBERG was more than a match for any ships of the RN's Cape Squadron who opposed her and she could also outrun them, but their presence (as a group) was enough to potentially drive her from an area. In the short term she caused the RN a great deal of trouble, sinking an elderly British protected cruiser and then (probably more importantly) taking up the time of a large number of more powerful and more valuable British warships. Throughout the siege of the Delta the RN had to ensure that enough British ships

remained on station to defeat the KONIGSBERG, which meant that many of the British ships were at risk if they remained near the Delta on their own.

Strategically however in the long term the KONIGSBERG did the RN and British maritime trade little harm. She sank only one merchantman and for much of her career was physically contained in the Rufiji Delta by the RN's superior resources, during which time she was no threat to merchant trade. Although she was an annoyance, the RN ultimately had the resources to deal with KONIGSBERG and ships like her.

The experiences of the German raiders in the opening years of the First World War suggest that the Kaiserliche Marine suffered from a broad lack of direction. A substantial amount of resources was invested in the German High Seas Fleet, which was never likely to defeat the British Grand Fleet unless the Admiralty badly mismanaged the situation. A much smaller investment was made in cruiser warfare; the investment was nowhere near enough to pose a serious long term problem for the RN, although German cruisers certainly caused great aggravation from 1914 to 1915.

The cruisers themselves had severe limitations as merchant raiders. They were fast and relatively heavily armed, but their coal consumption was high even under the best circumstances and the coal they needed was specialised and difficult to obtain. If German warships ran low on coal, they even faced the issue of not having enough power to distil drinking water. As German ports fell to British forces German raiders were forced to rely on German colliers and German merchant ships, which were naturally preyed on by British warships. Thus the colliers were a rapidly dwindling resource. The German warships were technically advanced which made them impressive but also complicated to maintain mechanically.



HMS GOLIATH (IV) 1898 sunk by the Turkish torpedo boat MUA VENET-I-MILLIYE in 1915.

In the end it came down to numbers. The Germans had too few raiders and insufficient infrastructure to support their operations. Although individual British warships were vulnerable to more modern German warships, the size and resources of the RN (including the availability of friendly ports and coaling stations) made it very unlikely the Germans would prevail. ■

FOOT NOTES:

1. Walter J *The Kaiser's Pirates: German Surface Raiders in World War One* Arms and Armour Press London 1994 p 27.
2. Lambert Nicholas *Sir John Fisher's Naval Revolution* University of South Carolina Press 1999 pp 97ff.
3. O'Hara Vincent, Dickson David W and Worth Richard: *To Crown The Waves: The Great Navies of the First World War* Naval Institute Press Annapolis Maryland 2013 p 137.
4. Staff G *Battle on the Seven Seas: German Cruisers Battles 1914-1918* Pen and Sword Maritime Great Britain 2011, Hoyt EP *The Germans Who Never Lost: The Story of the Konigsberg* Funk and Wagnalls New 1968, and Walter for a general account of the Konigsberg's career.

FURTHER READING

- Hoyt EP *The Germans Who Never Lost: The Story of the Konigsberg* Funk and Wagnalls New York 1968
 Lambert N: *Sir John Fisher's Naval Revolution* University of South Carolina Press 1994
 O'Hara Vincent, Dickson David W and Worth Richard: *To Crown The Waves: The Great Navies of the First World War* Naval Institute Press, Annapolis Maryland 2013
 Paice E: *Tip and Run: The Untold Tragedy of the Great War in Africa* Weidenfeld and Nicholson London 2007
 Gary Staff: *Battle on the Seven Seas: German Cruiser Battle 1914-1918* Pen and Sword Maritime Great Britain 2011
 Walter, John *The Kaiser's Pirates: German Surface Raiders in World War One*, Arms and Armour Press, London 1994



THE NAVY LEAGUE OF AUSTRALIA TENTH ANNUAL MARITIME AFFAIRS ESSAY COMPETITION 2016

The Navy League of Australia is holding the eighth maritime essay competition and invites entries on either of the following topics:

TOPICS

- 21st Century Naval Warfare
- Australian Naval History
- Australian Industrial Maritime Strategy (AIMS)

CATEGORIES

A first, second and third prize will be awarded in each of two categories:

Professional, which covers Journalists, Defence Officials, Academics, Naval Personnel and previous contributors to *THE NAVY*; and

Non-Professional for those not falling into the Professional category.

Essays should be 2,500-3,000 words in length and will be judged on accuracy, content and structure.

PRIZES

- \$1,000, \$500 and \$250 (Professional category)
- \$500, \$200 and \$150 (Non-Professional category)

DEADLINE

Saturday 27 August 2016

Prize-winners announced in the January-March 2016 issue of *THE NAVY*.

Essays should be submitted either in Microsoft Word format on disk and posted to:

Navy League Essay Competition
Box 1719 GPO, SYDNEY NSW 2001

or emailed to editorthenavy@hotmail.com

Submissions should include the writer's name, address, telephone and email contacts, and the nominated entry category.

THE NAVY reserves the right to reprint all essays in the magazine, together with the right to edit them as considered appropriate for publication.



STATEMENT OF POLICY

For the maintenance of the Maritime wellbeing of the nation.

CURRENT AS AT 1 JANUARY 2016

The Navy League is intent upon keeping before the Australian people the fact that we are a maritime nation and that a strong Navy and capable maritime industry are elements of our national wellbeing and vital to the freedom of Australia. The League seeks to promote Defence self reliance by actively supporting defence manufacturing, and the shipping and transport industries.

The strategic background to Australia's security is changing and in many respects has become less certain. The League believes that Australia should pursue the capability to defend itself, paying particular attention to maritime defence. Through geographical necessity Australia's prosperity, strength, and safety depend to a great extent upon the security of the surrounding seas and island areas, and on unrestricted seaborne trade.

The Navy League:

- Believes Australia can be defended against attack by other than a major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication with our allies.
- Supports a continuing strong alliance with the US.
- Supports close relationships with all nations in our general area and particularly New Zealand, PNG and the island States of the South Pacific.
- Advocates the acquisition of the most capable modern armaments, surveillance systems and sensors to ensure that the ADF maintains technological advantage over forces in our general area.
- Advocates a significant deterrent element in ADF capability enabling powerful retaliation at significant distances from our shores.
- Believes the ADF must be capable of protecting commercial shipping both within Australian waters and beyond, recognising that this means in conjunction with allies and economic partners.
- Endorses the control of coastal surveillance by the ADF, and the development of the capability for the patrol and surveillance of all of Australia's ocean areas, its island territories and the Southern Ocean.
- Welcomes Government initiatives concerning the recovery of an Australian commercial fleet capable of supporting the ADF and the carriage of essential cargoes to and from Australia in times of conflict.
- Strongly supports the acquisition of large, long range and endurance, fast submarines and notes the deterrent value, reliability and huge operational advantages of nuclear powered submarines and their value in training anti-submarine forces.
- Notes the potential combat effectiveness and flexibility of the STOVL version of the Joint Strike Fighter (F35 Lightning II) and supports further examination of its application within the ADF.
- In order to mitigate any industry capability gap following the completion of the Air Warfare Destroyer program, recommends bringing forward the start date of the planned future frigate program.
- Urges that decisions to enhance the strength and capabilities of the Army and Air Force, and to greatly improve the weaponry, and the intelligence, surveillance, reconnaissance, cyberspace and electronic warfare capabilities of the ADF, be implemented.
- Supports the development of Australia's defence industry, including strong research and design organisations capable of the construction and maintenance of all warships, submarines and support vessels in the Navy's order of battle, and recognises the fundamental importance of a stable and continuous shipbuilding program for the retention of design and building skills and the avoidance of costly start up overheads.
- Supports the efforts by Navy to rebuild the engineering capability to ensure the effective maintenance and sustainability of the fleet.
- Advocates the retention in preservation (maintained reserve) of operationally capable ships that are required to be paid off for resource or other economic reasons.
- Supports a strong Naval Reserve and Australian Navy Cadets organisation.
- Advocates a strong focus on conditions of service as an effective means of combating recruitment and retention difficulties.

As to the RAN, the League, while noting the vital national peacetime tasks conducted by Navy, including border protection, flag showing/diplomacy, disaster relief, maritime rescue, hydrography and aid to the civil power:

- Supports the concept of a Navy capable of effective action in war off both the east and west coasts simultaneously and advocates a gradual build-up of the fleet and its afloat support elements to ensure that, in conjunction with the RAAF, this can be sustained against any force which could be deployed in our general area.
- Welcomes the announced increase in Defence expenditure to 2% of GDP over the next 10 years.
- Considers that the level of both the offensive and defensive capabilities of the RAN should be strengthened, in particular with an increased number of new frigates to replace the Anzac Class, noting that these vessels will be our main escort forces in the middle of this century in a very different world.

The League:

- Calls for a bipartisan political approach to national defence with a commitment to a steady long-term build-up in Australia's defence capability including the required industrial infrastructure.
- While recognising budgetary constraints believes that, given leadership by successive governments, Australia can defend itself in the longer term, within acceptable financial, economic and manpower parameters.



HATCH: Launch of JDS KAGA (DDH-184) classified as a Helicopter Destroyer due to commission in 2017.



DISPATCH: HMA Ships BALIKPAN (L126), WEWAK (L130) and BETANO (L133) transferred to the Philippines Navy, March 2016.

The West's Two Nuclear Power Projection Powers (France and U.S.) - USS ABRAHAM LINCOLN (CVN-72) and FS CHARLES De GAULLE (R91) also built by DCNS.

