BOOK REVIEWS

CUYVERS, Luc. *Sea Power. A Global Journey.* Airlife Publishing 1994. 247 pages, generously illustrated. ISBN 0 87021 3164. Price £17.95.
(reviewed by Bryan PEARSON, RCNC)

The author hails from Antwerp and is described as a writer, photographer and film producer specializing in marine issues. The title is misleading since the real subject matter is the development of maritime commerce and sea power. Each of six chapters is dedicated to a ship type in which the author has taken passage, ranging from a Japanese ocean research ship, through Norwegian cruise liner to US aircraft carrier. The style involves an interweaving of contemporary narrative with historical parallels and precedents, and a tendency to journalistic assertion.

Thus:

> 'the Minoans of Crete . . . well placed to service the trade routes between the rest of the Mediterranean . . . were far more capable sailors than the Egyptians . . . who were never a seafaring nation in the first place.'

Later we are informed that:

> 'we do not know much about Crete's early inhabitants . . . since we cannot decipher their writing'

The distribution of Minoan pottery around the Mediterranean apparently provides sufficient evidence that they, rather than one of their trading partners, became 'the first sea power worthy of that designation', and remained so until around 1500BC.

Apparently, 'few Arabs feel comfortable at sea' yet, we are told, they had been undertaking the coastal trip to India since the first century AD and eventually reached China in 787AD, a route they sailed for much of the ninth century. (A round trip of 24 months, sailing four one month legs each way).

Not much less arduous is the life of todays merchant seaman serving in container ships or very large crude carriers, designed for minimum manning and maximum utilization.

> '35 days at sea, 4 hours ashore, 35 days at sea.'

Or a Chief Officer's:

> 'First time ashore in seven months.'

A German container ship owner is said to have taken crew numbers to the bare minimum (13), by installing a glass walled heads cubicle on the bridge and thus allowing one watchkeeper to be removed from the complement.

In 1983, when Iran and Iraq began targeting tankers, the demand for 'posh' accommodation was rekindled. A Second Officer relating that he was three times hit by missiles describes how, outbound:

> 'from Kharg to Larak with a full cargo the Iraqis would come from starboard, so we slept on the port side. On the return trip we would switch. All the missiles that hit us exploded in the (unmanned) engine room.'

It is tempting to dismiss this glossy softback, a spin off from a six part US TV documentary, as merely a coffee table accessory, with its copious supply of pretty photographs and generous text margins in which to park your tinnies. Although easy to dip into, this is in fact a surprisingly informative and entertaining read, but its superficial parentage is frustratingly evident in the failure to include a single map, graph or table to illustrate the many facts and figures.

EVANS, David C. (Editor). *The Japanese Navy in World War II.* Airlife Publishing 1994. ISBN 0 87021 316 4. Price £18.95.
(reviewed by LIEUTENANT COMMANDER K. YEARLING RN. (Ret'd))

Almost all books that one reads induces at least a smile on occasions. Not this one. A collection of clear and detailed events and experiences related by Japanese naval officers who took part in World War II battles in the Pacific and Indian Oceans. It provides an insight into the minds and personalities of the Japanese leaders who planned the strategy, tactics and operations at sea and those who implemented them.

The introduction of the Kamikazi tactic, its affect on the loyalty and rigid discipline of the participants and the fact this costly weapon provided a less than satisfactory return for the high level planners, is an account not easily forgotten.

The book contains many individual eyewitness accounts of major events, some of which are quite moving. It also discusses Japan's general naval strategy, spanning the pre-war period, through Pearl Harbour to their eventual naval defeat.

Suitably augmented by maps, photographs and statistics throughout, it makes a valuable addition to the historian's library and should keep the inquisitive reader engrossed for many hours.

HEPPER, David J. *British Warship Losses in the Age of Sail 1650–1859.* Jean Boudriot Publications, Rotherfield, 1994. 220 pages. ISBN 0 948864 30 3 Price £24.
(reviewed by David K. BROWN, RCNC)

This book gives a brief account of the circumstances of the loss of every British warship, large and small, between 1650 and 1859. The most striking fact is that it is a slim volume; in fact there are 1,700 losses described which is not a large figure for 200 years of near continuous war. There is a list of conflicts at the beginning of the book which suggests 75 years without naval action.

The principal source is the record of courts martial as in those days the senior survivor was automatically brought to trial—which might result in a knighthood or severe punishment. For example, the loss of the 74 gun *Alexander*, nearly 200 years ago on 6 November 1794 rates about 230 words to describe her surrender to the *Jean Bart* en route to Gibraltar.

There is a statistical analysis which shows that in the great wars from 1793–1815 the majority of losses were accidental and there were no losses in the big battles. The RN surely has a proud tradition of victory. It is a fascinating book in which to dip and should be at the bedside of every officer.

HERVEY, REAR ADMIRAL J. B. *Submarines.* Brassey's 1994. 290 pages, 150 illustrations. ISBN 0 08 040970 9. Hardback. Price £30. ISBN 0 08 04 0971 7. Flexicover. Price £17.50.
(reviewed by Richard COMPTON-HALL)

There has been a need for a clear, succinct, accurate and unclassified work on modern submarine technology. REAR ADMIRAL HERVEY has now produced it as one of twelve volumes in Brassey's *Sea Power* series.

Submarines is a no-nonsense book without frills or fancies. Exactly what is wanted, in fact, if politicians, civil servants (notably Treasury officials) and the general public are to understand the complexities of underwater warfare and the remarkable abilities of today's participants. Indeed, submariners themselves will find it handy for reference whether they are at sea, in offices or at school. John Hervey has a readable and straightforward style which nobody, however technically qualified, will find patronizing or simplistic.

The author's credentials can not be challenged. He commanded four submarines, including the nuclear *Warspite*, and was extensively involved in cold war operations. He had significant staff appointments, gaining detailed knowledge of

other navies, and became a consultant to MEL (now Thorn EMI), Cossor and Raytheon after retirement from the Royal Navy.

We can safely accept that John HERVEY's facts are facts; and he has set them down without breaching national security, which is a bonus for readers subsequently tasked with delivering open lectures, writing articles or talking to the media.

All submarine subjects are amply covered, with a broad international spread, from construction through propulsion and equipment to operations and future trends. Amongst the latter HERVEY suggests (without, he emphasises, any spirit of facetiousness) that certain surface vessels which are vulnerable to air or missile attack, such as Pickets and Towed Array ships, could be made submersible—presumably for short periods—as a means of self defence. Imaginative constructors, he says, ought to be pondering about that now: he cites the US Navy's SWATH *Kaimalino* as a starting point.

HERVEY concludes with the timely reminder that it is capabilities, not intentions, which count when estimating threats. Yes, this book should definitely be marketed amongst those whose philosophy appears to be that short-term savings take precedence over long-term security. Meanwhile, *Submarines*, is a first in the comprehensive but easily understandable technological field. Moderately priced in the 'flexicover' edition it will be a valuable addition to the library of anyone who wants a quick and reliable explanation of underwater systems and their usage.

HOWARTH, Stephen and LAW, Derek (Editors). *The Battle of the Atlantic 1939–1945*. Greenhill Books 1994. 639 pages. ISBN 1 85367 190 8. Price £35. (reviewed by LIEUTENANT COMMANDER J. S. SHEARS RN. (Ret'd))

This tome of 639 pages, with no photographs, contains the papers presented at the 50th anniversary International Naval Conference of the Battle of the Atlantic. The conference itself was summarized by David BROWN in the December 1993 issue of the *Journal*. The 36 contributors to the conference came from the UK, USA, Canada, Australia, Germany, France, and Italy, and consist of historians, engineers, naval constructors and architects, serving naval officers and journalists, all experts in their own field. Because of this, it would be very difficult to review the contents of this book, as a spy told the reviewer that it was known for the 'experts' attending the conference to discuss, over a few beverages, certain aspects of the papers well into the night!.

What cannot be denied is that this book must become a standard work of reference for all students studying this period. Of the 639 pages, the index takes up 25 pages, 10 pages for the consolidated bibliography cited by authors and a 2 page glossary. Throughout the book there are 1,222 notes taking up 59 pages and 22 appendices taking up a further 18 pages. So without reading the text, students have over 80 pages of references etc. that can lead them to other documents. It is interesting to note that the papers that had the maximum number of notes were:

1. Deployment of the U-boat—109.
2. Allied co-operation—93
3. Lufwaffe support of the German Navy—92

Does this explain why they have trouble in Brussels with the E.C.. Number 4 on the list was Training with 88 notes, so nothing really changes over the years!

Every page contains facts, some of which are very sobering. For instance over the 68 months of World War II, some 5,140 Allied merchant ships were sunk, aggreating over 21.5 million tons, nearly half of which went down in the North Atlantic. In defending and manning them, approximately 47,000 British and Commonwealth naval seamen and 30,000 merchant seamen were killed. When you start adding the families they left behind, then the number of people personally affected by this battle increases alarmingly.

Having established that this is a reference book for the serious student, should the layman have it in his book case? The book, although containing a wealth of information, is very readable. It is one that you can 'dip in into' and when you do, you are hooked A good example of 'dipping in' by the reviewer was about H.M.S. *Audacity* (FIG. 1), the first escort carrier to see operational service with 802 squadron embarked. She was a converted German merchant ship, the *Empire Audacity*, captured in 1940 and commissioned on 17 July 1941. She joined her first convoy on 13 September and began a short but brilliant career. Her six MARTLET fighters proved that carrier-borne aircraft with a convoy could be an effective means of protection against U-boats and shore based enemy aircraft. Typically her fighters intercepted unknown aircraft detected by her radar and also flew anti-submarine patrols. These patrols were flown, with two aircraft, at dawn and two hours before dusk, or half an hour before any major alteration of course. They operated 10–20 miles ahead of the ship at 200 ft; with the aircraft then turning and circling the convoy on opposite courses for two circuits.

FIG. 1—H.M.S. 'AUDACITY'

In her last convoy, HG76, her Captain decided to spend the night of the 21–22 December outside the convoy. She was initially hit by a torpedo which flooded the engine room and caused her to settle by the stern. Simultaneously a surfaced U-boat was sighted and engaged with gunfire. Two more torpedoes then hit her and she sank bows first.

Flag Officer U-boats reported in his log for 23 December 1941:

> '. . . the worse feature was the presence of the aircraft carrier. Small fast, manoeuvrable aircraft circle the convoy continuously, so that when they were sighted, boats were repeatedly forced to submerge or withdraw. The presence of enemy aircraft also prevented any potential shadowing or homing procedures by German aircraft. The sinking of the aircraft carrier is therefore of particular importance not only in this case but in every future convoy action . . .'

During this passage the reader is referred to chapters 27 and 28, where the attack on the convoy is discussed from both the German and RN side. The aircraft from the carrier began making their presence felt on the 17 December, when U-131 was sighted at 0925. The eventual sinking of U-131 is fully described, including the loss of one of the MARTLETS in the action. The next day in the forenoon, two FOCKE-WULFS were intercepted and one shot down. A further one being shot down in the afternoon. On the 20th the air activity continued, which again drove away the enemy reconnaissance aircraft and forced U-boats to dive.

On the 21st, an aircraft found two U-boats on the surface, alongside each other, apparently trying to carry out repairs following a collision in the night. During the day the aircraft continued to circle the convoy forcing the U-boats either to dive or

withdraw. That night the carrier was sunk by U-751. When her Captain, LIEUTENANT COMMANDER BIGALT, reported his success it was not initially believed by DÖNITZ, who requested other boats to confirm.

This book is a must as a work of reference and should be included in the bookcase of all those interested in naval matters. For those who have withdrawal symptoms, due to the lack of photographs, you can always see an illustrated version of David BROWN's chapter 25, in the December 1993 issue of the *Journal.*

KENT, CAPTAIN Barrie. *Signal!* Hyden House 1993. 384 pages + 8 in colour. ISBN 1 85623 006 6. Price £19 + £1.50 p&p. (Can only be purchased from the publishers at Little Hyden Lane, Clanfield, Hampshire, PO8 ORU.)
(reviewed by CAPTAIN J. HARRIES RN.)

In an illuminating vignette which is typical of this book, the reason given for the wish of that most illustrious of communicators, ADMIRAL Bertram RAMSAY, to specialize in signals was because:

> 'He liked to dress immaculately and was not inclined to get involved with nuts and bolts.'

True or not, this sentiment eloquently describes a popular misconception about communicators. However, as this book of impressive scholarship reveals, the caricature is largely incorrect. Whilst many communicators of my acquaintance have exhibited a certain sartorial flair, their profession is both detailed and exacting. As we are informed:

> 'The requirement of practically 100% efficiency in signalling forms a complete contrast to the 5 or 6% efficiency expected from the gun.'

Signal! is a comprehensive work of considerable importance. It is an importance, which is equally relevant to the old hand in his reminiscences as to the modern communications practitioner who is coping with the change to which ADMIRAL ASHMORE refers in the forward. The book admirably caters for both. Written in a smooth flowing highly readable style, the book deftly avoids the pitfall of superfluous technical detail. Nevertheless, just sufficient explanation of the evolution of communications technology is given. This maintains the thread, which leads from the early days of rudimentary flag signals to the present, as we enter the era of fully integrated communications. Most interesting are the thoughtful accounts of how communications, at each stage in their development, have influenced events of the day. First and foremost, this is a book set in the context of history. Fascinating and informed accounts are given of several major wartime engagements with, I fancy, fresh insights to complement 'accepted wisdom'.

The text throughout is laced with humour from neatly worded signals to the personal reminiscences of past members of the Communications Branch. Indeed the latter half of the book is largely devoted to the personalities involved in communications through the ages. Their memoirs and experiences make this history of the branch come alive.

The format of *Signal!* is pleasing. It is well illustrated with a wealth of maps and photographs and set out in a fashion which invites curiosity, although the serious reader might find some of the supplementary text distracting. Overall however, this book is a thoroughly good read and admirably achieves its purpose.

LAMBERT, John and ROSS, Al. *Allied Coastal Forces of World War II. Volume II: Vosper MTBs and US ELCOs.* Conway Maritime Press, 1994. 256 pages, 200 photographs, 700 line drawings. ISBN 0 85177 602 7. Price £35.
(reviewed by David K. BROWN, RCNC)

Volume II covers in great detail some 16 designs of Vosper MTB, together with those built in the USA, and three types of USN ELCO boats, some of which served in the RN. The book follows the style of the first volume published in 1990 and reviewed in this *Journal.* There is a brief history of each company followed

by a detail description of each design.

Rightly, much attention is paid to Vosper's private venture craft, eventually purchased for the RN as MTB 102. Her general design style was followed in virtually all later Vosper designs and influenced those of some other companies. Though her structure was generally well conceived, it did need additional strengthening as did that of most designs. It seems to be a natural law that fast craft will be driven by their keen CO's until something does break and extra stiffening merely increases the speed at which this happens. MTB 102 was also used by *Vernon* for trials of different methods of torpedo launching, ending with the sided and slightly angled pair of tubes used in almost all RN 'short' boats. She was also used, probably at the instigation of Lord MOUNTBATTEN, for demonstrations of the 20 mm Oerlikon gun. Happily, this historic craft is preserved and may be seen at various naval functions.

MTB 102 was originally fitted with Italian ISSOTTA-FRASCHINI engines as were a few of the follow-on craft but these ceased to be available when Italy entered the war. After some under powered stop gaps, the American PACKARD, which is described in detail, became available and was used in most craft. There are always problems in matching propeller and machinery power curves in fast craft and the author pays tribute to the work of AEW's new cavitation tunnel in solving this problem. (Though the 'E' is Experiment, not Experimental).

Altogether 127 Vosper design craft were built in the UK whilst the USA built 64 more for the RN and 100 for the Soviet Union and a few for other countries. The majority were derivatives of 102 though there was a substantial revision in 1943 with four torpedo tubes, changed again in 1944 to increase gun armament at the expense of torpedoes. Experimental types, such as the stepped hull 103 and the bigger 510, both of which were completed but not used operationally are well covered. Reference is made to the Denny hydrofoil 109 which the author says was not completed—some details of her trials appear in Conway's own *Warship 14*, together with a drawing. There is also some confusion between boats built by J S White to their own design and those they built to Vosper design.

The ELCO boats derive from Scott PAINE's British Power Boat design (to be described in Volume III) though later, bigger boats were considerably altered. A number of the earlier boats served in the RN, mainly as gunboats whilst a few of the later and better MTBs served in the Mediterranean. The book concludes with a number of essays on specialist topics such as hull construction, engines, weapons etc. There is a fascinating annex on the boats which remain, mainly as house boats.

The illustrations form an important part of the book. The drawings are beautifully done but, as in volume I, one may wonder if quite so much detail is necessary e.g. a thimble eye. The photographs are well selected and well reproduced but the captions show signs of haste; there are too many errors and omissions. Having been reviewing books for many years, I have noted in books from all publishers that errors in the captions to illustrations are much more frequent than in the text. I would ask authors and publishers to devote more time and care to this aspect of their books.

The authors have put together a vast mass of material which is not readily available elsewhere. Volume III is awaited with interest.

MACPHERSON, Ken and MILNER, Marc. *Corvettes of the Royal Canadian Navy. 1939–1945.* Airlife Publishing 1994. 174 pages, 188 photogaphes. ISBN 0 920277 83 7. Price £19.95.
(reviewed by David K. BROWN, RCNC)

Part I tells in 87 pages, the story of the design and building of the corvettes of the RCN, which contributed so much to victory in the Battle of the Atlantic. The story is very well told as the authors are not content merely to list the differences between Canadian ships and those built in the UK but give clear reasons for these

differences—we are even told why RCN ships were more rusty. (They were built so quickly that there was no time for the mill scale to be removed by weathering.)

During the war 121 corvettes were built in Canadian shipyards, a wonderful achievement considering that there was only a small industry before the war. Many of the excellent photos show ships under construction, a fine tribute to the builders. Part I also outlines the operational history showing how well the ships did even with very inexperienced crews. Equipment was very scarce, an important reason for the delay in modernization which so greatly hampered Canadian corvettes later in the war.

In part II, each ship has a photograph and a short note on its building and fate. There is a complex chart from which it is possible to obtain the wartime movements of each ship. This book is essential reading for anyone studying the Battle of the Atlantic, the contribution of Canadian shipyards or the valour of their crews.

PETROSKI, Henry. *Design Paradigms. Case Histories of error and judgement in Engineering*. Cambridge University Press, 1994. 221 pages, 69 illustrations. ISBN 0-521-46649-0 (paperback) 0-521-46108 (hardback)
(reviewed by David K. BROWN RCNC)

The author believes that most engineering errors should be avoidable and that the use of case studies of past errors in teaching, would make the new generation of engineers aware of the possibility of error and of the ways in which error has arisen in the past. PETROSKI provides the reader with a number of case studies, mainly in bridge design from classical time to the present day. He discusses failures in classical temples, GALILEO's incorrect treatment of the strength of cantilevers, failures such as:

- The Brighton Chain Pier in both 1833 and 1836.
- The Dee Bridge in 1847.
- The Tay Bridge 1865.
- Quebec 1907.
- The Tacoma Narrows in 1940.
- The walkway in a Kansas City hotel in 1981.

and others.

Some cases are treated in detail, in others the cause of failure is briefly sketched. In most cases the fault lies in a wrong concept or the use of one that is imperfectly understood. Late changes can be fatal; the Kansas City tragedy was caused by a simple change to ease production which reduced the factor of safety from 2 to 1. One of the most interesting 'failures' is that of STEPHENSON and FAIRBAIRN's Britannia Bridge, completed in 1850. Most British accounts see this bridge as a great success with a long, trouble free life and, with FAIRBAIRN's novel treatment of buckling, it had a great influence on structural design. (e.g. BRUNEL and SCOTT RUSSELL's structural design for the *Great Eastern*) PETROSKI points out that this novel structure only arose because British engineers had, wrongly, become convinced that suspension bridges were unsuitable for railways, an error exposed by a series of brilliant designs by John ROEBLING, his son and others in the USA. ROEBLING's success depended to a great extent on correct and complete identification of failure modes. The Britannia Bridge was very extravagant in the use of material and hence very costly whilst passengers suffered in a small, hot, smoke filled iron tube.

There is only one mention of a ship failure and, unfortunately, this passage contains a number of errors, each trivial, but cumulative. The photograph on page 57 is not of a LIBERTY ship but of the T2 tanker *Schenectady*. Naval architects of my generation saw this as an important distinction; failures in LIBERTY ships could be brushed aside as 'cheap and nasty' but the T2 tankers were seen as real

ships. Many kept this photo beside their desk with captions such as 'Lest we forget'. PETROSKI makes no mention of the stress concentrations and welding stresses which could initiate cracks nor of the search for tough steels which would not propagate such cracks; indeed there are few mentions of failures associated with incorrect materials.

But most of the book is excellent and it should be essential reading for every student, practising engineer and manager of engineering work. It is amazing that so few engineers even contemplate the possibility of error, particularly as one can scrape through an Honours degree at 60%—and the pressure in a busy design office is quite similar to that of the exam room. There can be no doubt that PETROSKI is right in suggesting that many errors are avoidable and that study of past examples can help to prevent future tragedy. The analysis of accidents has contributed much to the development of engineering philosophy though, to be cynical, it may be suggested that the lasting effect is due to new legislation following a disaster. It may also be wondered if a legal inquiry into a disaster, with its emphasis on attaching blame, is the best way to reveal the full truth. (See J. COWLEY, Presidential Address I MAR E, 1986)

There is no mention of mathematical risk analysis which is now a powerful tool in identifying failure modes. (It is important to realise that it is only a tool and used blindly can, itself, cause errors.) I also feel that study of the reasons for successs is important and more difficult than identifying the reasons for an obvious disaster. In extending a successful design approach it is important to understand the method fully to ensure that the basis of that success is not left out ensuring the extrapolation of success to disaster.

I hope that all engineers read this book and do not have too many sleepless nights pondering on the validity of their own work.

RIPPON, COMMANDER P. M. *Evolution of engineering in the Royal Navy. Volume II 1939–1992*. The Institute of Marine Engineers. 415 pages, 350 photographs, 180 line drawings. ISBN 0 907206 47 6. Price £47 (£37.60 to IMarE members).

(reviewed by REAR ADMIRAL J. R. SHIFFNER)

Publication of COMMANDER RIPPON's second volume completes an important piece of historical research. The first volume covered a relatively longer period (1827–1939)—for most of which the Royal Navy undisputedly ruled the waves. However, during the critical period between the wars engineering development in the Royal Navy was relatively static for all sorts of non-technical, but political, economic and social reasons; it was not until the rude awakening of WWII that brought both urgency and remarkable advances in all aspects of naval engineering. In his second volume, COMMANDER RIPPON gives an excellent insight into the way in which the ship and equipment designers met the new operating challenges facing the Royal Navy in WWII, and later as a result of the Soviet threat in the prolonged Cold War. It is an impressive story, and well told in necessarily short summaries, supported by some fascinating photographs and diagrams which all help to make it a compelling publication whatever level and aspect of engineering happens to appeal to the reader.

Clearly in any work that covers so wide a field the descriptions are frustratingly superficial, but it does give a fascinating picture of how the Royal Navy brought in pioneering technologies and ship designs to meet the requirement for greater endurance and enhanced habitability, and ever more sophisticated weaponry and sensors (from basic RDF Radar and missiles to clever ESM) to meet increasingly challenging threats. In the marine engineering field significant advances included gas turbine and nuclear propulsion, highly loaded and reversing gear boxes through to the more mundane but vital auxiliary machinery. Advances in naval aviation are particularly well covered—an area where the Royal Navy was very

much in the forefront (angled flight decks, steam catapults etc. and finally the versatile SEA HARRIER and its ski jump not to mention the operation of helicopters on relatively small ships flight decks).

As ADMIRAL HILL states in his foreword to this volume:

> 'COMMANDER RIPPON's completed work is a remarkable record of an important component of the nation's engineering heritage'.

Certainly it is a work which all naval engineers who have been associated with the story ought to possess; it would certainly remind them of their own involvement and they themselves can fill the gaps that are inevitable in a work of this scale condensed into only two volumes.

SKULSKI, Janusz. *Heavy Cruiser 'Takao'*. Conway Maritime Press, London, 1994. 256 pages, 30 photographs, 700 drawings. ISBN 0 85177 628 0. Price £25.

(reviewed by David K. BROWN, RCNC)

This book follows the well known and popular format of the 'Anatomy of the Ship' series. There is an 18 page introduction outlining the design, construction and career of *Takao* and her three sisters. This is followed by the photograph section which includes several interesting views taken during construction. Then comes the set of 700 drawings showing every detail of the ship, both as built and after her frequent modifications.

This book is particularly welcome as, before the war, the TAKAOS were thought, by staff and press, to be magnificent examples of warship design as it was claimed that within the 10,000 ton limit of the Washington Treaty, they mounted 10—8 inch guns, had a speed of 35.6 knots and were well protected. In fact they were grossly over-weight, were over-stressed, with poor stability and lethal subdivision.

The author explains that inter war Japanese cruisers derived from the small *Yubari* were designed in 1923 by HIRAGA and his assistant FUJIMOTO. She was intended to be of 2,890 tons, standard, but completed at 3,387 tons! This was not a breach of the Treaty in itself but signatories were supposed to declare the true displacement. The Japanese declared *Yubari* at the lower figure and no one even noticed which seems to have encouraged the later breaches. *Yubari* introduced to the Japanese navy the use of armour worked structurally—it had been used by the RCNC since 1912 in the *Arethusa*.

The most conspicuous feature of the later Japanese cruisers was their wavy deck line with high freeboard at the bows to keep them dry, high amidships to give good stability at large angles of heel and low in the way of turrets to keep the centre of gravity down. This feature appears to derive directly from the RN College notes where both HIRAGO and FUJIMOTO had been rather undistinguished students, both only just avoiding a fail. The wavy deck was quite a sensible approach as it avoided the structural discontinuity at the break of forecastle common in contemporary British ships.

Takao had a design displacement of 9,850 tons, declared as such under the Treaty. She completed at 11,350 tons and a naval architect can do a lot with a 15% bonus of concealed displacement. It does not seem that this excess was deliberate as the extra weight left her with poor stability, high stresses and inadequate freeboard. Rather, it would seem that Japanese naval architects were unduly subservient to their naval staff and tried to meet all their demands even when the laws of nature were against them. This is supported by a converation between HIRAGA and Stanley GOODALL RCNC, recorded in the latter's diary for 5 July 1934:

> 'I gathered that the Japanese organisation does not allow the designer to keep grip of the job so that he can watch stability.'

There must be a true dialogue between staff and constructor in which the

aspirations of the former are weighed against both constraints (the laws of nature as well as cash limits) and the opportunities of new technology.

Takao's failings were high lighted by severe gales in 1935 which led to the capsize of a small destroyer and structural damage to many bigger ships. *Takao* was rebuilt in 1938 with some 440 tons of additional structure. Much of this went into bulges to increase the beam, though even then her GM was only 1.5 metres and the compressive stress in the upper deck was still nearly 10 tons/in^2. The poor stability was particularly serious since, like most Japanese cruisers, they had been designed with a centre line, longitudinal bulkhead in the engine rooms and most boiler rooms. (My only quibble with the drawings is the use of a continuous line for the centreline in plans and sections making it hard to see where there are longitudinal bulkheads). This bulkhead led to large heeling moments after torpedo damage and contributed to the sinking of many Japanese cruisers.

The study of errors is an important part of design education and this book shows many of the errors of the *Takao*. (See also review of 'Design Paradigms' and the article 'Problems with the HUNT Class')

TILL, Geoffrey. (Editor). *Coastal Forces*. Brassey's 1994. 200 pages, 30 maps, 100 photographs. ISBN 0 08 040985 7. Hardback. Price £25. ISBN 0 08 04 0986 5. Flexicover. Price £15.
(reviewed by Ray TEE, RCNC)

Volume 10 in Brassey's Sea Power series.

This slim volume contains an expert review of the coastal forces scene in terms of operational tasks, ships' equipment and weapons. Examples are taken from a wide selection of countries. The authors set out the logic and constraints which have in the past and still do determine the scale of operation.

The opening chapter reviews the commercial and military case for maritime operations in coastal waters. This includes an assessment of the role of these forces in the Gulf in 1991. The chapters covering offshore patrol develop the pattern of operation for peacetime, periods of tension and war. The well established conjunction with maritime aircraft, is explored in relation to the activities undertaken and the types of craft employed by a number of countries.

Mine warfare chapters cover:

- Mines and minelaying.
- Mine Countermeasures (MCM).
- MCM platforms.
- Mine sweeping and hunting, including the sonars for mine hunting.
- Route survey.
- Navigation.
- Ship control.
- Command and control specific to MCM.

The introduction of Fast Patrol Boat (FPB) operations traces the development of the FPB in conjunction with the traditional weapon, the torpedo, and the availability of suitable engines for propulsion. It traces the pragmatic development of the craft and their role in naval warfare to the introduction of the gun and later the missile. The final chapter offers one view of the future in which the advance in technical sophistication is linked to the inevitable growth in vessel size to the light frigate and other developments for the offshore patrol vessel.

The book contains a wealth of information on the operations with coastal forces which is well supported by descriptions of the ships, their equipment and weapons. The presentation contains the degree of detail sufficient to set the ships and weapons into the operational perspective.

WELLS, CAPTAIN John. *The Royal Navy. An illustrated social history 1870–1982.* Allun Sutton Publishing, 1994 in association with the Royal Naval Museum. ISBN 0 7509 0524 7. Price £19.99.
(reviewed by COMMODORE S. TAYLOR RN.)

Was the Royal Navy made great through the popular association of rum, sodomy and the lash as declared by Winston CHURCHILL? To read this engaging account of the social history of our navy underlies this gloss by livid accounts of life at sea in the 19th and 20th centuries, portraying how change came slowly to match the aspirations and concepts of social patterns of these times. Did you know:

- Ratings were called such because they were rated up.
- Flogging was only removed as a Summary punishment in 1948.
- In the absence of an approved pattern, Messrs Gieves marketed their own life jacket.

This book is packed with information and reliable detail which we easily overlook today in our knowledge of origins, or just take for granted. But, more importantly, it describes the way in which the RN slowly adapted to changing perspectives whilst maintaining customs (and standards?). As a study of the officer corps, its development, the introduction of trades and professionalism, it is unparalleled. Jackie FISHER is the hero of the hour bring sense and efficiency into a world of yesterday.

For those of us concerned over todays issues of 'downsizing', redundancy and career opportunity; our contemporary problems are put in perspectives of similar and worse issues which challenged our predecessors. To digest this book reduces our worries of today when compared with the scale of change in previous bouts of peace.

John WELLS is a master of naval tradition and cultures, and this book is a must for those who have any love for the Andrew, and who may be worried by what is going on around us. The wheel turns with varying speed, but does not need re-inventing.

WHEELER, Raymond L. *From River to Sea. The marine heritage of Sam Saunders.* Newport, Cross Publishing, 1993. 316 pages, ca 900 photos and plans. ISBN 1 873295 057. Price £25.
(reviewed by David K. BROWN, RCNC)

Ray WHEELER's first book, *Sea to Air*, published in 1989 and reviewed in this *Journal*, dealt with the aircraft activities of Saunders Roe. This new book is concerned with the water supported craft built by the company including hydrofoils and hovercraft. It opens with a family history of Sam SAUNDERS, covering the growth of the company from the family boatyard at Goring. They soon gained a high reputation for fast river launches with minimum wash. It is interesting that SAUNDER's recipe for minimum wash was long, narrow and light weight, supported by research 100 years later. In 1890 SAUNDERS began to use DAIMLER BENZ internal combustion engines.

At about the same time, SAUNDERS developed a very successful form of light weight construction which he called CONSUTA (Latin for seaweed). This used 3–4 thin wood laminates sewn together with copper or annealed brass wire. Canvas impregnated with a rubbery adhesive was placed between the laminate to ensure watertightness. The first such launch achieved 27½ knots with a 100 HP steam engine.

The company moved to Cowes in 1901 and soon became involved in building racing craft such as S. F. EDGE's *Napier Minor* in 1904. They also won an exclusive contract for RNLI boats in 1913. During World War I the company was almost entirely occupied with aircraft work but once the war was over they

returned to building racing boats, family cruisers and a few weird experimental craft. SAUNDERS' death in 1927 had little effect on the output of the company. They built *Miss England II* in 1930 which won the world speed record three times leaving it at 110 mph. Later they designed and built *Bluebird* which put the record up to 130 mph in 1938. This speed and later record by the *Bluebird II* were predicted with incredible accuracy by AEW, Haslar who must have had an excellent crystal ball in those days.

After World War II, the company built their first ships for the RN with four IMS followed by four DARK class fast patrol boats with laminated wood skins over aluminium frames. A modified craft, *Dark Scout*, was built in 1958 with an all welded aluminium construction. Saunders Roe built the successful research hydrofoil *Bras d'Or*, for the Canadian Navy in 1959—she may be seen today in an Ottawa museum.

The rest of the story is mainly that of the hovercraft which began so well but failed to win the success that the author (and reviewer) think it deserved. COCKRELL's early model tests led to the building of SRN 1 in 1959, which crossed the Channel the same year. The big SRN 3 for naval use followed in 1963 and was proved in a number of roles including ASW, amphibious operations and Mine Countermeasures (MCM). The commercial SRN 5 was completed in 1964, the first car ferry, SRN 4, in 1967 and the naval BH 7 in 1969.

By this time naval interest was centred on MCM and it was demonstrated in full scale trials that the hovercraft could carry out every function of conventional MCMV, usually better and often more cheaply. A series of explosion trials against the old SRN 3 in 1974 showed that the air cushion made hovercraft almost invulnerable to underwater explosions. The air cushion decoupled the craft from the sea giving very low acoustic and pressure signatures. Trials in 1977 with a hired SRN 4 and with the BH 7, showed that track keeping in severe wind and sea was better than that of a HUNT. In 1983 a 193M sonar was installed on a retractable strut under BH 7 and worked very well. This craft was fitted up as a full MCM demonstrator and was very successful, but in 1985 the company was informed that naval hovercraft work was to be dropped as a savings measure, a decision which the author describes as incredible.

It is not possible to mention all the various topics dealt with in this book in a review of reasonable length—such as the BLACK ARROW rocket which launched the all British PROSPERO satellite. The many illustration are well selected showing craft under construction as well as in use. It is a fine record of a high technology company, written by an engineer who was involved (latterly as technical director) in most of the post war work.

WEIR, Garry E. *Forged in War.* Naval Historical Center, Washington DC,, 1993. 331 pages, 42 illustrations. ISBN 0 16 038258 0. Hardback. Price not given. (reviewed by David K. BROWN, RCNC)

This book describes the procurement of USN submarines from 1940 to 1961 and, in particular the relation between the Department of Defense and industry. The war time years were dominated by the need to produce very large numbers of similar vessels. After the war the need for fast submarines led first to the GUPPY conversions, which were very successful, and then to the TANGs which were not, mainly because of unreliable diesels. The development of the ALBACORE is well covered.

The nuclear submarine brought new problems and made others more serious such as flow and cavitation noise, Helmholtz cavity resonance and singing propellers. The requirement for increased diving depth brought HY-80 steel with initial welding problems. The author does not attempt to deal with the technology of these problems which is just as well—he seems to think that HY-80 means it can withstand 80,000 psi of water pressure. It is surprising that there is no

mention of the very active collaboration between US authorities and AEW & NCRE.

The author is clearly of the opinion that technical innovation is more likely to be initiated in house rather than in industry and a partnership led by the navy with industry using its production expertise is desirable. However, he sees such a partnership as impossible in today's climate where, as he says:

'The bean counters have inherited the earth'.

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The approach of the 50th anniversary of D-Day has led to a large number of books of variable quality. Two of the more interesting are reviewed below. Also recommended are the newspaper format supplement to *Navy News* and the somewhat similar D-Day by the *Portsmouth News*.

BUFFETAUT, Yves. *D-Day Ships*. Conway Maritime Press, London, 1994. 162 pages, 140 photographs, maps. ISBN 0 85177 639 6. Price £20.
(reviewed by David K. BROWN, RCNC)

This is a clear, well written account of the planning, the ships and preparation for the invasion with a comprehensive story of the operation itself. The author is French and often gives a slightly different slant from well known British accounts; for example, he suggests that the immense effort which went into building the MULBERRY harbours was not cost effective and produces figures to support this view. He uses eye witness accounts to add colour but is careful to weigh exaggerated claims against known losses.

The description of the specialized ships and craft is generally accurate and comprehensive. However, there are many errors in the text where S for Ship (as in LST) is muddled with C for craft (LCT). Similarly, there are too many errors in the captions. For example, the author expresses surprise at seeing a large crane on an LST; it is a US ARL repair ship conversion of which at least two went to Normandy. The photographs are generally well known and most are relevant but there are a few which show the ship in an earlier state—one in World War I configuration—and others as altered post war.

Readers unfamilar with the operation will enjoy this very readable book and get a generally accurate picture but there are too many errors for the serious reader.

WINSER, John de S. *The D-Day Ships*. World Ship Society, Kendal, 1994, 172 pages, 131 photographs, 5 maps. ISBN 0 905617 754. Price £15 (£10 to Society members)
(reviewed by David K. BROWN, RCNC)

This book is certainly different. It is a detailed record of every ship and craft which took part in the landing operations listing where it started from, which convoy it sailed in and which beach it arrived at. A typical entry reads:

> '*Waveney* As LSH Force J2—embarkation at Southampton (Berth 39), left Solent (Anchorage 19E/2) 5th, arrived Juno 6th (Assault convoy J10): ferry control HQ ship 23rd.'

This detailed information makes it any essential reference book for the serious student but it is far more than that and is recommended as an excellent general guide to the operation. The book opens with about 10 pages of text outlining very clearly the naval side of OVERLORD.

There are surprisingly few good photographs of the landing itself and most are now very well known. This author has managed to find a few new ones and make good use of the better known ones. Unusually, his captions are both informative and accurate.