BOOK REVIEWS

LAMBERT, John, and HILL, David: *The submarine Alliance*; London, Conway Maritime Press. 1986. 120 pp. ISBN 0 85177 380 X. Price £12.95 (reviewed by Captain D. N. F. Meares, R.N.(ret.))

This book, the latest addition to an excellent series entitled 'Anatomy of the Ship' published by Conway Maritime Press, provides the most detailed documentation on the 'A' Class submarine of the 1945–1970 era. The title suggests that the book concentrates on *Alliance* only, but in fact it covers all the submarines of the Class. The title is purposefully a nice reminder that alone of the Class, *Alliance* survives—for all to see—at the Submarine Museum, Gosport.

The 'A' Class was designed during the Second World War and as the boats were intended for action in the Far East where long distances would be involved, the design included improved endurance, habitability and *surface* speed—(this latter attribute will amuse the submariner of the nuclear age). 43 submarines were ordered in 1943 but the war ended before they could be deployed, and only 16 were completed and commissioned. None saw action in that war but they were deployed worldwide and kept their end up both in the pancake ice up North and in the Malaysian/Indonesian confrontation. *Amphion* commissioned in 1945 and the last boat of the Class ran on until 1975—not bad for a designed twenty-year life.

All this and much more can be gleaned from the first 37 pages, which include interesting extracts from patrol reports of prolonged snort patrols in

arctic and tropical conditions. One is led with great accuracy and detail through the design improvements, the building programme and the subsequent modifications, alterations and additions inevitably found necessary and implemented in the years after. I note an early A and A to *Amphion* was the addition of the bow buoyancy tank to improve surface stability in rough weather. I feel for Commander Dewhurst and his crew, because the stability was still dreadful after fitting the tank!

These pages also include a series of photographs and line drawings which between them serve to remind that almost every boat of the Class had its own specific history of change of duties, armament, shape, etc.

The remaining 83 pages are the main speciality of this series. They contain hundreds of detailed and annotated drawings, many three-dimensional, of the various hull layouts, external and internal arrangements, all the systems, Vickers and Admiralty engines, armament and all the auxiliary machinery and fittings. I suspect we would have been pleased to have had such a comprehensive collection of technical drawings on our submarine course, even if a large number are based on the eventual B.R.s. You might need a magnifying glass to study the detail in depth (inevitable when drawings are reduced in production), and a knowledgeable fellow to hand to explain what an Iswas is (or was)—item 80, page 46 B3/2.

If nothing else a browse through this book brings back to mind:

the conflicting smells of galley cabbage and diesel oil;

the cracked Admiralty Engine frames;

the Vickers Column Studs and their kit for pulling down;

the Superchargers and their drives (more likely come across these in the Depot Ship);

the Distiller that just made enough water to refresh its watchkeeper;

the Sewage Tank non-return valve;

Crankshaft Grinding in place and the Depot Ship capability to re-metal main bearings;

Bow Cap clearances and Christmas in the Floating Dock at Port Bannatyne.

a host of other technical and non-technical adventures.

But these are personal reactions and in no way denigrate the book or the submarine, both of which thoroughly deserve our acquaintance.

CAMPBELL, John: *Naval weapons of World War Two*. London, Conway Maritime Press. 1985. 416 pages, 350 photographs, 300 line drawings. ISBN 0 85177 329 X. Price £30. (reviewed by Peter Hodges)

The reviewer has met John Campbell on several occasions over the past decade—the last time, some three years ago in Portsmouth. Campbell then confessed that he was finding it time-consuming in the extreme translating data on naval guns from Japanese into English; and this is a measure of the meticulous research which was undertaken in compiling this exceptional work.

The contents are arranged by country, and each national section follows the same standard order starting with Naval Guns, followed by Torpedoes; Anti-Submarine Weapons; Mines; and Bombs, Rockets and Missiles.

The sections on Naval Guns form the largest part of the contents and are themselves sub-divided into design, mountings, projectiles, fire control, and so on. Typically, the British section starts with the 16 inch Mk I gun on the triple 16 inch Mk I mounting as fitted in H.M. Ships *Nelson* and *Rodney*; and one may be astonished to read that the revolving weight of this incredible

weapon was about 1500 tons and that its front face armour was nearly 16 inches thick. The section progresses through diminishing calibres and ends with machine gun mountings weighing barely a ton.

Even more staggering weights are revealed in the Japanese section. The 18 inch triple turret of *Yamato* and *Musashi* weighed 2470 tons and each 162 ton gun, using a 794 lb charge could hurl a 3000 lb projectile to a maximum range of 45 960 yards at a rate of fire of two rounds per minute.

Campbell's work, however, is no mere catalogue of data; and although his forté is clearly gun design and construction, he writes with authority on fire control, and particularly on torpedoes.

The sheer scope of his research may be judged by the following short extract from page 399.

> The mines used were Vickers H3 and Sautter-Harle HS1 and HS4, described under Denmark and France but H3 is given with six Hertz horns and antenna.

—and this, under Romania.

With its superb photographs—many from private foreign collections—and a multitude of detailed line diagrams and drawings, *Naval Weapons of World War Two* surpasses the already high standards set by Conway and will surely become recognized as the reference work on the subject. A boon to the devotee of Naval Weapons and a triumph for John Campbell.

CAMPBELL, N. J. M.: *Jutland—an analysis of the fighting*. London, Conway Maritime Press. 1986. 416 pp. Price £20. ISBN 0 85177 379 6 (reviewed by D. K. Brown, R.C.N.C.)

This book lives up to its title in that it analyses the events of the battle based on original sources. Alternate chapters deal with the events of seven main phases of the battle and provide a very detailed study of all the principal hits on ships of both fleets.

The operational chapters include accurate track charts in which the author has made good use of the gunnery records of both sides (incidentally, throwing doubt on the accuracy of the well-known *Kiel & Jutland* by von Hase). To a considerable extent, a successful attempt has been made to identify which ship was engaging which target. For the first time, an explanation is given of where the German destroyers were during the night action—lost.

The chapters describing the major hits and their effects are the most novel and interesting part of the book, summarized and analysed in the last two chapters. For this *Journal*, the review will concentrate on the technical aspects. The propulsion machinery, particularly in British ships, stood up well to prolonged steaming and there were few serious mechanical problems. The German battle cruisers had some difficulty with their coal-fired furnaces, lacking the opportunity to clean the grates. *Markgraf* had an overheated shaft bearing whilst *Kaiserin* and *Grosser Kurfurst* had leaky condensers.

There were more problems with gunnery equipment, a few ships having problems with hydraulic machinery used to run out the guns after firing. British turrets seem to have worked a little better than the German ones. Both sides were able to fire at about two salvos per minute (one round per gun, per minute), the rate of fire mainly being governed by the need to spot fall of shot.

The overall statistics show that the German heavy ships scored some 122 hits from 3597 shells fired whilst the Grand Fleet obtained 123 hits from 4480 rounds (3·39% and 2·75% respectively). These figures conceal wide differences between squadrons, caused by differences in visibility, state of training and equipment. On the British side, the 5th Battle Squadron (5BS)

with 2·64% hits did twice as well as the battle cruisers with which they were in company. Both Beatty and Jellicoe were aware of the lack of opportunity for gunnery practice in battle cruisers based at Rosyth, and the 3rd Battle Cruiser Squadron (3 BCS) had been detached to Scapa for practice. The better shooting of the 5th BS was due in part to better training but also to the accuracy of the 15 inch Mk 1 and to 15 ft rangefinders fitted instead of the 9 ft instruments in earlier ships. The success of the 3rd BCS with 4·29% hits is explained by the close range at which they fought and the relatively favourable visibility, though they were also helped by longer (4Crh) and more accurate shells. The German stereoscopic rangefinders seemed to have worked better under the conditions of the day. They were normally 10 ft long.

Discussion of fire control systems is rather brief, the author seeing the British system of director control and the Dreyer table as distinctly better than the German. It is, perhaps, unfortunate that Mr Campbell has not examined recent claims for the Pollen fire control system[1, 2]. *Queen Mary* had the Pollen system and appears to have done better than the other battle cruisers during a phase when the change of range rates were high and changing rapidly[1], though the number of hits was not statistically significant.

The first of several British material failures was the poor performance of 'armour piercing' shells. The steel of the case was overhardened and brittle, the fuzes were unreliable and the filling, lyddite, likely to detonate on hitting enemy armour rather than after penetration. Seventeen hits on German armour, 10 inch to 14 inch thick, are identified and only in one case did the shell function as intended. Even against 6 inch to 9 inch plates, the heavy shells were very disappointing with only 3 correctly functioning out of 15 hits.

These deficiencies in British shells had been noted in pre-war trials, notably against *Edinburgh* in 1910 and had been fully documented in the 1915 Gunnery Manual (summarized in Ref. 3). Nothing had been done to remedy the situation. The 'common' shell, black powder filled, was more effective against light structure and nearly as good against armour.

It is harder to assess the quality of German shells. They were not perfect; the first hit of the battle by *Elbing* on *Galatea* was a 'dud'. There were few hits on thick armour amongst the surviving British ships and, as Campbell shows, there were complicating factors which make interpretation difficult. German shells did function correctly after hitting and penetrating 6 inch armour.

The most serious British problem lay in their own magazines. The cordite used was MD (30% nitroglycerine, 65% nitrocellulose and 5% petroleum jelly), whilst most of the German ships had RPC/12, the first 'solventless' propellent which, with added stabilizers detailed in the book, was far safer. To make matters worse, British heavy charges were in four parts, each in a single silk bag, each with a 16 oz. gunpowder igniter which could leak gunpowder over the charge during handling. The German charges were wholly or largely contained in a brass cartridge case which protected the single igniter.

The *Seydlitz* suffered from a major magazine fire at Dogger Bank when 62 complete 11 inch charges burnt but did not explode. As a result of this incident the German navy limited the number of charges out of the magazine at any time. They did not, with the exception of *Lutzow*, fit any additional flash doors and, in general, German flash protection remained inferior to British. Campbell is sure that had the Germans used British cordite, the *Derfflinger* and probably *Seydlitz* and *Von der Tann* would have blown up. They would have lost even more if they had been exposed to German shells. Interesting references on cordite[4, 5] largely confirm Campbell's views. It is a

general criticism of the book that it is not referenced, though an extensive list of sources is given at the back.

The causes of the losses of *Invincible*, *Indefatigable* and *Queen Mary* are explored in detail. Various paths are identified by which shells could have penetrated and caused ammunition to explode as observed. Campbell rejects the idea that thicker armour would have been the salvation of these ships (and others which exploded). The pace of development before World War I was extremely rapid and this year's armour would always be inadequate against next year's shell.

There was a basic difference in Staff Requirements between British and German capital ships. The R.N. adopted heavier guns and lighter armour and this still seems the logical choice. If the ammunition had been of similar quality, our heavier shells would have been well matched against thicker German armour but, with a much heavier bursting charge would have done much more damage within. The German staff also demanded heavier secondary batteries and more torpedoes in their battleships, seemingly a waste of resources.

Underwater protection was inadequate in both navies. The torpedo hit on *Marlborough* by *Wiesbaden* seemed to cause little damage at the time and *Marlborough* remained in action. However, various problems made matters worse and her return to Britain became a matter for serious concern. The value of the closer German subdivision was largely nullified by too many poorly designed penetrations, particularly for ventilation, which made it difficult to establish a flooding boundary. Such flooding caused the loss of *Lutzow* and, almost, that of *Seydlitz*. The poor integrity of German subdivision was noted in ships which surrendered after the war[6, 7]. Luckily, the torpedo was a much less dangerous weapon than believed at the time. About 200 were fired for 8 or 9 hits, the R.N. scoring twice as many hits as the Germans. Perhaps the lighter gun armament of German ships prevented them penetrating the British screen.

This is a fascinating book and even this lengthy review has only explored a few of the topics covered. There is much relevant to today's problems; the obvious problem of the safety of explosives but also more subtle organizational problems. The responsibility for turret protection lay with DNO whilst DNC was responsible for the rest of the ship. Were their efforts properly co-ordinated—and can we do better today? As a constructor, I welcome this book. British warships were not perfect in 1916 but their most serious problem lay in ammunition, shells which failed to penetrate and in dangerous cordite. Beatty's famous saying that there's something wrong with our bloody ships is at last seen as incorrect.

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