

## BOOK REVIEWS

BROWN, A. and POLGLAZE, R. *HMS 'Aristocrat.' A Paddler at War.* Waverley Excursions Ltd, Gwalia Buildings, Barry Docks, CF62 5QR. 72 pages, 55 illustrations. Price £4.95 post free.

(reviewed by David K. BROWN, RNCN)

The LNER paddler *Talisman* was built in 1935 by Messrs A & J Inglis for service on the Clyde. Though she looked to be a typical Clyde paddle steamer she was actually very different. She was diesel electric with the motor on the paddle shaft. The main advantage was that bridge control was easy and there were also savings in fuel and in wages. However, there were many problems; the entablature castings cracked as did their replacements and there were problems with the salt water cooling system. When war broke out she was undergoing a major engine refit and was not taken over by the Admiralty until June 1940. Since the name *Talisman* was in use by a submarine she was renamed HMS *Aristocrat*.

Her early war service was in the Thames and Medway as an AA ship; her armament varied but, eventually, she had four single pom-poms, three Oerlikons, two power operated quadruple 0.303 turrets and two twin Lewis. She took part in several rehearsals for the Dieppe raid but was lucky to be refitting in the actual attack. Her days of glory came as Headquarters ship for the building of Mulberry B at Arromanches. Later, she provided AA protection round the Dutch coast.

This book tells the story of the ship and her men and gives a vivid picture of wartime life in a small warship. During five years of war service she had covered 46,583 miles without any more machinery problems. After the war she returned to the Clyde until laid up in 1966 and she was scrapped the following year.

BOSSCHER, Dr P. (editor). *The Heyday of Sail, The Merchant Sailing Ship 1650-1830*. Conway Maritime Press, London, 1995. 175 pages, ca 200 illustrations. ISBN 0 85177 562 4 Price £28.

(reviewed by David K. BROWN, RCNC)

World trade increased enormously during the period covered by this book and yet very little has been written about the ships which carried this increase. The distinguished authors of this book, led by Dr BOSSCHER, formerly a commander in the Royal Netherlands Navy, do much to remedy this ignorance though they have to admit that there are occasional gaps in their own knowledge. Most of the chapters deal with a single nation or region—Britain, Netherlands, Scandinavia and the Baltic, the Mediterranean, followed by pleasure craft and inland sailing craft and concluded by two more general—and fascinating—essays on economics and the men who manned them.

Growth in size and changes in style were slow, almost imperceptible, decade by decade, but over two hundred years the changes were large; for example the size of ships on the Atlantic trade roughly doubled, even allowing for changes in the way in which tonnage was measured. In 1650 Holland was the biggest trading country but by 1830 Britain dominated world shipping. The size of the British merchant fleet which was about 340,000 tons in 1686 rose to 2,201,000 tons by 1830. London was by far the greatest port with about 50% of the country's trade in the earlier years though increased trade elsewhere reduced its percentage somewhat in later years. The Thames was also the main shipbuilding area in the 17th Century but, increasingly, this activity moved to the north-east coast. The change in leadership from the Netherlands to Britain was largely due to the wars which were fought over the Netherlands during which the British merchant marine flourished, supplying armies world wide.

The illustrations are a happy mix of contemporary paintings and etchings with a considerable number of building plans. They add much to the readers understanding of the ship types described.

Most of the authors are Dutch and their viewpoint forms an interesting contrast to the usual British insular accounts.

CROSLY, Mike, COMMANDER DSC & Bar RN. *Up in Harm's Way*. Airlife Publishing Ltd 1995. 256 pages, 27 photographs, 8 Appendices. ISBN 1 85310 555 4, £18.95.

(reviewed by LIEUTENANT COMMANDER J.S. SHEARS RN Ret'd)

This book follows on from where the author's first book, *They gave me a Seafire*, ended. He arrives back from the Far East as part of the Forgotten Fleet in 1946 and by this time people were trying to forget the war and return to normality (including the Customs). He decides to stay in the Navy and applies for and gets a place on No 6 Course at the Empire Test Pilot School (ETPS). If he had known that 50 of the first 200 to go through the ETPS would die in flying accidents, he states he might have had second thoughts. On the course it is the first time that he gets to fly a jet. The author has strong views on certain subjects that he expresses in a very readable manner throughout the book. For instance having now flown jets, why did it take 7 years to get them to sea after the 1945 trials?

Chapter 3 is the back to school chapter and is the largest in the book (39 pages). It is titled 'Some Basic Design Requirements.' Again presented in a very readable way with plenty of examples to illustrate certain aspects. The examples vary from modern aircraft, yachts, Formula 1 racing cars and WWII fighters. If at the end of this chapter you do not realize that the SEAFIRE was hard to land, then you have not been paying attention!

The other technical chapter is 'Decklanding and the Catapult'. Again very interesting with plenty of examples, but very depressing. Everything invented we hand over to the Americans, who then do it better!

From ETPS he leaves the Navy and joins Shorts. This in hindsight is quite depressing, as the reader knows he is flying 'No Hoppers'. The float change on a Short's SOLENT, during tropical trials at Khartoum, appears to be an interesting engineering exercise and he does appear to have liked the SEALAND, despite the troubles in getting it airborne!

He returns to the Navy and first has to do sea time in a frigate operating around the Mediterranean, which confirms his views on Naval Gunnery! Then to Korea, where he describes the flying as more professional, but less effective. He returns to test flying and is responsible for Pilots Notes. Again this section is full of good and interesting examples.

Next as the Commanding Officer of a WYVERN Squadron, where he gives the impression that he rather liked the aircraft. He admits that it is a good example of an aircraft being asked to do two different roles and ending up doing neither. The aircraft eventually got to sea after several fatalities, during testing, and it would seem that the safest place to be was piloting the beast. 'Goofers', for instance, had been banned following fatal accidents when bits of propeller had flown around the flight deck.

Finally he ends up as the CO of 'C' Squadron at Boscombe Down. Here he was involved with the introduction of the BUCANEER into service, with all the problems that threw up.

A very readable and interesting book. One slight niggle is that I wish he could decide whether he is the 'Author' or 'I'. As for the photographs, I would have liked to have seen one of the SPERRIN and the SEAFANG. But the one I would really have liked to have seen was of the London double-decker bus, that had been converted into a caravan and towed behind a Rolls-Royce Silver Ghost driven by a member of his ETPS Course.

GREENHILL, Basil (Editor). *The Evolution of the Sailing Ship 1250-1580*. Conway Maritime Press, 1995. 264 pages, 223 illustrations. ISBN 0 85177 655 . Price £20.

(reviewed by LIEUTENANT COMMANDER J.S. SHEARS RN Ret'd)

Any book that starts:

"The lower portion of the tracery of the east window of Malvern Priory Church consists of twelve lights, each of which is occupied by the figure of an Apostle. In the fourth light from the south of St. Jude, whose right hand supports a model of a ship. The glass . . ."

will either be thrown to one side or prove to be a fascinating insight into the erudite debates that occur on subjects which, most of us mere mortals, have only a superficial understanding. This book is a collection of articles, notes and queries that were first published in *The Mariners Mirror* (MM), the international journal of the Society for Nautical Research (SNR). The Society came into existence on 14 June 1910, as a result of the enthusiasm of a small group of men whose leisure interests had led them to study the development of the sailing vessel, and more especially of her sails and rigging, in the medieval and post medieval periods. The SNR has two main objectives in launching this book:

1. By focusing on the material first published in early volumes of the MM, it is intended that it will reveal the interests and scholarly contribution of those who founded the SNR.
2. Make accessible to modern researchers the works of previous generations of historians.

Forgetting the researchers etc. who obviously will need to use this volume for reference, it is thoroughly recommended to the layman. This reviewer would categorize this as a 'dipping in' book. The book is A5 size, which makes it handy to pass away time on those train journeys etc. There are 70 chapters with subject headings varying from 'Early Reefs' to 'A Haseatic Bergentrader of 1489'. Thoroughly recommended to anyone who has an interest in sailing ships. All those 'Yachties', as you next head across the Channel, how about giving your partner the job of being the 'Shifter.'

(A 'Shifter' being a sort of 18th Century nautical equivalent to a kitchen maid.)

HILL, J.R. (editor). *The Oxford illustrated history of the Royal Navy*. Oxford University Press, 1995. 479 pages, approximately 110 illustrations, 108 photographs, 23 maps, 26 colour plates, 6 Action Stations. ISBN 0 19 211675 4. Price £25.

(reviewed by LIEUTENANT COMMANDER J.S. SHEARS RN Ret'd)

This excellent book, one of the illustrated series of histories from the Oxford University Press, is a must for anyone who has an interest in the Royal Navy. For £25 it is superb value, the quality of the print, illustrations etc. can not be faulted. The layout of each page makes finding particular subjects easy, as notes are contained in side margins. There are 14 chapters and 14 authors, which means basically 14 separate essays and 14 different styles. Obviously some are easier to read than others, but on the other hand this could be due to the varying subjects and what the reader is interested in. It is suspected that, unless an expert in some particular aspect of Naval history, the average reader will turn to the end of the book and read first those chapters which cover the periods/decisions that they may have been involved with. This does mean the later authors will have more critics!

Every chapter contains a wealth of information, but this reviewer does like looking for the odd facts and his favourite in this volume can be found in the first chapter. In 1297, Edward I had planned an expedition to Flanders. 300 ships had been pressed from South and East coast ports and assembled at Winchester. The expedition never sailed as a bitter fight occurred between the men from the Cynque Ports and Yarmouth, which resulted in the loss of 37 Yarmouth ships and 171 men. With the European Cup happening this year, it would appear that football hooliganism is nothing new!

KINGSLEY, F.A. (editor). *The Applications of Radar and other Electronic Systems in the Royal Navy in World War II*. Macmillan, Basingstoke, 1995. 395 pages, 52 illustrations. ISBN 0-333-62748-2. Price £40.00

(reviewed by David K. BROWN, RCNC)

This is the third book published for the Naval Radar Trust devoted to recording the history of the introduction of Radar in the Navy. The first, *Radar at Sea* and reviewed in the *Journal*, was a general survey whilst the book now under review is a more technical study of the applications of Radar. The subject is covered under the headings of:

- Weapon direction and control.
- AIO.
- Fighter Direction.
- Electronic Counter Measures.
- HF/DF.
- German developments.

The first section is strong on the effectiveness of the whole system in that improvements in the radar soon showed the need for better directors, compu-

ters and, eventually VT fuses. Little could be done about the proverbial 'way of a ship in the sea'. There are many useful tables of detection ranges and estimated kill probabilities.

Prior to the war the only input to the AIO was from visual observation and a single ARL table was adequate to keep the command in touch. As more and more information came in from air and surface radars more and better plots were required and fitted. There were many problems in ship fitting and in its use deriving from the secrecy attached to radar as those not in the know could not appreciate its importance. In the 1930s, with short range fighters and no radar there was little which could be done to develop fighter direction. The first modern carrier, *Ark Royal*, never had radar and information was supplied by visual signalling from *Sheffield*. Operation PEDESTAL in 1942 was seen as a landmark as *Victorious* had the best AIO in the fleet. It was reasonably successful but near saturation. By the time the Pacific Fleet was formed, a good plotting team could handle 12 tracks per minute.

ECM was somewhat less glamorous but vital when the Germans started to use radio controlled bombs. The section on HF/DF is particularly welcome as it has not received enough credit for its vital role in the Battle of the Atlantic and it is hoped that historians will re-assess the value of this equipment. If anything, HF/DF was regarded as more secret than radar as much of its value would be lost if the Germans had realized that it was in use. Luckily, they decided that such equipment was impossible to fit in a ship. Credit is given to a Polish team for their important contribution.

The Germans had a small lead in surface and gunnery radars at the outbreak of war but this was soon lost when HITLER ordered work to be stopped on all projects which would not complete in six months. British ASV was a particular shock to them and work, belatedly, restarted.

This book is aimed at the informed reader who will find it fascinating. It is hoped that much of the sense will, in time, filter down to general historians.

PLUMMER, R. *Paddle Steamers at War 1939-1945*. GMS Enterprises, Peterborough, 1995. 64 pages, ca 80 photographs (Paperback). ISBN 1 870384 39 3. Price £5.95 post free from Waverly excursions Ltd, Gwalia Buildings, Barry Docks, CF62 5QR.

(reviewed by David K. BROWN, RCNC)

Few readers of the *Journal* will be aware that the RN operated over 50 requisitioned paddle steamers as minesweepers and as estuary AA ships during World War II. Their story is told in this fascinating little book.

The first section lists each ship by its peace time area of operation, supplying brief notes on its operation history. For two of them the cycle had gone full circle as the *Queen of Kent* and *Queen of Thanet* had been built as minesweepers in 1916 and converted into paddle steamers after that war. There are then a number of personal accounts by men who served in them dealing with the dreary but always dangerous task of minesweeping, the perils of the Dunkirk evacuation etc.

The illustrations are mainly of the ships spiced with a few shots of life on board. They are well chosen, many have been drawn from private collections and not been used before but the reproduction could have been better. If your interest lies in ships of the RN you will enjoy this book.

ROBERTS, J. *Warship 1995*. Conway Maritime Press, London, 1995. 224 pages, ca. 230 illustrations. ISBN 0-85177-654-X. Price £26.00

(reviewed by David K. BROWN, RCNC)

Like a good Christmas pudding, this annual may be described as the mixture as before but the high quality of the ingredients make it as enjoyable as

ever. There is a fascinating article on masts and funnels in RN DREADNOUGHTS by John BROOKS. The cost of battleships was quite tightly constrained by governments and this led to limits on size. The critical factor was length, determined by upper deck layout and, in turn this was governed by the blast effects of the big guns on neighbouring turrets, directors, the bridge etc. Boats were still an emotional design feature and the mast usually had to support the main derrick. All this led to many bad compromises with the control top in the hot smoke cloud from the funnel and a few expensive re-builds.

This is followed by McBRIDE's article on battleship design studies by major navies at the outbreak of World War I, with some strange layouts trying to optimize the arrangements of guns and their increasingly important fire control gear. LAYMAN demolishes some of the myths that have grown up concerning the sinking of the elderly German Battleship *Ostfriesland* during US bombing trials after the war. There is a welcome—and well illustrated—article on the Union fleet of the US Civil War, a topic not well covered in UK books. One may link this with a short note on guns of the *Alabama*.

Other excellent articles cover Torpedo Rams of the Austro-Hungarian Navy, British coast defence guns of World War II, French cruisers, the SCORPION and DRAGONFLY classes of river gunboats, German auxiliaries, *Warrior* and *Magnificent* in the RCN. Moving forward, MOORE discusses the post war British coastal frigate designs. Information on these is incomplete and anyone who can help is invited to write to the reviewer. The biography of Sir Rowland BAKER is reproduced in abridged form in this issue.

There are the usual notes, book reviews and a review of the year's naval events. If you enjoyed earlier annuals you will like this one.

SUMRALL, R.E. *Sumner-Gearing Class Destroyers, Their Design, Weapons and Equipment*. Conway Maritime Press, London, 1995. 320 pages, 225 photos, 25 plans, 23 colour illustrations. ISBN 0 85177 657 4 Price £35-00. (reviewed by David K. BROWN RCNC)

The book opens with a short section on the development of USN destroyers between the wars, a topic which is not as well known in the UK as it should be. This development led to superb ships with welded, longitudinally framed hulls, the best guns and fire control system in the world and machinery which was light, compact, well subdivided, easily maintained and, above all, reliable. (I will return to US machinery later)

By 1940 development had led to the FLETCHER class which, on a design displacement of 2110 tons (Standard) carried 5 single 5 inch guns and 10 torpedo tubes and had a design speed of nearly 38 knots. The arrangement of five single mounts and a quadruple 1.1 inch on the centre line made the upper deck arrangement very cramped and, even before they entered service, an improved design was sought. There were numerous studies, most of which are illustrated, and opinion soon hardened on a design using the same machinery as the FLETCHERS and an almost identical hull (Beam increased a foot) but with the upperworks entirely changed around three twin 5 inch mounts. This became the SUMNER class; later an extra 14ft was inserted amidships to increase the fuel stowage leading to the GEARING class.

There is then a detailed 'walk through' description of the ships. The first 19 are described as having a 'British style' bridge which was greatly disliked. I'm not surprised; though loosely based on MOUNTBATTEN's ideas, used in most British WW II destroyers, the USN derivative was obstructed and with poor visibility.

About the only complaint made of these classes were that they were wet. Again, I'm not surprised as their freeboard was inadequate even by the standards used by British constructors in WW II. Freeboard/sq rt length is a use-

ful guide and British destroyers were expected to have a value of over 1.1 and on completion, most achieved at least 1.2 (and there were complaints from sea that they were wet!). The SUMNERS seem to have achieved about 1.0 and the GEARINGS 0.9. I would have given them a little more flare but that is a matter of hot debate. At the time, their wetness was blamed on the weight of two twin 5 inch turrets, well forward, but it is unlikely that this had much effect. Their bridge was rather far forward at 0.29 of the length which would have exacerbated the perceived motion.

The book continues with a description of the many conversions during and after the war. Their large hulls made this relatively simple and they became radar pickets, minelayers, specialist A/S vessels and carried prototype missile launchers. Dr FRIEDMAN, in his introduction, suggests that the British DARINGS, whose concept owed much to the GEARINGS, could not be modernized because their turrets were too high. I think this is wrong; the reason was at their half life, guns were seen as outdated and there was no way of getting SEASLUG onto a DARING. The elaborate gun bay of the 4.5 Mk 6 made alteration difficult.

There are detailed sections on armament, radar and other equipment. These are clear and well illustrated but it is likely that most readers already have this information in other books. Only four of these ship were lost and there are some fascinating photos of ships which survived incredible damage. These classes must rank as the best destroyers of World War II and the author has done them justice, helped by excellent drawings by Paul BENDER and Michael DOYLE. The numerous photographs are well chosen and clear. Some foreign designs inspired by the SUMNERS are mentioned but, strangely, the DARINGS are not included and their machinery, at least, was based on the SUMNERS.

## Machinery

It is worth looking in a little more detail at USN machinery and the author's views on its development. The first USN designs between the wars had machinery built by the shipbuilder to (British) Parsons design. The Bureau of Engineering became unhappy with the design ability of Parsons and in May 1935 the US Espionage Act was invoked to prevent further involvement of foreign companies. This was partly due to intense lobbying by the design agency Gibbs and Cox (and GIBBS was related to the ROOSEVELTS by marriage) who preferred machinery based on power station experience, particularly by Westinghouse. ADMIRAL BOWEN, who became head of the Bureau in May 1935, gives two specific, technical reason for his choice:

The Westinghouse company had carried out a great deal of research into blade vibration and, though this work had been published, it had not been adopted by Parsons. The RN had put an experimental high temperature, high pressure plant into *Achates* which never performed well. Its failings have been dismissed as teething troubles but the few accounts available suggest that the fundamental problem was blade vibration.

BOWEN also points out that the number of moving parts was greatly reduced—e.g. *Benham* had 1,750 blades compared with 17,500 in a similar Parsons design—reducing first cost and improving reliability.

The MAHAN class were given a Westinghouse derived plant, but the lack of experience of Gibbs and Cox led to a very congested layout which was very unpopular and got the new machinery a bad reputation. It was over weight and the promised savings did not materialize. However, the trials of the SOMERS in November 1937 showed a reduction of 20% in fuel consump-

tion with a considerable saving in weight. By this time the shipbuilders were fighting back and the GRIDLEYS had Bethlehem machinery which SUMRALL says fully matched the performance of the Gibbs plant preferred by the Bureau. BOWEN gives very different figures and your reviewer lacks the knowledge to decide.

In a decade, steam temperature had risen from 648 to 850 °F and pressure from 400 to 580 lbs/in<sup>2</sup>. Double reduction gearing had been introduced and, though there were teething troubles, these were soon overcome. It is not possible to detect any great change in cost of the ships, either way, due to the introduction of advanced machinery but, using conventional exchange rates, US destroyers were very expensive. Costs are very difficult to compare and the fact that US shipbuilders could compete in export markets suggests that the real costs may not have been very different from European builders.

Many books have been published about the destroyers of World War II but none have looked seriously at the technology of naval architecture and marine engineering and how these differed between navies (I have a draft!). Mr SUMRALL **gets closer than most and reminds us that the SUMNER/GEARING classes were not only the best destroyers of the war but that other navies took a long while to catch up after the war.** It is a book to be read with attention by enthusiasts and engineers alike.

TARRANT, V.E. *Jutland. The German Perspective.* Arms and Armour Press, London, 1995. 318 pages, many line diagrams and charts. ISBN 1 85409 244 8. Price £20.

(Reviewed by David K. BROWN, RCNC)

The author has tried to provide a new outlook on the battle of Jutland by describing it from the German point of view. The main source is the official history, *Der Krieg in der Nordsee* by GROOS, written in 1925 with additional material from personal accounts by German officers. These sources have been used by previous writers from the RN point of view so that there are no great surprises.

The daylight battle is seen in fairly similar ways by the two navies though there is still no good explanation of why SCHEER and HIPPER thought that BEATTY was running for home in the so-called 'Run to the North' (The course was east of north). It did not occur to them that BEATTY was joining the Grand Fleet. The new approach comes into its own in describing the night action. From the British viewpoint this was a confused set of attacks, largely unsuccessful but seen from the German side it is much clearer. They were steadily running for the safety of the Horns Reef passage only slightly distracted by the British attacks.

For both day and night actions there are very clear charts and the student of Jutland will obtain a new insight. The text concludes with a collection of signals made by the German side during the battle. A point of great interest is to discover how long it took for a signal to pass from the bridge of one ship to the bridge of another, passing coding rooms and transmitter/receiver on the way. It is not possible to do this in all cases since differences between clocks suggest that some signals were received before they were sent. A reasonable interpretation suggests a time of about 7 minutes for transmission, perhaps a little faster than in the RN.

There are a few minor quibbles. Early on the author refers to the much heavier deck protection of the German ships but there was little difference with 1-2 inches in modern ships (a little thicker on the slopes). It should be appreciated that the protective deck was intended to keep out splinters from shells bursting above and not to stop shells impacting directly. One, perhaps two, splinters pierced the deck of surviving British ships. It is also said that the Germans improved flash protection after the fire in *Seydlitz*' turrets at the



Dogger Bank. This seems to be incorrect, the only additional precautions were to reduce the number of charges in the turret.

It is also said that German shells penetrated British armour without difficulty. The thickest armour hit in surviving ships was 9 inches (ships lost did not have anything thicker than 9 inch) and several shells failed to penetrate and burst behind. The failure of British shells is beyond dispute.

This is a well written and interesting contribution to the story of Jutland and at £20 should find its way to many bookshelves.

VOLCY G C, *Memoirs of a Marine Troubleshooter*. The Institute of Marine Engineers, London 1995; 297 pages with photographs and diagrams. (reviewed by Dr D.W. CHALMERS, OBE, RCNC).

The author of this slim paperback volume was born in Poland in 1923 and emigrated to France in the late 1950s where he was employed immediately by Bureau Veritas (according to himself, before they had even seen him). He had already during his university studies in Poland discovered a strong interest in vibrations and in particular the interactions between a ship's structure and machinery. The time that the book covers is from about 1960 to 1980 which was a period of very rapid growth in ship size, especially of tankers and bulk carriers, and of a resulting increase in the number and severity of vibration problems. The author's intention in the book is to pass on to his readers some of his experiences and so to reduce the risks of the same mistakes being made again. Unfortunately, because of the time between the experiences related and the present, the book has much less value than the author hopes; the majority of his methods are now commonly taught in university engineering courses.

The reader quickly becomes aware that the book is essentially memoirs, and written in an idiosyncratic manner. The style is remarkably pretentious to the British ear, but in fairness that may be as a result of translation (which could be via Japanese as the foreword is to the Japanese edition!). The text drops names everywhere, few of which will have any meaning to the reader, and moreover contains an element of dialogue, hardly adding to the technical matter. In trying to be both an engineering guide and a lighthearted review it sadly falls between the two.

The content tends to be repetitive after the first one or two chapters (of ten). Basically each takes the line of shipowner or shipbuilder has a vibration problem associated with the propulsion train; author comes along with a revolutionary solution; owners very doubtful but are convinced by technical argument from author; solution is implemented and is successful; happiness all round. In each case however, the solution is fairly clearly explained by the use of diagrams (albeit reproduced rather small and difficult to read) and photographs. Nevertheless, one can readily understand the reluctance of shipowners in the 60s and 70s to accept the then unusual analytical proposals.

All the ships described are merchant vessels, but perhaps the one of most interest to the readers of the *Journal* is that in chapter 9. It involves a 22 knot LNG carrier with a 45,000shp single screw steam turbine installation driving a shaft supported on an A bracket (rather than shaft bossing). The problem of excitation of the after end structure was identified and solved analytically during the build of the ship, and required a new and more rigid design of A bracket to be installed. It is also notable that the solution of this problem was associated with the development by BV of the ISO6954 shipboard vibration limits.

It has not proved an easy book to read and it is doubtful whether its price of £21 is really justified except to another vibration enthusiast.