

Paper: "AN OUTLINE OF NAUTICAL BIBLIOGRAPHY"  
Read to the Society by Mr. B.W.BATHE, 15th January 1944

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In this short paper I am attempting to outline some books and manuscripts written on Shipbuilding and Rigging, in the sailing-ship era, and to give some information about their authors; dealing more particularly with books useful to the ship model-maker.

An interesting early book printed in Latin, and later in German, is Breydenbach's Travels, published 1486; this is not a book on shipbuilding, but the story of a pilgrimage to the Holy Land by Bredenbach in 1483. Its is, however, illustrated by coloured woodcuts of Mediterranean craft, both galleys and sailing vessels, with views of shipbuilding by the artist Erhard Reuwick, publisher of the book who accompanied the author. It is also of interest to note that the book contains the first folding plates to be found in any book. Bayfius, a French writer and diplomat, a Councillor of Francis I and ambassador to Germany and Venice, wrote his 1536 his Annotations.....de re Naval, published in Paris. This is a history of early navigation and contains woodcuts of early galleys. The Pepysian Library at Magdalene College, Cambridge, possesses a manuscript described by Samuel Pepys as Fragments of Ancient English Ship-wrightry, which gives most valuable data on the exact form of Elizabethan ships. Although it is unsigned and undated there is some evidence to shew it to have been the work of Matthew Baker, a master shipwright, and to have been written about 1536. The manuscript contains elevations, plans, and sections of a number of ships of the period. A book printed in 1587, Palaciu's Instrucción Nautica, was one of the first books published to describe how ships were built and rigged at the time he wrote, and ends with a vocabulary of nautical terms.

In 1607 there was published in Rome, B.Crescentio's Nautica Mediterranea, which describes very fully the building and rigging of galleys, galleases and ships; it consists of about 690 pages and contains many diagrams and plates. Joseph Furttenbach published at Ulm in 1629, his Architectura Navalis, based on Italian practice, which deals with the building of galleys and ships, and also describes the Battle of Lepanto. Furttenbach wrote on many other subjects connected with architecture and gunnery, and a collection of his works which included Architectura Navalis was published in 1663.

We now come to an English work, in Captain John Smith's An Accidence.....for all Young Seamen, published in 1627, together with other editions under the title: The Seaman's Grammar which appeared in 1627, 1636, 1653 and 1691. John Smith, adventurer and colonist, was Governor of Virginia, and in 1614 explored and mapped the New England coast. His early editions were mainly a list of technical terms but the title page of the 1691 edition describes the book as "Explaining all the difficult terms in Navigation, and the Practical Navigator and Gunner" "in two parts containing most plain and easy directions, to Build, Rig, Yard and Mast any Ship whatsoever. With the manner of working a ship in all weathers - and how to manage a fight at sea - also the charge and duty of every Officer of the Ship and their Shares - and the use of the Petty Tally - and abstract of the act of Gunnery (or shooting in great ordnance and mortar-pieces) - wherein the principles of the art are plainly taught both by arithmetical calculation and by Tables ready calculated - with the ~~several~~ compositions for the making of several Fire-works useful in war, both at sea and on land - and an appendix how by several Geometrical ways to take Heights Depths, and distances, accessible or inaccessible."

This book was followed in 1644 by Sir Henry Mainwaring's The Sea-Man's Dictionary or Exposition and Demonstration of all the Parts and Things belonging to a Ship. Among the sea adventurers of that time there was perhaps no more striking character than Henry Mainwaring, whose strange and chequered career equals that of many a hero of fiction. He sailed in 1612 as a privateer and later as a pirate, but reserved his attention for the ships of Spain. In 1616 he was offered a pardon by James I, returned to England and ~~Wrote~~ wrote his Discourse on Pirates. Now followed a period of employment as Lieutenant of the Cinque Ports, and it was at this time he wrote The Seaman's Dictionary. From 1623 onwards, Mainwaring was employed on naval matters and was responsible to a large extent for the development of Portsmouth as a Naval Dockyard and Harbour. In 1640, he was deprived of command in the Navy because of his strong Royalist sympathies, but for a time continued to serve at Trinity House, until in 1642 he lost this position, too. He later accompanied Prince Charles to Jersey but eventually made his peace with Parliament, paid a fine and returned to England, where he died two years later. His Seaman's Dictionary was republished in 1922 by the Naval Records Society in Vol II of The Life and Works of Sir Henry Mainwaring.

A Treatise on Rigging, circa 1640, published by the Society of Nautical Research in 1921, from a manuscript formerly in Petworth House and now in the Science Museum, describes very fully the rigging of early 17th century ships. The "Sovereign of the Seas", launched 1637, is described in a small book by Thomas Heywood, published London, 1637, and the frontispiece is an engraving of this ship. The Boat-Swains Art, or the complete Boat-Swain by Henry Bond, first printed in 1642 and reprinted many times, was sold with a scale in brass or wood for scaling the sizes of masts. Another book on rigging, The Complete Modellist, by Thomas Miller, of Great Yarmouth, "Seaman and Master in the art of raising the Model" was printed in 1664. It has two plates and tables of sizes and proportions of ropes etc. The first printed work in English dealing only with naval architecture appeared in 1669, written by a shipwright, Edmund Bushnell, entitled A Complete Shipwright. It contains designs for a ship of 60 ft on the keel, giving a sheer draught and a midship section. Two more manuscripts from the Pepys Collection must now be mentioned, the first: Sir Anthony Deane's Doctrine of Naval Architecture, of 1670. Deane, a close friend of Pepys, was a very successful shipwright, appointed as Master Shipwright at Portsmouth in 1661 and promoted to Naval Commissioner in 1672. He was responsible for the building of at least three First-rates and many smaller craft including yachts.

When Peter the Great of Russia visited England in 1698, he was instructed in the art of shipbuilding by Deane. The manuscript contains a series of body plans, with mast and rigging plans for each of the ~~six~~ six rates of ships which then made up the Royal fleet. A second manuscript is Mr. Dummer's Draughts of the Body of an English Man-of-War which contains a number of sectional views of a First-rate of about 1680. Edmund Dummer was Assistant Master Shipwright at Chatham and later appointed Surveyor to the Navy in 1692. He was suspended from duty in Decr. 1698 and appeared before the Board of Admiralty in 1699. The Admiralty seemed eager to get rid of him and represented to the King that Dummer was a person not fit to be employed as a Surveyor of the Navy. This recommendation received approval and Dummer was discharged. In 1702, he inaugurated the first transatlantic mail and passenger service between England and the West Indies. He received Government contracts for carrying the mail and, though a financial failure, Dummer's West India Mail Line was a land mark in maritime history. Incidentally a descriptive catalogue of Pepys Collection preserved at Magdalene College, Cambridge, has been published by the Naval Records Society.

I now come to the 18th century, when several well known and important books on naval architecture of the period were published. The first is a book by William Sutherland, who styles himself Shipwright and Mariner. He held the position of Master Caulker at Sheerness from 1717 until his death in 1740. This book, entitled The Ship-builders Assistant, published in 1711, ran to many editions, and was one of the most famous works on the subject during the 18th century. It is a small book of 165 pages, full of practical information, with 12 plates, two of which are rigging plans. In the edition of 1704 the following items are included: "The method of entracting the Square and Cube roots", "Observations on the Nature and Value of Timber", "The Method of Drawing the plans of ships" "Directions for making the masts and yards and the Boatswains art.....with some directions for cutting out sails. A second book by the same author, Britain's Glory, or Ship Building Unveiled was published in 1717. It is divided into two parts: Part I goes into sizes and proportions and includes a specification for a new ship: Part II deals with prices of labour and material.

In 1737 a most remarkable book was published, written by an inventor Jonathan Hulls. He calls it A Description and Draught of a new invented Machine for carrying vessels or ships out of or into any Harbour, Port or River against wind or tide or in a calm. Hulls was the first who attempted practically to employ steam in propelling a vessel in the water, and his very primitive steam propelled vessel was primarily intended to be used as a tug. His experiment proved a failure and only excited derision. Thomas Blanckley published in 1750 his Naval Expositor which, according to the title-page, explained "the words and terms of art belonging to the Parts, Qualities and Proportions of Building, Rigging, Furnishing and Fitting a ship for Sea. It contained several small marginal engravings of various parts of a ship. Mungo Murray, a shipwright in H.M. Dock Yard at Deptford, wrote in 1754 his treatise on Ship-building and Navigation. Murray also served as carpenter on H.M.S. "Weymouth" and as a sort of teacher of navigation in several warships under Lord Howe. He had published in 1768 another book giving the description of a 60 gun ship. In 1756 William Mountaine "Teacher of Mathematics and F.R.S." published the Seaman's Vade Mecum and Defensive War by Sea, re-printed in 1780 and in 1783 (In the preface of the 1756 book Maountaine states: "it is a Third Edition"but I have been unable to trace dates of the earlier copies) This small book of 270 pages is packed with information on the Royal Navy and Merchant Service, as is shewn by the title page which reads as follows: "The Proportions of Rigging, Masts and Yards, Weight

Navy, The Exercise of the Small Arms, Bayonet, Granadoes and Great Guns, Duty of Officers etc., also showing how to prepare a Merchant Ship for a close Fight by disposing their bulk-heads, Leaves, Coaming, Look-holes, etc., Chasing; The Advantage to be taken by the chase considered, under all positions in respect to Wind and Tide. "Defensive-Fighting" shewing how Merchant Ships are to act whether single or in Fleets, when cannonaded or boarded by the enemy. "Naval Fortifications", the advantages of mooring considered in respect to wind and tide and how to lay Booms in straight or crooked Rivers etc. An essay on Naval Book-keeping; as well in respect to the Purser as to the Captain's Clerk and Steward. The method of forming signals for the regulation of Merchant Ships sailing in company, under the directions of a Commodore in Time of War; with many other Particulars relating to the Navy and Merchant Service." That part of the book dealing with Defensive Fighting for Merchant Service is a reprint of a work by Captain Robert Parker of Ipswich published in 1704.

There was published at Stockholm in 1768, one of the most important works of the century - Frederick Hendrick Chapman's "Architectura Navalis Mercatoria". Chapman was born 1721 and came of an old English family from Deptford, from whom he inherited his skill and enthusiasm for naval architecture. After experience in various classes of ships, in 1757 he became a shipwright at the Swedish Naval Dockyard, Karlstrona, and later rose to Chief Constructor and Admiral Superintendent. On his death in 1808, a medal was struck by the Swedish authorities shewing the head of the Admiral, and on the reverse a hull under construction. The work measures approximately 3 feet by 2 ft and consists of an atlas of drawings of plans of ships in all types, showing sheer, body, and half-breadths, ships boats, rigs, methods of launching, and a number of perspective views. The plans mainly consist of European types but a number of English vessels are included, i.e. H.M.S. Unicorn, 32-gun frigate, the Royal Yacht Caroline, and East and West Indiamen, also what are probably the earliest plans of English fishing boats, namely a herring-buss and a smack with live-well. The exact date of these is unknown but they are about 1740-1755. Other English small craft are shown, such as a chalk barge, English Hoy, Thames Wherry and Ballast Hoy. A half-size of Chapman's work was published by a German firm in 1937.



Chapman wrote a number of other books, including, in 1775 a Treatise on Shipbuilding which is an amplification of his Architectura Navalis. The importance of this work (and the slow progress of naval designers in the wooden-ship period) is shewn by the fact that it is quoted freely in the official report of the Chatham Committee of Naval Architects of 1842-1844.

Falconer's Universal Dictionary of the Marine was first published in 1769, and reprinted over and over again, editions modernized and enlarged by William Burney being published in 1815 and 1830. William Falconer, born at Edinburgh in 1732, served his apprenticeship on a merchant ship, later entered the Royal Navy, which he left about 1760 to serve as 2nd Mate of the *Britannia*, a merchantman in the Levant trade, which was shipwrecked at Cape Colonna on a voyage from Alexandria to Venice, with only four survivors. From this incident Falconer drew the outline and characters of his well-known poem 'The Shipwreck'. In 1762, he re-entered the Navy and served in several ships until in 1769 he was appointed to H.M.S. *Aurora*, which sailed from Portsmouth Sept. 1760 and after touching at Good Hope was lost with all hands. The earlier edition of his Dictionary was described as "copious explanation of the Technical Terms and Phrases employed in the Construction, Equipment, Furniture, Machinery, Movement and Military Operations of a Ship" and contained 12 folding plates, some of which were copied from Chapman's Architectura Navalis. The later editions were enlarged and brought up to date, with the addition of articles on Astronomy and Navigation, they were illustrated with 35 plates. An American edition of Falconer was published at Washington City in 1805 under the title The Mariner's Dictionary, or American Seaman's Vocabulary of Technical Terms and Sea Phrases. In 1930, a modern abridged edition was issued, entitled the *Old Wooden Walls*, edited by C. S. Gill, based mainly on the 1815 edition.

Marmaduke Stalkratt, of Deptford, published in 1781, a treatise on Naval Architecture and Ship Building, together with an atlas of 14 large draughts and plans of various vessels; including a long-boat, yacht, cutter, sloop, 44 gun ship and a 74 gun ship. A second edition of this work was published in 1787. About 1785,

William Hutchinson, the Dock Master at Liverpool, published a book on Seamanship and Ship Building, giving form and proportional dimensions in length, breadth and depth of merchant ships in general. Other editions are dated 1787 and 1794. Nicolas Ozanne, a great French marine architect of his day, and teacher of naval construction to Louis XVI, published about 1790 his Marine Militaire which contains 50 engraved plates of various types of vessels. He had published other books of a nautical nature, including, in 1777, one containing 60 very fine engraved views of the principal French harbours and maritime towns. David Steel, compiler and publisher of numerous nautical works and an Admiralty agent for charts, issued in 1794 his Elements and Practice of Rigging and Seamanship in two volumes, the first containing mast-making, rope-making, anchor-making, sail-making, block making, and Rigging, with 65 engraved plates. The second comprised Seamanship, Naval Tactics, and tables of sizes of rigging for ships of every class, with 27 plates. In 1795 to 1797, the work was reprinted in four volumes entitled The Art of Making Masts, Yards, Gaffs, Booms, Blocks and Oars; The Art of Rigging; The Art of Sail Making; and Seamanship both in Theory and Practice. Other editions appeared in ~~XXXX~~ 1800, 1806, 1818; and in 1932 Messrs W. & G. Foyle Ltd. published the work, arranged by C. S. Gill from the 1794 edition with the rigging tables of 1806. Steel published in 1804 The Elements and Practice of Naval Architecture. In this work, among other important data, are tables of dimensions for ships of each class of the Royal Navy, types of Merchant Vessels and numerous small craft, illustrated by 39 plates in a separate volume. The plates are on a large scale and shew many details of shipbuilding practice. Included in the draughts are plans for Ships, boats, for a collier brig, bomb-vessel, 18 gun brig, 40 gun frigate, 80 gun ship and an East Indiaman. Another book, The Ship Master's Assistant and Owner's Manual "containing complete information as well to Masters, Merchants, Masters of Ships and persons employed in the Merchant Service, as to Officers and others in the Royal Navy relative to Mercantile and Maritime Laws and Customs" was published by Steel in 1801. It contains plates shewing section and rigging of a First Rate Ship of War, while another edition, in 1808, has one plate shewing the rigging of a merchant ship of 550 tons. In 1800-2 was published what has been called an English shipbuilding classic, John Charnock's History of Naval Architecture which, in three volumes, describes the history of

shipbuilding from the earliest period to 1800 and is illustrated by 97 plates, with views of all kinds of craft.

First published in 1808, Darcy Lever's The Young Sea Officer's Sheet Anchor, or Key to the Loading of Rigging and to Practical Seamanship was for forty years the text book on rigging both in the Navy and Merchant service. The book was reprinted many times, with an American edition published at Philadelphia in 1819 and a Spanish one published at Madrid in 1842. Darcy Lever was born about 1760, and as a young man went to India, where he acquired his nautical knowledge; he returned to England while still quite young, and died at Edinburgh in 1837. The original edition contained 55 plates and was published at Leeds. John Goldie, shipwright and mariner, published at South Shields, 1817, A New Treatise on Ship-building, improved also the Mast-makers Guide, and the Mast-maker explained, together with the terms used in Ship Buildings." The Ship-Wright's Vade Mecum by Nôrie, was published in 1822, with an atlas of four folding plates, shewing plan of a 74 gun ship, a 350 tons merchantman, plank-ing and inboard works of a merchantman. A Treatise of Mast-ing Ships, by John Finchen, was published in 1829. This represents an attempt to codify and simplify details of masts and spars of the many men of war. The title-page of the 1st edition reads "On Mast-ing Ships and Mast-making, giving some of the Principals on which the mast-ing of ships depends; with the practical operations of Mast Making: Intended for use of the Students of the Royal Naval College and School of Naval Architecture." This edition was illustrated with four folding plates, a second large edition published in 1843 had a separate folio atlas of four plates of various types of craft, spars and sail. A third edition was published 1854. Finchen was the author of several other books, including in 1851 a History of Naval Architecture illustrated with 58 plates of early sailing vessels, ship construction and early steam ships. In 1830, at Edinburgh, was published a Treatise on Marine Architecture by Peter Hadderwick, with a portfolio of plates. This contained the theory and practice of shipbuilding, with rules for proportions of masts, rigging and weights of anchors. Much information on the merchant ships of this period is obtained from the work, and among the plates are: a plan of a 250 tons steam packet: draft and Sail plan of a 173 tons smack, draught and sail plan of a 151 tons schooner, and draught and sail plan of a 500 tons ship. The two books Archeologie Navale and Glossaire Nautique both by Auguste Jal, were published in Paris in 1840 and 1848 respectively. These are important works, although some of Jals' comments and surmises have proved incorrect in the light of more recent research.



Masting, Mast-making and Rigging of Ships published in 1854 and The Elements of Sail-making published in 1857, were both written by Robert Kipping. The second book is a complete treatise on cutting out sails, with full and accurate dimensions and is illustrated by 17 plates. There may be earlier editions of both.

First published 1854, The Sailing Boat, by H.C. Folkard, ran to six editions, the last published in 1906. The later editions are described as a Treatise on Sailing Boats and Small Yachts: Their Varieties of Type, Sail and Rig. It is interesting to note that in the 5th edition of 1901, the small yachts of the West Lancashire, Southport, Corinthian, Hoylake and New Brighton Yacht Clubs are fully described with lines and sail plans. Published 1861, The Elementary and Practical Principles of the Construction of Ships by H.A. Sommerfeldt, contained among its illustrations a Clipper Ship, a Schooner, and an East Indiaman, with sail-plans. Souvenirs de Marine by E. Paris, published 1908-10, is probably the finest collection of plans of all types of vessels in existence. Its six volumes contain 360 engraved plates. An idea of this work can be gained by the titles of a few of the plates, i.e. fishing vessels, 1873, ~~Labec~~ of 22 cannons 1787, Venetian Man-of-war of 16th century, French Slave Ships 1788, Danish Coaster and Dutch ship 1689.

The large number of books written during the past 30 years on wooden shipbuilding and rigging practice, makes it impossible to deal fully with them here. Such books as:- The Rigging of Ships in the days of the Spritsail Topmast, by R. C. Anderson: History of American Sailing Ships, by H. I. Chappelle: Fore and Aft Craft, Sailing Ships and their Story, Ships, Their History and Development, Ships and Ways of other Days, and Old Ships, Figureheads and Sterns, by such writers as E. K. Chatterton, Laird Clowes, L.G.C. Laughton, to quote but few, are interesting and useful works. G.W. Munro has written several excellent articles in Marine Models, including Practical Wooden Shipbuilding for Model Makers, Vol 10., A Series of Notes on Ships ~~Marine~~ Boats 1750-1822, with designs based on plates from Stalkratt, Falconer, Steel etc., Vol 8. ~~and~~ and Wooden Merchant Ship-building, circa 1800, Vol 12, which includes a useful glossary of terms used in theory and practice of shipbuilding. Ship and Ship Models (Vols 1-8) also contain such useful data on rigging etc. Lastly, the Mariners Mirror, the journal of the Society of Nautical Research, has since its commencement in 1911, contained many articles on shipbuilding and rigging, for example Italian Naval Architecture circa 1445, Vol II., The History of Wood Preserving in Ship-building, Vol 12. Construction of Gallies, Vol 13., Dutch Shipbuilding in 1664 and Venetian Naval Architecture Vol 20.