The Liverpool Nautical Research Society

TRANSACTIONS

VOLUME III

1946-7

BRYNHILDA, Glasgow, 1885.

THE LIVERPOOL NAUTICAL RESEARCH SOCIETY

"All delight is in masts and oars and trim ships to cross the stormy sea."—ODYSSEY.

TRANSACTIONS, VOL. III 1946-7

CONTENTS

Early Steamship Types

By Nigel W. Kennedy, F.G.A.

If I had the task of discussing almost any other kinds of vessels than Early Steamboats, I should find little difficulty in classifying them into definite types characteristic of certain periods. Such simplicity is impossible, for it was only after about 1820 that Steamships can really be said to have settled down to any definite form of construction or method of propulsion (in the United Kingdom at least), and my review is intended to include all the earliest more or less experimental forms which have come under my notice. Up to that time progress in steam propulsion had of course been closely allied with the development of the steam engine, and of engineering practice, while prejudice had been responsible for much unnecessary delay in the general adoption of motive power. The diverse methods of propulsion had been mainly experimental and primitive, but as experience was gained, so the form of the steamship was modified and began to have an identity of its own.

Although many pioneers, such as James Watts, have made ambitious claims for the " invention " of the steam engine, marine and locomotive, in actual fact no single individual may be credited with this distinction, since the steam engine was a simple and logical consequence of natural evolution and progress. So soon as steam had been adopted for marine propulsion, progress was steadily maintained, keeping pace with extending mechanical invention, but somewhat checked at times by tardy legislation. Steam power was not the only means suggested, but was soon accepted as the cheapest and most practicable, for while patents were filed for the internal combustion engine, for example, as early as 1825, its adoption and development has had to wait until quite recent times.

According to various authorities several half-hearted attempts were made from about 1700 in the propulsion of vessels by steam, long before the steam-engine was actually known, or anyone knew how to construct even a boiler safely, and probably the earliest substantiated attempt was that of Jonothan Hulls, whose little engine was cast at the Eagle Foundry, Birmingham, by Brunton, in 1735. It is claimed that a small vessel was propelled by this device on the Avon a year later, but authentic records are now very difficult to find. Similarly, the historic case of Dr. Denis Papin, a refugee Frenchman, who is stated to have navigated a small steamboat on the Fulda about 1705, appears to require more corroboration.

There seems little doubt that the first authenticated attempts at the propulsion of vessels by steam took place between 1785 and 1790, when Patrick Miller, William Symington and William Taylor in Scotland; the Marquis de Jouffroy in France; and Fitch and Rumsay in America found their various solutions to the problem, which, however, was not satisfactorily solved for some years after that date.

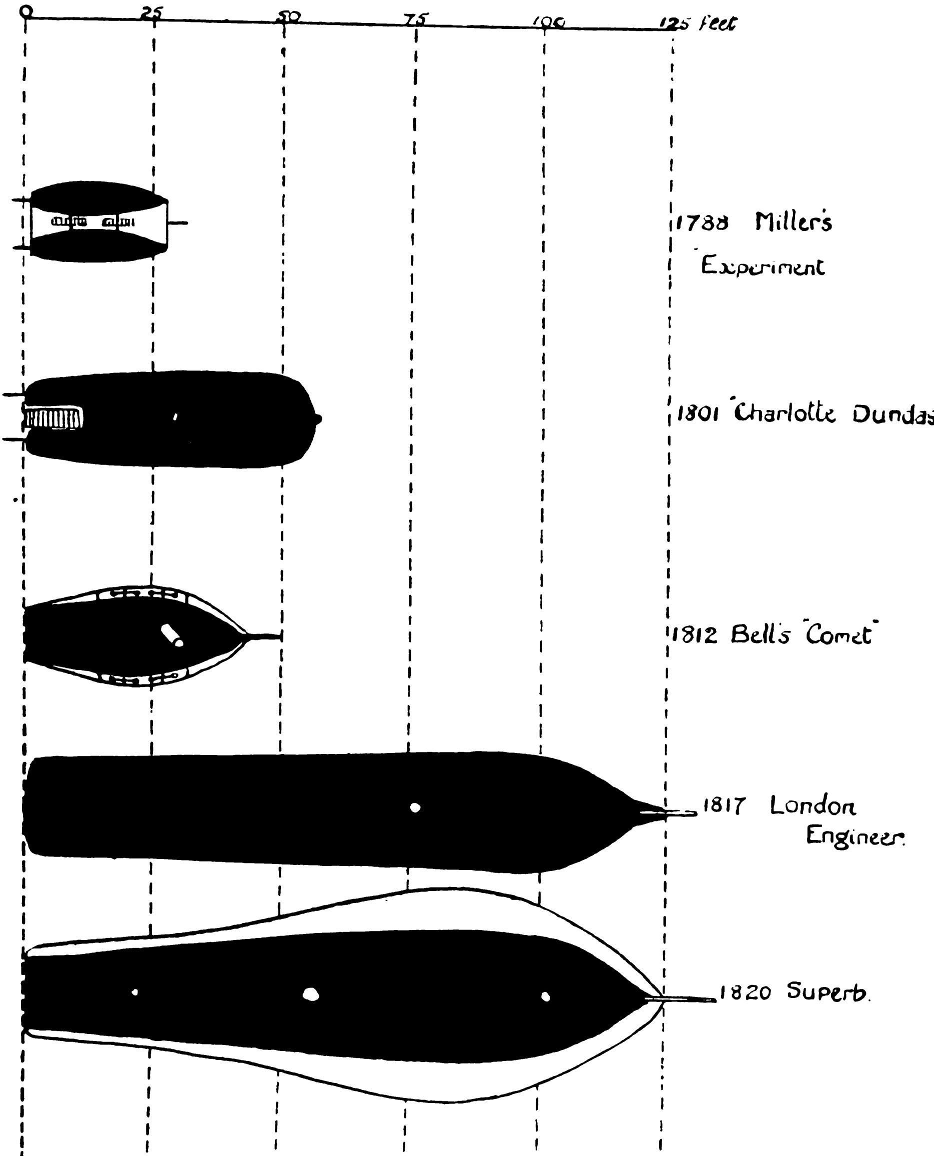
Few of the earliest steamboats were specially built or designed, as the engines were usually fitted to some convenient vessel, such as a row-boat, barge, or other small vessel, and the trials took place on enclosed water, such as canals, lakes, rivers, etc., before ventures were attempted upon the open sea.

In spite of this general rule, it is remarkable how many inventors did actually design their own vessels, even at an early date, and apparently realised that a vessel under its own power required a different construction from a wind-driven craft. Some vessels did, however, make a maiden voyage immediately after conversion to power, as in the case of the former French privateer *L'Actif*, which was converted by an enterprising Norwich gentleman who employed Matthew Murray (Murray, Fenton & Co., Leeds) to make an engine and fit into the craft, which then (1813) travelled under her own power to Yarmouth, by way of the Trent, Humber, and east coast, and arrived without mishap and apparently plied satisfactorily for some time.

It is impossible in this Paper to discuss in detail the many and varied methods of propulsion suggested or tried from time to time, but the following chronological summary gives some idea of the wide field covered during about a century. Many of the ideas were projected years before their time, and their adoption was not practicable.

From this summary it is apparent that some seventeen actual trials were made in various vessels during a period of some seventy-five years, and of these, seven were in craft specially designed and constructed by or for the experimenters, but records of the remainder are too vague in most instances to denote the type of vessel employed, and it is inferred that they would be converted craft.

In later days both engines and hulls were specially designed for steamships by specially trained draughtsmen, but at first only slight differences were made in the lines for sailing craft and steamships by builders whose experience was limited to the former.



EARLY STEAMSHIPS

Classified List of Steamships of the United Kingdom

c.1700—1811

Giving Method of Propulsion (Where known)

c.1700-1704 (?). Capt. Thomas Savery, F.R.S., and Dr. Denis Papin in collaboration may have produced a small vessel, afterwards used on the Weser or Fulda, in Germany. (Various contemporary records). Appears to have used *paddle wheel.*

1736. Jonothan Hulls—Small boat stated to have plied on River Avon in 1736. *Stern-wheel.* Engine by Brunton, Eagle Foundry, Birmingham. (Authority—Patent Records, etc.)

1785. Joseph Bramah—Took out a patent for a *screw,* but there is no evidence of his having tried it for marine propulsion.

1787. Furness and Ashworth—Stated to have constructed a steamboat which plied successfully on R. Hull. (Patent Office).

1788. Furness and Ashworth—Constructed a steamboat worked " *On the paddle principle* " for the Prince Regent, which plied on R. Thames, and was destroyed by fire. (Patent Office.)

1788. Patrick Miller, William Taylor and William Symington constructed a twin-hulled vessel " of tinned iron " which had *two centre-wheels,* operated by a single cylinder engine made by the Carron Company, and plied on Dalswinton Loch. (Authority, Patent Office, James Nasmyth, Smiles, etc.)

1789. Patrick Miller had a larger, similar twin-hulled boat constructed, which was named *Experiment of Leith* and was tried out on the Firth of Forth. (Contemporary Records cited by various authorities). *Centre-wheel.*

1790. James Rumsey took out a patent for a steamboat operated by a *chain and rack-and-pinion* motion to submerged paddles. (Robertson Buchanan, 1816, Patent Office, etc.) No details.

1792. Early Naval experiments mentioned by R. Buchanan in his " Steam Navigation " (Glasgow, 1816). On R. Thames. No details.

1793. Naval Experiments on Thames, using *Jet* principle. (R. Buchanan, 1816.)

1793/6 Dr. Cartwright, Robert Fulton and Earl Stanhope made tests with experimental vessel propelled by "*Duck-foot paddles* " apparently working vertically astern.

1793. John Smith converted a small sailing boat bought at Liverpool into a steamboat propelled by *seven vertical paddles* on each side, and plying successfully on the Bridgewater Canal between St. Helen's and Warrington, or even Manchester. (*Gentleman's Magazine* 1793, Patent Office, etc.)

179-?. Records of tests made on the Bridgewater Canal by the Duke of Bridgewater; various means of propulsion were tried, one being *chains with moving paddles over the bows.*

1799. *Buonaparte* (or *Old Nancy*) was built at Worsley Yard (almost certainly of iron) and plied on the Sankey Navigation, her motion being produced by a *stern-wheel.* (Records Worsley.)

1801. *Charlotte Dundas* was engined by W. Symington, and operated by a *recessed stern-wheel,* plying on Firth and Clyde Canal. (Patent Office.)

1801. Hunter and Dickinson stated by several contemporaries to have tried a steamboat on the Thames, but no details so far traced.

1801. Another (anonymous) experiment stated by several writers in the contemporary press to have been made on the Thames, but no details were given.

1803. Symington apparently produced a second *Charlotte Dundas* similar to the first but with improvements.

1807. Steamboat on the Birmingham Canal Navigation, according to Boulton and Watts' Boiler Book entry, but no details stated.

1808. James Linaker (Superintendent, Naval Dockyard, Portsmouth) designed a *Jet*-propelled vessel, and took out a Patent.

1811. Many early writers (including Robertson Buchanan) mention Dawson's *Comet* which is stated to have plied at Dublin, but so far no details have been forthcoming.

Summarising the above details so far as possible, it is seen that up to 1811 the methods of propulsion suggested or tried include 2 centre-wheel; 4 stern-wheel; 2 (?) side oars; 1 stern oars; 2 jet; 1 chain and float (paddle), and about 5 not described. It is a remarkable fact that *none of these pioneer vessels appear to have used side-wheels,* nor does this obvious method seem to have been suggested up to this date, nor does the screw seem to have been tried, the latter being quite understandable in view of the many difficulties involved, as was found even so late as 1840.

Classified List of Steamships of the United Kingdom Between 1812 and 1820

Continuing the classification from year to year, is is now possible to tabulate them under three principal heads as under :—

Date	Centre Wheel	Side Wheels	Side Wheels assumed	Stern Wheel	
1812		2			Bell's *Comet and Elizabeth.*
1813		6	2		2 not stated, not traced.
1814		19	2		2 do. do.
1815		17			2 do. do.
					1 iron vessel on Mersey not identified.
1816		21			1 with oscillating wheels. 2 not traced.
1817		19			
	1				*Etna* on Mersey, twin hulls.
1818		13			
1819		13			1 not traced.
	1				*Mersey* on Mersey, twin hulls.
				1	*Sampson* on Clyde.
1820		22			
					Rising Star believed to have had jet propulsion.
		8			Rebuilt vessels mainly on Clyde.
	2				Centre Wheel.
		140			Side Wheels.
			4		Side Wheels (assumed).
				1	Recessed Stern Wheel.
				1	Jet Propulsion.
				7	Not stated.

On examination we note that a significant change has taken place, and that a very definite type is asserting its merits over other systems, for out of 155 vessels about 144 had side paddle wheels.

It is probable that at least three were built of iron and upwards of ten were fitted with Oldham's revolving paddles (or some other similar oscillating device) prior to 1820, and that in spite of Colonel Steven's successes with the twin-screw in the United States in 1804, the screw was still practically unknown in the U.K. and does not appear as a means of propulsion in one single instance.

Little appears to have been written about the various types of screw, and their disadvantages—slip, effective power, immersion, et cetera—and even by 1840 the screw was being modified, tried and discarded by various inventors. In my opinion its later adoption has developed a very unscientific and ineffective method of propulsion.

Hulls

Most of the earliest steamships were built by celebrated builders of wooden sailing vessels, and at first, lack of experience resulted in the old building traditions being followed closely, until it was found that the bluff bows required by a vessel which floated over the seas running before the wind, were unsuited to a craft which could run into the wind and cut through adverse seas, and that wood was becoming obsolete. In spite of this, many very beautiful steamships were constructed from wood even up to a late date, and on graceful slender lines, with a sharp cut-water and improved flare. Some, as in the case of the re-built *Waterloo* on the Liverpool-Dublin service were coppered.

It is usually stated that the first British iron steamship was *Aaron Manby* built at Tipton, Staffs., in 1822, but this is definitely incorrect, and it is almost certain that a number of successful iron steamships were plying before 1820.

James Nasmyth states very definitely that Miller's twin hulled experiment of 1788 was of *tinned iron*, and that the passengers included Miller, Symington, Taylor, Robert Burns (the poet), Sir William Monteith and Alexander Nasmyth (James' father) who made an historic sketch of the event (now in the Patent Office), besides three servants.

It is almost certain that *Buonaparte*, a steam barge on the Sankey Navigation, was of iron, as she was built at the Bridgewater Foundry at Worsley in 1799. Another vessel, so far unidentified, is referred to in the contemporary press as plying on the Mersey in 1816, *made of iron.*

Unfortunately few reliable pictures of the earliest steamships now exist, but there are sufficient to shew that they had frequently a dignity of their own.

London Engineer of 1817 was stated to be so lightly built that it was said that the thin hull was almost held together by paint.

It may not be generally realised that even so early as 1817 buoyancy tanks as a safety measure were suggested by Captain G. Dodds, and probably incorporated in this trim little *Victory* of that date, on the Richmond-Ramsgate service. These tanks were fitted on the outside of the hull, beneath the sponson-deck, and in some old prints appear as " blisters " each side of the paddles.

The sponson-deck was a characteristic feature of the early paddle-steamers, particularly river and cross-channel craft, whose deck accommodation was considerably increased by this extension. Sometimes this deck extended from bow to stern, where it might project several feet on either side; in other cases it was limited to a flying deck either side of the paddle-boxes, and faded into the main deck in gentle curves, but when it is remembered that even in 1820 the paddles might each be eight or ten feet wide, the increase over the actual beam amidships will be apparent.

Propulsion

I can only refer very briefly to engines and boilers.

The first steam boilers were of very simple construction, from lack of materials, some even consisted of wooden barrels reinforced with iron bands, and others spherical or lenticular in shape, formed from two cast-iron halves, bolted together. Such castings varied in thickness from one-quarter inch to two inches, and it is hardly a matter of surprise that explosions of both types of boiler resulted in an official enquiry and the passing of special laws in 1817. Rivetted sheet boilers soon followed, and although Richard Trevethick had invented his tubular boiler before 1812 it does not appear to have been used for marine boilers before 1820.

Each engineer had his own ideas of a marine engine, so there was considerable variation in design from the very beginning, but all were either LOW or HIGH PRESSURE engines, the first having a working pressure up to about 6 lbs. per sq. in., while Scotch engines commonly had pressures up to 40 lbs. per sq. in., which was considered very dangerous, and the reckless Americans worked at even 150 lbs.

The earliest engines were of the atmospheric condensing type, in which the entering steam pushed the piston up, after which a jet of cold water entered and condensed the steam, causing a partial vacuum, which caused the piston to descend again under atmospheric pressure.

In the High Pressure engine the steam usually underwent double expansion. The engines were at first very small and clumsily built, but improvement was steady and rapid. Two engines or twin cylinder engines, and double-acting cylinders were followed by oscillating cylinders. As an example of progress, the little engine made by the Carron Company for Patrick Miller was of about 1 h.p., while *Rising Star* of 1820 was fitted by Maudeslay with twin 35 h.p. engines, and is stated to have had a speed of 14 knots, against Miller's four miles per hour.

The paddle wheel soon became the most popular means of propulsion, but was never ideal. Two main difficulties were quickly encountered and some very ingenious methods of overcoming them were adopted. The first difficulty was that a fixed-blade or float has maximum effect at one point, and neither enters nor leaves the water with any feathering effect, thus causing unnecessary resistance. The second is, that for maximum effect, the float should never exceed a certain maximum immersion, but since immersion depended on the amount of water the vessel might draw at any particular time, the float might be immersed either too deeply or not at all. In due course it was found possible to raise and lower the axis of the wheel, and also to vary the pitch or feather of the blades, though many forms were tried out before perfection was achieved, in such vessels as the famous 22-knot *Empress Queen* and her contemporary *La Marguerite* still remembered by many who had the pleasure of delightful trips in them. But how many could credit that the marvellous oscillating wheels dated back to about 1816?

These intricate compensating wheels were developed from quite humble ancestry, for *Comet* was originally fitted with two pairs of simple wheels, consisting of "malting shovels" set in a four-armed cross, and without rims. Rimmed wheels consisting of eight, twelve, sixteen of more floats set radially soon followed, to be succeeded by similar rimmed wheels in which the floats had a feathering effect produced by setting them at an angle, instead of radially, like an undershot water-wheel.

To obtain a continuous propulsive effect, the next advance was to step or "stagger" the blades by combining two or more wheels in one, side by side, but with a different setting of the blades, which were also given a sort of twist. This can be simply illustrated by holding a ruler between the hands with one edge resting on the table, representing the radial setting. If now it is tilted slightly, this resembles the feathering effect, and if now one hand is moved forward so as to bring the rule slightly out of its original alignment, this illustrates the additional twist, particularly if another blade is imagined at one side. It is almost impossible to describe the automatic feathering, devices, such as oscillating or compensating wheels, which consisted of two wheels revolving within each other by means of an eccentric axle.

By the year 1820 the wheels had increased in diameter from about four feet, with a width of twelve inches, to some 16 feet diameter and a width of six to eight feet.

Early steamers had more or less bluff bows, and a beak frequently projected after the fashion of sailing craft. In many instances the hull was handsomely decorated both with ornate carving and the lavish use of bright paint, and figureheads were not uncommon. The *London Engineer* was a famous example of the period, and *Victory* another, and were probably the most exquisite achievements to date. Some ships had solid bulwarks, but river craft frequently had ornamental balustrades, or light iron rails sometimes filled in with slender metal lattice.

A comparision of tonnage should give some idea of relative sizes of craft, if this was always given in gross, or displacement tonnage, but unfortunately, during the last hundred and thirty years, methods of computing tonnage have been periodically revised and one finds Builders' Measurement, Old and New Measurement, Gross Tonnage and Displacement, and Net Register which makes tonnage misleading. Miller's little vessel of 1787 was probably about 12 tons, while the tonnage of the *Rising Star* of 1820 is quoted as 400, the largest up to then.

Funnels were necessary features and could hardly be hidden but were often both artistic and utilitarian. In the smaller experimental craft the smoke stack was merely something to get rid of the smoke, but on the Clyde it was quite usual for some years for vessels to have a tall funnel which acted as a mast and carried a useful square sail. These early funnels were not sheathed, and sometimes set the decks alight. They were tall to increase draught, sometimes forty odd feet. They were usually round in section, and single, but *Victory* with an oval funnel and *Rising Sun* with two circular stacks side by side were exceptions.

Londoners are familar with the hinged funnels on small boats, enabling them to pass under the low bridges at high tide, but how many realise that Dodds invented a " lobster-backed hinged funnel " in 1818 for this purpose, and the 40 foot funnel of his *Victory* was fitted with this ingenious invention.

A comparison of the sizes of several vessels between 1788 and 1820 is made on the attached diagram, which indicates the increases in beam and length, illustrated by Miller's steamboat about 30 feet long, *Charlotte Dundas* (1801) 56 ft., *Comet* (1812) 38 ft., *London Engineer* (1817) 120 ft., and *Superb* (1820) 120 ft.

The classical experiments made by David Napier with blocks of wood of various shapes on his father's mill-pond at Camlachie resulted in marked improvements in the form of steam-ship bows, and a sharp cut-water, and he had designed several steamers before 1820 (*Marion* named after his wife, and *Post Boy*—renamed *Euphrosene* and *Dumbreck*) which were experimental in conception. It should be stated that similar experiments made previously by the Admiralty are mentioned by Robertson Buchanan in 1816.

These few observations have, I hope, served to draw some attention to the merits of the early steamships and their general features.

Model Shipbuilding

By Dr. Stephen Rowland

I have been asked to write a few words on model shipbuilding, and it will be a source of pleasure to me if my experience can be of any assistance to other model makers. Nothing in these notes is to be taken as a dogmatic statement, but merely as a hint or suggestion on methods which I have found to be satisfactory in the past.

When about to start a model sailing ship, it is advisable to choose a well-known vessel, as the model, when finished, will be more valuable than one representing no particular ship. The next thing is to obtain scale drawings of the rigging and deck plans and if the model is not going to be a water-line one an additional drawing is required, viz :—one shewing the " lines." I have always made water-line models. Drawings of several well-known ships, prepared by a naval architect, can be purchased from the *Model Engineer*, but I have always obtained my drawings from the builders.

One has now to consider the scale to be adopted, always remembering that the larger the scale the more detail can be shown, in fact must be shown if the completed model is not to look bare. By this I mean that while it is almost impossible to put jackstays, beckets, buntline blocks, etc., on the yards or use chain sheets, etc., on a $\frac{1}{16}$in. scale model, these are necessary on one twice this size. While on the question of scale, one has also to take into consideration the difficulty of handling and housing a large model. A $\frac{1}{4}$in. scale replica of a hull three hundred feet would be about six feet, to which must be added another foot for the bowsprit, making seven feet overall—too large, one would imagine, for any ordinary house. There is an advantage in adopting $\frac{1}{8}$in. scale, as most shipbuilders' rigging plans were drawn to that scale. A $\frac{1}{8}$in. scale model of a vessel of 1,400 tons register would be about thirty inches B.P., with another six inches for the bowsprit, a manageable size. Having adopted a scale, stick to it. This is the only point on which I feel justified in being dogmatic. If one adheres closely to scale, there is no reason why all details should not be shewn without any overcrowding of the decks, etc. Those who have visited the Model Engineer Exhibitions during the pre-war years will appreciate these remarks, but I am pleased to note a considerable improvement in this respect at the last Exhibition held.

A few words may not be out of place regarding tools required for Model Shipbuilding. One reads of men making models with nothing but a penknife. There are models and models, and while all credit must be given to such enthusiasts, I cannot believe they make scale or Exhibition models. Much depends on whether one is going to make all fittings, blocks, bollards, boat davits, capstans, and twenty other things oneself or purchase them. To do the whole thing it is, in my opinion, necessary to have a small lathe, say a 3 in., which need not be a screw cutting one as it is all hand turning, and a small electric drill up to ¼in. There was a beauty (the Whetherall drill) on the market before the war. A blowpipe for silver soldering is essential and can be obtained from Messrs. Fletcher, Russell & Co., of Warrington. Little need be said about small hand tools—a small hacksaw, files, wire cutters, tweezers (forceps), etc.

Having obtained the necessary drawings either from a shipbuilder or from the *Model Engineer*, one has the choice of two procedures, viz :—to make the hull and deck fittings first, then the masts and spars, or vice versa. It does not matter which method is adopted. I have always made the masts, etc., first. Are the masts and spars to be made of wood or metal? Personally, I prefer to make them of metal—brass rod which can be turned in the lathe without any difficulty, especially as all modern lathes have a hollow mandrel. Unfortunately, mine is an old pattern with a solid mandrel, so the turning of a long spar or pole jiggermast was not quite simple. The reason for choosing metal instead of wood is, it is stronger when one comes to the upper yards, royal and skysail yards. The royal yard of a 2,000 ton ship would not be much if anything above ten inches in diameter at the slings, about half this size at the yardarm. When this is reduced to ⅛in. or $\frac{1}{10}$in scale it becomes a very slender spar and easily broken. If wood is used I think it would be advisable to use lancewood; a fishing rod top would be suitable. The second reason for selecting metal is that one can fit the bands closely and fix them securely with a touch of soft solder. The eyebolts for the jackstays on the *Glaucus* and *Brynhilda* were made from pin heads drilled, using a No. 75 or 77 drill, the pin head being softened in the blowpipe, and flattened, then drilled and touched up with a fine file. The yards were drilled and the eyebolts soft soldered in. Use twist drills, they are more satisfactory then spear-pointed ones and are available in such a wide range of sizes. I think it is also easier to fix the parrels securely on metal yards than on wooden ones, and also the yardarm-bands with their three eyes silver soldered on, the upper one for the lift to the lower one for the clewline block and the after one for the brace pennant. Before leaving the yards it is well to mention that a yard, whether it be a lower one or a skysail yard, is not a series of straight lines but rather a series of curves whose radii become more rapidly smaller as one approaches the yardarm. It is only by bearing this in mind that one can get the spars to look lifelike and, of course, that is the main object in model making. Some of the later ships had the lower mast and topmast in one piece as in the *Wray Castle*, of which I was second mate, which would considerably reduce the work of making the mast. In fact I thought the masts of the *Glaucus* were of this type until I got the drawings from Messrs. Barclay, Curle, when I found they were fitted topmasts which certainly look better in a model. The masts require to be fitted with sheaves for the chain haulyards and for the mast rope. This can be done by substituting a dummy sheave made by drilling two holes the distance apart of the diameter of the sheave, followed by the use of a suitable punch, easily made from the tang end of a file. I made a set of different sizes for the sheave for the mast rope, chain tie, and the sheets passing through the yard-arms. It is a great advantage to have the caps on the lower mast and topmast heads a good tight fit for the masts they are to take. I feel I might be excused for emphasising this point. While it has been my practise to make all masts as well as spars of brass (and the method has answered well with me) it has a disadvantage, viz :—if one forgets to put in an eyebolt there is no putting it in after the masts is stepped, which oversight could easily be overcome with wooden masts.

The spreaders at the cross trees for the backstays should be just the right length, otherwise they throw the backstays out of line. I always silver plate the masts and spars after they are completed, before painting them, the reason being it does not require so many coats of paint to cover them after the silver plating, and one has to remember that every coat of paint adds to the size of the spar and adds considerably if one is working to a small scale. Use coachpainters' paint, which dries flat ; I think it looks better on a model than paint with a shiny surface. Only the best paint should be used and it should be allowed to dry hard before being handled, otherwise finger marks will be left and another coat of paint applied and the yard increased in diameter. The topmasts and topgallant masts are painted to represent pitch pine.

A word about blocks. I think it is almost impossible to make wooden blocks to scale, at least the buntline and clewline blocks, which would only be about nine inches long in the full-sized vessel. All the small wooden blocks I have seen are too thick and clumsy and are made to be used as stropped blocks, whereas in modern iron sailing vessels there were very few (if any) stropped blocks in the rigging. A better plan is to make them of brass, silver soldering an eye on the top (across the block) which would much more nearly represent correct practice. There are two methods of making these blocks, either turning them with a small forming tool and finishing with a file, or filing two flats on a rod of the correct diameter then drilling it for a single, double, or treble block, parting off in the lathe, touching up with a file, and soldering the eye on the top. I use both methods, the first one for small single blocks, the second for larger ones for main lifts, haulyards, etc. The blocks are also silver plated. The smallest blocks on the *Glaucus* and *Brynhilda* are for the signal haulyards on the gaff end, and are less than in $\frac{1}{16}$ in. length. The chain haulyards for topsail and topgallant yards run in gin blocks, easily made from a bit of rolled wire and a small sheave.

A word about rolled wire, which is one of the handiest bits of equipment that can be used in model making and so easily made by passing brass wire of different gauges through a tinsmith's roll. One can roll anything from such fine strip as to be suitable for hatch battens or stout enough for $\frac{1}{8}$in. scale ladder sides. The strip is not straight when it comes out of the rolls, but if heated in the blowpipe and stretched while holding one end in the vice, a perfectly straight even strip is produced.

Perhaps the most tedious work in the whole model is putting on the ratlines or what we called at sea " rattling down." Most models one sees have the ratlines much too heavy, but this can be avoided by using Pearsall Flytying Silk Gossamer, to be obtained from Messrs. Farlow, Fishing tackle makers, Panton Street, off the Haymarket, London. It is very fine smooth silk but a little stiff and the ratlines require to be knotted around the shrouds ; it should be a clove hitch, but a half hitch is easier to tighten. It has been my custom to " rattle down " say half one side of the lower or topmast rigging at one "sitting" (not more, I could not stand it), then paint all the hitches with gold size and leave it for twenty-four hours, by which time the size was dry and the ends could be cut off close to the shrouds with a safety razor blade.

Is the model to be rigged with wire rigging or with silk twist? The former looks better but is not easy to manage, i.e., there is more difficulty in getting everything tight, and slack rigging looks slovenly and spoils the model. It is possible to purchase wire rope of different sizes; I made mine from five amp. fuse wire twisted up in lengths between two pin vices. It can be made on a lathe with a hollow mandrel. All the backstays below the level of the top and the shrouds of the lower and topmast rigging were usually served, but serving the backstays, etc., of an $\frac{1}{8}$in. scale model would be a remarkably tedious business, so I painted them with flat black paint and the result was not too bad.

Having said so much about the masts and spars, a few words about the hull. I generally select yellow pine and, for a model of the size we are making, carve the hull out of a solid block, having first marked out the sheer and the deck plans. It will be remembered that the greatest breadth is not at the top of the bulwarks or even on the water-line, but about the level of the "tweendecks," giving a slight "tumble home," as it was called, which improves the look of the hull, but must not be overdone; in other words, stick to the scale.

A good figurehead adds much to the appearance of the model, but it is not easy of achievement. The figurehead of the *Glaucus* was carved by a professional wood carver. I told him there were only two points to remember, viz:—to keep it small enough and keep it in line with the curve of the stem. Nothing looks worse than a figurehead projecting like a gargoyle on some ancient building. The carver followed pretty closely the second injunction, but strayed away a little from the first one.

Nearly all ships had decks laid with yellow pine, "free from knots" the specification ran. I think it is better to lay a deck than use the actual hollowed out portion of the hull to form one, so I have used a piece of Kauri pine free from grain, cutting it to the right size and shape so as to leave water-ways about two feet wide. The covering board was "teaked" all around the deck, which was lined with a three "H" pencil. It is a mistake to line decks with Indian ink; all one wants is what artists call a suggestion of planking. While on the subject of decks, one might say a word about teak decks. A few ships had teak decks, but teak is unsuitable for a model as the grain is as large as in the actual ship. A better plan is to use a piece of satin walnut which will clean up with glass-paper to resemble teak without the grain. The same remarks apply to deck fittings, houses, etc. Most, if not all, modern ships had steel deck-houses, about six feet nine inches high, painted white and panelled in green, a few in brown. The deck-house doors can either be lined in with Indian ink and painted over with a thin coat of teak colour paint, or they can be made from satin walnut let in and panelled, if the drawing shews them so, which is certainly the better method. The deck-houses, boats, etc., of the *Glaucus*, now in the Royal Scottish Museum, Edinburgh, had nine coats of coachpainters' paint, each coat strained through silk and finally rubbed down with dentist's pumice powder, which must be used very moist. Do not be afraid of the water, it will not harm the paint after it is thoroughly hard. The door handles were of the ring pattern and can be made by filing the head of a very small pin into something like a sphere and silver soldering on to it a minute open ring which hangs down in the natural manner. A very small amount of solder is required and one must be careful with the blow-pipe or all will suddenly disappear, but I assume all the prospective ship model-builders know more about silver soldering and silver plating than I do.

The hatches should have battens in cleets, but here again it is merely a question of care in the soldering, the battens being made from a bit of rolled wire of the right gauge. There should be ring bolts in the coamings. Hawsreels are easy to make, the frame being made from rolled wire and the drum turned in the lathe. Mooring bollards are made up from three pieces, the bollard heads turned with a forming tool and soft soldered into the base with a web between the heads to give a finishing touch.

It is difficult to make poop ladders, fife rails, etc., to $\frac{1}{8}$in. scale of wood, but here rolled wire comes to our assistance. These can be finished to resemble teak very closely by copper-plating, then a very light "oxidising," followed by a coat of clear lacquer. Belaying pins can be made from ordinary brass laundry pins, 18 gauge wire. A forming tool cannot be used for this operation as the pins are too fine to stand the pressure. The difficulty can be overcome by putting the pin in the lathe chuck with a little less than $\frac{1}{8}$in. projecting and as the lathe revolves either turn the "handle" of the pin, or better still use a small file, then withdraw the pin a half inch and with the same or a suitable file make the portion to go through the rail, leaving a very narrow rim to prevent the belaying pin slipping through the hole in the rail. The operation is much simpler to do than to describe. I can turn them out at the rate of one every three minutes. Finish by " teaking " as before described. When not feeling inclined for serious work, but more for mere pottering about, it is my practise to make a dozen or so belaying pins or half a dozen blocks, with the result I always have plenty on hand, almost enough for another model when one is finished. It is annoying when rigging to find one is short of a particular size or type of block; that is avoided by always keeping a good stock in hand.

It may be well to mention the finishing of iron-work on a model. Nearly all iron-work around a ship's deck was painted black or green, two colours easily obtained. Paint should never be used, as it fills in the finer details and quite spoils the effect. Parts which are to be black, such as anchors, chains, ring bolts, hatch battens, gin blocks, etc., should be silver or copper-plated and what is commonly (but quite erroneously) called oxidised, i.e.—after being silver or copper plated they should be dipped for a short time in a hot solution of calcium sulphide (liver of sulphur), which forms a black coating of silver or copper sulphide (not oxide) on the articles; then rinsed, dried and scratch-brushed. If green is the desired colour, as for mooring bollards, pumps, drums of steam winches, and hawsreels, etc., all that is necessary after the so-called oxidising is to give the parts a coating of green Zapon lacquer, which could be obtained before the war from the Frederick Crane Chemical Co., Birmingham. The effect is very good.

I need say nothing about making anchors, as this presents no difficulties. I think the anchors in the *Glaucus* were built up of ten parts. The lighthouses were turned in the lathe, the framework for the glazing, the screens, and the stay to support the screen (in case it was hit by a sea) were all soldered on and the whole copper plated, after which all was painted white except the rounded top which was left bright copper, the screens being painted red and green on their respective sides. There were no catheads on the *Glaucus* from which to let go the anchors, an ingenious arrangement known as the tumbler being used instead.

In all the older ships deadeyes were used for setting up the rigging backstays and stays. These present no difficulties as they can be turned off a length of brass rod $\frac{3}{32}$in. diameter for $\frac{1}{8}$in. scale, the stanchion being hard soldered on and the deadeye drilled to take the lanyard. For the upper deadeye a small eye is soldered on to take the shroud or backstay, or better still a groove turned round the deadeye. Do not use too small a drill; the lanyards were nearly as big in diameter as the shroud or backstay. If it is proposed to use screw rigging, the box and screws (dummies) are turned in one piece in the lathe from say eighteen or twenty gauge wire; an eye is hard soldered on the end of each "screw." A stout pin is taken and the head filed flat and on to it is soldered an eye like the ones on the "screw," the two are now joined by a small ring which is squeezed up to form an ellipse and soft soldered to prevent its opening. The whole forms a rigging screw and stanchion and should measure about $\frac{7}{16}$ in. from the pin head to the top of the upper eye, or three feet six inches for the full size, i.e.—the height of the poop rail.

The pin rail presents some difficulty and I am not sure I have solved it. The rail should be made of wood but as it is required to be drilled with so many holes for the rigging stanchions, backstays, and belaying pins, I was afraid to use wood in case it should break under the strain, so I used metal and coppered it to more or less resemble teak, with a moderate amount of success.

The windlass presents no difficulty if one has a drawing. The gear wheels can be cut on a hob held in the lathe chuck, much on the same principle as cutting the gears for the geared turbines on a battleship or the *Queen Elizabeth.*

The pump wheels with the cranks are more difficult to make satisfactorily, in fact they are the only really difficult parts, and it is here one feels the want of a dividing head on the lathe, but even that want can be overcome to a large extent. The first thing is to put into the chuck a length of round brass rod $\frac{1}{4}$in. or slightly over and mark on the circumference with a "twiddler" three indents corresponding exactly to the centres of the three positions precisely with a pair of dividers, thus marking out six points each 60 degrees apart. Now take a suitable twist drill for the size of the brass wire to be used for the wheel spokes, e.g. a No. 73 for 23 gauge wire, and drill for less than $\frac{1}{8}$in. each of the marked positions. Then turn up the rim of the wheel from the rod. The hubs are best made by taking a piece of $\frac{1}{16}$ in. (a little over size) hexagonal brass rod and in the exact centre of each flat, drill right through with the same drill before mentioned and turn the hexagonal into a round and part off. In assembling the wheel, thread one of the spokes through one side of the rim right through the hub and through the other side of the rim. Slide the hub along the spoke until it is in the centre and put in the other spokes, which will of course not go through the hub as the first one did. Centre all and silver solder together, using very little solder. The hub requires to be drilled for the shaft. I think it is better to make built-up cranks rather than try to bend the shaft to for the webs. No difficulty should be experienced. The wheels are then put on the shaft at the correct distance apart to come just inside the main fife rail. The whole is then copper plated and " oxidised."

Many eyebolts are required for the model, some on mast-bands or yardarmbands, others under the cross tree (for buntline blocks), others for use in the deck, and I think the best way to make these is by twisting a length of say 22 gauge wire tightly round a piece of 20 gauge (and smaller wire for smaller eyes) and cutting off the rings with a fine slitting file. Each ring is now pressed flat and closed with a pair of fine pliers and a flat filed on the rim at the point of closure. This eye can now be silver soldered on to a block or band be it a yardarm or a masthead. If the eyebolt is required for use in the deck for fixing the lower haulyard block, all that is required is to silver solder the eye on to a pin, cut off say ¼in. from the point with the end filed flat. This should always be done as it gives a much firmer joint than trying to solder the eye on to the end left by the cutting pliers. The eyebolt can be turned into a ringbolt for taking a spare lashing, etc., by putting a larger ring through the eye and soft soldering the joint in the large ring.

As there must be thousands of men who during the war have been on munitions and using tools for the first time in their lives, the foregoing notes may be of some assistance to them should they turn to model making in their leisure when peace returns.

The subject of model shipbuilding is too big to treat in a paper, it would require a book fully illustrated to go into the matter thoroughly.

The Idea of a Maritime Museum

by Dr. C. Northcote Parkinson

In attempting to interest you in the idea of a Maritime Museum in Liverpool, I shall begin by pleading such right as I have to be heard. My first plea is that I am a Lecturer in Maritime History and, so far as I know, the only one in existence. I have a scarcity value, and I mean to make the most of it. More than that, I was, nearly fifteen years ago, one of the late Sir Geoffrey Callender's assistants. When the National Maritime Museum was formed—and before it opened its doors to the public—I constituted fifty per cent of the staff. I knew then—I think I know now—how a Museum is formed. I have seen it happen. While, therefore, I concede that you might reasonably have hoped for a paper from one who knew far more, you might also, I maintain, have had to listen to one who knew even less.

Granted so much, you may still doubt whether a newcomer to Liverpool can expect to grasp the complexity of the problems which surround the Shipping Gallery and the Bluecoat School site. But a newcomer's position has its advantages. Such knowledge as I have of Liverpool ends, as I readily admit, round about 1815. Facing a Liverpool audience in the year 1808, say, I should have known, more or less, what topics to avoid. But now I am happily unaware of the toes on which I may trample and the feelings I may outrage. My ignorance, which I have been careful to preserve, although powerless to improve, must be my protection.

What I am discussing is the *idea* of a Maritime Museum—of a Museum in the abstract. I am in no position to argue the merits of this site or that. Leaving that to the experts, I shall stick to principles. I ask not " where is it to be ? " but " what is it to be ? " And you will notice that I have partly answered that question—in the very title of my paper. For I have used the word " Museum " and not the term " Shipping Gallery." That I shall continue to do. I never saw the Shipping Gallery and have read only one description of it, apart from the catalogue. Even from that, I should think the name imprecise. Granting, however, that the term " Shipping Gallery " fairly described what Liverpool used to have, I should still maintain that it is not what Liverpool *ought* to have. What is needed is a Museum.

At this point I may be asked to define my terms. What *is* a Museum ? The word has, for many people, rather gloomy associations. We picture to ourselves a wet Saturday afternoon in November, the bored attendant at the turnstile, the catalogue (2d.), the lovers disturbed by giggling children at the moment when they thought themselves alone. We visualise all this against a dusty background of skeletons, Zulu weapons, pampas grass and a scale model of the Parthenon. There is that bust of Garibaldi, those Roman coins, the blunderbuss, the coaching horn. Overhead the rain falls pitilessly on a grimy skylight and in the next room someone is lecturing as pitilessly on we know not what. We are tired and depressed, and mainly anxious to go home. These visions of ours relate, of course, to some distant period, and (naturally) to some other City. Since our young days things have changed. A Museum is no longer a collection of objects under glass, grimly surveyed by people whose sole care is to prevent their being stolen. A Museum is nowadays a more enlightened, a more lively institution than that.

The change could best be summarised perhaps by saying that a Museum consists primarily to-day of people rather than things. By people I mean those who work in it, those who endow it, those who support it and those who frequent it for their use and pleasure. Without all these people, a Museum is dead. Without them, it scarcely exists. Just as a playhouse, with its lights and curtain and scenery, is nothing without players and audience, so is a Museum nothing without its active friends. I would urge you to think of it, first of all, in terms of people. We must, from the start, visualise its public; interested, excited, pleased and entertained. I do not say that things do not matter. I only plead that people matter more.

Does all this bring us any nearer a definition of the word " Museum ? " I think it does. Discarding our more painful recollections and fixing our attention on Museums that are alive, we might frame a definition on these lines : a centre of public resort for instruction and entertainment, mainly by means of exhibits. Let us assume that this definition will pass muster for the time being. A Maritime Museum would then seem to be a centre of public resort for the instruction and entertainment of those interested in the Sea.

There must be exhibits. What are they to be ? Taking Greenwich as our model, we might list the exhibits under these headings :—(I) Ship models, (II) Marine paintings, prints, drawings and photographs, (III) Printed books, (IV) Manuscripts, (V) Instruments and (VI) Relics. Those are the obvious categories, but the arrangement would, of course, be according to subject and period. The ideal (almost unattainable) would be to show, say, the model of a Liverpool West Indiaman with, nearby, a painting of the same ship, a portrait of her owner, a page (in facsimile) from her log, a chart pricked out with the routes she normally followed, her actual house-flag and a telescope which her last captain is said to have used. I urge that this is better than scattering these things round the town—the portrait in a Gallery, the chart in a Library, the telescope in private hands, and the house-flag in a Museum of Local Antiquities.

Then there must be books. Let us agree not to rob any existing Library of a single volume. Our Maritime Museum should have a Library just the same. How else could the assistants answer the questions which are hurled daily at every Museum of any reputation? When was this ship launched? Which harbour does this painting represent? From what period does this model date? Without a reference library these questions could never be answered. As for the acquisition of such a library, it is easy—only provided that we all make our Wills. True, we have to die before any good comes of it. But those of us who use the Liverpool trams must always feel on the brink of eternity, and should act accordingly.

This brings me to my next point. We cannot make our bequests because there is no existing body we can name. Every month—every week perhaps—our future Museum, if there is to be one, is losing the gifts and bequests which it would receive if already established. I know of several, even in the short time I have been in Liverpool. Many present will know of more. And the moral of this is—let's get on with it! Whenever this subject is discussed we tend to get bogged down in arguments about where the Museum should be. That is a question for a later stage. I am convinced that no useful purpose can be served by discussing it now. Let the Museum exist before we seek its home. I was with Sir Geoffrey Callender, remember, when the National Maritime Museum was founded, and I can assure you that a Museum must grow underground —probably for years—before it can open its doors. There *must* be a temporary Museum; a storehouse and office. There must be time to accumulate the exhibits, train the staff and convert the public. It does not matter, for the present, where the final home is to be. But it does matter that the Museum, as a corporate body, should be brought into existence, and with the least possible delay.

I wonder if I have, so far, gained some measure of agreement? I hope so, because my next point may well arouse opposition. It is this: such a Museum as I have tried to describe should *not* be housed as part of a larger Museum. It is wrong, as I think, to group (in effect) several Museums under one roof. Why? Well, first, because the best Museums are relatively small. True, there is the British Museum, and such a place, on the national scale, is justified. But one thinks with more pleasure of the Musee de Cluny, the Musée des Arts Decoratifs, the Casa d'Ore or the Kirke Collection at York. Apart from size, however, considered as a disadvantage in itself, there is a stronger reason for keeping Museums apart; a reason connected with human fatigue. People who have been through a Museum may want a number of things. They may want to sit down. They may want tea. They may even want brandy. What they *don't* want is another Museum. There is nothing, you may say, to prevent them going only to the bit they want to see. Perhaps not. But that is not what happens. In practise the seeker after Chinese pottery has to run a gauntlet of stuffed giraffes. And people who like ships are not (as a rule) equally enthusiastic about butterflies, fossils, flint arrow-heads or surrealist art. Perhaps it will be urged that Museums which do not connect can still adjoin. They can. But why should they? *Administrative Convenience*? Of that expression we have heard enough.

My next plea is that out Maritime Museum should be controlled (not necessarily owned by) a body of Trustees, and not preferably by the City of Liverpool as such. My plea is founded on two main considerations. First, I maintain that the scope of the Museum should stretch—and must stretch—far beyond the municipal boundary. Such a Museum should serve the educational needs not only of Liverpool but of Birkenhead, Manchester, Chester and Whitehaven. I will go further than that. The Museum should have the closest connection (just as Liverpool has always had) with Boston, Philadelphia, Halifax and Newfoundland. Were I to choose a name for it, I should call it THE ATLANTIC MUSEUM. Second, I maintain that the Liverpool Shipowners are the men without whose support the Museum must fail. I am not asking for their money. I suspect that there are enough people doing that. No, what the Museum needs is their support, their archives, their builders' models. One does not expect a Firm to make the Museum an immediate gift of, say, the dockyard model of the *Queen Elizabeth.* But in twenty years time, when all up-to-date vessels are being drivenby atomic energy—what then? Well, even in twenty years time, I suggest, a Firm would be rash to hand over its treasures to any body of Trustees on which the Shipowners, as such, were not directly represented.

Since I have the audacity to be appointing the Trustees in all but name, allow me to add one more to the list : the Director of the National Maritime Museum, whoever he may be. It should be made clear from the beginning that we intend no harmful rivalry. Greenwich must always remain the national centre and we would not have it otherwise. In things strictly naval, for instance, there would be no competition at all. But should anyone propose that the local collections of models and paintings should go down to Greenwich, I should say, " No." Greenwich is too far away. We cannot send our schoolchildren there to see in what sort of ships their forebears used to sail. But there should be close co-operation and we should not be ashamed to ask advice.

Sometimes I allow myself to dream of what a Maritime Museum here in Liverpool could be. I think its main theme should be the story of transatlantic shipping—it would be the point, as it were, where Liverpool and Boston should be drawn most closely together. The main sections would be three in number : the age of sail ; the age of transition ; and the age of steam. But other galleries would be needed, too. In one we should see the growth of Merseyside. In another we might see what an 18th century Counting House looked like, with the tall desks, the great ledgers, the glimpse of the quayside from the windows. Models would show how a merchantman was laden and how her guns were fired. We should see the portraits of 19th century Sea Captains—some of the finest men this country has ever produced—and we should see how a 20th century vessel is built and launched. The Museum might include—I think it should—a restaurant (serving dishes, presumably of burgoo and lobscouse), a cinema, a lecture-room and (for members of this Society) a Club. One room might be a memorial to Nathaniel Hawthorne ; a place to which Americans would be especially welcome. In another a floating model would demonstrate exactly how a sailing ship really works. Here and there the building itself would look rather like a ship. And somewhere near the entrance I can imagine a statue of John Masefield, the poet of Merseyside and perhaps our greatest poet of the sea.

Suppose it agreed that such a Museum, or something remotely like it, is desirable, what are the immediate steps to take ? The first step is to urge on the City the appointment of Trustees. The second is to begin enrolling the people on whom the future Museum is to rely. This Society is the nucleus but it is not more than that. We must seek more widely for help and encouragement. It is only by the co-operation of the City, the University, the neighbouring Boroughs, the Shipowners and Shipbuilders, together with such Societies as this, that our Museum can ever come into being.

" Brocklebanks "

By the late W. Stewart Rees

The object of this paper, is to give a brief outline of the shipbuilding activities of this well-known firm, and to trace their progress in this respect.

Daniel Brocklebank, the founder of the House, was born at Torpenhow, Cumberland, in 1741, the youngest son of the Reverend Daniel Brocklebank of that Parish ; he was apprenticed to Shipbuilding at Whitehaven, and in due course completed his indentures and became a shipbuilder.

Soon after his marriage at Whitehaven in 1769 he went to America, and there he established a Shipbuilding Yard in 1770, seemingly in the neighbourhood of Sheepscott, Massachusetts Bay State, Maine, which at that time was a British Colony. There he built four vessels, and had about completed the fifth, the brig *Castor*, single deck with beams, of 220 tons and 20 guns, when the War of Independence broke out, so taking command of the *Castor* he sailed from Sheepscott on the 8th of May, 1775, for Whitehaven, where he arrived on the 8th June, after a passage of 31 days.

The following account of their departure from America and arrival in England is taken from the *Cumberland Pacquet*, printed in Whitehaven, and dated the 15th June, 1775. Referring to Captain Brocklebank it says :—

> He left the country with a new vessel, which he had built there, on board of which he had only one barrel of beef and some bread. Provisions could not be purchased there, he therefore gave his Seamen the choice of running for Nova Scotia or the Banks of Newfoundland, to try whether they could secure a sufficiency of fish to support them on their passage to Europe.
>
> They chose the latter and in a few hours caught an amazing great quantity. They had some salt but not enough to preserve the fish they had taken, this deficiency they however soon supplied, by scraping up the salt which had been laid between the timbers (a custom used for preserving ships) wherever they could get it, and by these means got as much as cured a quantity which served them plentifully on the passage.
>
> After twenty days sail, they were in St. George's Channel, and on the 11th from that, came safe into Whitehaven, to the great joy and astonishment of their friends, who did not expect them so soon, as the Captain had purposed building another vessel, but from the disturbed state of the Province thought it most prudent to quit it, and a considerable part of his cargo which he had purchased, and had ready for shipping.

For some years Captain Brocklebank crossed and recrossed the Atlantic in the *Castor*, and in 1779 was granted a Letter of Marque by George III, as Commander of that vessel, which was now registered at Whitehaven, armed with 18 carriage guns (six and four pounders) and 8 swivel guns and carried a crew of 45 men, and he was authorised "to set forth in a war-like manner the said ship called the *Castor* and to seize the ships, depots, and goods belonging to the King of Spain and his subjects."

In 1780 Captain Brocklebank became master of the Ship *Precedent* (300 tons) which had just been built for him at Whitehaven, having been launched as the *Pollux*, but renamed. In March of the following year his former ship, the *Castor*, when in convoy, was wrecked in the West Indies.

Another *Castor* (342 tons) was constructed for him at Whitehaven in 1782, and when peace was declared in the following year, this ship and the *Precedent* were employed as transports. They both left New York on the 2nd December, 1783; the former, with Captain Brocklebank in command, brought 129 officers and men belonging to the 22nd Regiment (Foot), now the Cheshire Regiment, while the *Precedent* carried 128 officers and men of the 38th Regiment and 14 other passengers. This vessel reached Portsmouth on the 19th January, 1784, and the *Castor* arrived next day.

After taking the *Castor* from the Mersey to Philadelphia, and returning to Liverpool in 1784, Daniel decided to remain ashore in order to look after his increasing fleet, as other vessels had been built for him at Whitehaven, and he also had a large merchants business.

Having obtained a suitable site just outside the North Wall of the Harbour of Whitehaven, he commenced building ships again in 1788, and the first craft to be completed in that yard was the brig *Perseverance*, of 155 tons. With the advent of Brocklebanks, shipbuilding developed into a most important industry at Whitehaven, and as the years went by, more and larger ships were launched. The second *Castor* having been sold, Daniel himself built a third vessel of that name in 1790, a brig (179 tons) which was immediately disposed of, and the next year a fourth *Castor* (247 tons) was completed, and the command given to his eldest son Daniel, aged 19 years; a great responsibility for so young a man.

Cordage being such an important item in a ship's requirements, Daniel Brocklebank, senior, in 1794 bought the Bransty Ropery at Whitehaven and thereafter made his own ropes.

These were the days of enemy warships and roving privateers, and although ships sailed in convoy, a number were captured; and so it came about that Brocklebank's ship the *Nestor* (233 tons, built 1792) when homeward bound from the Mediterranean was taken off Cape St. Vincent by the French frigate *L'Ambuscade* (32 guns) and carried into Cadiz. In 1798, another Brocklebank ship the little brig *Ceres* (93 tons), built in 1797, was captured off Peterhead by a French privateer, whilst on a voyage from Whitehaven to Hull, and carried into Bergen.

In 1798 the *Alfred*, a ship of 314 tons (built in 1796) after loading in the Old Dock at Liverpool proceeded to Ireland and sailed from Cork, with Daniel junior in command, as part of a convoy consisting of 116 vessels, escorted by 6 warships. Unfortunately, young Daniel, then aged 25 years, died at Jamaica, and was buried at Montego Bay in July, 1798.

The *Alfred* was sold on her return to Liverpool, and after many years service in the Greenland Seas was wrecked in the ice in 1847, having been afloat 51 years, a working life that speaks well for the builders' skill.

Daniel Brocklebank died at Whitehaven in March, 1801, aged 60 years, and was buried at Trinity Church in that town. According to the *Cumberland Pacquet*, he had recently retired from the business; was highly respected by all who knew him, and during a very active life made 25 voyages across the Atlantic alone, and had built 25 vessels at Whitehaven. These varied from cutters of 60 tons to ships over 300 tons. Actually two more craft were built during his lifetime, namely, the *Active* (134 tons) and *Cumberland* (340 tons; 100.0 ft. x 23.2 ft. x 18.6 ft.), both in 1800, but they were constructed under the direction of his son Thomas. the *Cumberland* was described at the time of her launch " as the finest on the coast."

The title of the firm was now altered from Daniel Brocklebank to Thos. and Jno. Brocklebank, and the business of Shipbuilders, Shipowners and Merchants continued by his two sons; Thomas who at the time was in his 27th year, and John six years younger.

The ropemaking was carried on under the name of Brocklebanks and Co. and the two brothers had as a partner their cousin John Brocklebank, known as the Ropemaker, a son of the Reverend Ralph Brocklebank, who was a brother to old Captain Daniel. In the darly days Thomas generally remained at Whitehaven, but his brother John visited London, Liverpool and other ports in the United Kingdom and Ireland, wherever their ships were discharging or loading.

Carpenters at Whitehaven in 1807 worked from 6-0 a.m. to 6-0 p.m. with half an hour for breakfast and one hour for dinner, and in winter (from 1st November to 1st March) from light to dark ; breakfast before they came and not more time than necessary for dinner.

Brocklebank's own vessels brought hemp, oakum, tar, pitch, etc., from the Baltic, and oak timber from the Welsh Ports. In addition they engaged small schooners for the same purpose. They also sent some of their larger ships to Canada, and chartered tonnage to load timber for use in the Shipbuilding Yard at Whitehaven.

The business began to expand quickly and many vessels were put into the water from their yard, among them the brig *Ariel* (204 tons), launched in 1807. Two years later in January this vessel, when homeward bound from Caracas for London, was captured in the English Channel by the French privateer *Adventuriere* of 14 guns and a crew of some 50 men, and although the *Ariel's* crew numbered only 18 and she carried but 10 guns the action lasted for two hours and a half, during which the privateer's sails were torn to pieces and her shrouds and topmast cut away, before the Brocklebank ship surrendered. She was then taken into Cherbourg, and her captain made a prisoner and detained in France until released 12 months later. Thomas Brocklebank was greatly interested in India, and in consequence 1815 saw the launch at Whitehaven of the *Princess Charlotte* (514 tons), the largest ship built at the Port and intended for the Indian Trade. Her dimensions were 119.3 ft. x 31.2 ft. x 18.6 ft. ; she was a full rigged ship, copper-bolted and fastened and wood-sheathed, with a capacity of about 800 tons. She cost £14,000. It will be noticed that her length was about 4 beams.

The *Cumberland Pacquet*, dated Whitehaven, 12th September, 1815, contained the following account of the launch :—

> On Wednesday morning a new vessel called the *Princess Charlotte* was launched from the building Yard of Messrs. T. and J. Brocklebank. She was 514 tons register measure (which we are informed is 7 tons more than any ship built at this Port) and is believed to be a vessel of uncommon strength and beauty.

> The weather was delightful, and a great concourse of people, computed at not less than 6,000, witnessed her gallant descent from the stocks a little before 10 o'clock. It is what is called a dry launch, and after smoothly running (or rather gliding) about 80 yards without any apparent diminution of speed, she stopped. The tide was then flowing. In a little more than half an hour she was afloat, and soon after one o'clock was towed safely into the harbour.

The *Princess Charlotte* had a crew of 35 men, including a surgeon, and on her first voyage from Whitehaven to Batavia and Calcutta she was armed with 10 nine-pounder guns. She had " superior accommodation for passengers " The *Princess Charlotte* proved a most successful vessel and was employed in the Indian service for 30 years before she was sold. She was lost 9 years later. The *Perseverance*, of similar tonnage, was built in 1819, also for the Indian trade. She was unfortunately driven ashore in bad weather and wrecked near Madras when outward bound for Calcutta in 1829.

Thomas Brocklebank went to Liverpool in 1819, and in the following year opened an office there in the name of Thos. and Jno. Brocklebank, and while he directed the firm's activities at Liverpool, his brother John looked after their interests at Whitehaven.

1820 marked the completion of the first 50 years of the Firm's existence, and at this time, in addition to their shipbuilding, the Brocklebanks were operating no less than 22 vessels. In that year, too, their present white and blue House Flag came into use, being flown from the Fore, as it is to-day.

Trouble in the shipyards was not unknown even in those days, as the following account, taken from Gore's *Liverpool Advertiser* of the 20th October, 1825, shews :—

> Combination—The system which has done so much injury to the Shipbuilding Trade of this Port appears, from the *Cumberland Paquet* of Monday last to have commenced operating in Whitehaven. For some time past the workmen in the employ of Messrs. Brocklebank, builders, as well as others and even the boys, have exhibited strong symptoms of a refractory spirit.
>
> Insolence to the Masters and Overseers is the order of the day and those men who do not belong to the " Union " are annoyed on every occasion. Messrs. Brocklebank at length determined no longer to submit to this and on the 17th advertised for men at 24/- per week on condition that they were unconnected with any " Union."
>
> This, however, could not have led to what took place on Tuesday morning, for the plan of that proceeding had been laid on the Monday before the advertisement was published.

It appears that on Tuesday, the 18th, the apprentices seized two men who did not belong to the " Union," and mounting them upon poles successively paraded them through the streets.

On the latter occasion they were met at the foot of Duke Street, by Mr Brocklebank who endeavoured to prevail upon them to liberate the men, but in vain. A scuffle ensued. Mr Brocklebank pressed in among them and was either knocked or thrown down by one of his own apprentices, and he did not arise again without soiled apparel and a bloody face.

Justly incensed, Mr. Brocklebank proceeded to his yard and dismissed every man and boy employed in it and shut it up. Several of the apprentices were taken into custody but were afterwards liberated on bail. They have since had an interview with Mr. Brocklebank and on Monday morning last the Yard was again opened and several, both men and boys, were admitted to work.

Messrs. Brocklebank are well known as highly respectable builders and from their extremely liberal conduct at all times to the people under their control merited a very different return from what they recently received.

The shipwrights of Messrs Kelsik Wood and Sons of Maryport are also off work for a somewhat similar reason.

Brocklebanks built their first Paddle Steamer in 1827, the *Countess of Lonsdale* (241 tons gross, 150 tons net and 120 Horse Power) for the Whitehaven Steam Navigation Co., in which they were largely interested, and she was employed between Whitehaven and Liverpool. In 1828 the firm launched no less than 6 vessels including the *Herculean* (317 tons), all for their own trades.

In 1831 John Brocklebank died at Greenlands, near Whitehaven, aged only 51, as a result of being thrown from his horse, and was buried at Irton in Cumberland. The management of the Shipbuilding Yard was then taken over by a cousin, Daniel Bird, and on his death in 1845 the yard passed to Joseph Henry Robinson, also related to the Brocklebanks.

The barque *Hindoo* (266 tons) was launched in 1831, and during the next year the *Patriot King* (338 tons) came into commission. and on her first voyage made the round trip to Calcutta and back to the Mersey in the record time of eight months and two days.

The newly built *Jumna*, too, launched in 1833 (364 tons, 111.10 ft. x 27.9 ft. x 18.11 ft.) sailed to Calcutta and returned to Liverpool in eight months and two days and in 1834 she went out to Canton and arrived back in the Mersey early the following year, having made a record round voyage of ten months.

Another paddle steamer, the *Earl of Lonsdale*, of same dimensions as the *Countess*, was launched in 1834 for the Whitehaven Steam Packet Co. In 1836 the *Tigris*, a ship of 422 tons, on her first voyage sailed for Calcutta and then proceeded to China. In the same year the following paragraph appeared in a Liverpool paper of September :—

> A very handsome new vessel of 252 tons register measurement, called the *Globe* was launched on Monday last from the building Yard of Messrs. T. and J. Brocklebank at Whitehaven, and is intended for the Foreign Trade.

It is worth noting that the *Globe* remained in Brocklebank's service for 20 years, then was disposed of and after a similar period was resold, and 20 years later again changed ownership, finally being destroyed by fire in Strangford Lough, Ireland, in 1910, after a career of 74 years !

In 1837 the *Herculean* was reported at Bombay in 73 days from Liverpool.

The *Patriot Queen* (547 tons) came out in 1838 ; *Princess Royal* (579 tons) in 1841 ; the *Robert Pulsford* (593 tons) in 1844, and the *Sir Henry Pottinger* (629 tons) in 1845, in which year the Brocklebank fleet reached its maximum number, with 50 ships of 12,484 tons, all built at their Yard, and employed in their own trades. In addition the firm had an interest in 15 other vessels. On the 8th November, 1845, Thomas Brocklebank died at Greenlands, near Whitehaven, and was buried at Irton. The notice that appeared in the *Cumberland Pacquet*, read :—

> On Saturday evening last, at Greenlands near this Town, Thomas Brocklebank, Esq., of the eminent and well-known Firm of T. and J. Brocklebank, Merchant and Shipbuilder, in the 72nd year of his age. Mr. Brocklebank was a gentleman of retiring and unassuming manner, but as a Merchant and a man of general business talents, he had perhaps no equal. He has long been considered, and we believe justly so, as the greatest Shipbuilder in the World.

Two years previously he had taken into partnership his nephew Thomas Fisher, son of his sister Anne, and his cousin Ralph Brocklebank, the son of John the Ropemaker, both of whom had been associated with the firm for a number of years. They both lived at Liverpool. On the death of his uncle, Thomas Fisher, who was the sole surviving male descendant of Daniel Brocklebank, was made senior partner, and under the terms of the Will took the name of Brocklebank. He was made a Baronet in 1886.

More ships well known in their day were built at Whitehaven at this time :—1847 *Thomas Brocklebank* (629 tons). 1847 *Crisis* (426 tons). 1849 *Harold* (666 tons). 1850 *Petchelee* (393 tons). 1852 *Martaban* (852 tons), to mention but a few of them.

The launch of the *Martaban* in October, 1852, was witnessed by 5,000 people. She was not only the biggest vessel built at Whitehaven, but also had the greatest proportion of length to beam of any vessel yet built there, her dimensions being, length 171.1 ft., breadth 32 ft., depth 21 ft. She was 31 ft. 8 ins. longer but only 1 ft. 10 ins. more beam than the *Arachne* of 654 tons constructed the previous year. The *Aracan* completed in 1854 was of similar tonnage and the same beam as the *Martaban*, but 15 ft. longer.

As regards the *Martaban*, it may be of interest to quote the late Sir William Bower Forwood, in his book " Reminiscences of a Liverpool Shipowner," who wrote :—

> I remember seeing one of Brocklebank's Ships, the *Martaban* of 600 tons, sailing into the Georges Dock Basin under full Canvas. Her halliards were let go and sails clewed up so quickly that the Ship as she passed the pierhead was able to throw a line on shore and make fast. It is difficult in these days to realise such a thing being possible. It was skill supported by discipline.

In 1854 the *Petchlee* from Calcutta and *Aracan* from Bombay, both came home to the Mersey in 85 days.

When the second *Herculean* (531 tons) was completed in 1856 (164.9 ft. x 28.3 ft. x 18.11 ft.) it was recorded that her sharp and fine model was ahead of anything previously built at Whitehaven.

The *Rajmahal* (1,302 tons) launched in 1858, length 234.5 ft., breadth 36.9 ft., depth 22.8 ft., was the largest ship ever built by Brocklebanks at their own yard.

The *Sumatra*, *Juanpore*, *Veronica*, *Cambay*, *Tenasserim*, *Burdwan*, *Everest* and *Bowfell* followed, and finally the *White Winged Mahanada* (1,000 tons), their last ship, was launched on the 26th April, 1865, and the yard was closed.

Iron vessels were coming into general use, and the firm considered the question of building such vessels, but difficulties had arisen over the renewal of the lease of such a nature that they brought to an end Brocklebanks' building activities at Whitehaven, where, during a period of 78 years (from 1788 to 1865) they had constructed 153 wooden vessels ; comprising smacks, cutters, sloops, schooners, snows, brigs, brigantines, barques, ships and two paddle steamers, totalling 46,693 tons.

The Ropery was carried on for another 10 years.

Previous to the death of Daniel Brocklebank in 1801, many of the vessels he constructed were sold, although an interest was retained in some of them, but after his death the majority built by the firm were kept, and employed in their numerous services to India, China, South America, etc.

The Brocklebank ships were noted for their wonderful workmanship, and splendid materials, and were all of the highest class. They were exceptionally strongly built, copper-bolted and fastened. In the early days they were wood-sheathed, at a later date they were copper-sheathed over patent felt, and towards the end of the period the copper was superseded by yellow metal.

The average life of the 126 vessels, built by Thos. and Jno. Brocklebank between 1801 and 1865, exceeded 26 years; 28 of the craft were afloat for 30—40 years; 16 were in service for upwards of 50 years and 9 were still sailing the oceans 51—56 years after launching. The little cutter *Mackaral*, of 23 tons (built 1831, sold 1850) when broken up in 1899, finished a career of 68 years service, and the *Globe*, mentioned already, was 74 years old when she was burnt in 1910.

Brocklebanks were the biggest shipbuilders in Whitehaven, having launched at their Yard more vessels than any other firm at that port.

The Liverpool Nautical Research Society
(Founded 1938)

The annual subscription of ten shillings entitles members to attend meetings of the Society, to read papers before it, to take part in any excursions that may be arranged and to receive the annual "Transactions."

For further particulars, apply to :

MICHAEL H. SMYE,
Hon. Secretary,
The Liverpool Nautical Research Society,
Holly Lodge,
Leighton Road,
Neston,
Cheshire.

The Liverpool Nautical Research Society

CONSTITUTION

1. The objects of the Society are :—

(a) To encourage interest in the history of shipping (particularly local shipping) by collecting and collating material relating thereto ;

(b) To undertake an historical survey of Liverpool vessels, their builders, owners and masters ;

(c) To disseminate such information by publications or by any other available means ;

(d) To co-operate in every suitable way with other organisations in Liverpool or elsewhere having similar or cognate objects ;

(e) To encourage the making and collection of scale ship models, and their exhibition.

2. Membership of the Society shall be open to all persons interested in the objects of the Society who are elected in accordance with the Rules and pay the Subscription fixed from time to time, together with those appointed under Section 5 of the Constitution.

3. The affairs of the Society shall be managed by a Council who shall carry out the policy of the Society as decided at each Annual or other General Meeting, and shall report its proceedings to the next subsequent General Meeting.

4. The Council shall consist of the following officers :— Chairman, Secretary, Treasurer, Archivist and five other members, all of whom shall be elected at the Annual General Meeting.

5. The Council may nominate a President, Vice-Presidents, and Honorary Members, for appointment by the Society at any General Meeting, provided that in the case of Vice-Presidents, not more than four shall hold office at any one time. These appointments shall not be subject to annual election, and the President and Vice-Presidents shall be *ex-officio* Members of the Council.

6. This Constitution shall not be altered except at the Annual General Meeting of the Society, after due notice in accordance with the Rules.

RULES

1. Applications for Membership shall be considered by the Council and submitted to the next General Meeting for approval.

2. The financial year of the Society shall begin on the 1st September, when the annual subscription shall be payable. At the Council Meeting immediately prior to the Annual General Meeting, the Treasurer shall read out the name of any member whose subscription has not been paid for the previous year. The Council shall have the power to fix a special subscription in respect of any publications of the Society, subject to the approval of a general meeting.

3. The Annual General Meeting shall be held in October, and not less than seven days' notice in writing shall be given, stating the business to be transacted.

4. The business to be transacted at the Annual General Meeting shall be :—

(a) To receive the annual report of the Council.

(b) To receive the annual report of the Treasurer together with his audited accounts.

(c) To elect the Officers of the Council together with the five other members of the Council.

(d) To transact such other business as shall have been notified in the circular convening the meeting.

5. Nominations for election as Officers of the Society may be made by any Member in writing to the Secretary, prior to the commencement of the Annual General Meeting, provided that the nominee has signified in writing, or in person, his readiness to serve. Members of the Council may be nominated during the meeting, if the nominee signifies his agreement.

6. The Council shall meet not less than four times a year, five members being a quorum. All Members of the Council shall be given seven days notice thereof in writing. The Agenda for each Council Meeting shall be drawn up by the Secretary after consultation with the Chairman.

7. The Council may appoint *ad hoc* Sub-Committees, as may be found desirable. Sub-Committees shall report their proceedings to the next Council Meeting, and shall cease to function after the Council Meeting immediately prior to the

Annual General Meeting. The Council shall have the power to fill any unforeseen vacancies. Persons so appointed shall hold office for the same period as those they replace would have held office.

8. The Chairman shall be empowered to take emergency action when necessary, but shall first consult two other Members of the Council. Any action taken to be reported within 21 days to a meeting of the Council called in accordance with the rules.

9. The Council shall arrange a syllabus of papers to be read at General Meetings of the Society which will be held from time to time throughout the session.

10. Members shall be entitled to not less than seven days notice in writing of each General Meeting, stating the business to be transacted.

11. At all General Meetings, eight shall constitute a quorum, of whom at least four shall be ordinary members.

12. At all meetings of the Society, or of the Council, in the absence of the Chairman, or any prior arrangement, the Chair shall be taken by the senior member of the Council present.

13. The author of any paper read before the Society shall supply a copy to the Archivist which shall be available to the Members of the Society.

14. The annual subscription for the ensuing year shall be fixed at the Annual General Meeting of the Society.

15. No alteration of these Rules shall be made except at the Annual General Meeting of the Society called in accordance with Rule 3.

16. A General Meeting of the Society may be called at any time at the discretion of the Chairman, or at the request of four ordinary members who must state the business to be transacted thereat.

Passed 26th November, 1948.

List of Hon. Members, 1949

President : E. B. Royden, Esq.

It is unlikely that this list is free from errors and the Secretary would appreciate his attention being drawn to them.

Bankes, Capt, W., 5 Brunswick Parade, Waterloo, Liverpool 22
Bathe, B. W., 37A Radnor Drive, Southport, Lancs.
Beggs, Capt. E. W. C., 30 Dalmorton Road, Wallasey, Cheshire.
Blackburn, D., "The Old Cottage," Brantfell Road, Bowness-on-Windermere.
Bland, A. L., c/o Messrs. Rea Ltd., Pacific Building, James Street, Liverpool.
Booth, J. H. Lawson, 180 Roe Lane, Southport, Lancs.
Bristol Central Public Library, College Green, Bristol.
Clarke, P. J., Eyarth Hall, Ruthin, Denbighshire.
Cochrane, D. B., 35 Newton Road, Ashton, Preston, Lancs.
Corlett, W. E., c/o Bremner Sons and Corlett, 1 Cross Hall Street, Liverpool 1.
Davies, A. L., 4A Westmorland Road, Wallasey.
Dawson, J. L., "Dentdale," 48 Woodville Avenue, Crosby, Liverpool 23.
Dixon, J., 29 Lancaster Road, Birkdale, Southport, Lancs.
Docwra, H., 1 Platt Street, Seacombe, Wirral.
Farr, Capt. G. E., 3 Horseshoe Drive, Stoke Bishop, Bristol 9.
Finigan, G. Lysaght, The Direct Publicity Co., Ltd., 42 Stanley Street, Liverpool 1.
Fisk, Malcolm E., 1 Lansdowne Road, Wallasey, Cheshire.
Fletcher, Alex, The Roberts Boys' Modern Secondary School, Bootle, Liverpool 20.
Gibbs, Commander, C. R. V., "Bridge Cottage," West Dean, Salisbury.
Grayson, Sir Henry, K.B.E., 26 Birchin Lane, London, E.C.3.
Green, L. E., P.O. Box 1242, Johannesburgh, South Africa.
Greenwood, Norman H., 19 Trafalgar Road, Birkdale, Southport, Lancs.
Haire, D. A., 70 Sandy Lane, West Kirby, Cheshire.
Harvard College Library, c/o E. G. Allen and Son, Ltd., 12-14 Grape Street, Shaftesbury Avenue, London, W.C.2.
Hayes, W., "Brackenridge," Cefn Bychan Road, Panty-y-Mwyn, Mold.
Heal, S. C., "Sydbrigol," Black Horse Hill, West Kirby, Wirral.

HOCKADAY, H. H., 15 Ince Avenue, Liverpool 23.
HOWARD, G. F., Ph.D., 498 Bolton Road West, Holcombe Brook, Bury, Lancs.
HUKIN, H., 106 Chester Road, Southport, Lancs.
KANE, R. W., P.O. Box 699, Johannesburg, South Africa.
KARRAN, T. W., 114 College Road, Harrow Weald, Middlesex.
KENNEDY, Capt. NIGEL, 87 Tanfield Avenue, Neasden, London, N.W.2.
KIDDIE, G. A., 136 Roe Lane, Southport, Lancs.
LANCASTER CITY LIBRARY, Market Square, Lancaster.
LAURITZEN, KNUT, c/o J. Lauritzen, Hammerensgaof 1, Copenhagen.
LEA, Miss ANITA, 28 Karslake Road, Liverpool 15.
LEE, R. M., 116 O'Connell Street, Limerick.
LEWIS, KEITH P., 20 Morecroft Road, Rock Ferry, Birkenhead, Cheshire.
LIVERPOOL PUBLIC LIBRARY, per the Librarian, William Brown Street, Liverpool 3.
MCGRAW, C. B., 2 Whitby Avenue, Wallasey.
MCMANUS, E. P., 8 Harboard Road, Liverpool 22.
MARINERS' MUSEUM, THE, Newport News, Virginia, U.S.A.
MATHER, W. McQ., "Moorside," King's Drive, Caldy, Wirral, Cheshire.
MITCHELL LIBRARY, THE, North Street, Glasgow.
PARKINSON, Dr. C. NORTHCOTE, M.A., The School of Maritime History, The University, Liverpool.
PATTINSON, Major E. H., "Quarry How," Bowness-on-Windermere.
PEACOCK, A., "Herm," Priory Road, West Kirby, Wirral, Cheshire.
PECK, H., 36 Foundry Street, Barrow-in-Furness.
POOLEY, HUBERT, 32 Victoria Park Road, Leicester.
PUGH, J. A., 17 Greenhays Road, Irby, Wirral, Cheshire.
REES, J. S., 13 Kimberley Drive, Great Crosby, Liverpool 23.
ROWLAND, Dr. S., 7 Langham Place, Northampton.
ROYDEN, E. B., "Hill Bark," Frankby, Wirral, Cheshire.
SALISBURY, W., 5 Riddings Road, Timperley, Cheshire.
SAXTON, Miss E. B., 72 Alexandra Road, Great Crosby, Liverpool 23.
SLOMAN, GUY R., 21 Thornton Avenue, Bebington.
SMART, JOHN, 16 Sandiways Road, Wallasey, Cheshire.
SMITH, ROBT. MARTIN, 19 Williamson Square, Liverpool 1.
SMITH, Capt. W. C., 8 Melbury Road, Stockbridge Lane, Liverpool 14.
SMYE, M. H., Holly Lodge, Leighton Road, Neston, Wirral.

SOUTHPORT PUBLIC LIBRARY.
STEPHENSON, Major W. H., J.P., 5 Park Crescent, Southport.
SUMMERFIELD, R. B., c/o Summerfield and Lang, Ltd., 28 Exchange Street East, Liverpool 2.
TAYLOR, P. R. H., 155 Score Lane, Childwall, Liverpool 16.
TODD, Prof. J. A., 6 Holland Road, Wallasey.
WARDLE, ARTHUR C., F.R.H.S., " Camelot," Hunts Cross, Liverpool.
WALLASEY PUBLIC LIBRARIES, per the Chief Librarian.
WATSON, J. A. HOWARD, " Bella Vista," Nicholas Road, Blundellsands, Liverpool 23.
WILSON, G. S., 17 Finchley Road, Anfield, Liverpool 4.
WOAD, C. A., Dutton Hospital, Preston Brook, nr. Warrington, Lancs.
WOODS, E. CUTHBERT, F.R.H.S., " Green Gables," Bowness-on-Windermere.
WORTHY, R., 20 Bridle Avenue, Wallasey.
WRIGHT, LEO H., J.P., C.C., " Oakdene," Caldy, Wirral, Cheshire.
WHYTE, A. J., 4 Kempson Terrace, Bebington, Cheshire.

To :— Date....................

Michael H. Smye,
Hon. Treasurer,
The Liverpool Nautical Research Society,
" Holly Lodge," Leighton Road,
Neston, Wirral.

Dear Sir,

I shall be glad if you will submit my name at the next meeting of the Council as a member of the above Society. In anticipation of their approval of my application, I enclose a remittance of 10/-. Kindly acknowledge receipt.

Please enter my name and address as follows :—

....

....

Yours faithfully,