

## CHAPTER 11

### SHIPBREAKING HISTORY AND METHODOLOGY

#### Historical developments and contractual arrangements

Although useful building material and parts from old ships have always been re-used, ships were more likely to be abandoned in some out of the way place. For many centuries, the usual practice was to recover all that was really worthwhile from a wooden ship by burning her. She would be first stripped of the fittings and then towed inshore at high water to a suitable location. The ship was then set on fire and left to burn until there was little more than a heap of ashes left on the foreshore. The metal fastenings and the copper sheathings could then be collected and sold for further use.<sup>1</sup> However, as development progressed in the UK, the warship salvage that did take place was usually in the Royal Dockyards located at Devonport, Portsmouth, Chatham, Sheerness, Pembroke and Woolwich.

The paucity of literature on shipbreaking history has meant that a wide variety of primary sources have had to be consulted in order to gain an overview of how the shipbreaking industry operated. We have therefore combined this knowledge with the information contained within the Castles Archives. In this way, we have put together an interesting and useful explanation of a little researched activity. It is stressed however that the authors claim no expertise in this field and have simply and as accurately as possible reproduced and recounted the information and experiences gained from other sources. We believe it to be an accurate assessment of how shipbreaking operations were conducted in the various Castle businesses.

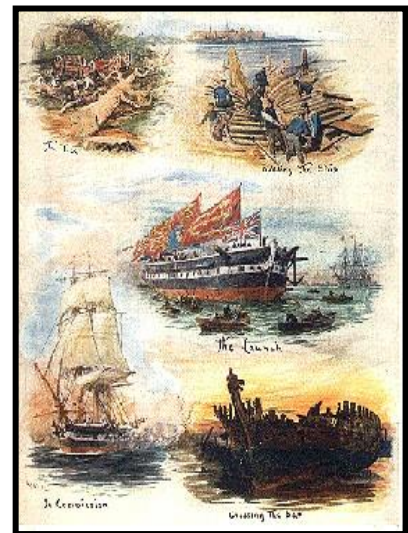
This particular narrative is therefore concerned principally with developments in the industry from the mid-nineteenth century onwards and with the disposal of HM ships by the Admiralty in particular. It is also more than likely that the methods described would have been used in earlier decades and centuries depending on the size and origin of the wooden sailing vessels involved.

Obsolete Men-of-War usually contributed a substantial proportion of the material that came on to the scrapping market. The progress of warship design was so steady that the older ships were always going to the shipbreakers in a constant stream. Even when political events periodically delayed the removal of larger ships from the Navy List, their disposal at a later date was inevitable. The arrival at the shipbreaker's yard was known as 'crossing the bar' and is epitomised in the watercolour by W. L. Wyllie - right.<sup>2</sup>

After the Armistice in 1918 there were many Men-of-War to be disposed of, as well as a large number of merchant ships, which had been kept in commission beyond their normal life owing to the wartime boom in freight. Sidney Castle junior participated in this market in 1919 and 1920 when he moved to Plymouth from Blyth in Northumberland.

The price of a ship for scrapping is usually fixed at so much a ton gross for a merchantman and so much a ton displacement for a Man-of-War. The expert eye of the scrapper assesses her value remarkably quickly – bronze propellers, metal in the engine-room, furniture that can be used again and many other items.<sup>3</sup> All the Castle family members, in the trade, were clearly experts in this field.

Despite the fact that the Admiralty Indexes and Digests at the Public Record Office and the London Trade Directories clearly indicate that there were a number of shipbreakers operating in the London area from the early 1860's onwards, it is believed that it was not until the mid-1860's that a comprehensive contract for "Breaking Up Old Ships" was fully



developed by the Admiralty.<sup>4</sup> Whilst contracts had always been used it was not until 1865 that a significant step forward took place in the drafting of appropriate documentation. In this way the Admiralty contracted out the breaking work to a shipbreaker on well-defined terms and conditions, rather than always offering the ship for sale by private treaty, auction or tender.

This document laid down stringent procedures as to how firms selected to break up HM ships should carry out their responsibilities and how the material recovered from the vessels should subsequently be dealt with. In this connection, the contractors breaking up the ships were obliged to return all copper and mixed metal articles recovered from the vessel to the nearest Dockyard. All other material recovered had to be sold by the contractors, either by public auction or by private sale, the proceeds being paid over to the Paymaster-General of the Admiralty.<sup>4</sup>

Control procedures were elaborate and an Inspecting Officer was appointed by the Admiralty to supervise the demolition of the ship. Under the terms of the contract this individual had full access to the Contractors' premises and was at liberty to inspect their books and documents relating to the sale of materials recovered from the ships at any time. In return for breaking up the ship, the contractors were paid a flat rate per ton on the gross tonnage of the vessel, plus a percentage of the value of the copper and mixed metal returned to the Dockyard and on the net proceeds of sale of the other materials generated by the contract. It seems likely this would have included the sale of all the realisable timber salvaged from the ships as well.<sup>4</sup>

The full contract documentation is available and we detail it below together with our comments and observations regarding certain clauses. The wording of the contract is surprisingly modern in its format and reasonably easy to follow and understand.

## **BREAKING UP OLD SHIPS**

*Articles of Agreement made and entered into this .....day of .....one thousand eight hundred and sixty-five between  
of*

*hereinafter called "The Contractors" of the one part and THE COMMISSIONERS FOR EXECUTING THE OFFICE OF LORD HIGH ADMIRAL OF THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND (for and on behalf of Her Majesty her heirs and Successors) hereinafter called "The Commissioners" of the other part. WHEREAS the Commissioners have determined to break up divers Vessels the property of Her Majesty which have become unfit for the Public Service*

*NOW IT IS HEREBY CONTRACTED AND AGREED between and by the parties hereto as follows that is to say*

*1. The Contractors shall within one calendar month from the date of these presents provide proper and suitable premises for the purpose of this Contract at such place or places as shall be approved of by the Controller of Her Majesty's Navy and shall pay all such outgoings and other expenses of and incidental to such premises during the continuance of this Contract*

*2. The Commissioners shall deliver at the said premises at their own cost in all things when and as the Contractors shall be ready to receive the same Vessels mentioned in the Schedule hereto and such other Vessels if any as they shall desire to have broken up under this Contract and the Contractors shall break up all such Vessels as shall be so delivered upon the terms subject to the conditions and in consideration of the payments hereinafter mentioned*

**It is noted that the Commissioners paid for the cost of delivering the ship to the shipbreaker's premises. In the case of Castles this usually meant delivery to Charlton Buoys, which was mid-stream, just opposite Anchor & Hope Wharf, Charlton.**

3. *Each Vessel delivered at the said premises to be broken up shall be broken up by the Contractors within such time as shall be agreed upon at or before the delivery thereof by the Contractors and the Inspecting Officer of the Commissioners to be appointed as hereinafter mentioned*

**We have previously discussed the time taken to break up ships and the average of three months was probable in the case of ships broken up under the terms of this style of contract as well. Clearly, however the tonnage of each ship concerned would also determine the time period agreed with the Inspector.**

4. *The Contractors shall provide all labour plant tools and implements and every other matter and thing necessary for the breaking up of the said Vessels at their sole costs*

5. *On the breaking up of each Vessel the Contractors shall deliver at their own cost and risk to such one of Her Majesty's Dockyards as shall be nearest to the premises in which such Vessel shall be broken up all copper and mixed metal articles which shall be in or upon such Vessel and shall not form part of the Boilers or Engines thereof or of the fittings of such Boilers or Engines and shall at the time of such delivery produce to the Storekeeper of such Dockyard a Schedule containing the weight and description of the copper and mixed metal articles so delivered and a declaration subscribed by them and by the said Inspecting Officer stating the name of the Vessel from which the said copper and mixed metal articles have been taken and that the said Schedule specifies the whole of the copper and mixed metal articles which were in or upon the said Vessel at the time of the delivery thereof at the said premises except such copper and mixed metal articles as formed part of the Engines or Boilers of the said Vessel or of the fittings of such Engines or Boilers*

**This clause expresses very clearly the requirement to deliver the copper and mixed metal articles back to the nearest Dockyard, which would have been Woolwich in the case of Castles. In view of the debate over this stipulation in 1868 it is likely that this clause would have been modified in subsequent contracts.**

6. *The Commissioners shall be at liberty before the delivery of any Vessel to the Contractors to take out of such Vessel and retain for the use of Her Majesty's Navy the Engines and Boilers thereof and the fittings of such Engines and Boilers or any parts thereof respectively and in case the said Engines Boilers and fittings shall not have been taken out by the said Commissioners before the delivery of such Vessel and the Commissioners at or before the delivery thereof shall give notice to the Contractors that they intend to take the said Engines and Boilers and the fittings thereof or any part thereof for the use of Her Majesty's Navy and the said Commissioners shall be at liberty to take and remove the said Engines and Boilers and the fittings thereof from the said premises at their own expense after the same shall have been taken out of the said Vessels by the Contractors*

**These stipulations were based on the previously assumed need to re-use whatever parts of a ship that could be usefully salvaged. This was not always done in practice as the memos available to us from Vice Admiral Robert Spencer Robinson indicate that the Dockyard stores were already full of such materials. It seems therefore that Castles may have often retained the Engines and Boilers for breaking up and for disposal as described in clause 7.**

7. *All materials which shall arise from the breaking up of the said Vessels other than the said copper and mixed metal articles which are to be sent to the Dockyard aforesaid and other than such or such part of the Engines or Boilers of the said Vessels and of the fittings of such Engines or Boilers as shall not be taken by the Commissioners as aforesaid shall be sold from time to time as soon as reasonably may be by the contractors either by Public Auction or Private Contract as they shall think best and the gross proceeds of sale thereof after deducting only the commission payable to the Auctioneer or other person or persons by whom such sale shall be conducted shall be paid by the Contractors to Her Majesty's Paymaster-General within seven days after each sale. The Contractors shall be personally liable to Her Majesty for the amount for which the said materials shall be sold and shall at or before the time of each such payment to the Paymaster-General produce to*

*the Accountant-General of the Navy at the Admiralty Somerset House a certificate from the Auctioneer or other person or persons by whom the sale shall have been conducted and from the said Inspecting Officer that the sum proposed to be paid by the Contractors to the Paymaster-General as aforesaid with the amount deducted for commission is the entire sum for which the materials in respect of which such payment is proposed to be made were sold*

**This clause clearly explains how salvaged materials were to be dealt with. The breaker was required to send all the materials for auction or to sell them privately and the net proceeds after deducting the Auctioneer's commission had to be paid to the Paymaster General. It is interesting that a certificate for the amounts concerned had to be obtained from the Auctioneer. A further certificate was even required from the Inspecting Officer appointed to monitor the contract. The controls were therefore strict.**

*8. The Contractors shall break up the said Vessels and sell the materials thereof in such manner as shall be calculated to realize the largest price for the same and shall do as little injury as reasonably may be to such of the Engines Boilers and fittings as shall be taken out of the said Vessels by them*

*9. The Contractors shall be liable for and shall pay to the Commissioners the value of all materials and other articles belonging to the said Vessels which shall be lost or stolen after the delivery of the said Vessels to the Contractors and for all copper and mixed metal articles which shall be lost or stolen in the transmission thereof by the Contractors to the Dockyard to which the same are to be sent under the provisions of this Contract*

**The contractors were made liable for any materials lost or stolen. As we have learned this potentially could be a serious problem as pilfering, particularly of copper bolts, was widespread.**

*10. The Commissioners shall on or before the delivery of each Vessel at the said premises furnish the Contractors with a statement of the tonnage and of the estimated value thereof distinguishing the value of the Engines and Boilers and fittings of the said Engines and Boilers and the Contractors shall forthwith at their own cost in all things insure such Vessels in the joint names of the Commissioners and the Contractors in some one or more Office or Offices for Insurance against Fire in London or Westminster to the amount of two-thirds at the least of the sum stated to be the estimated value of such Vessel and shall at their own cost keep the same and the materials thereof when broken up so insured until the materials shall be disposed of as is provided and shall within six days after the delivery to them of such Vessel produce to and lodge with the said Commissioners the Policy or Policies of Insurance effected on each such Vessel and shall pay the premiums and duty in respect thereof and produce the receipts for the same to the Commissioners on demand and all monies payable under the Policies so effected shall be received by Her Majesty's Paymaster-General*

**Insurance was an important protection for the Commissioners and the cover had to be for the amount of two thirds of the vessels stated value which was always higher than the sale proceeds actually realised. It is probable that the valuation figures utilised would be those prepared by the Dockyard Officers and if their figures were the ones used then two thirds thereof would in all probability provide sufficient cover for insurance purposes.**

*11. All Vessels delivered at the said premises and the materials thereof until sold shall be and remain the property of the Commissioners on behalf of Her Majesty*

*12. The Commissioners shall during the continuance of this Contract appoint an Officer to superintend on behalf of Her Majesty the breaking up of the Vessels hereby provided to be broken up and the carrying out of this Contract and such Officer shall during the continuance of this Contract have access at all reasonable times to the premises on which the process of breaking up is being carried on and shall be entitled to overlook and superintend the said process of breaking up and to enter upon and view all places in which*

*the materials metals stores and other articles of and belonging to the said Vessels are stored and shall have at least two days previous notice from the Contractors of all intended sales by Public Auction or Private Contract of the materials metals stores and other articles provided to be sold by this Contract and shall be furnished by the Contractors with all such information with reference thereto as he shall think fit to require and shall be at liberty at all reasonable times to inspect the books and other documents of the Contractors containing entries with reference to such sales*

*13. In consideration of the matters and things hereby agreed to be done and performed by the Contractors the Commissioners shall pay to the Contractors the sum of.....a ton on the gross tonnage of all Vessels which shall be broken up under this contract and a further sum of .....per cent upon the sum which shall have been paid by the Contractors to Her Majesty's Paymaster-General under this Contract in respect of materials sold and upon the value of all copper and mixed metal articles which shall have been delivered by the Contractors at the Dockyards aforesaid for the use of Her Majesty's Navy and of all Engines Boilers and fittings which shall have been removed by the Commissioners from the Contractor's premises after the same shall have been taken out of the said Vessels by the Contractors but no payment shall be made to the Contractors in respect of any Engines Boilers or fittings which shall have been taken out of the said Vessels by the Commissioners before the same shall have been delivered to the Contractors*

**This clause clarifies how the Contractor will be remunerated and as explained in Chapter 5 the basis of these figures, particularly the percentage rates payable to Castle & Beech, were subject to negotiation from time to time.**

*14. The said payments shall be made by the Commissioners to the Contractors at the times following that is to say - one-half of the sum payable for breaking up each Vessel at the said rate of.....per ton so soon as the said Inspecting Officer shall certify by writing under his hand that one-half of such Vessel is broken up one-fourth more of the sum so payable when the said Officer shall certify in manner aforesaid that three-fourths of the said Vessel are broken up and the remaining one-fourth of the sum so payable when the said Officer shall certify in manner aforesaid that the whole of the said Vessel is broken up and that the whole of the copper and mixed metal articles in or upon the same have been delivered by the Contractors to the Dockyard to which the same ought to be delivered in pursuance of this Contract and that all liability if any of the Contractors in respect of articles lost or stolen from such Vessel has been duly discharged. And the sum payable to the Contractors in respect of the .....per cent on the amount of Sales and of the value of the copper and mixed metal articles delivered by the Contractors at the Dockyards aforesaid and of the Engines Boilers and fittings if any removed by the Commissioners from the Contractors' premises after the same shall have been taken from the said Vessels by the Contractors shall be paid to the Contractors as soon as the said Inspecting Officer shall certify in manner aforesaid that all the materials of such Vessel hereby provided to be sold have been sold and the amount at which the same were sold received by the Paymaster-General and that all the copper and mixed metal articles in or upon the same have been delivered at the Dockyard aforesaid and that all liability if any of the Contractors in respect of articles lost or stolen from such Vessel has been duly discharged. And for the purposes of the payments aforesaid the tonnage of the Vessels and the value of the Engines Boilers and fittings specified in the statement to be furnished by the Commissioners as aforesaid shall be conclusive and the value of the copper and mixed metal articles shall be calculated at the market rate per lb. of old copper and mixed metal respectively on the day on which the same shall be delivered at the Dockyard aforesaid. The market value of the copper and mixed metal to be determined by the Registrar of Contracts to the Admiralty and such valuation to be conclusive and binding on all parties*

**At first sight, the terms appear to be quite demanding as the Contractor has to break up half the ship before receiving a first payment of 50% of the total sum payable. On the other hand, it is probably preferable to paying a large sum up front to purchase the vessel outright. It is also noted that the agreed percentage is not payable until all the salvaged materials had been sold, which effectively means only when the ship had been completely broken up.**

**It seems to us that if this type of condition applied in the contract to break up the Ajax in 1904 then it would not be surprising if the Contractor had incurred substantial and unexpected costs before half the ship had been broken up. It appears that this was probably the case as the expertise to break up a turret ship was completely lacking. Furthermore, the probable delay in paying over the agreed percentage would likely have caused further cash flow difficulties**

**Overall, therefore this type of contract placed a far greater emphasis on the management skills of the Contractor than had previously been the case.**

*15. In case the Contractors shall fail to perform this Contract or any part thereof it shall be lawful for the Commissioners by a notice in writing under the hand of their Secretary for the time being to determine this Contract without any previous notice to the Contractors and without making any compensation to the Contractors in respect of such determination. And in case the Contract shall be so determined all Vessels which shall have been delivered by the Commissioners at the Contractors' premises and shall not have been broken up shall be re-delivered by the Contractors at their own expenses at the Dockyard from which such Vessels respectively were delivered to the Contractors. And all Vessels which shall have been delivered as aforesaid and have been partially broken up and all materials of any Vessels wholly or partially broken up under this Contract which shall be in or upon the said premises shall upon the determination of the Contract in manner aforesaid be delivered up to or taken possession of by the said Inspecting Officer as the property of Her Majesty the said Commissioners paying to the said Contractors the amount if any which upon the footing of this Contract shall remain due to them. And on the determination of this Contract in manner aforesaid it shall be lawful for the said Commissioners their Officers Servants and Workmen to enter upon the premises in which the said Vessels and materials shall be and to complete the breaking up of such of the said Vessels as shall be partially broken up and the sale and disposition of the said materials upon the said premises and for that purpose to have the exclusive use of all machinery plant tools and other articles required for breaking up the said Vessels and which would in the opinion of the said Inspecting Officer have been employed for that purpose by the Contractors if this Contract had not been determined making a reasonable allowance or compensation to the Contractors for the use of the said premises machinery plant tools and other articles such compensation to be fixed by the said Commissioners. And the Contractors shall not during the continuance of this Contract remove any machinery plant tools or other articles employed in the carrying out of this Contract from the said premises without the consent in writing of the said Inspecting Officer*

**Failure to perform is well defined in this clause and the Contractor had to be confident of fulfilling the terms agreed and the time scale envisaged.**

*16. And the said Contractors further covenant that with the first and final payment for each Ship they shall and will produce and leave at the Office of the Accountant-General aforesaid a written Declaration made by themselves before a Magistrate that they have not directly or indirectly given or caused or allowed to be given or promised to give nor will afterwards give nor cause nor allow to be given to any Officer Clerk or person whomsoever employed either under the said Commissioners or otherwise in Her Majesty's Service or to any person or persons on their behalf or for the benefit of any such Officer Clerk or other person any money or other thing as a gratuity fee or reward for any matter in or relating to this Contract. And further that they will not without the consent in writing of the said Commissioners for the time being assign or transfer this Contract.*

**It is noteworthy that the contract recognises the possibility of corruption and that a written declaration had to be made.**

*17. And in pursuance of the directions contained in a certain act of Parliament made and passed in the twenty-second year of the reign of King Geo III entitled "An Act for restraining any person concerned in any contract commission or agreement made for the public service from being elected or sitting and voting as a Member of the House of Commons" IT IS HEREBY EXPRESSLY DECLARED AND AGREED and these presents are upon this express condition that no Member of the House of Commons hath been or*



shall be admitted to any share or part of this Agreement or to any benefit to arise therefrom

**Further to clause 16 even an MP cannot have an interest in the Agreement.**

18. *AND IT IS HEREBY FURTHER AGREED between and by the parties hereto that if the Contractors and the said Inspecting Officer shall not agree as to the time within which any Vessel shall be broken up by the Contractors the question shall be referred to the Controller of Her Majesty's Navy for the time being who shall decide thereon and his decision shall be binding on the Contractors and the Commissioners and that if any doubts disputes or differences shall arise between the said Inspecting Officer and the Contractors or between the Commissioners and the Contractors as to the meaning of this Contract or any part thereof or as to the liability or extent of the liability of the Contractors or the Commissioners under it or as to the amount payable to the Contractors or the time when the same is payable or as to the Contractors failing to perform this Contract or as to any other matter or thing in anywise relating to this Contract or incident thereto or to the construction and performance thereof such doubts disputes or differences as shall from time to time be referred to and decided by the Controller for the time being of Her Majesty's Navy who shall be competent to enter on the subject matter of such doubts disputes or differences with or without formal reference or notice to the parties concerned or either of them and who shall decide and determine thereon and the order and award of the Controller shall be final and binding on the said Contractors and the Commissioners respectively. And it shall not be competent for the Contractors or Commissioners to except at law or in equity to any hearing or determination before or of the said Controller on the ground of any want of jurisdiction excess of authority or irregularity of proceeding or otherwise howsoever but all matters made the subject of any such hearing or determination or included in any order or award shall be held and deemed both at law and in equity to have been properly adjudicated. And it shall not be competent for the Contractors to prefer or prosecute any petition of right or to maintain any action at law or suit in equity in respect of this Contract or any matter or thing arising under or out of it until the matters in dispute shall have been referred to and decided by the said Controller and then only for such sum if any as the said Controller shall award. And the obtaining of the decision of the said Controller on the matters and claims in dispute is hereby declared to be a condition precedent to the right of the Contractors to prefer any such petition of right or to maintain any such action or suit*

**The Controller of the Navy has the final say in any dispute and it therefore seems that the arbitration process described is very much one-sided.**

19. *AND LASTLY for the due and faithful performance of this Contract and every part thereof the Contractors do hereby bind themselves their heirs executors and administrators unto Our Sovereign Lady the Queen in the sum of Five Thousand Pounds of lawful British Money to be paid to Our Lady the Queen her heirs and Successors by way of stipulated or ascertained damages agreed upon between the said Commissioners and the Contractors over and above the amount of any other sum or sums which they the Contractors may have hereby rendered themselves liable to pay in case of any failure on their part in the due execution of this Contract or any part thereof and not by way of penalty*

*IN WITNESS whereof the said parties to these presents have hereunto set their Hands and Seals of the Day and Year first above-written*

*Signed, Sealed, and delivered (being first duly Stamped) in the presence of*

Despite the introduction of these new contractual arrangements there is clear evidence that the late 1860's was a period of controversy and debate with regard to the shipbreaking industry. This aspect of the situation has been discussed previously in Chapter 5. However, further consideration of the issues is warranted here as well.

Correspondence between a number of influential figures within the Admiralty highlights significant differences of opinion, often reflected by the individual's position or function

within the Navy. Whilst the Lordships of the Admiralty urged caution, thinking strategically of the number and type of battleships and frigates which would be required in the event of a war, the Controller of the Navy, Vice Admiral Robert Spencer Robinson, was wholeheartedly in favour of selling the old ships.

The objective was simply to obtain by their sale a substantial sum of money which could be paid into the Exchequer. Indeed, in a letter to the Lordships of the Admiralty the Controller emphatically states his case in the form of the following question and answer:<sup>5</sup>

*"How can a mass of costly but useless material be converted into a new and much wanted engine of war? The answer, which must occur to everyone, is "Dispose of what is useless on the best terms you can procure and apply the proceeds towards buying what is not only useful but of paramount necessity."*

The Controller was not alone in his thoughts on this matter and support for him can be found in a small unmarked letter<sup>6</sup> contained within a bundle of correspondence belonging to the Surveyor's Department. The letter suggests that retaining "old useless, defective or rotten vessels" was false portrayal of naval strength, pointing out that

*"Those unacquainted with the facts imagine a long list of ships represents national naval power, whilst it is positively a source of weakness and embarrassment. Of weakness because it dissipates our resources in taking care of old hulks which never could be fitted for ensigning on battle; of embarrassment because it prevents a Minister from persuading the Country that new ships are required whilst they read a list of vessels which they presume mistakenly to be efficient."*

However, opposition to the Controller's case was provided by the Storekeeper General of the Navy, Mr Romaine, who clearly felt that *"no amount of money approaching the real value of these ships in relation to their cost will be forthcoming under any conditions of sale"*. Furthermore, his concern was centred on discussions which were taking place about whether the Contractor's obligation to return all marked copper and mixed metal recovered from the ships to the nearest Dockyard should be retained or whether removing this stipulation from the Conditions of Sale would be an inducement to purchasers to pay more money for the ships. The Storekeeper General was firmly against any such move, arguing that to do so would practically annul the Naval Store Act set up to protect HM Naval equipment stores, increasing the opportunity for embezzlement and making the conviction of Marine Officers for the possession of these stores practically impossible.<sup>7</sup>

HM ships have not been identified specifically within the papers examined about these debates, however it is important to understand that the shipbreaker was governed by the market prices obtainable for the metals and the wood recycled, consequently knowing the total costs involved in the breaking up of a ship were also crucial.

An understanding of the costs can be derived from the letter written by Castle & Beech to the Seely Select Committee in 1868. In their presentation they estimate that the cost of breaking up a Line of Battleship or large Frigate including tools and labour to be 13/6d per ton. In addition, they estimated that a further £500 per ship should be added for incidental expenses such as towing and transporting, insurance, interest on money borrowed, rent of premises, plant, staff and sundry expenditure. The entire cost of breaking up each ship was therefore estimated to be approximately £2250, a figure that included the removal of engines and the cutting up of old boilers. Using these estimates Castle & Beech had calculated that the ten ships they had bought in March 1867 - see Chapter 5 - had cost about 17/6d per ton to break up giving a total cost of £21,268. Added to the original purchase cost of £66,773, this meant that a total cost of £88,041 had to be realised from the ships before any profit could be made from the transaction.<sup>8</sup>

An additional expense not included in the above calculations arose from the high rate of theft of the copper and mixed metal recovered from the ships. The extent of this problem is highlighted by a request from Castle & Beech in 1864 that their yard at Charlton be protected by Dockyard Police - see copy correspondence set out in Chapter 5. In addition, see the contract clauses and comments set out above.



It would appear therefore that comparing the likely sale proceeds with the original cost of building a ship was always going to be unrealistic. We have also noted that much of the wood was rotten making some ships almost worthless.

It is also very hard to say how long it took to break up a ship and this probably varied a great deal, although estimates can be made from passing comments in correspondence, such as Castle & Beech's letter of the 29th February 1868 to the Controller of the Navy which states:

*"We are now fast approaching the completion of the ships we bought last March and we are very desirous of finding more work for the employment of our staff, men and premises..."*

It is known that on this occasion they had bought ten ships with a total tonnage of 23,524; approximately 1960 tons per month.<sup>9</sup> However, there is no evidence to suggest that this is representative of the industry as a whole and the time taken would of course depend upon the number of men employed. In Chapter 5, we calculated that a ship could be broken up in as little time as a month, however it is felt that this was the exception rather than the rule. When Castles made their offer for the 13 Line of Battleships in 1867 they proposed to pay for and remove three ships within one month and the remainder within twelve months.<sup>10</sup> Marshalls of Plymouth (shipbreakers) offered to remove one ship immediately and then one every three months. Consequently, the overall evidence points to an average of three months, to break up a ship but it could be done quicker if the breaking up process was continual. Quite often ships would be broken up in clusters of three or four at a time and this would affect the total time span taken to finish the breaking up process involved on a number of ships alongside the wharves at any one time – see picture above by W L Wyllie of the *Hannibal* and *Duke of Wellington* at Charlton in 1904.



Further difficulties arise in identifying when ships were actually broken up. In some instances the year that the ship was sold to the breaker is recorded, but in others it may be the year that the breaking up was begun or completed that is given. An example of such difficulties of timing is provided by the acquisition of the *Dublin* a third rate of 74 guns, which was sold to Castles by a contract dated 16th July 1884. However the ship was not moved by Castles until 15th July of the following year.<sup>11</sup> Similarly the decision to sell the *Phoebe* to Messrs Castle & Sons was taken by the Admiralty in 1875 and yet the sales certificate which permitted the purchaser to take possession of the ship was not handed over until April 1876.<sup>12</sup>

Moreover, it appears that shipbreaking was not a continual process at Castles and was carried out as and when the timber was required or when other activities were slack. As long as the timber was kept in the water it was perfectly preserved and there was no rush to salvage it. Accordingly, the best estimate we can give of how long it took to break up a ship is that the time involved could be as long as a year for any one ship but that on average the time taken would be around three months when clustering is taken into account.

On the question of costs, we have discovered in the Castle Archives a contract applicable in Plymouth which is of much interest and it is likely that a similar type of arrangement may have applied on the River Thames. The contract relates to harbour regulations governing the activity of shipbreaking once a vessel had been purchased and which are highlighted clearly in an Agreement dated 1st May 1931 between the Cattewater Harbour Commissioners and Shipbreakers Limited.<sup>13</sup>

The shipbreaker was required to pay an annual sum of one hundred pounds for the privilege of using the Commissioners' channel for approach purposes, the Harbour and the beach up to the high water mark adjacent or near to Corporation Quay and Passage Wharf, Cattedown. In addition, the Company was instructed that:

*"On any and every vessel entering the Cattewater Harbour to be broken up by the shipbreakers her displacement tonnage shall be ascertained in accordance with the formula attached to this agreement and cash payment at the rate of Three-halfpence per ton on the dead weight shall be made by the Shipbreakers to the Commissioners immediately on the arrival of the vessel or vessels"*

This pre-determined formula to calculate the displacement of a vessel in tons was given as follows:

$$\text{Weight in tons} = \frac{(\text{Length in Feet}) \times (\text{Breadth in Feet}) \times (\text{Draft in Feet}) \times \text{Co-efficient}}{35}$$

The co-efficient in the formula was intended to represent the proportion which the vessel displaces as compared with the volume of a rectangular solid whose dimensions are the length, breadth and draft of the ship. In accordance with this, the approximate co-efficient of a Battleship was 0.6 and a Destroyer 0.55. The significance of the denominator 35 was that it equalled the number of cubic feet of salt water needed to weigh one ton.

Furthermore, the Agreement also stipulated that a rate of Three-halfpence per ton in dues was to be paid to the Commissioners on all goods shipped or unshipped within the harbour (other than goods covered by the previous regulation described above), including all scrap material exported or imported.

From an environmental point of view the control of shipbreaking was equally as stringent with the agreement emphatically stating that, *"No dirt, rivets, concrete or materials of any description shall be thrown overboard or allowed to fall into the harbour and anything accidentally dropped overboard shall be recovered immediately"*.

## **The Breaking Up Process**

In the nineteenth century dismantling the old wooden warships was a very hard and skilled job as they had been built with the finest materials and put together with enormous care and skill. The methods employed by the shipbreakers would have been very primitive and almost the inverse of building, with the ships being taken to pieces very carefully so as not to damage the timber and fittings, which could be resold or reused.

Ships purchased by Henry Castle & Sons were moored at Charlton Buoys on the River Thames. Anecdotal evidence supplied by Mrs Gladys Bromley, whose father Charles Frederick Perry was the manager of the Woolwich and Charlton Yards between 1886 and 1905, suggests that the firm started to dismantle the ships mid-stream until they were light enough to be towed alongside Long's Wharf or Anchor & Hope Wharf where they were then broken up completely - see further comments below.

Whilst little technical information concerning the actual dismantling of the ships in this era has been identified, an account - see below - by a former employee of Sidney Castle in Plymouth, Ernest Harkcom, indicates that ships broken up mid-stream in the early 1920s had their top structure cut up into pieces before the remainder of the ship was brought alongside the quay. Based on this account and that of Gladys Bromley it appears likely that this procedure would also have been used in the twentieth century by Castles Shipbreaking. Furthermore it is worthy of note that the latter company was a barge owner and operator and that they also built barges for their own use and for customers.<sup>14</sup>

Examination of the construction of some ships broken up by Castles highlights the nature of the task undertaken. The *Lord Warden* broken up by the firm in 1889, for example, and

reputed to have been the largest wooden ship built for the Royal Navy consisted of a framework of oak ribs two feet thick, filled between with oak. Outside this was a skin of 1½ inch iron plates and over them a 6-inch oak layer as backing for the armour. Beneath the waterline the armour was sheathed in a 5-inch thick layer of oak, and the whole bottom was covered with muntz metal (60% copper, 40% zinc).<sup>15</sup>

In addition to wood and metal plates there is usually a good deal of cast iron in a steam ship, especially in the engine room, and this was broken up into convenient pieces by the methods that had been in vogue for three-quarters of a century. A heavy ball, made of material, which is not easily fractured, is suspended on a wire to a jib of considerable height. Steam is the simplest means of hauling it up to the top, where it depresses a trigger. The winch barrel is then declutched and the ball comes down with a crash on the cast iron to be broken, leaving a mass of metal on deck – see picture left from the Dodds Family



Archives. The dropping ball, as it is called, is the principal reason why the location of a scrapping yard, in the vicinity of a residential quarter, is undesirable.<sup>16</sup>

In earlier days, before Henry Castle, there was an appalling waste in the process, for as a general rule the shipbreakers were interested only in the metals for which they had a market and anything else was usually disregarded. However, Castles reformed this process by recycling the timber from the old sailing ships broken up by them and as described in Chapter 8.

As a rule, a shipbreaking firm carefully selects the position of its yard, used exclusively for the purpose with many factors in mind. The site must have a foreshore as long as the ships to be scrapped and at high water sufficient depth for them to be floated in, although this demand is reduced by making the ship as light as possible before bringing it alongside the wharf. A 10 ft. rise and fall of tide is usually necessary. The foreshore must not be exposed to the full force of the waves or the work would frequently have to be suspended. The best bottom is one that is hard and shelving; while the longer it is dry at low water the better.<sup>18</sup> These are the ideal conditions, but it is not always possible to find them in a convenient location. All of the Castle yards mainly met these criteria both on the Thames and in Plymouth.

However, the transition to iron and steel in the construction of warships revolutionised the shipbreaking industry and turned it into a significant commercial enterprise. In contrast to the tools used in the old wooden scrapping yards, mainly axes, hammers of all sizes, chisels and other small hand tools it was no longer possible to break up the newer metal ships with the primitive tools of the wooden ship scrapper.

Oxyacetylene burners were introduced for the task although initially they were used only for particularly thick sections of the hull, hand "unbuttoning" still being the norm. The head of each rivet would be cut off using a hammer and chisel and then punched out. The whole process therefore was slow, tiring and labour intensive and only economic if wages were low. These burners were extensively used in every yard as the operation of a burner needed only two men instead of about twenty-five by the older methods.

Once the top structure had been removed and the pieces towed back to the quayside<sup>19</sup> the remainder of the ship would then be broken up using oxyacetylene burners. In earlier times the process would have been continued by separating the teak planking one by one until only the ribs remained. The wood would often be left in the ship until lifted onshore by crane – see Castles Archives picture, right, of the *Ganges* at Cattedown.





Shipbreaking was a dirty and hard business, with some of the copper bolts weighing as much as 4 lb. each. Working with the teak was a hazard for those involved with breaking up of the ships and for those using it to manufacture various products. According to a former foreman, who joined Castles as an apprentice at 14, many employees used to suffer from teak poisoning which used to bring their skin out in purple blotches.

As we know, the timber from the old ships was used to make furniture but some was also sold to a local cooperage, which used to make barrels and some furniture as well. The metal from the old metal ships used to be removed by steam crane and then sorted into different types on the shore. This metal was then often sold to a scrap dealer or to auction and despatched by truck or train.<sup>19</sup>

Energy efficiency appeared to be important to Castles and a former employee Mr. Powell, between 1940 and 1942<sup>20</sup> who used to cut up the timber in the Saw Mill described how overhead trunking transferred the sawdust and all the wood shavings from other parts of the works into a silo, which was then used to feed the boiler. The boiler then produced steam which was fed into the drying shed where timber from the ships was placed before being transferred into the Saw Mill. Depending on demand within the works timber was typically kept in the drying shed for about 3 or 4 weeks. Material was transferred from one area of the works to another by a rail track running through the centre of the yard.



Large and unusual pieces of timber had to be cut down before being moved to the drying shed - see Castles Archives picture, above, at Cattedown. This woodworking machine had a static saw with a moving bed and cut the timber into manageable, appropriately shaped pieces with the minimum of waste. In addition, a 'mono saw' could be used where the flat bed was fixed and the single saw blade moved down the bed.

During Mr. Powell's employment at Castles it is estimated that there were around 90 employees, all of whom were male. It is thought that women began to be employed from about 1943 onwards in the machine shop and in the assembly shop, as part of the war effort.<sup>21</sup>

At the age of 14 Mr. Powell received a wage of 15 shillings per week, which was collected from the 'cashier' (Leslie Radmore) though a small window. Money was handed over in a small round metal tin with the employee's clock number on it. The money was then emptied into the employee's hand and the tin returned to the cashier.<sup>22</sup>

Apparently rats, the size of cats, were a frequent problem at Cattedown and one employee remembered how the timber used to be stored in the yard outside and this attracted rats from the adjacent gelatine factory. Many a time the workers heard loud screams of fright from people entering the yard. Indeed, for one man it all got too much; he decided to take matters into his own hands and brought a rifle in to work to shoot the rats.<sup>23</sup> Unfortunately, he slipped at the crucial moment and shot himself in the leg. Heaven only knows what it must have been like at Baltic Wharf, Charlton and Woolwich in years gone by.

A great deal of information about the methodology of shipbreaking was obtained from Ernest Harkcom, a former employee of Sidney Castle, mentioned above,<sup>24</sup> who in an extended interview with Julia Sargent confirmed much of what has been learned by us about the breaking up techniques used for wooden ships and how the techniques progressed through to the breaking up of metal ships.

## Interview with Ernest Harkcom

Mr. Harkcom left Cattedown Road School, Plymouth in 1922 at the age of 14 and went to work for Sidney Castle at Cattedown. This site, which was next to Lomas Gelatin factory, was where the offices and a wharf for breaking up ships were located. Mr. Harkcom was taken on as an office boy\* and was paid a wage of 15 shillings a week, which was a comparatively high wage for a boy of his age. His main duties were making tea and taking Sidney Castle's three terriers for walks.

\*The term "boy", as opposed to "man" was the term used to describe a male under the age of eighteen.

Mr Harkcom recalls that Sidney Castle was a very tall man (about 6' 1") who was always smartly dressed and wore leggings or gaiters. He was pleasant and worked from the office, never going on board the ships, preferring to leave that to his manager Mr. Harris and his foreman instead. Sidney Castle insisted that he be referred to as Mr. Sidney Castle, and would not tolerate his Christian name not being used in his title.

The other key person in the organisation was known as the Timekeeper. Each employee had a small tin tag with an identification number on. Each morning as they arrived the employee used to move their tag from the "OUT" board over to the "IN" board; with the reverse being done in the evening. The working hours were 8 to 12 and 1 to 5, Monday to Friday and 8 to 12 Saturday. Sidney Castle operated a very strict routine and so at 8.05 am the Timekeeper used to check the "IN" board noting the numbers of the tags which had not been moved over. Workers were only paid for hours worked and no overtime was ever done whilst Mr Harkcom was there.



When Mr Harkcom joined the company they were breaking up the warship the St George at Cattedown. After four weeks as office boy he transferred to work on the ship because the boys out afloat received 17 shillings a week, 2 shillings more than he did.

Sidney Castle had a second yard in Plymouth at Ocean Quay, just over the Stonehouse Bridge, below Richmond Walk. Three ships were being broken up there in 1922: the Bacchante, - picture left from Castles Archives – the Leander and the Donegal. Breaking up began mid-stream off Mutton Cove with the top layers being totally removed before the ships were towed back to the quay to be finished off. In 1922 the Bacchante was alongside Ocean Quay and the other two were still mid-stream. Mr Harkcom was transferred from Cattedown to work on these ships at Ocean Quay and these were the only ships broken up by Sidney Castle during his period of employment.



Two boats called the Scrap and the Nancy used to pick the workmen up at Ocean Quay at 8 am and take them out to the warships and would pick them up again at 4.45 pm. Mr. Harkcom estimates that there were about 200 men in total working on the ships. The ships being broken up were mostly iron and wood. The top structure of the ships used to be cut up into pieces - picture left from Dodds Family Archives - which were lifted by crane into barges alongside and then taken back to the quay where they were lifted from the

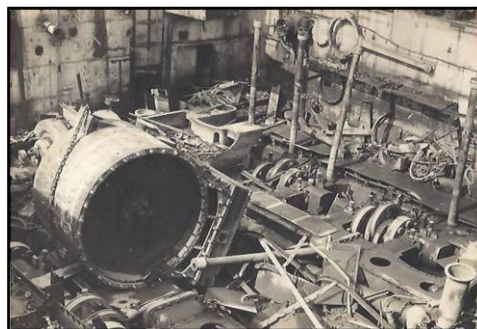
barge onto the quayside. This material was then cut up into pieces small enough to fit into railway trucks using oxyacetylene burners and was taken away by rail daily (destination unknown).

The oxyacetylene burners consisted of 2 bottles: one containing oxygen and the other containing acetylene. Rubber hosing used to be screwed onto each bottle and then attached to the torch itself. The torch was then lit and the burner was ready to use.



Before the lower levels could be broken up the ship had to be towed back alongside the quay. The outside of the ship was constructed of teak planking, with individual planks measuring approximately 30ft in length, 6" thick and 12" high. In order to remove these planks, the workers used to work in pairs - one man and one boy - standing on rafts alongside the ship. The first task was to cut through the brass bolts, which were about 3" in diameter and 12" in length, which held the planks in place. The boy would hold a chisel bar against the bolt and the man would strike the bar with a large hammer. When the first end of the plank was free it would be secured to the top of the ship. When the last bolt was removed the plank would swing free still secured by the other end. This end would then be released and gradually lowered until the teak plank was floating in the water. It was then towed back to the steps at Ocean Quay and lifted out of the water by crane. The teak was later chopped up and used as fuel for the steam cranes.

The remainder of the ship would be broken up using oxyacetylene burners. One of the main tasks undertaken by the boys employed by the company was to chip the rust off the ironwork before it could be cut up. This was necessary because otherwise the rust would just fly up when the burner was used and the cutting would not be successful. The men doing the cutting would mark the area to be cut so that the boys knew where they had to chip the rust off. According to Mr. Harkcom there used to be about 12 burners operating per ship, each with a boy doing the chipping - see picture right from Castles Archives of the *Alexandra's* boilers and engines, at Charlton in 1908.



During cutting, holes were made in the iron and a shackle was attached so that the pieces could be hooked on to the crane and lifted away from the ship. The cutting was a time consuming task and it used to take about 45 minutes to cut up a piece of iron 6ft by 4 ft.



An additional task undertaken by the boys - see picture from Castles Archives. Ernest Harkcom is in the front row right - was to remove any coal left in the ship's coal bunkers. This job would again be performed in pairs. One boy would be at the top of the manhole with a bucket on the end of a rope, whilst a second boy would be down in the bunker using an oil-lamp to find the lumps of coal and put them into the bucket. When the bucket was full it was pulled up and the coal was used as fuel for the cranes. Needless to say this was an extremely dirty job, and with

no washing facilities at the Quay, the boys used to travel home black from head to toe.

The above detailed description tallies a great deal with the memoirs of Gladys Bromley who recounted, as mentioned above, that timber-built ships to be broken up would be moored to Charlton Buoys where they would start to dismantle them mid-stream.

"When the ships were light enough they were towed to Long's Wharf or Anchor & Hope Wharf and then broken up. William Watkins tugs brought the ships up to Charlton Buoys. They used to strip the copper sheeting off the hulls of the ships and weigh the sheets on scales when selling them."



Finally, as an aside, we noticed that the presence of these famous ships at Charlton often attracted a number of tourists and sightseers as can be seen in the picture above from Castles Archives of the well-known troopship, the *Serapis*, at Castles Charlton Yard in 1894.

## **Summary**

When taken altogether the foregoing narratives give an intriguing insight into the working techniques and arrangements utilised within the shipbreaking industry in the nineteenth and early twentieth centuries. They also demonstrate clearly the hard and dangerous work that was often undertaken by these skilful and adroit workmen in taking apart some of the most famous warships ever built in the United Kingdom. For the lover of ships there is always something sad about a scrapper's yard where a beautiful vessel is ruthlessly cut up into lumps of dead material, however their subsequent use in the recycling process set out in earlier chapters enhances their journey into the annals of history.

## **Conclusion**

We have now reached the end of our history of the Castles era and hope you have found it to be both informative and interesting and that you have learned something about the work, techniques and personalities involved in the shipbreaking industry.

Our story covered a time span from the 17<sup>th</sup> century right through to the present day, However there remains much more to tell and if the level of interest in this preliminary history is significant then much more information from our archives can be released at some future point in time together with any valuable feedback that may be received from you the reader, other individuals and organisations.

Thank you for your time and interest

Robert & Linda Tait



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