



H. A. J. Silley

HENRY ARTHUR JOHN SILLEY

Mr. H. A. J. Silley was born in 1899 and educated at Felsted, King's College, London, and St. Catherine's College, Cambridge.

He commenced his apprenticeship in 1915 with Denny Brothers, Ltd., at Dumbarton, and subsequently served in the First World War as second lieutenant in the Royal Engineers. On demobilization in 1920 he continued his engineering training at Smith's Dock Co., Ltd., South Bank, Middlesbrough, and from 1922 to 1924 served as a seagoing engineer.

On leaving the sea he took up service with R. and H. Green and Silley Weir, Ltd., in London, first as Ship Manager and then as Works' Manager.

He was made a Director of the Company in 1926 and Deputy Chairman in 1927. In this year he was also appointed a Director of the Associated Companies at Falmouth—Silley, Cox and Co., Ltd., and The Falmouth Docks and Engineering Company, and became Managing Director of the Falmouth Companies in 1932.

On the death of his father (a past-President of the Institute) in 1941, he was appointed Chairman of R. and H. Green and Silley Weir, Ltd., and became Chairman of the Falmouth Companies in 1950.

PRESIDENTIAL ADDRESS

of

H. A. J. SILLEY

I am very appreciative of the honour that you have conferred upon me in appointing me your President this year and I am conscious of the responsibility which rests on this office in having to deliver a Presidential Address. The subject of the Address is left to the President and there is a very wide field from which he may choose. In considering my choice of subject I have to remember that many of your past Presidents have dealt with a great number of different aspects of shipping and marine engineering, and I felt, therefore, that I should endeavour to enlist your interest in a field closely associated with the work of this Institute. With this thought in mind I have decided to address you on the subject of shiprepairing—an industry in which I have spent my working life.

Shiprepairing, by reason of the variety of services that it performs, is in some ways unique as an industry. Those engaged in it are called upon to carry out a great many tasks for the shipping industry and for the Royal Navy, and it is difficult to name any other commercial activity that bears comparison in the number and variety of operations with which it deals. It may well be that the medical profession can make a similar claim in dealing with the many ills that befall mankind, but I feel that the general question of shiprepairing in the United Kingdom is one that warrants the special attention of this Institute.

In a nation like ours, so vitally dependent upon its seaborne trade, it is essential that the best possible service is obtained from the Merchant Fleet in peace time and from the Merchant Fleet and the Royal Navy in time of war. The all-important factor in this is the efficient maintenance of these fleets which requires speedy refit and quick turn-round so that both merchant ships and ships of the Navy can operate with the maximum efficiency and the minimum delay. In peace time the period spent in port is a matter of concern to the shipping companies, whose operating costs have risen sharply in the post-war years, and in war time, delay in port of vessels urgently required may mean to this country the difference between victory and defeat. A survey of the shiprepairing position during the last war emphasizes the extent to which the United Kingdom and the Commonwealth were dependent upon our repair yards for survival.

The operation of repair and maintenance of ships is no new one to this country. It has its place in history since earliest times. We know that from time to time our country has been faced with problems relating to trade and defence, and that on many occasions our survival as a free people has depended on those of our countrymen who manned our ships and on those who laboured at home to keep the ships at sea.

In those historical days when trade was largely coastal and cross-Channel, ships were based and manned from a particular port. The problem of repair and upkeep, therefore, presented no great difficulty. There was no call for drydocks as we know them today nor for any great variety of machine

tools or other facilities. Grounding or careening sufficed for dealing with underwater work. Almost the only material used in ship construction was wood, and this—generally speaking—was available locally, but as shipping grew in importance and as ships grew in size, it became necessary to enlarge the repair facilities to deal with the ever changing conditions.

The first ship that I have been able to trace as being drydocked was the *Grace Dieu*—a vessel of 400 tons. She was beached at high water at Southampton and a cofferdam of brushwood and clay constructed round her. This took place in 1434. This primitive dock is said to have cost forty shillings and sixpence, but it showed the way to the creation of the first graving dock which was built at Portsmouth sixty-one years later in 1495. This dock was subsequently enlarged to take the *Henri Grace de Dieu*—a vessel of 1,000 tons.

Towards the end of the sixteenth century—a century that marked the rise of this country as a naval power—the Royal dockyards made their appearance where warships were built and repaired, and the first Naval dockyard was constructed at Portsmouth in the year 1656. By 1698 there were some nine single and three double drydocks in these Naval yards. The single docks were 100 feet long, 35 feet wide and 20 feet deep, and the double docks were 200 feet in length.

Prior to this, in 1626, a drydock of 100 feet length and 34 feet beam had been constructed at Bristol, and in 1653 the East India Company built a dock at Blackwall which is referred to in Samuel Pepys's diary. These early drydocks were arranged so that the floor level was above low water ordinary spring tides, and no pumping was, therefore, required.

During the seventeenth and eighteenth centuries the expansion of shiprepair facilities and of drydocks was slow, and it was during the nineteenth century that the real increase in the numbers and sizes of drydocks took place. At the beginning of the nineteenth century British shipping totalled 1.7 million tons, and by 1900 this had increased to 9.3 million tons. To deal with the docking of this merchant fleet there were 200 drydocks in Great Britain—twenty of these ranged between 600 to 800 feet in length, and there were ten docks of a length greater than 800 feet, but the size of ships went ahead of the size of drydocks. Readers of "The Great Iron Ship" by James Dugan will remember that after the *Great Eastern* had struck an uncharted rock approaching New York in 1862 and sustained serious damage, it looked at one stage as if she were doomed as she could not be beached and there was no drydock big enough to take her. To overcome the difficulty a cofferdam had to be specially built to cover the damaged area.

This twentieth century has seen our country engaged in two major wars, when shipping supplied the vital link between the sources of supply across the world of raw material and essential supplies as well as the food without which we might have been starved into submission. A survey of the shiprepairing position during the last war emphasizes the extent to which

Presidential Address

the United Kingdom was dependent upon its shiprepairing facilities. At the commencement of the 1914 war the number of men employed in the private yards and in the Royal dockyards in the United Kingdom on shipbuilding and repairs totalled 132,000, and this number increased to over 220,000 at the cessation of hostilities in 1918. However, in consequence of the policy of disarmament adopted in the early 1920's and also due to the world recession in shipping, this number of men dropped steadily in the years between the two wars, and in spite of the rearmament programme which commenced in 1938 there was just under 157,000 available in our shipbuilding and repair yards at the outbreak of World War II—a decline of between one-quarter and one-third of experienced men.

	Royal dockyards	Private yards	Total
July 1914	40,662	92,144	132,806
November 1918	61,245	161,300	222,545
September 1939	37,023	119,666	156,689

The demand for replacement tonnage and shiprepairing soon overloaded the yards, and the numbers of men were increased rapidly until by 1943 the total had risen to 180,000, but of this total some 40,000 were continuously employed on naval repairs. The remaining 140,000 was still inadequate to meet the heavy demands for building and repairs, and work on many merchant ships had to be deferred until after the war. The position would have been much worse if the United States had not, early in 1941, expressed its willingness to help with the repairs of H.M. ships. Between 1941 and September 1945, 180 H.M. ships were refitted and repaired in the U.S.A. The value of this relief to the load of work in the United Kingdom yards at this time cannot be overestimated.

The importance of drydocks as part of the essential services soon became painfully apparent to those who had the responsibility of conducting our maritime affairs, and one of the first steps taken by the Prime Minister was the setting up of the Offices of Controller and Director of Merchant Shipbuilding and Repairs. This new department acted in liaison with the Board of Admiralty and was in constant and daily contact with the War Cabinet. So important became the drydock position that their use was strictly controlled by the exercise of varied degrees of priority. With the steady assault of the enemy the demands for drydocks for the immediate repair of torpedo and mine damage became for the country as important as such matters as the output of fighter aircraft and bombers.

In 1939 the following drydocks were available in the United Kingdom:—

	Royal dockyards	Private dock
Graving docks	50	240
Floating docks	5	16

In Germany there were twenty-five graving docks and 130 floating docks. (As a matter of interest nearly 80 per cent of the latter were sunk by Allied air attack.)

Of the 240 graving docks in this country, only eighty-two could accommodate ships of over 57-ft. beam. Between 1938 and 1954 the number of ships over 57-ft. beam registered in the United Kingdom or on charter increased from 780 to about 1,580, whilst the number of drydocks available had only increased by five.

When the number of vessels of a beam of 80 feet is examined, it is found that whereas those in that category will have risen in number from fourteen in 1938 to a probable eighty-one by 1957, the number of graving docks with an entrance width of over 85 feet will have increased in that time by only two, i.e. from sixteen to eighteen.

The following tabular statement of the world position regarding large ships has recently been published:—

	1924	1952
Gross tonnage over 70-ft. beam	1,600,000	8,000,000
Number of vessels with beam of:—		
70-80 feet	70	376
80-90 feet	5	123
Over 90 feet	5	11

This article commented that the private dock accommodation for such ships has not materially altered in the United Kingdom and as a result Britain's share in shiprepairing facilities in the world is decreasing.

From a detailed survey of the requirements of merchant shipping it is a matter of profound importance to appreciate that some 25-27 million gross tons of shipping are drydocked annually in the United Kingdom, and that of this total the major tonnage consists of ships requiring the larger drydocks. This tendency will undoubtedly increase as the smaller ships are replaced by fewer but larger ships.

Before 1938 the entrance width of a well-proportioned drydock was about one-tenth of its length. The beam of many modern ships, however, is some 20 feet greater than for pre-war ships of similar length, and this has meant that the entrance width of some long docks has had to be increased.

As ships grow in size, so more and more drydocks in use become obsolete. The cost of building a large drydock is high, between £1,500,000 and £2,000,000, and it is a matter of interest to study the taxation aspect in regard to this large capital outlay for the construction of a drydock. The Finance Act of 1953 enabled industrial buildings to be written off in forty-five years, but expenditure on excavation, tunnelling, etc., was disallowed. The 1954 Act decreed that such expenditure should rank for an initial investment allowance of 10 per cent, but for no annual allowance. Although this was a step in the right direction it was totally inadequate to meet the cost of depreciation on the greatly increased cost of buildings and drydocks constructed today is compared with those prior to 1938. This factor has undoubtedly discouraged the building of new drydocks in anything like the numbers that might have been achieved if the various Chancellors of the Exchequer had given more sympathetic consideration to this matter of vital public interest.

It is interesting to compare the treatment meted out to the shipyards in England with that enjoyed abroad. In a recent interview the President of the Italian Parliamentary Merchant Marine Commission stated that a ten-year shipbuilding programme had been authorized in a new law approved in July last providing for a substantial government subsidy to shipyards. "Subsidies are necessary", said Signor Angelini, "because shipbuilding costs are high in Italy and without Government aid Italian Shipyards would not be able to compete for foreign orders". The benefits to Italian shipbuilding have, of course, been reflected in their repair industry. Aid from the United States—especially under the Marshall Plan—has also played a vital part.

The present position of large drydocks shows how relatively small is the number available in this country in comparison with the rest of the world.

		Entrance width of drydocks		
		Over 80 feet	Over 90 feet	Over 100 feet
Great Britain:	State-owned	15	13	9
	Private	25	13	6
Commonwealth:	State-owned	16	13	7
	Private	15	10	7
U.S.A.:	State-owned	40	33	22
	Private	71	36	7
World's total		297	196	107

Presidential Address

Drydocks must be regarded as essential to the industry of shiprepairing, but there are many other services that must be available to make up the efficient unit. Shiprepair yards in the United Kingdom have, in general, been established for many years. They are situated mainly on congested rivers or harbour frontages and surrounded by towns, and any extension of area is extremely difficult if not impossible. To lay down a new repair yard with a deep water frontage and proximity to a supply of suitable skilled labour seems well nigh impossible under present conditions. It follows, therefore, that in the main the only means of increasing our shiprepair capacity is to increase the labour supply, to improve both plant and technique, and to make fuller use of the plant by overtime and shift work. Criticism of the industry is more often confined to the time taken for the work than to the cost, and rarely—if ever—to the quality of the work executed. The standard of workmanship in British yards will bear comparison with that of any of our world-wide competitors.

Associated with the increased size of the ship is the larger unit of hull construction. There has been, in latter years, a considerable increase in the size of machinery parts which may have to be lifted. This has necessitated the provision of big lift cranes alongside the drydocks and wharves. As an example, in the case of a new tanker delivered early this year it is understood that the propeller weighs some 42 tons. It is also necessary to equip drydocks with an adequate supply of compressed air, electricity for ship supply for lighting and power and for electric welding. Boiler plant and steam pipe lines must also be available to enable the ship's services to function when the vessel's own steam units are shut down.

In the case of many shiprepairing firms whose premises are not incorporated in a dock or port organization, provision must be made for sanitary and cloakroom accommodation for the officers and crew whilst the vessel is alongside the repairers' yard or in drydock. This accommodation can involve the shipyard in very heavy capital expenditure for which no direct recompense can be obtained.

The various types of ships in different trades and carrying special cargoes must be catered for, and the enormous increase in the use of oil, which has now become by far the largest commodity transported across the world, has brought to the shipyards special problems associated with tankers. The efficient cleaning of cargo tanks and the removal and disposal of sludge is becoming of increasing importance. For this class of vessel the repair yards will need also to take special measures to deal with the problems of hull corrosion which is peculiar to tankers.

With the high duty machinery now in use on merchant vessels of all types, the engineering shops in the repair yard must be equipped with the most up-to-date machine tools both for repairs and for shop tests. We now have to deal with the high pressure boilers and with large turbine units. For an engineering repair shop to be fully equipped it appears necessary to have dynamic balancing machines for turbine rotors in order to avoid the necessity of sending these large units away to marine engine builders with the consequent delay, added cost, and the risk of a major accident whilst in transit between the works and the shiprepairing yard. To handle such heavy items of machinery in the engine shop, heavy lift travellers and other appliances are required. Many of the older shops cannot be readily adapted to take these heavy loads and this often means that new shops must be erected with heavy steel structure capable of carrying such loads.

The developments taking place in new construction have their reaction on the repairer's yard. As an instance, the fitting of stabilizers to passenger liners having proved so successful, demands are being made for vessels already in commission to be fitted with this new device. In order to maintain the ship's schedule it may be necessary for such work to be carried out in stages. This calls for special arrangements being made in planning the work so that the vessel can leave on time and the work be so conducted that it can be readily continued or completed on her subsequent return to port.

Another problem arises from the introduction of electronic equipment for navigational aids such as radar screens and many other specialized pieces of equipment. The repairer generally is not equipped to deal with the maintenance of these specialized units, and it is necessary for sub-contractors to be brought in to service them. It is often necessary, however, to provide store room for spare parts and also to give assistance to the specialists who carry out this work.

Increasing demands are being made by owners for surface treatment by sand-blasting of the bottom plating followed in some cases by special coatings. Sand-blasting is extensively used in the United States shipyards and the repair yards there are lavishly equipped for this work. In one drydock on the West Coast there are four filling stations with two 5-ton tanks for sand on each side. The containers—one is filling whilst the other is in use—each serve four machines, making a total of thirty-two in all. The main reasons given by U.S. yards for adopting sand-blasting are (1) the high standard of surface preparation required for the new type of protective paints; (2) a reduction of time in drydock for cleaning; and (3) a saving in man-power.

Sand-blasting is also used in Continental yards but with varied degrees of success. In this country, although we have been experimenting for many years, advance has been slow. The stringent Factory Act Regulations in this country make dry sand-blasting virtually impossible on any large scale.

Shipyards rely very largely on the apprenticeship system to maintain the skilled trades. During and since the last war our shiprepair yards have been maintained at a high capacity, and in consequence there has been a welcome increase in interest shown by parents in apprenticeship as a career for their sons, and local education authorities have also co-operated in putting the training schemes into effect. Schemes have been developed to enable entrants to the industry to obtain a high standard of theoretical knowledge as well as practical training in yards and workshops. Scholarships are open to the best apprentices, and it is hoped that with the improved pay there will be less incentive for boys to go to initially higher-paid employment which offers them no training for a skilled trade on reaching adult age. Whilst the industry recruits its executive staff largely through apprentices, both the Merchant Navy and the various Classification Societies also rely upon this source of supply for their engineering officers and surveyors.

It is of the utmost importance to the shipping industry and the country that the highest standard of training be maintained. This will be helped if full employment is assured in the yards. One recalls the tragic loss of skilled men from the industry in the slump between the two World Wars when many emigrated, to the considerable advantage of other countries.

Increasing competition from shiprepairers on the Continent—particularly from Germany and Holland—raises serious issues. Most of the shipyards in these countries were badly damaged during the war and have to a considerable extent been rebuilt. Many new shops of modern design with the most up-to-date machine tools have been erected. Having as a rule plenty of room, the transport systems have been overhauled and arranged for speedy movement of men and materials throughout the yard. New docks have been built and others enlarged and modernized. First-class heavy duty cranes have been provided and all this has meant an enormous capital outlay which undoubtedly has been state-aided. American aid has also been used extensively in this connexion. In France, new machine tools which have been accepted as reparations from Germany are installed in many yards.

The wages paid in Continental yards are—in general—less than those paid in the United Kingdom, and in addition there are less onerous terms for overtime and shift work. The men are anxious to retain employment and work well. One of the most important factors undoubtedly is the general acceptance of a system that enables the management to transfer men readily from one job to another. This greatly facilitates repair work

Presidential Address

and enables individual jobs to be efficiently manned and assists in the planning of continuous working. It cannot, unfortunately, be said that the same conditions exist in British yards. Here there is still a great deal of attention paid to demarcation between trades. This is to the detriment of the firms, and—I believe—also to the men themselves.

There is considerable unemployment in Germany, France and Italy, and this undoubtedly is reflected in the attitude of the men to this question of demarcation and also other problems. So anxious are they to retain their employment that strikes concerning demarcation very rarely occur. On the other hand, however, strikes do occur from time to time in Continental yards on political issues. We are happily spared this form of labour trouble.

Owing to the versatility of his labour and his ability to man overtime and shift work, the Continental shiprepairer is usually able to quote a reduced time to complete the work as compared with the shiprepairers in the United Kingdom. This saving in time does in fact reduce the overall cost of the job, but more important to the shipping company is that this reduced time in port enables him to increase the earning

capacity of his vessel. Whilst such conditions prevail the British shiprepairer is going to find this competition most difficult to overcome.

It is not easy to see how any radical changes can be made in the shiprepair yards in this country. We must increase our drydock capacity for larger ships either by building new drydocks or enlarging existing ones. Our yards must be equipped with the most efficient machine tools, cranes and services to meet the new requirements. All this involves large capital outlay which must be borne by the shiprepairers themselves without the aid so lavishly given to their Continental competitors.

A high standard of living has been provided for people in this country by our leadership in world commerce, our merchant fleets having at all times been pioneers in opening up new markets for trade. Our Navy has kept us free from foreign invasion for close upon a thousand years. These two great services call for the highest state of efficiency in our shiprepairing yards and many members of this Institute who are serving the industry will, by their initiative and determination, see that we prove worthy of our great heritage.