

The present author's connection with this Circular Quay controversy led to an intense antagonistic feeling towards him at the time (as a prominent Government official strongly resented proposals coming from anyone but himself), but it commenced in a most innocent way, at the time when the subject of the wharves was in everyone's mouth. The defects of the Appendix B. scheme were being discussed by a number of nautical men, including a member of the Marine Board—the Minister for Public Works, being also present. One of the experts asked for opinions with regard to a sketch for the wharf improvements which he himself had made and shown to the author, and also showed at the same time the modifications to the arrangement which the author had suggested to him. This latter proposal was so favourably commented on by those present, that it led to the author being officially requested to forward it to the Government. In response thereto, and on the 4th of September, 1873, the author forwarded a plan accompanied by a letter to the Department of Public Works, and showed how, instead of—as in the official scheme—giving accommodation for small ships not so large as our present coasting vessels, his plan provided berths for "Mail Steamers" on the east side of the Cove. This was so far as is known, absolutely the first proposal on record ever made with such an object, the mail boats, up to that time, having always laid out in the stream, and never come up to the quay.

It would profit nothing now to go into the long details of the "warfare of the wharves" which waged so strongly for many months, that the author's newspaper cuttings in reference to that matter alone, fill a whole book. Suffice it to say, that the official proposals were modified time and again, each time providing a lesser number or longer berths for the vessels, but still keeping to the iron construction; while the author maintained that the vessels should not be locked in, that the construction should either be of timber or Masonry, and not of iron, and that, if there were not to be jetties to separate the vessels, as in Fig. 3, then there should be a continuous Quay wall, as in Fig. 4. (Plate XIX.).

Unfortunately the author of this Iron Wharf did not take the trouble to make himself acquainted with the details of the rival schemes, or even of his own. At that time the waters of Sydney Cove were greatly fouled by sewage, and there were in the official proposal, 209 cross girders with only one quarter inch thickness of plates in their webs, all exposed to corrosion; but this responsible official had so forgotten it that he told the Committee on May 5th, 1874 (Q. 35), that the thinnest part of his girders was 5-8ths of an inch—of course, quite a different matter. At the same time, he knew so little about the rival proposals, which he condemned, that when questioned with regard to the author's plans, he treated the words "Hand packed rubble" as being synonymous with "rubbish," and told the Committee that the "rubbish" backing would push the walls down.

The result of all these and many other similar extraordinary statements made to the Committee was that in their report they made no recommendation to Parliament at all, but simply reported the evidence, and the whole matter was shelved for a few years more. Those who are further interested in wharf construction will find a curious want of knowledge with regard to ships, allied with a contempt for the opinions of experts, and a great number of plans printed in the "Votes and Proceedings of Parliament," from 1872 to 1874. As a great deal of misconception has prevailed in the past with regard to the author's connection with this Circular Quay controversy, the present opportunity is taken advantage of to state once for all, that he did nothing in the matter, that he was not officially asked to do, and that he still preserves a number of most flattering letters from the Government of the day, which show that he was asked to prepare the plans for these wharves at the Government's expense; but at that time, owing to the terms of his engagement with Mort's Dock Company, he was unable to make any charge for his services, although tenders were called upon his plans and specifications, which are printed with the Report.

THE IMPROVEMENTS OF 1884.

It is unnecessary to say that the iron construction was abandoned, and the berths on the eastern side of the Circular Quay were built some years later, when the following features, which the author had advocated in opposition to the original proposals were embodied in it:—the construction was of timber; the berths were for large vessels and for a lesser number; the sheds were separate and detached; a clear space was left in front of the sheds to land the goods on.

Parliament, on the motion of the Government, subsequently voted a gratuity to the author for the service he had rendered to the Colony in this matter, not only in preventing money being wasted, but in saving it from the ridicule that would have ensued had the original proposal been carried out. A movement for further wharf improvements took place in the year 1882, in connection with a remodelled city, and was so keen that a Citizens' Committee was appointed, and a competition was instituted to secure designs. In this the author took no part, being too busy with the practice he then enjoyed. The first prize was gained by Mr. Oscar Schultz, who had worked out a most comprehensive scheme, dated 9th May, 1883, which was published. Mr. Schultz, in his plans, shows new quay frontages, warehouses, and city Railway Stations.

IMPROVEMENTS IN WHARF CONSTRUCTION.

Whatever stiffening the old time jetties had was generally above the water level, in the shape of walings and diagonal braces, and was ample when the piles were short and the water alongside shallow. When preparing the plans for deep water jetties of timber at the Circular Quay, the futility of this arrangement was so apparent to the author, that he introduced for the first time in Sydney the use—now so common—of diagonal piles, to provide the lateral strength required: but the first opportunity which he had for adopting this arrangement was at Moore's Wharf, reconstructed by

him about 1880. He is up to the present time not aware whether these diagonal piles were so used previously in other ports.

Half a century ago, when the "Maid of Judah," and the "Woolloomooloo" (vessels about 700 tons) were typical ships in the oversea trade, and were often over three months in port, a 12in. pile was large and strong enough for wharf building; girders were often round timber, flattened on the top for the planking, and the better class of jetty had sawn timber walings. With the ever increasing tonnage of both oversea and coasting vessels, greater length, breadth and strength of the jetties became imperative, and an era of wharf reconstruction prevailed during the last twenty years of the old century. The principal improvements in Darling Harbour to meet these requirements—largely for coasting steamers—and the introduction of the double storied wharves, were carried out by the Messrs. McCredie Bros. The deep-sea wharves at the north end of the city were mainly the work of the author; while the Department of Public Works kept the Government wharves up to the requirements of the times, especially at the Circular Quay. At many of the Government Wharves, much rock had to be removed and much dredging was necessary to give the draught of water required; dredging was also required at Darling Harbour; but between Miller's Point and Dawes Point the extension of the jetties introduced problems never before met with in Sydney, and no wharf improvements in the port, so far, have presented such a marked contrast to those of the old school as those carried out by the author at "Parbury's" shortly before the resumption by Government.

In this case a jetty was run out at a site where there is 60 feet of water, and 50 feet of mud below it, thus requiring great numbers of the bearing piles to be 120 feet long, and the diagonal or spur piles 140 feet long.

These were all made of two large trees butted and "fished," the joint being encircled by four heavy hoops. The small end of the upper pile was 19 inches diameter. The

fish timbers are 12ft. 12in. by 8in., and the hooping of 3½in. by ¾in. iron galv. The general construction is shown by the model exhibited, and the piles were driven by a three ton monkey. At the Central Wharf extension into deep water, also carried out by the author, a single pile was driven which weighed about ten tons in one tree 108 feet long.

The energy stored up in a vessel of 8 to 10,000 tons displacement, when moving even at a slow speed, is so great that when she comes into contact with a wharf (as may happen if caught by a wind in being berthed) the effect is something to reckon with, and timber jetties are now necessarily made very strong, with diagonal bracing of 12in. by 12in. timbers in their deck framing. In Parbury's Jetty the headstocks were magnificent sticks of grey ironbark, 60 feet long, 16in. by 14in. Special rounded ends are built at the ends of these jetties, as fenders, of solid ironbark in several layers and protected with heavy steel plates, yet a vessel coming quite slowly in to the wharf, stem on, tore off a heavily bolted plate 20 feet long, 18in. by ¾in., like a bit of tin, and "upset" the concrete at the shore end, through the springing of the whole 400 feet of the jetty, with only a trifling injury to the timber work itself.

RECENT WHARF IMPROVEMENTS.

In 1888, an official proposal was submitted to the Public Works Committee, to erect a jetty in the centre of Woolloomooloo Bay, and the author was summoned as a Witness in the matter; after inspecting the plans, he, for a number of reasons, recommended that Quays should first be built along the eastern side. Page 5 of the Committee's Report is nearly all taken up with quotations from his evidence, and his recommendations were adopted. After some alterations had been made, the fine commodious wharves now occupied by different Companies were completed by Government, and Woolloomooloo Bay became a most important shipping centre of Sydney.

It was often stated as grounds for the resumption of the wharves by Government that private wharf owners did not study the wants of the shipowners; that, however, was pure fiction, because before the resumption by Government, great improvements both for coasting and deep sea vessels were general, and the Central Wharf owners had spent about £70,000 in improving one property alone. The real difficulties that existed under the private ownership were, first, the conflicting interests of adjoining owners of the water frontages; then the uncertainty as to the limit line for extensions laid down by the Departments, and, most important of all, the impossibility of any broad and comprehensive scheme being initiated by separate proprietors of comparatively small private properties. The passing of the water frontages to the Harbour Trust took away from the author a very large slice of his bread and butter, by depriving him of the business he had built up at the north end of the city, and not being a licensed victualler, nobody has proposed compensation for the loss—but it has given the State the many and great improvements under the hands of the Harbour Commissioners that are now in evidence, and that could not have come in any other way. It is only necessary to cite the splendid broadside wharf occupied by Dalgety and Co., at Miller's Point as one example. The Harbour Trust has further than this prepared a scheme for building a series of magnificent parallel jetties between Moore's Wharf—now Tyser's, and Parbury's, on the author's old ground; and further improvements to provide berths for the larger class of vessels are already in hand between the Gas Works and Miller's Point. When these works are completed it would appear that the City proper will then be encircled with wharves to its fullest capacity. As the berths above Pymont Bridge are not popular ones, it is possible that instead of them being extended, there may be further reclamations there in the future, and the Bridge be removed. (Plate XX.).

The deep water between Miller's and Dawes Point's, will make the construction of the projected great jetties there comparatively costly. In that locality as is often the case, deep water is backed up by high land, and steep grades on the approaches. During recent years the pull out to Windmill and Lower Fort Streets, so severe on horse teams, has been assisted by hydraulic lifts, which were first suggested by the author, and were designed by him in detail in two cases for the Central and Parbury's Wharves. Under the improvements contemplated by the Harbour Trust Commissioners, these will be superseded by a new low-level road between Miller's Point and Dawes Point, which will not only be a vast improvement to the National Wharves, but will make a radical alteration in the map of the north end of Sydney. An alteration is also being made to the east side of the Circular Quay, which will make it practically continuous as proposed by the author in 1874. (See Fig. 4.)

Undoubtedly the finest wharf in the Port is the Concrete Quay at Darling Island, particulars of which will be found in a most interesting paper on Wharf Construction, by Mr. H. D. Walsh, Engineer to the Harbour Trust, read on the 18th February, 1906, at the Engineering Section of the Royal Society. This paper is full of valuable information with regard to the timbers used for wharf building, metal sheathing of piles, and the protection of wharf frontages with Monier concrete plates. Speaking of the Circular Quay controversy of thirty years ago, and the "opinions regarding the future shipping requirements of the port," Mr. Walsh says:—"Mr. Selfe, who appeared to stand alone in his opinions, advocated larger berths, sufficient if necessary to berth the 'Great Eastern' if she could come here."

Well, our ships are now getting up towards that tonnage with "White Star" liners of 13,000 tons; and numbers of vessels afloat in the Atlantic trade are much larger than that unfortunate vessel. Mr. Walsh, however, was evident-

ly not aware when dealing with "Solid Quay Walls," of the existence of the concrete wall at the Central Wharf; this was put in by the author 27 years ago, and was undoubtedly the first work of the kind carried out in Sydney. So much impressed was the author with the value of masonry quays in those days, that in giving evidence before the Select Committee of Parliament 30 years ago, on the construction of his proposed Masonry Works at Circular Quay, he advocated the use of "Swimming Caissons," furnished with air locks, for the purpose of founding the proposed solid piers and wharf walls, under water. This system—then quite novel—has since come into common use. (See Report, p. 57).

THE WHARVES OF THE FUTURE.

With the wharfage improvements now in hand by the Harbour Trust, we may dismiss our consideration of the "Past and Present," and are thus brought face to face with the Prospective;" and the problem of how to provide by the extension of wharfage accommodation for shipping of the future! Diagram No. 2 shows graphically the relative tonnage of the vessels which arrived in Sydney in each year from 1900 to 1907, the figures of the first and last years being in round numbers, 2.7 and 7.1 million tons; also the prospective increase up to the year 1918. (Plate XXI.).

By curious coincidence the length of the wharf frontage at present available from Woolloomooloo to Darling Harbour inclusive, amounts to about 37,825 feet, equal to, say, 7.1 miles.

If we allow for increase in the future, and in the same arithmetical, not percentage ratio, then the tonnage that will enter the port in the year 1918, may be expected to reach fourteen million tons! And the question arises, Where are all the additional ships to be berthed?

To suppose that, in a port having 150 miles of water frontage, the shipping business is for all time to be confined

to the shores of the City of Sydney, is absurd, and apart from that the frontage is practically all utilised at present. With the present agitation for additional foreshore reserves in the harbour, it is to be hoped that public sentiment and private interests will for all time preserve the southern shores from Pott's Point to Rose Bay for private residences and recreation areas.

On the left hand side of Diagram No. 2, there is shown graphically the proportional frontage of the present wharves, and a large extent of easily accessible water frontage available for the accommodation of the shipping in prospect. The horizontal lines are drawn at intervals of one million tons for the shipping, and of 5280 feet, or one mile, for the wharf frontages; thus enabling the respective increases to be easily compared.

In the last report of the Harbour Trust Commissioners, there are details of the present wharf frontages supplied from which the total of 37,800 feet has been compiled. The projected wharves at Miller's Point will give, say, 3000 feet more. Then there will be 3700 feet of quays possible on Glebe Island, to which a special branch railway is to be brought. As that same railway will also equally serve—by a short branch—the opposite shore at Balmain, that frontage should be resumed at a very early date, where the plan shows 3000 feet of frontage as available. Then there is the Long Nose Point scheme of Mr. Whitton, first proposed by the late Engineer in Chief for Railways in 1873, and which was nearly being carried out 20 years ago. That line would serve another 3000 feet of shipping quays, which must come with the necessary resumption sooner or later, for the shipping of coal, and yet these together only bring up to a total frontage from about seven to less than nine and three-quarter miles.

It will be noted that the diagram shows that fourteen million tons of shipping may want accommodation by the year 1918. No doubt it is true that wharf frontage will not re-

quire to be increased in the same ratio as the tonnage of the vessels' increase, because the tonnage increases as the cube of the linear dimensions of the ships, and with larger vessels, facilities for discharging cargo are multiplied. The mammoth liners and tramps of the future, therefore, will not need wharf frontage on quite the same tonnage scale as present vessels, but they will require broadside wharves or quays rather than jetties.

We often hear about New York as the greatest shipping port of the Western World, but there is every indication that when Sydney has reached the age of the American City, our shipping tonnage will be greater than that of New York at the present day. But, with all its length of shore line, the shipping of New York is not concentrated on the frontage of the city. The Navy Yards are on Long Island, Brooklyn, and two great manufacturing cities are on the New Jersey Shore. If Balmain is to be our Jersey City, North Sydney, is certainly to be our Brooklyn; and on that Brooklyn the State now owns ground with miles of magnificent water frontage admirably adapted for quays and wharves, that can be brought into direct communication with the city once the two shores are connected by a bridge. Leaving out of question for the present the more westerly portion of the Berry Estate, that has been recently acquired by Government, it will be seen by the map (Plate XX.), how a very short railway from the Government Bridge will bring the whole northern system and the city into direct touch with 9,300 feet of water frontage, where several magnificent lines of quays can be built with railways at their rear. There are also 2000 feet of at present unused frontage at Lavender Bay with the railway already there that will be all part of the scheme of the future easily connected by a bridge and with more difficulty by a series of tubes or tunnels. As our magnificent timbers are fast disappearing, it is fortunate that a bountiful nature has in store for us unlimited supplies of lime and clay, thus, as we now

make our own cement, we can line these new business shores with solid and rat-proof quays, without incurring the enormous outlay for excavating tidal docks, as in cities like London and Liverpool.

After all the western shores of North Sydney, and the whole of Balmain frontage are occupied with shipping, a few years hence, in the not distant future, there are still other possibilities. For instance, Mr. Lawrence Hargrave has shown (in a paper read by him before the Royal Society) how 147 acres of the "Sow and Pigs" Shoal, near the Heads, could be reclaimed, and eight thousand yards of quays for ships constructed without interfering with either the east or west channels. A subaqueous tunnel would give this gigantic shipping dock direct railway communication with the city.

It may be said that this proposal is much too prospective altogether, and need not be seriously considered by the present generation, but it must be remembered how Sydney has lost so much in the past, and has wasted or let slip altogether so many of her golden opportunities, through not looking ahead at all,

Happily a new era seems recently to have opened out in the matter of public sentiment; the increase in the population, the enormous development of the railway and tramway traffic, the great gulf in the communication with North Sydney, the marvellous advances in our exports, with the lost opportunities for improvements, followed by congestion, in our city streets, have effected a widespread awakening; and we are just beginning to see our wonderful surroundings and responsibilities as they appeared to the poet Erasmus Darwin (father of the great naturalist) 120 years ago.

With a piece of clay sent from Sydney Cove, the celebrated Wedgwood modelled the medallion of Hope visiting Port Jackson, now in the Sydney Museum, and this inspired the poet with prophetic vision.



In those oft quoted verses, Hope—it will be remembered—is depicted as standing on a rock, and apostrophizing the surroundings of Sydney Cove. Some of those lines—with comments perhaps—may now be quoted as an appropriate conclusion to what has so far been said with regard to the future of Sydney and its Harbour.

- “Hear me, “she cried” ye rising Realms! record
 “Time’s opening scenes, and Truth’s unerring word—
 “There shall **BROAD STREETS** their stately walls
 extend,
 “The **CIRCUS WIDEN** and the Crescent bend;
 (*To this end the Government has recently appointed a Royal Commission*)
 “There ray’d from cities o’er the Cultured Land,
 “Shall **BRIGHT CANALS**, and solid roads expand—
 (*Shea’s Creek and Leichhardt Canals are no doubt already useful if not handsome, but those in hand at Barren Jack will make the Barren Bush respond, and fashion glades with garden flowers, where all is now a waste.*)
 “There the proud arch Colossus-like, bestride
 “Yon glittering streams, and bound the chafing tide;
 (*This must mean the North Shore Bridge because the Poet saw no Tubes or Tunnels in his dream.*)
 “Embellished Villas crown the landscape-scene,
 “Farms wave with gold and Orchards blush between—
 (*No more wharves on the South Shore below Sydney, but plenty of grain and fruit for export from the country.*)
 “There shall tall spires and dome-capt towers ascend,
 “And Piers and Quays their massy structures blend;
 “While with each breeze approaching vessels glide
 “And northern treasures dance on every tide.”



Mr. H. D. Walsh (visitor) exhibited a diagram (Plate XXII.), showing the work that the Harbour Trust Commissioners had already carried out in Port Jackson, and also what was contemplated in the near future. In reply to questions, he said the piles were of timber. Regarding crane accommodation, this would be provided to meet the requirement of the lessees of the wharves. At the present time there were no hydraulic cranes on the double-decked wharves. The President conveyed the thanks of the Association to Mr. Walsh for the information he had contributed to the paper.

