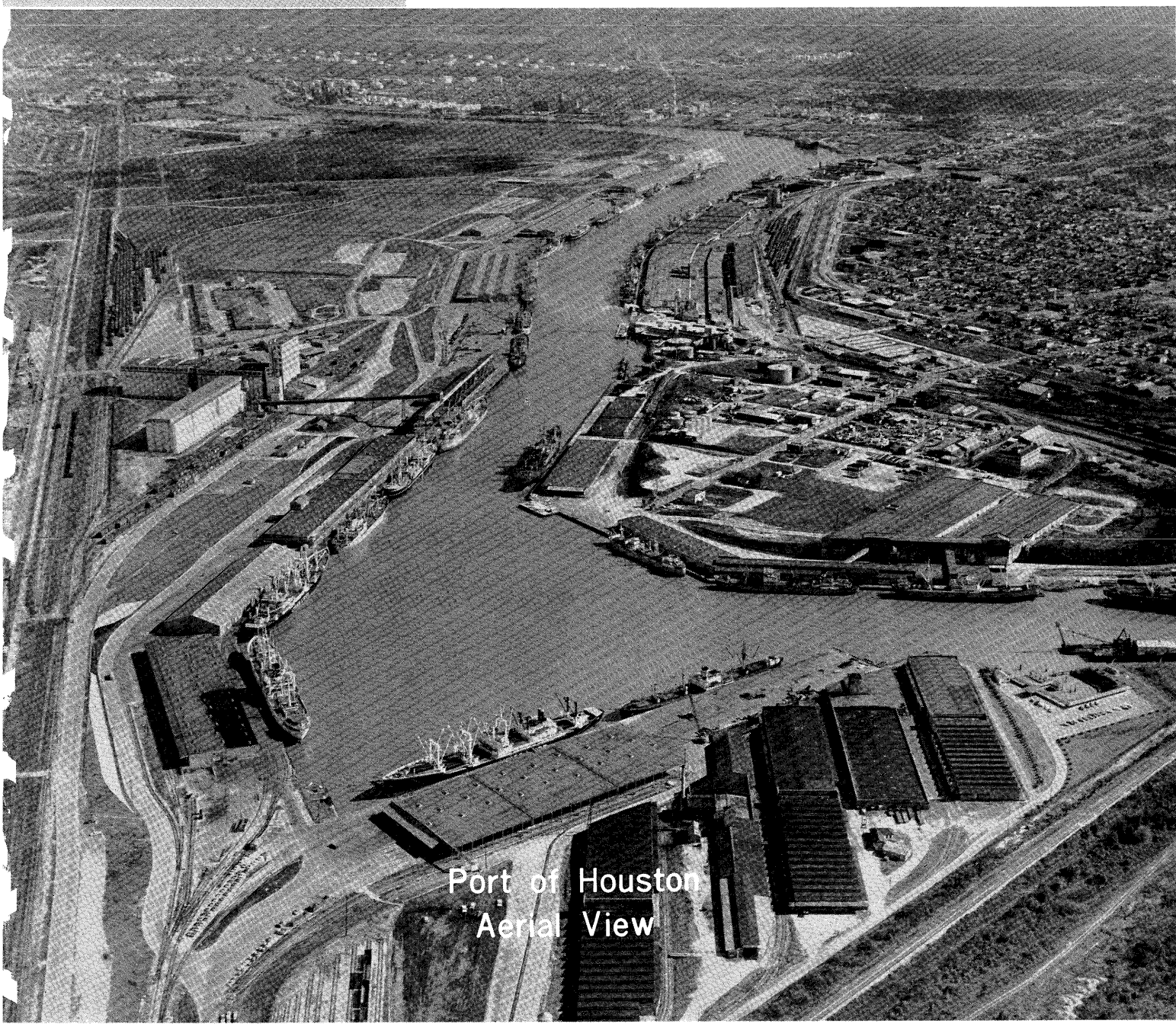
PORTS and HARBORS

December, 1968 Vol. 13, No. 12



Port of Houston
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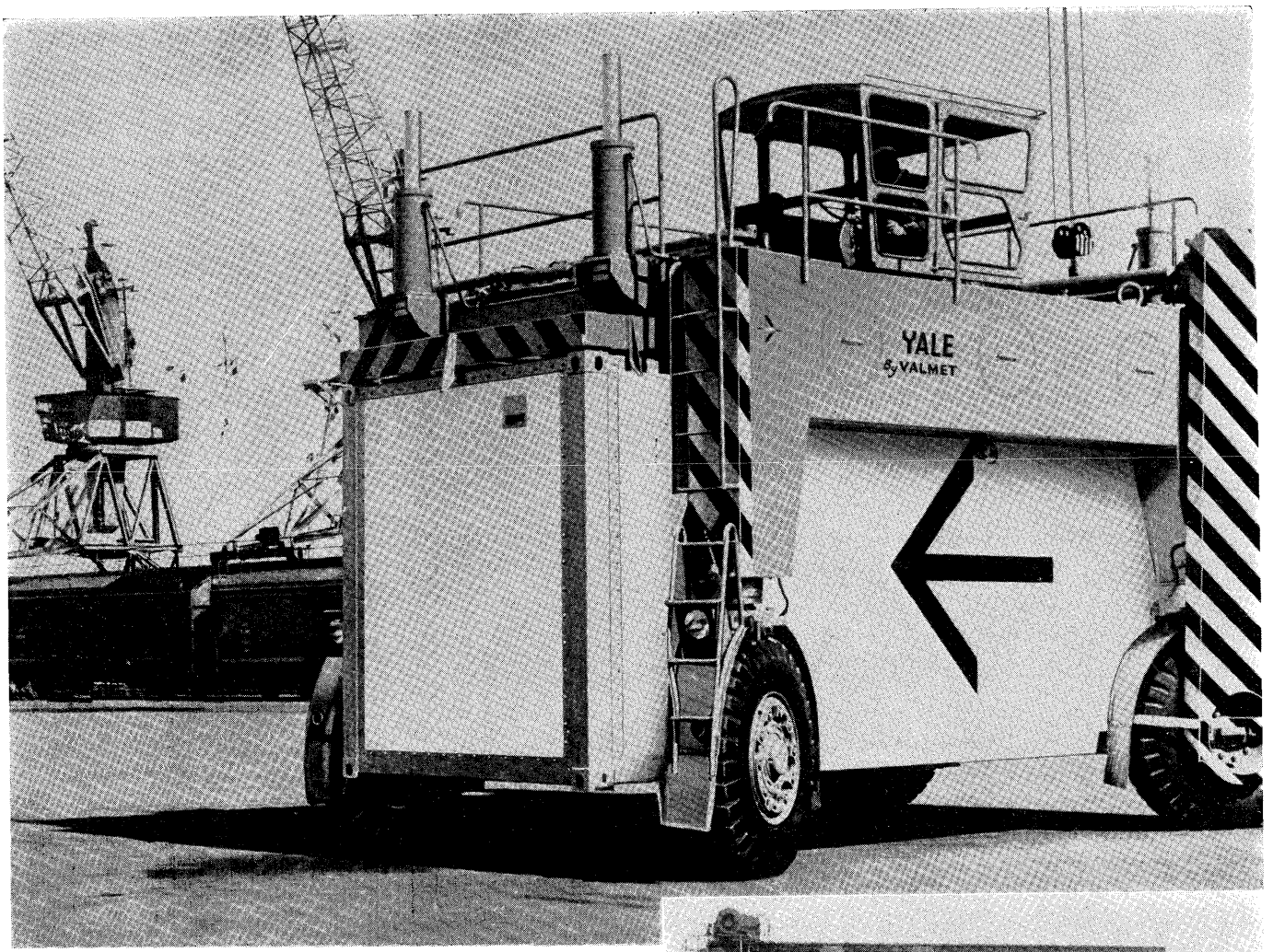

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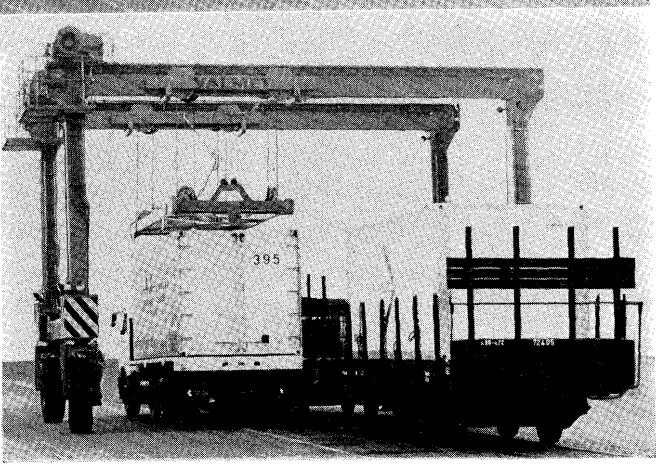

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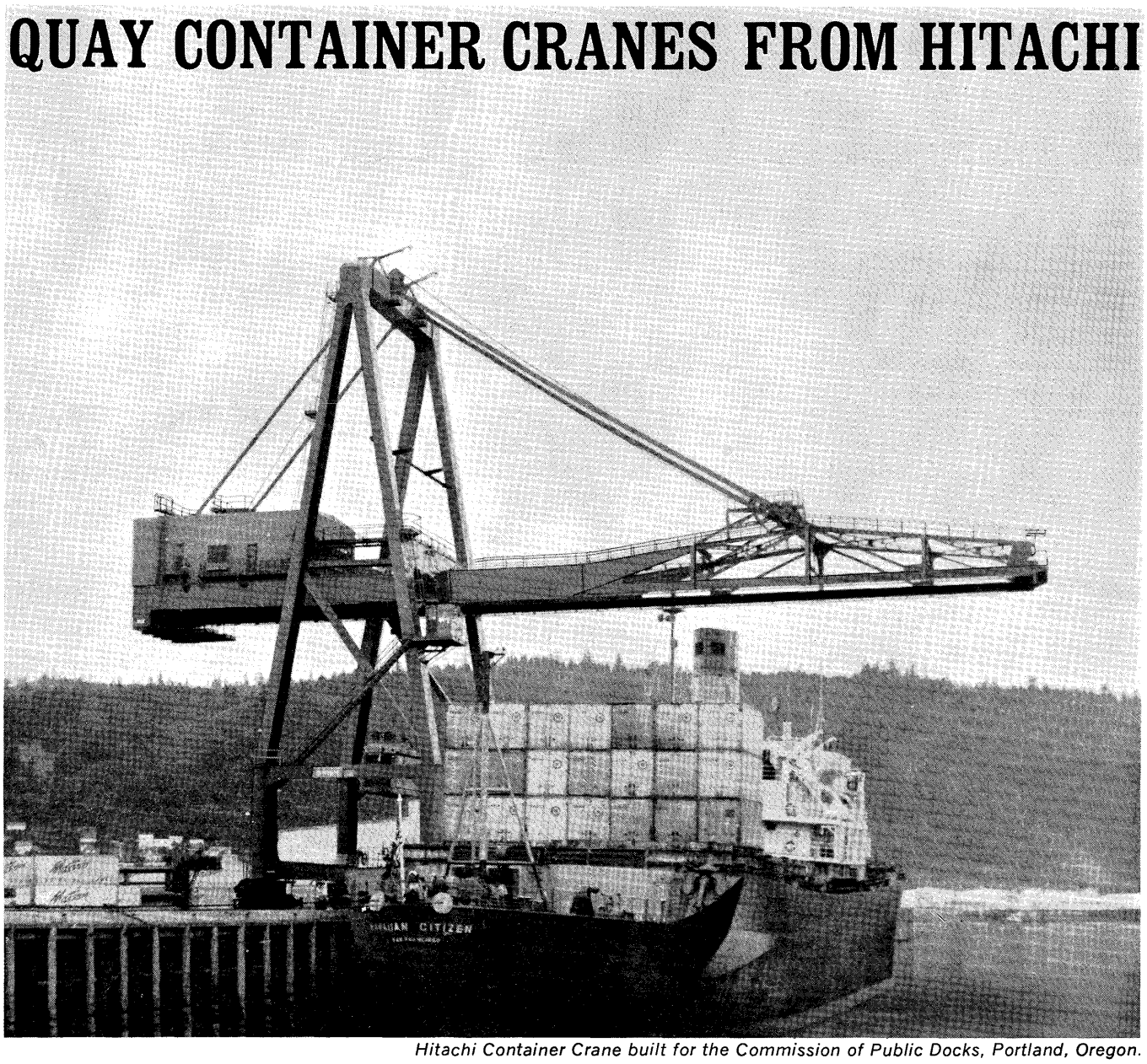

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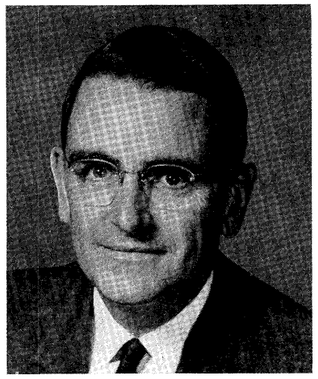

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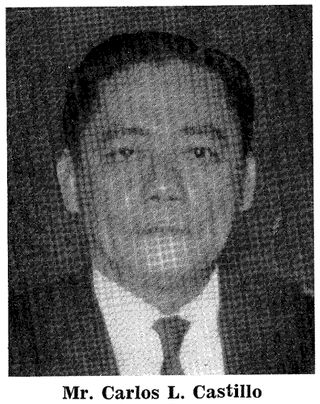

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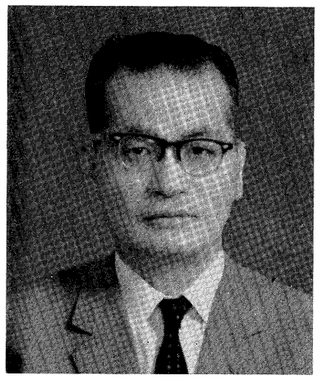

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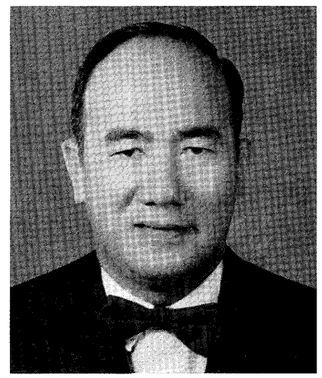

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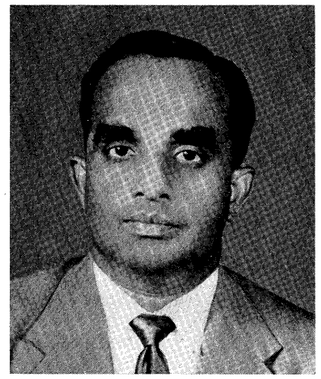

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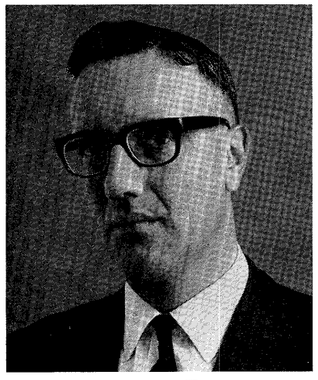

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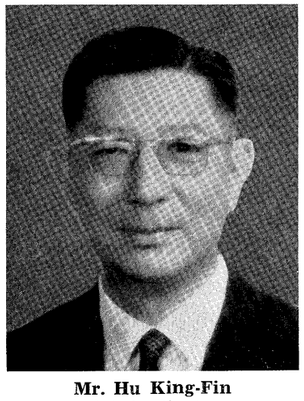

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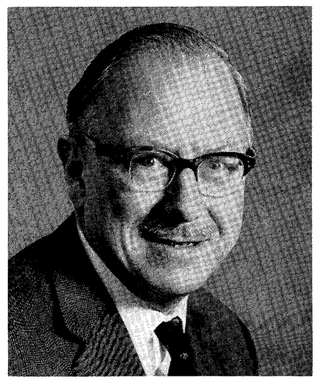

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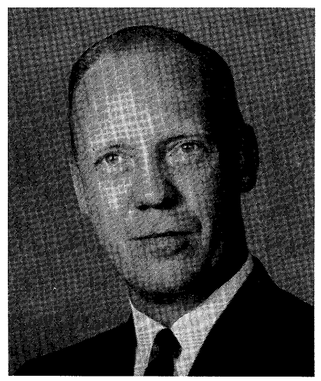

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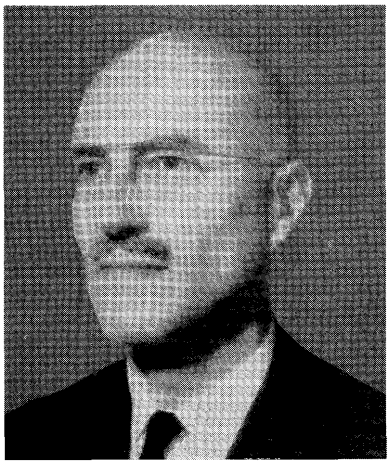

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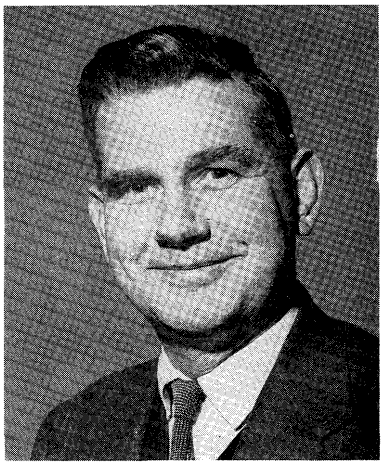

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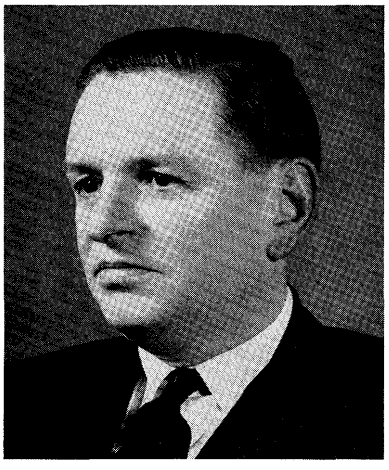

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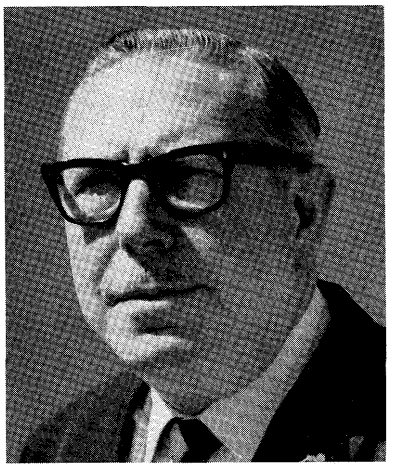

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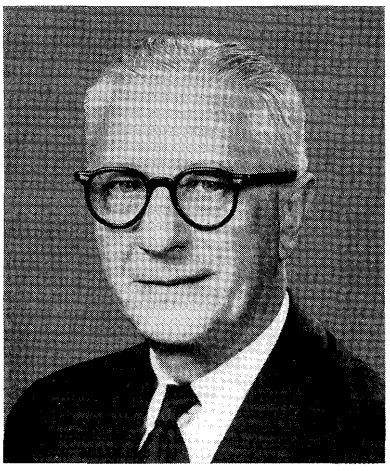

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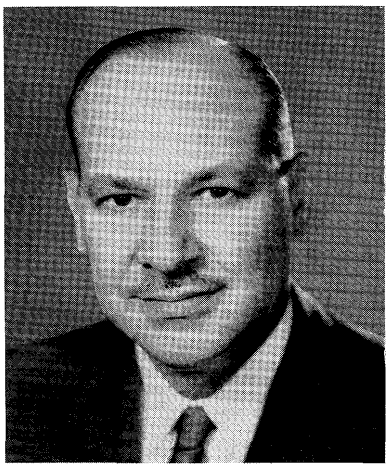

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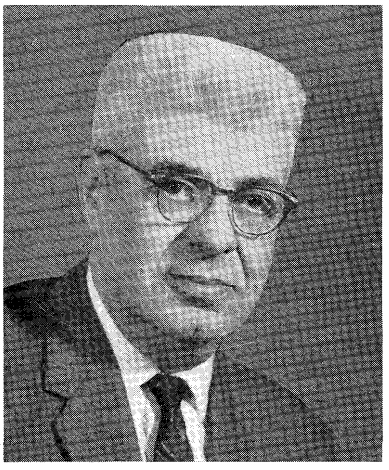

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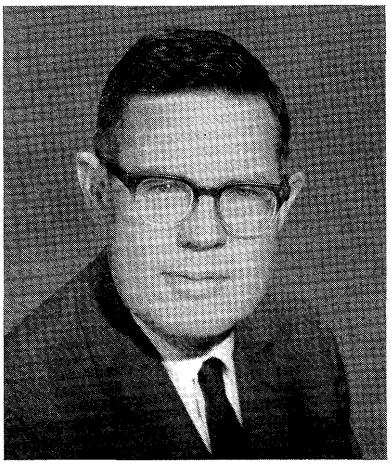

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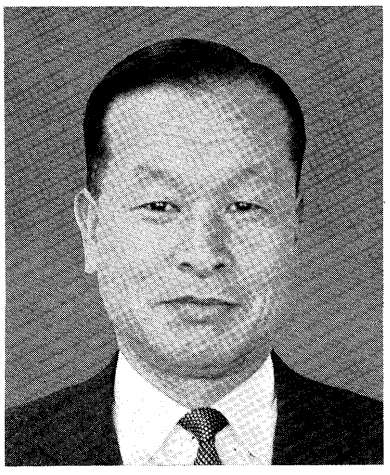

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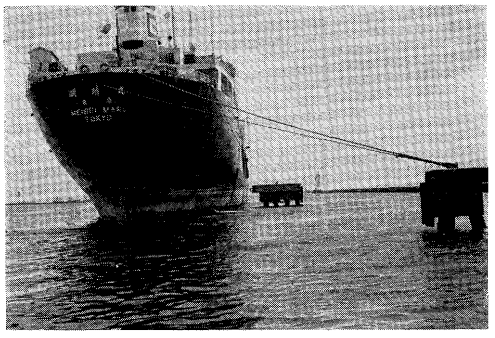

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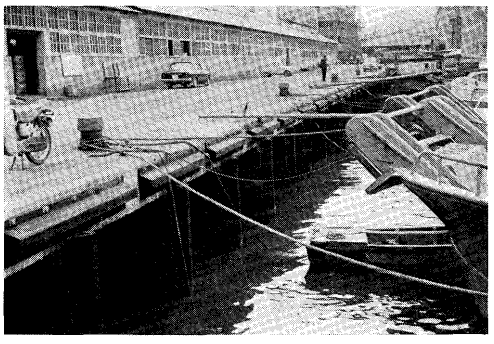

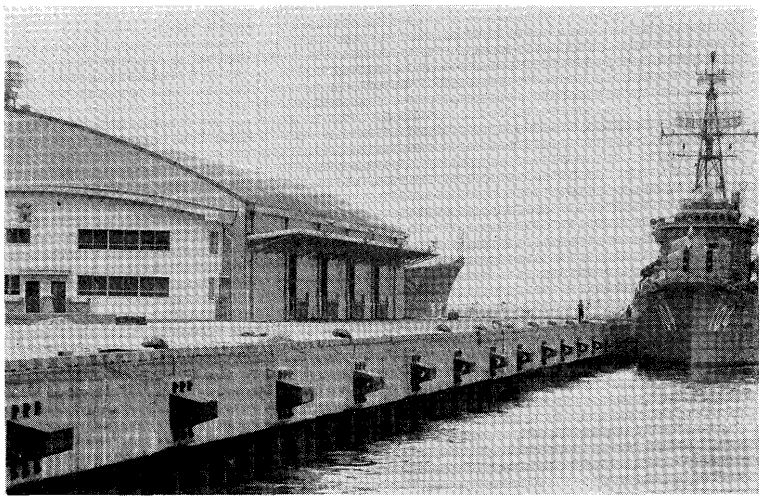

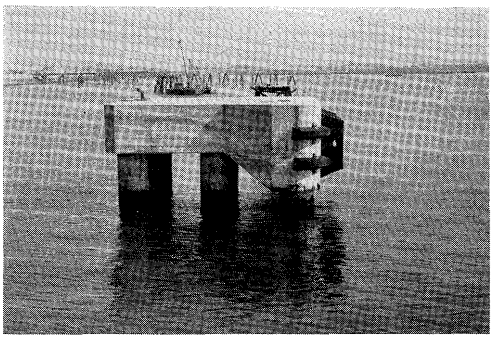

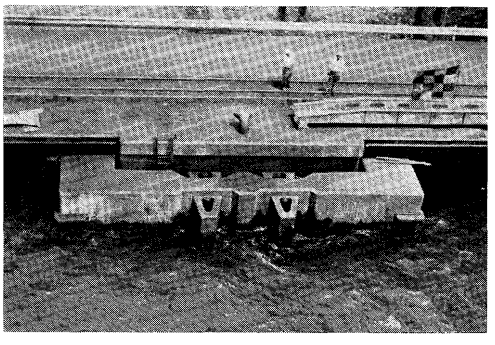

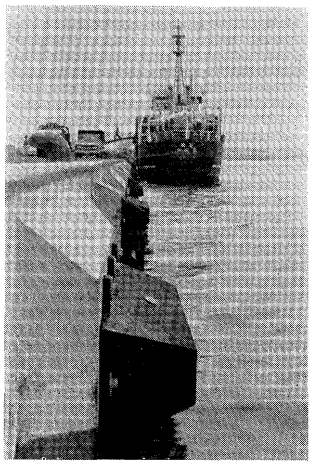

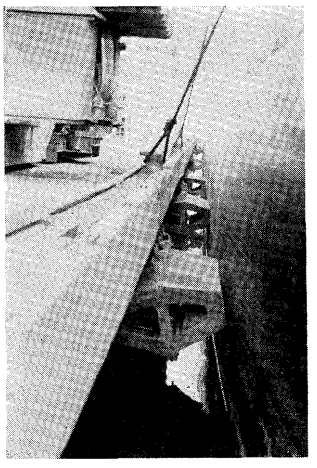

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WHAT IS ROTTERDAM-EUROPOORT?

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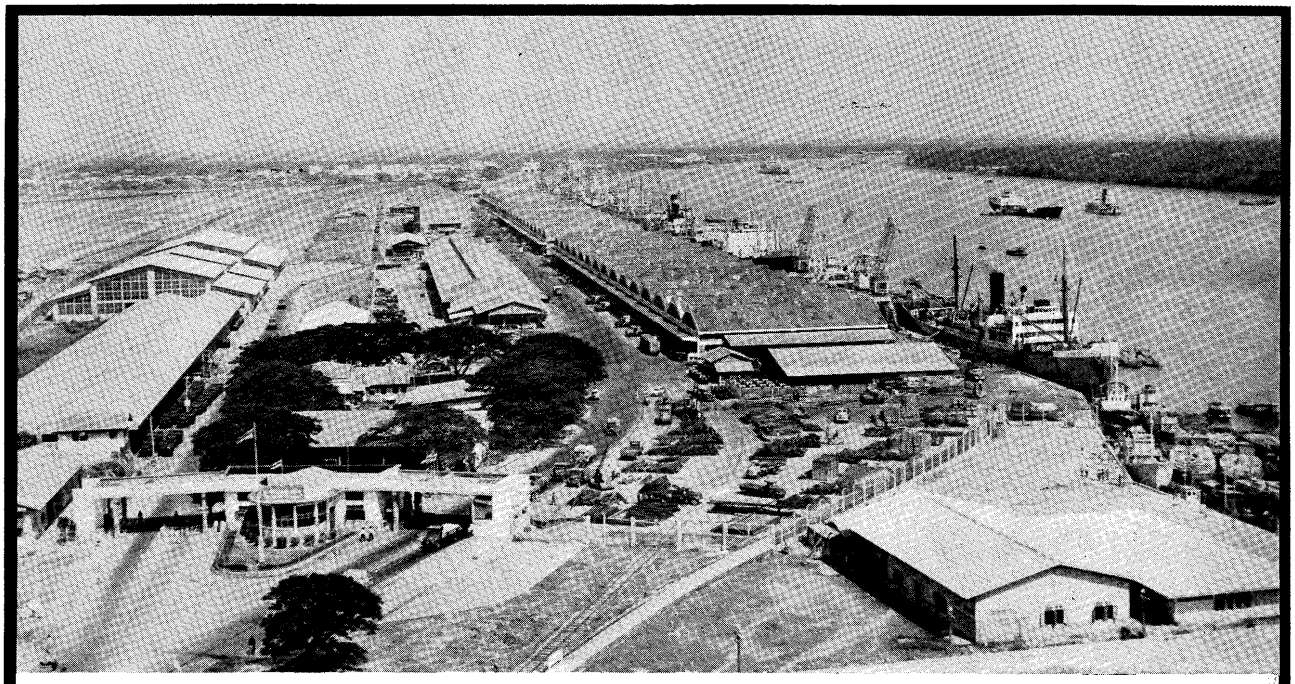


PORT OF BANGKOK

THE GATEWAY FOR INTERNATIONAL TRADE AND SHIPPING TO THAILAND

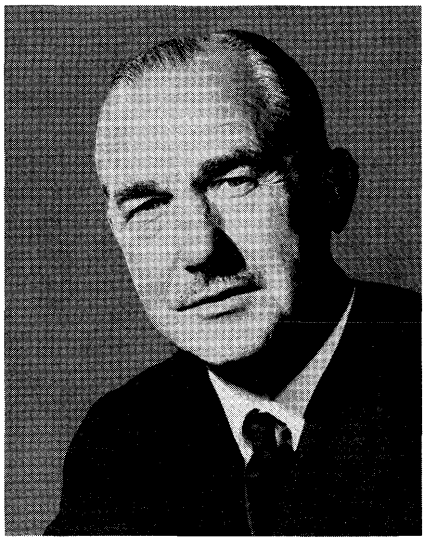
PORTS and HARBORS

Forum on Port Problems:

Recent Developments at United Kingdom Ports

By S. A. Finnis, Chairman
British Transport Docks Board

(At ICHCA U.K. National Committee Conference 1968)



Mr. Sidney Finnis, O.B.E., E.R.D.

The word development used in relation to ports generally brings to mind physical construction rather than such matters as organisation or labour supply or mental processes. In fact, physical changes must follow mental ones and it is clear that the most important development in the port industry in recent years is in outlook. This is not confined to the United Kingdom or specifically to the port authorities and refers to the world-wide change in outlook on the movement of cargo that has brought about the so-called container revolution and the widespread introduction of the roll-on/roll-off ship. There are no major technical reasons why many of these developments could not have taken place a great deal earlier and, in fact, while materials handling in industry advanced, there was a long period of stagnation in the docks. Only now is the rapidly rising cost of labour, coupled with the increased volume of international trade, bringing about changes in method and in organisation in what has traditionally been a labour intensive industry. It is against this background that any picture of port development must be painted and although the theme of our Conference is "Expediting Exports" it is necessary also to deal with facilities for imports for we are a manufacturing nation and our ability to compete in world markets depends on the importation of raw materials at unit costs not greater than those of our competitors. The landed cost of iron ore with its impact on export prices of cars and machinery is an obvious example. The same applies to other goods and also to fuels for, although we import over 90 million tons each year, some 70 million tons are shipped outwards, of which nearly 17 million tons goes to foreign countries.

If then the background is one of change it follows that much of the future is uncertain. How individual ports will fare will depend on many factors and clearly some ports will rise and others decline—as, in fact, they have throughout the ages. There is nothing new in that but what is new to our generation—in the United Kingdom at any rate—is not only the extent of the constructional work but the degree of public promotional activity. Decisions made within the next few years can have vital repercussions for ports and set the pattern for many years to come and it is essential that we should look forward to what can be achieved rather than back at what has been done in the past. Although no set pattern has yet emerged there are trends of interest for the future and in this paper I shall say something of development at our United Kingdom ports for, as a maritime and mercantile nation, we have always made use of the sea and there are over 300 harbours in the United Kingdom. They range in size from the Port of London, one of the great ports of the world, to small harbours across whose quays are trundled only a few packages in a year. In total some 300 million tons of cargo passes through them but lest the number of ports mentioned should give a wrong impression it is important to remember that about 85% of this tonnage is handled through nine of our estuaries, i.e. Thames, Southampton, Severn, Milford Haven, Mersey, Clyde, Forth, Tees and Humber.

The Post-War Years

Most of the port undertakings in the United Kingdom were constructed during the 19th century when the ships they served were still changing over from sail to steam. They were built soundly and solidly by Victorian engineers and made to last. Indeed, their very excellence has proved to be a restricting factor in the efforts made by United Kingdom port authorities to keep in step with change and many have continued in use long after becoming obsolescent. Thus 19th century ports which were built within the confines of 19th century cities and later strangled by urban development left the British authorities attempting to cope with 20th century volumes of trade in outdated and outmoded docks. After the Second World War the

national demand for materials with which to rebuild far exceeded supply and successive governments gave a low priority to docks. Thus the industry was slow to recover — in marked contrast to its competitors in Europe—and what capital investment was made was mostly concerned with arrears of maintenance or small scale improvements rather than with the large scale development which at some continental ports had been made both possible and necessary by war devastation.

The "Rochdale" Report

In 1948 a Working Party reported on the "Turnround of Shipping" and a Ports Efficiency Committee made three reports between 1952 and 1956 but their recommendations had little impact outside dock circles and it was not until 1961 that the Government of the day appointed Lord Rochdale to head a Committee with the following remit:

> "To consider to what extent the major docks and harbours of Great Britain are adequate to meet present and future national needs; whether the methods of working can be improved; and to make recommendations."

The Committee's report was presented to Parliament in September 1962 and although the analysis which was made is a model of its kind and the facts and figures remain a monument to the work of the Committee and a valuable source of reference to those of us working in the docks, the opinions and recommendations relating to method and physical development have, in the case of general cargo, been overtaken by events. Despite this, what the Rochdale Report did for British ports was to create a national awareness of their needs and a climate of opinion favorable to their development. If the country was to progress, then the ports would have to be in the van, and, to ensure this, money would have to be made available.

Some of the recommendations of the Rochdale Committee were subsequently incorporated in the Harbours Act of 1964, but there was one major difference to which I would draw attention in that the Act set up an advisory body called The National Ports Council instead of an Authority as recommended by the Committee. The Minister of Transport was, however, empowered to make grants and loans to statutory port authorities to a maximum total of £50 million and this limit has recently been doubled. At the same time, the Act provided that no scheme costing more than £500,000 could proceed without the authorisation of the Ministry, who would be advised by the National Ports Council on the merits of the scheme.

Figures of capital expenditure published in the Rochdale Report[1] for the period 1949-1960 show that the rate of investment rose from £7.7 million in 1949 to £23.6 million in 1960 with a total of some £150 million for all ports during this period, an average of £12.5 million per annum, The provisional figure for 1961[2] produced for the Committee was £21.3 million and Lord Rochdale had to report that this postwar expenditure had been made largely on minor projects and (his italics) that **"no single additional deep-water berth for general cargo has been started since the 1930's, apart from those now nearing completion at Teesport".**[3]

The great disparity between the United Kingdom and continental ports in the number of deepwater dry cargo berths available greatly concerned the Committee. They saw plainly the trend towards larger vessels, yet there were only 53 dry cargo berths at major ports with a limiting depth of 35 ft. in the United Kingdom, compared with some 224 at Hamburg, Rotterdam and Antwerp.[4]

(1) Report of the Committee of Inquiry into the Major Ports of Great Britain (the Rochdale Report 1962). Table 18, p. 76.
(2) Ibid. Table 18, p. 76.
(3) Ibid. Para. 47, p. 22.
(4) Ibid. Table 27, p. 250.

There were forecasts then that Britain's foreign trade might well double by 1980 or even earlier. The Rochdale Committee found that there was "a need for a properly planned programme of port development which should provide **inter alia** additional deep-water births".[5] The Report emphasised the urgency of starting priority development schemes without delay: "The longer a start is delayed, the more serious will be the consequences later on".[6]

Capital Expenditure

Up to 1962 the majority of the money spent on the docks went on rehabilitation and modernisation to improve arrangements for what has now come to be known as the conventional method of handling. There was plenty to be done. In addition to the repair of war damage and the overcoming of arrears of maintenance there were re-cranage schemes and the replacement of old sheds by new ones at a greater distance from the quay edge to provide a wider apron on which to work. There were approach roads to be improved to meet the increasing needs of road traffic and many miles of obsolete railway track to be removed. There was also a great deal of re-equipment to be done in the shape of forklift trucks and other handling aids.

From 1962 onwards money has been spent at an increasing rate and although in 1963 expenditure was only £19 million, it rose in succeeding years to £20 million in 1964, to £24 million in 1965, to £36 million in 1966[7], and in 1967, to an estimated £50 million.

The only analysis of capital expenditure at U.K. ports is in the Annual Digest of Statistics which shows that for 1966 out of a total of nearly £36 million, £31 million went on major schemes in 16 of the largest ports.[8] My Board spent nearly £17 million of the 1967 total and with us, as in other ports, the trend would seem to be clear; that the big money is going on major schemes in the larger ports. This is perhaps only what one might expect and in contrast to the position before 1963 where smaller schemes were predominant.

Physical Development

In thinking in terms of physical development it is desirable to differentiate between the various classes of traffic and for the purposes of this paper I propose to refer separately to:

(1) Facilities for bulk cargoes.
(2) Facilities for deep-sea general cargo including containers.
(3) Roll-on/roll-off and other short-sea ferry services.

Bulk Traffic

The four major bulk traffics moving to and from this country are oil,

ore, grain and coal. Some 90 million tons of oil is imported with approximately 13 million tons of foreign exports, much of it passing over jetties owned by the petroleum companies. Considerable advances have been made in the size of ship that can be brought alongside but since the larger ship is mainly confined to the import of crude oil. I will only mention the facilities at Milford Haven where improvements to the channel by the Conservancy Authority will enable vessels of 170,000 tons to be dealt with this year and where it will be possible to deal with 250,000 ton ships by 1970. The capacity of other terminals is being steadily increased and present indications are that for the time being, at any rate, the largest tankers may call at two ports, one able to accommodate them in a fully laden condition and the other when they are partially loaded. Refined products are principally distributed in smaller vessels within the capacity of existing ports.

(5) Ibid. Para. 67, p. 29.
(6) Ibid. Para. 68, p. 29.
(7) Digest of Port Statistics, 1967. National Ports Council, Table 4.
(8) Ibid. Table 5.

The total of iron and other ores coming into this country is only about 20 million tons per annum and import is restricted to a limited number of ports. The outstanding development in this field is the tidal harbour at Port Talbot now being built by my Board at an estimated cost of £17 million. This will be ready next year to take 100,000 tonners and can, as necessary be expanded to provide for 150,000 tonners. The harbour is close to the British Steel Corporation's works at Port Talbot and ore will be delivered to the local works by conveyor belt and may be distributed further afield by rail. It is possible that at least one or two other deep-water harbours will be required by the Corporation as their development plans progress.

In contrast to ore, grain is fairly widely imported to mills situated round the coastline and with a total of only from 7 to 8 million tons throughput there is little scope for major development on the same scale as for oil or ores. Nevertheless, major construction to handle larger vessels is taking place in the Thames and in the Mersey and the new berths will be capable of dealing with the substantial transhipment trade in this commodity which is now largely centred on the continent. The potential total of traffic is thus considerably higher than our domestic requirements and success could help the balance of payments problem.

Coal exports to foreign countries have fallen drastically even in the last few years and out of a total shipment of some 20 million tons in 1966 less than 4 million tons was export traffic, the balance moving coastwise. As the result of devaluation and other factors the National Coal Board hope to improve materially on the 1966 export total within the next few years and are now building a major coal shipment terminal at Immingham on the Humber comprising stocking grounds and a jetty with rapid shipment facilities. The approach channel to the area of the jetty is to be dredged to take 75,000 ton oil carriers and so there is ample scope for coal vessels far larger than those which have up to now been used for exports.

Deep-sea general cargo and containers

Grangemouth had the distinction of bringing into operation in the early summer of 1967 the first ocean container ship terminal in Britain equipped with a transporter crane to serve a fully containerised North Atlantic shipping service. This was followed by the completion of a similar terminal at Felixstowe also equipped with a transporter crane.

Now these symbols of port modernisation are springing up all around our coasts and the talk of containers and containerisation overshadows the many other efforts to improve port facilities and services. Of the schemes in hand the largest are at Tilbury—within the area of the Port of London — and at Liverpool, at both of which substantial new quays are being built for container ships and other vessels. Both schemes are being built within existing dock systems and, as in all cases where water is impounded, the limiting factor in respect of size is the width and depth of the lock entrance. This is in contrast to continental ports, many of which do not have to provide enclosed docks because of the smaller range of tide. Thus they are not only at an advantage in first cost but also when it comes to expansion to deal with a larger class of ship.

Other major development schemes are taking place at Southampton, where the first container berth is almost ready, at Hull where a considerable extension to the King George Dock is nearly complete, at Greenock on the Clyde where a container berth is being built, at Felixstowe and elsewhere. The pattern that appears to be showing up is for major container facilities to be provided at Tilbury, Liverpool and Southampton with lesser but by no means negligible provision at Hull, Newport, Manchester, Greenock and Felixstowe. It should perhaps be added that the service from Southampton will be a combined cellular container and roll-on/roll-off operation whereas generally for deep-sea services provision has been made for wholly cellular vessels.

Ferry Services

The first roll-on/roll-off service was that of the Transport Ferry Service from Tilbury to the Continent which at the beginning of the period under review was enjoying an outstanding success. Now five years later, there are approximately 40 roll-on/roll-off and unit load services on short-sea routes from United Kingdom ports. The British Transport Docks Board alone has built eleven rol-on/roll-off terminals in the last five years at a cost of some £5 million, and a twelfth is under construction in Swansea. National statistics dealing specifically with special services of this kind are hard to come by but, as an indication of the volume of traffic, my own Board's figures reflect the national growth and last year we handled some 55 000 containers and over 1 million tons of unit load traffic. The amount of money which needs to be spent on terminals for this kind of service is small in relation to that required for deep-sea services and similarly with the construction of vessels. Thus progress has been a great deal faster and has been helped by the increasing volume of trade with the continent. Although, in the first instance, the roll-on/roll-off vessel was thought of in terms of only the shortest possible sea voyage the distances are now increasing and there is still argument as to whether

roll-on/roll-off, unit load or cellular container services are the most suitable for freight on the short sea routes. My own view is that for the short-sea trades there is no one single answer.

Access to Ports

If the above is a brief reference to some of the major schemes which will contribute to improved efficiency in the docks, it is also necessary to consider access to ports. On the seaward side this is generally, in this country, considered to be the responsibility of the port or conservancy authority which is in contrast to conditions in some foreign countries. Port control services with radar surveillance are now common in the major estuaries and proposals have been made for traffic regulations in the congested area of the Straits of Dover. On the landward side rail services are in the hands of British Railways and they are generally conscious of the ports as focal points for concentrated traffic flows and have planned their freightliner depots accordingly.

It is on the road side, however, than the construction of modern facilities have so far fallen behind the needs of the ports. Some 83% of freight traffic is now carried by road transport and while the further development of freightliners may cause some small reduction in the percentage figure the total volume of road traffic is unlikely to decrease materially. It seems clear that future road plans must consider more closely the needs of the ports if the present congestion is to be kept below levels where conditions in the landside approaches will become chaotic.

Port Organisation

Since port resources can only be used efficiently if the organisational structure is adequate, I should also mention changes in port organisation and in the control of labour. Lord Rochdale's Committee recommended that the ports should be organised on an estuarial basis with port authority, conservancy and pilotage functions, wherever practicable, combined in single authorities. Some progress has been made towards this in the Clyde, Forth, Tees, Tyne, Humber and Southampton in that there have been amalgamations and single authorities now control port authority and conservancy functions. In all, some eighteen harbour undertaking have been amalgamated into the six larger organisations with the expectation of a better use of resources in the future. Pilotage is the subject of a separate enquiry.

In addition to the above there has been some modernisation of the constitutions of Port Authorities but it is likely that further reorganisation will await the Government proposals to nationalise the ports industry which are expected to be published shortly.

Dock Labour

The history of dock labour is a stormy one, riddled with strikes and enquiries, and although there have been improvements in recent years, the organisation of employment was, until twelve months ago, not greatly altered from the days of casual labour. During the 1950's there were several major enquiries into dock labour problems, and in 1961 employers and unions issued a national joint policy directive calling upon local organisations to report on the practicability of regular weekly employment. Little progress was, however, made and in 1964 the Minister of Labour appointed a committee of enquiry under the chairmanship of Lord Devlin. This committee published its report in August 1965 and its main recommendations were embodied in the Docks and Harbours Act of 1966. This is the foundation of the current approach to dock labour problems and following disastrous strikes in London and Liverpool in the Autumn of 1967 the new arrangements appear to be settling down. The problem of surplus labour is still a live issue in many ports and the trend of a decreasing labour force, which has been apparent over the past five years, continues. In 1958 there were nearly 77 thousand registered dock workers, and the daily workers' weekly earnings averaged £13 6s. 6d. By 1966 the number had dropped to 62½ thousand workers, while the 1967 figure was 59 thousand. Average earnings had by this time reached the level of £22 10s. 5d. per week.[9] This indicates increased productivity on a considerable scale although it must be pointed out that the total wage bill has risen materially.

Another development which must have had some bearing on labour relations and productivity during the last five years is the increasing amount of training which is being done at all levels. The National Dock Labour Board now have seven training schools and although priority is given to new entrants to the industry there are other courses covering advanced and specialist training, For supervisors there have been courses at Burton Manor for many years and, more recently, there have been courses sponsored by the National Ports Council. My own Board opened its Staff College at King's Lynn in 1965 and, if one type of course stands out as being more successful than others, it is that for supervisors. Our work in this field, both at King's Lynn and at the ports, is unique in the ports industry and, in my view, amply justifies the time and expense involved.

At higher levels too there is much going on within the industry and it is clear that training and education activities have been considerably stimulated by the activities of the National Ports Council and National Association of Port Employers. For the first time training is being loooked at from an industry rather than a port basis and this has to be encouraged. My Board is still the only Port Authority in this country with its own College and King's Lynn is adequate for our needs but one of my hopes is that there might eventually be a Ports Industry Staff Training College which would advance still further the joint causes of (1) training and education and (2) thinking on a national rather than a parochial basis.

The Future

For the future the question is, what does it hold for the ports industry in the United Kingdom? It could well be that it will be dominated by three multi-syllabled words — nationalisation, containerisation and computerisation. On nationalisation there is little new to say. One-third of the nation's port capacity is already owned nationally by my Board while the nation's two largest ports are publicly owned non-profit making trusts. The case for nationalisation rests not so much on the ownership of the assets as the necessity for central planning and the employment of labour by the

dock owners. At the time of writing (mid-August 1968) a Government White Paper is expected setting out decisions reached after a re-thinking of the position in the light of replies to the proposals circulated for comment in July 1967. Uncertainty and doubt are enemies of efficiency but, although there is uncertainty and there is doubt, it has not reached the stage where major port developments are in jeopardy. Doubt on whether to modernise and re-equip or whether to postpone expenditure has, however, affected the private sector of the industry and one can have every sympathy with them in their present position.

(9) Ibid. Tables 9 and 12 and National Dock Labour Board Report 1967.

Containerisation will undoubtedly have an enormous impact on the ports of this country. There is nothing fundamentally new about it and it is a manifestation in the cargo handling business of two basic concepts which are having world-wide implications — simplification, and economy of scale. It is going to be quicker and cheaper to move fewer big boxes of the same size than many thousands of irregularly shaped packages. But it is only going to be quicker and cheaper if the boxes are in fact kept moving, and not left unproductively on the quayside or at inland depots. This is one of the fields in which computerisation will make itself felt. It seems paradoxical that our goals of speed and simplicity are only going to be achieved by embracing the complexities of the computer, but such is the case. The enormous complications of routing cargoes through our ports in the quickest possible time, and in the most economical way, and with the least effort, are likely to be solved at the more intensively used container terminals by using computer techniques.

And now, finally a word about port planning because planning can prevent a waste of assets and should be productive of greater efficiency. Lord Rochdale's Committee in 1962 had as its first main conclusion "the need for a properly planned programme of port development which should be supervised by a non-operational National Ports Authority equipped with statutory powers". The National Ports Council was set up and not a National Ports Authority and this body published an Interim Plan in July 1965. This postulated considerable developments at a number of other ports but the proposals have been overtaken by events.

And so in 1968 we are still without a national plan for port development. Clearly in a time of change it is not easy to plan ahead but it looks as if the highly sophisticated container service is likely to be confined to relatively few ports. The pundits may argue that one port only could be used and, in theory, there is something in the argument. From the practical point of view, however, it would seem wrong to put so many valuable eggs into one basket and one might guess at three major container terminal ports—let us say for arguments sake, London, Liverpool and Southampton. The choice is properly for the shipowners since they are providing the bulk of the money required for container services and need not only safe havens for their ships but also concentration points for the traffic which they carry. One can only guess at the total figures involved but one of the country's leading transport correspondents has estimated that if the United Kinkdom/Europe-Australian trade goes over to 80% containerisation within the next few years the shopping list might total £135 million.[10] The same article points out that although later container ship operations will cost less to launch, nevertheless huge capital investment is needed. Compared with the cost of port development the shipowners' figures are immense and although concentration could bring economies it would also be less flexible in times of difficulty. In addition to these main terminals I would expect also that there will be a number of other container ports with one or more deep-sea services of which Manchester, Grangemouth, Felixstowe, Hull, the Clyde and Newport may well be the pattern as being spread conveniently round our coastline. These will not need the expensive and complicated procedures for the high density terminal but will need space alongside the quay, good local communications and appropriate lifting machinery which, when not in use for containers, can deal with other traffics or heavy lifts.

(10) **The Times,** The Great Container Gamble, 13th August, 1968.

Because of the volume of money involved containerisation will not come all at once and for many years the less dense trade routes will continue with conventional vessels, possibly with a higher proportion of cargo palletised or containerised but not, I hope, still in single packages. The tendency could well be that this class of ship will be of a smaller and more handy size from the point of view of the volume of cargo. This seems to make sense because the numbers of men available will not be able to deal with big cargoes of conventional type with their many hundreds of thousands of separate packages. This, of course, excludes ferries where modern methods are already widespread and which may well take an increasing quantity of traffic from this country to a widening range of destinations on the continent and oust the smaller chartered ship now used for substantial consignments of outward traffic.

If there is to be a concentration of container traffic at a few ports and the modern ferry services take an increasing proportion of our continental trade, one would expect a few ports to grow larger and some others to lose traffic. We have also to remember that the air is likely to take a greater proportion of the high value traffic but although this shows up well in the value figures it will not have much impact on the mass of relatively low value bulk materials passing through the docks. Despite doubts that there may be over provision for the future it is important that port development should continue. In the national context the money involved is not large and, in fact, about £150 million would probably cover the total. The gains could be far bigger than this and play a vital part in helping along the country's exports. Much more than mere physical development is, however, necessary and above all it must be remembered that the ports exist to serve shipowners and shippers. Perhaps as a

(Continued on page 17)

Port of Aden Today

Reprinted from
"Port of Aden Annual 1968"

(Photos, Ministry of National Guidance and Information Aden)

Administration

The port authority is the Aden Port Trust, established in 1888 by an Act of the Bombay Legislature. The present statute covering the establishment of the Aden Port Trust and the powers, duties and responsibilities of the Board of Trustees is the Port Trust Ordinance, while the Port Ordinance covers the general legal provisions relating to the movements and safety of shipping in the port. Both these ordinances are administered by the Aden Port Trust through its senior officers. There is also subsidiary legislation covering the operation and administration of the port, namely the by-laws under the Port Trust Ordinance and the port rules under the Port Ordinance.

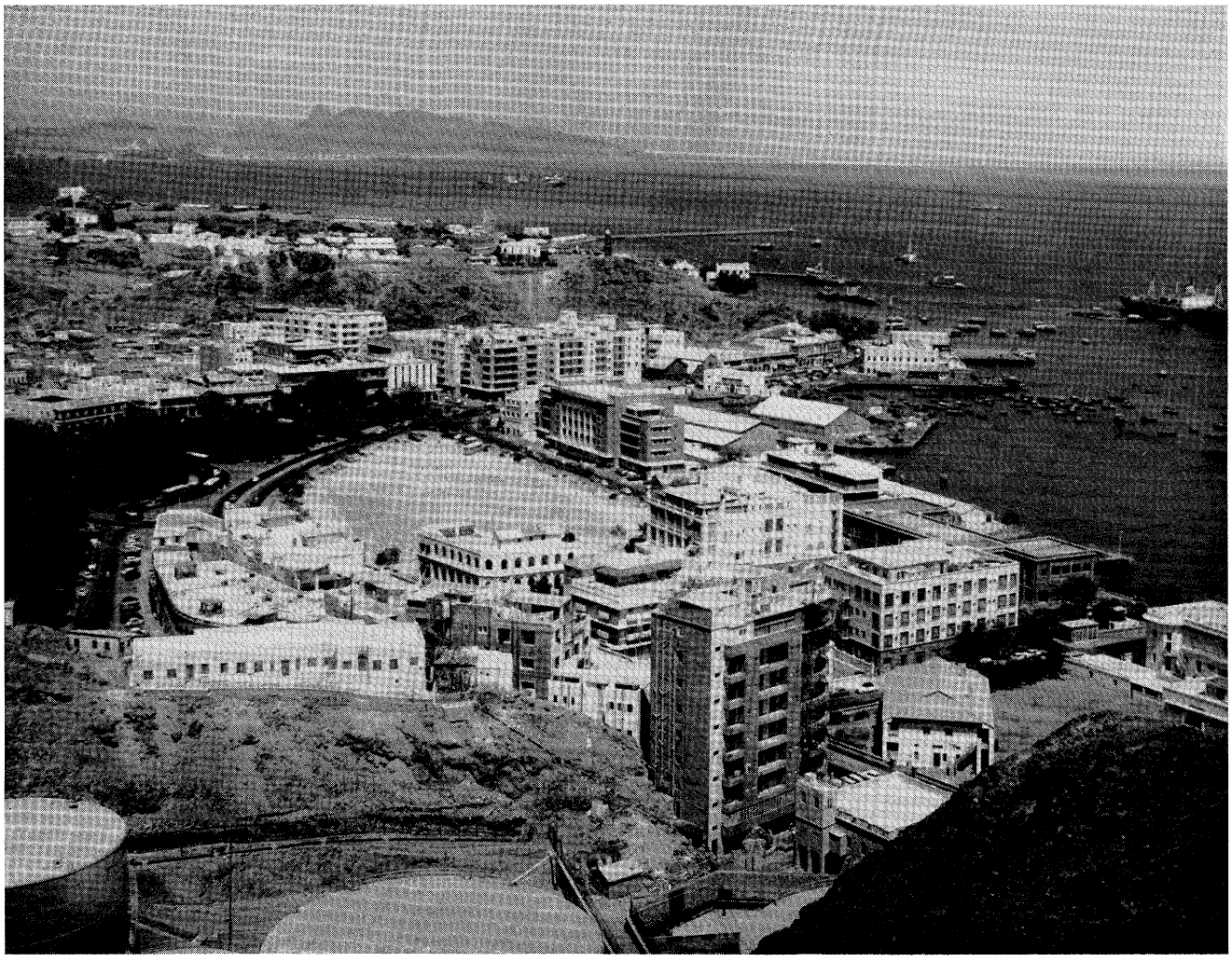
The Port Trust itself is an autonomous public body, but the powers and responsibilities of the Board of Trustees are subject to a certain amount of ultimate control, particularly in connection with financial matters, as will be seen from various sections of the Port Trust Ordinance which provide for certain decisions of the Board being subject to the ultimate approval of His Excellency the President.

Constitution of the Board

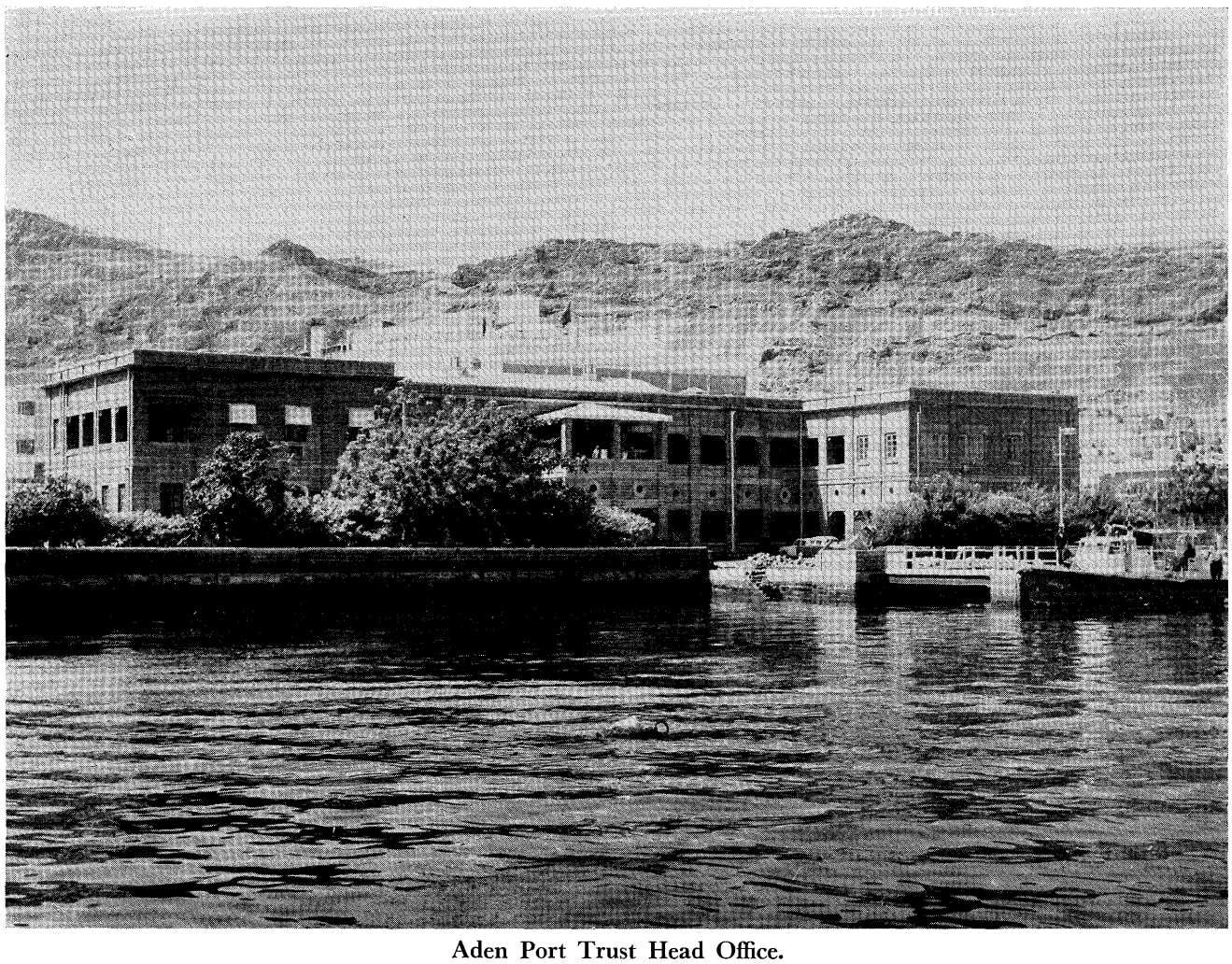
The Board of Trustees is a body corporate, and has perpetual succession and a common seal and can sue and be sued in its corporate name. It may enter into contracts and acquire, purchase, take, hold and enjoy property.

The Board consists of a Chairman (who is also a Trustee), and not less than six other Trustees, all of whom are appointed by His Excellency the President subject to such conditions as he may determine, for a period which does not exceed two years. In addition to these Trustees the Board includes the person who for the time being is performing the functions of General Manager. He is a Trustee **ex-officio,** and is the Deputy Chairman of the Board.

The Trustees meet fortnightly for transaction of business, but much of the business is actually disposed of by approving papers in circulation.



Steamer Point, with harbour view in the background.



Aden Port Trust Head Office.

Limits of the Port

The limit of the port extends to high-water mark, and extends to any part of the navigable approaches to the port and includes any piers, jetties, landing places, wharves, quays, docks and other similar works for convenience of traffic, for safety of vessels, or for the improvement, maintenance or good government of the port, whether within or without high-water mark, and, subject to any rights of private property therein, any portion of the shore within fifty yards of high-water mark as His Excellency the President determines.

Functions

The Port Trust is in charge of nearly all functions pertaining to the port, but it is not engaged in cargo handling, i.e. there are not separate authorities for control of pilotage, towage, light-houses, etc., as in many United Kingdom ports. The marine section of the Port Trust is a very large one, in keeping with the large number of ships visiting Aden. The assistant harbourmasters, pilots and marine craft crew work on the eight-hour-watch system, as work of berthing and unberthing ships goes on uninterruptedly through the twenty-four hours and on Fridays and holidays. There are five harbour tugs for assisting in the berthing and unberthing of vessels, five pilot launches and eight mooring launches. All these marine craft have a total crew strength of about 500. The harbour office, which is the pilotage control centre, is in constant touch with ships approaching Aden and with the Port Trust's own craft by means of radio telephone. The Port Trust marine section also deals with the control of berthing and pilotage of ships entering and leaving the Little Aden oil harbour.

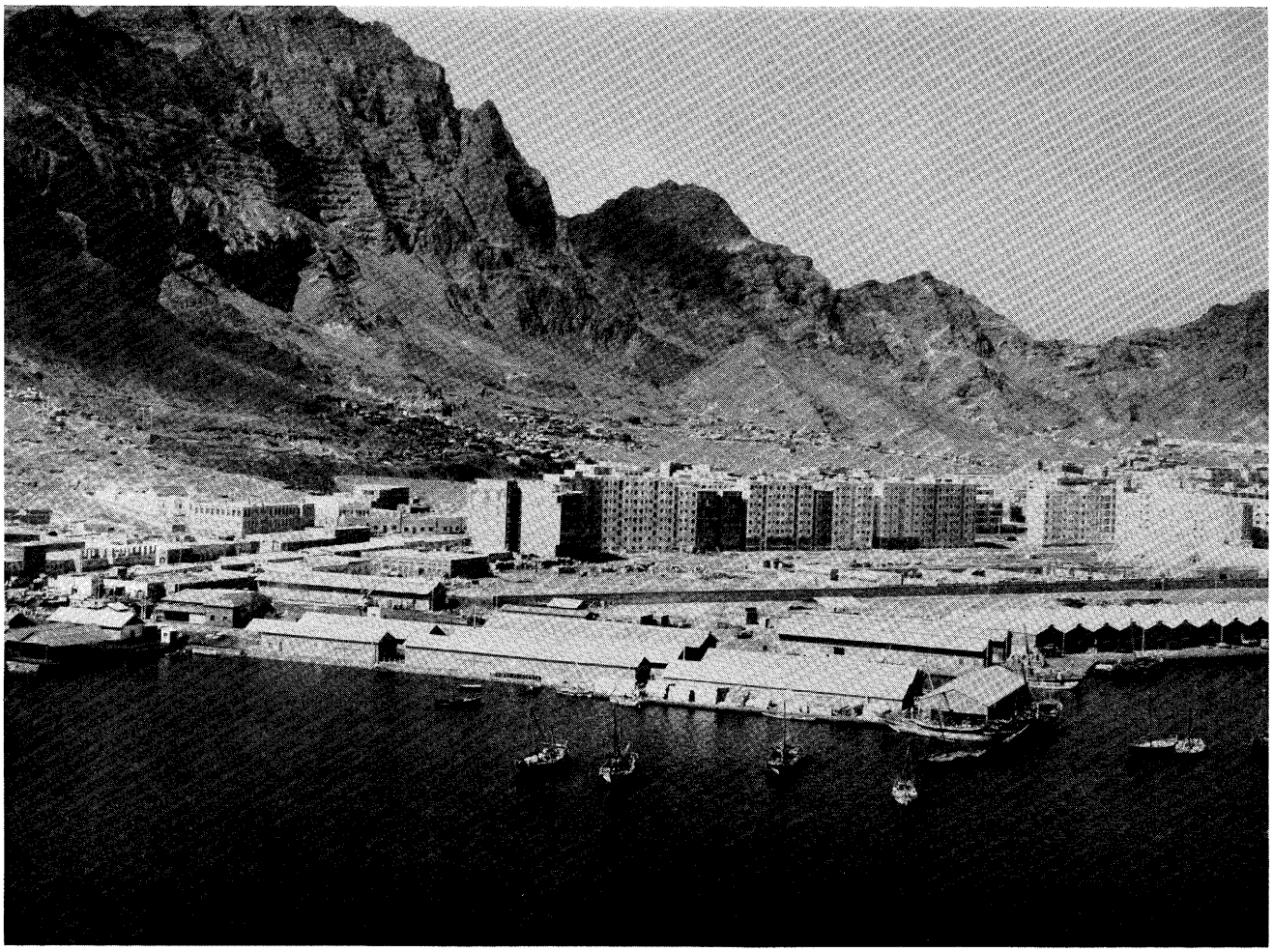
The Aden Port Trust also administers the two lighthouses at Aden and the two lighthouses on Perim Island at the southern entrance of the Red Sea.

The Port Trust, which provides all the wharves, buoys, moorings, etc., also provides a certain number of other services in the harbour, for example floating cranes, and pontoons for landing stages against passenger ships.

Description of the harbour

The harbour of Aden is a semi-enclosed area, which is surrounded by the peninsula of Aden proper on the south, the isthmus of Khormaksar to the east, a strip of desert to the north and the peninsula of Little Aden to the north-west. There are both an outer harbour, which provides a sheltered anchorage for a number of ships which for one reason or other are not to enter the inner harbour, and an inner harbour which has been established and improved over the years by dredging and other improvements.

The inner harbour as it exists today has a "dog-leg" entrance channel approximately three miles in



Aerial view of Ma'alla wharf.

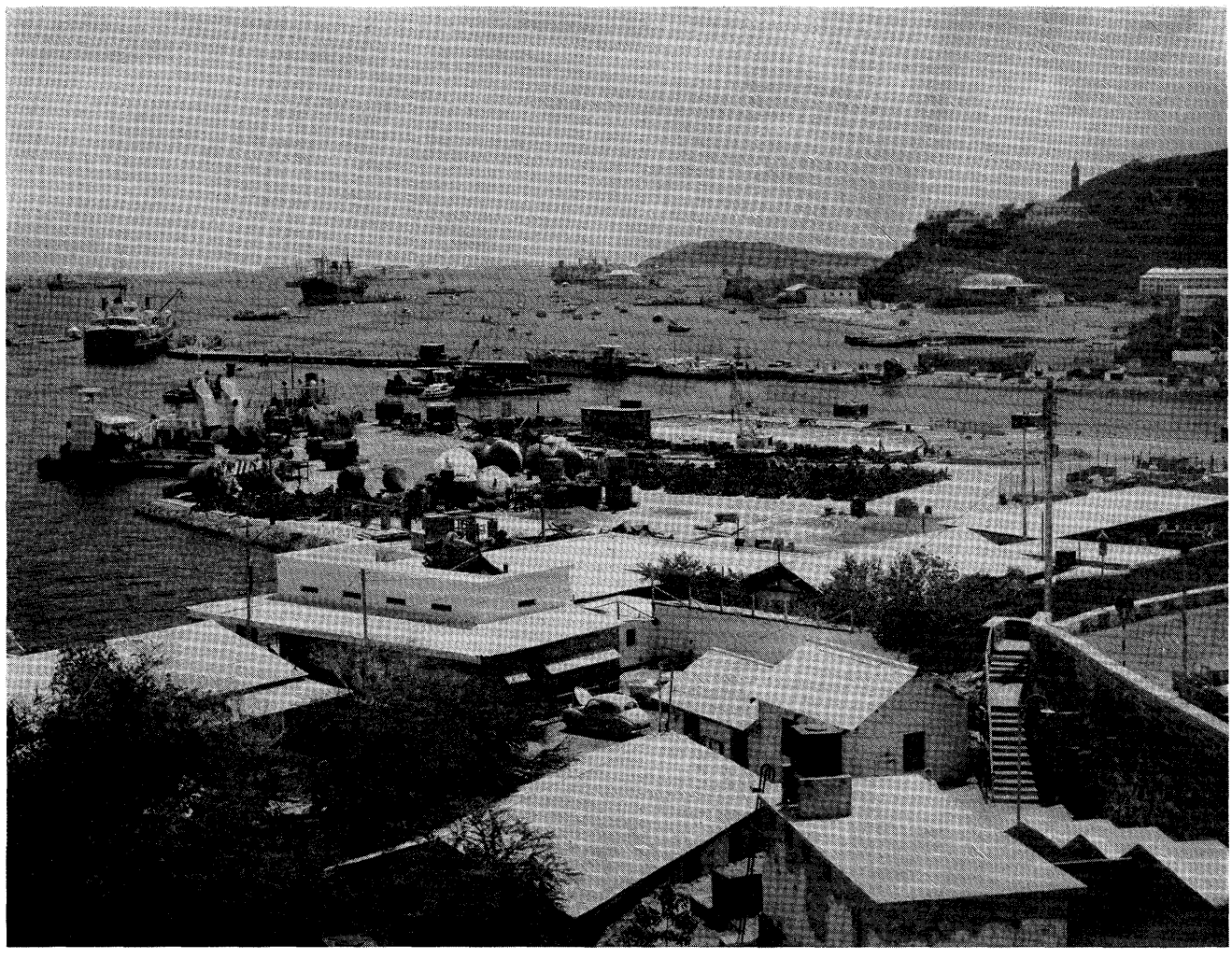
length, 600 feet wide and dredged to a depth of thirty-six feet at low water Indian spring tide. The main berthing area of the inner harbour, which extends to 297 acres, is dredged to the same depth, with the exception of three oil berths which have been dredged to thirty-nine feet and one cargo berth 1,541 feet in length. Immediately to the east is an area of seventy-four and a half acres dredged to eighteen feet. From the south-eastern corner of the eighteen-foot dredged are a channel leading to the home trade quay at Ma'alla wharf has been dredged to eighteen feet depth and 200 feet width. Abreast of that quay the channel widens to 500 feet. The mouth of the inner harbour is protected to a considerable extent from the southwest monsoon swells by a breakwater, and the northern side of the harbour is protected by a rubble mound slightly over two and a half miles long constructed during World War II. On the west side of the harbour at Little Aden is an oil harbour capable of berthing tankers up to about 50,000 tons dead weight. The entrance channel of the oil harbour has been dredged to thirty-eight feet depth and 600 feet width. The oil habour itself has been dredged to forty feet and contains four alongside berths. In addition there is one jetty for packed oils and another for tugs and landing facilities. The Port Trust provides navigational lights and marks as well as pilotage services for the oil harbour.

Berthing

In the main harbour the position is that there are sixteen first-class berths, at four of which vessels drawing up to thirty-seven feet and at twelve of which vessels drawing up to thirty-four feet can be accommodated; four second-class berths for vessels drawing up to twenty-eight feet; and seven third-class berths for vessels whose draught does not exceed sixteen feet. In addition to the above there is ample room to accommodate vessels of light draught at anchor in the eighteen-foot dredged area.

Up to date the largest vessel to berth in Aden harbour is the tanker **Manhattan,** 940 feet in length.

The berthing system in the main harbour is based largely on the use of mooring buoys and breast buoys except at the three berths recently converted to dolphin berths with oiling platforms, where ships can lie alongside to take bunkers. In cargo berths a ship is secured with her anchor or anchors down and her stern lines to a mooring buoy. This procedure is varied in the oiling berths, where ships are berthed with the anchor down and head ropes to a breast buoy, while the stern is secured to a mooring buoy and a breast buoy. Once connected to the oil terminal, which is the floating end of a submarine pipeline, oil can be pumped on to a ship at very fast rates; in fact it is believed that Aden can supply bunkers faster than any



The buoy yard and the harbour.

other port in the world.

There are thirteen berths where ships can take oil bunkers direct from oil terminals. At the three dolphin berths the oil terminals are based on reinforced concrete oiling platforms on piles; the remaining ten berths have floating oil terminals. Ships may also work cargo while taking bunkers, but if the cargo is not completed when bunkers are finished the ship is required to move to a cargo berth.

Wharves

The Port Trust wharves are situated in the suburb of Ma'alla, covering an area of approximately sixty-five acres. They are divided into five sections, namely the trading estate, the home trade quay, the return wall, the import/export quay and the new dhow quay. The trading estate is served by lighter quays of a total length of 1,000 feet and sheds, and there are large open storage spaces as there are at the other sections. The home trade quay is 500 feet long and can accommodate coasting vessels up to 2,500 tons gross with a draught of up to sixteen feet. This quay is served by three-ton-capacity semi-portal electric cranes and ample transit shed space, with a generous time limit. The return wall is dredged to nine feet depth and is used for heavy lifts. The import/export quay is again a lighter quay approximately 1,800 feet in length dredged to six feet alongside. Again there is considerable transit shed space at this quay. The dhow quay is 550 feet long and is dredged to nine feet. The quay is served by improved shedding facilities and by oil-bunkering facilities. The total area of covered accommodation at Ma'alla wharf, including the home trade quay and the trading estate, is about 400,000 square feet. The port area of Ma'alla is well provided with up-to-date roads, lighting, water and drainage arrangements, and there are canteen facilities for wharf labour. Craneage is provided by the Port Trust to the extent of three electric semi-portal cranes at the home trading quay and sixteen mobile diesel-electric cranes for the lighter quays. The Port Trust also provides one new thirty-ton and one twenty-five ton floating cranes. Quite a lot of cargo, however, is still handled to and from lighters without the use of cranes.

Recent Development—

(Continued from page 13)

final word I could say that the British ports industry has shaken off the lassitude of the intervening years and is now well aware of its role in the life of the nation. Its development must follow the requirements of shipowners and shippers and what we want to know is their needs over the next two decades.

Containerization On Review At America's Container Capital

From "Via Port of New York"
July, 1968

Members of the transportation industry from throughout the world gathered at the Port of New York last month to participate in the First Technical Congress on Containerization & Export Services, held in a New York hotel, and to wander through the displays of the First National Export Services & Containerization Exposition (Export '68) held in conjunction with the Congress at the nearby New York Coliseum.

Theme of the Congress was "Containerization Creates New Marketing Opportunities," and the 21 distinguished speakers addressing the three-day meeting represented virtually every facet of international trade. Diversity also characterized the 85 exhibits amassed a few blocks away at the Coliseum. The show's comprehensiveness enabled Port of New York Authority Executive Director Austin J. Tobin to state at ribbon-cutting ceremonies that Export '68—as the Coliseum exposition was dubbed — constituted "the largest and most diverse display of container equipment ever assembled under one roof."

If the Export '68 exposition had all manner of container products, the Technical Congress which complemented it was even more encompassing. Norman E. Bateson, vice president of research and engineering for the Pullman-Standard Division of Pullman Inc., sounded the keynote when he asked Congress participants to "consider some of the conditions that exist today that will accentuate the growth of containerization in the future."

Of primary importance, he declared, was the impact of the computer on intermodal shipping and physical distribution. "Industry," he noted, "is making increasing use of electronic data processing equipment to maintain tight inventories —a competitive necessity in this age of myriad products, sizes, colors, models and optional features." He continued: "But to operate efficiently with minimum inventories, retailer, warehouseman and producer alike require a swift, safe, economical means of moving goods from plant to store shelves. What better way than to use modular-sized containers geared closely to order size, which with new handling concepts can reduce packaging expenses while providing maximum protection against loss and damage?"

"We have the tools available to meet the (industry's) requirement for minimum inventories," Mr. Bateson stressed. In explaining how the computer could be a direct as well as indirect boon to the transportation industry, particularly in the area of accurate cost analysis and cost reduction, Mr. Bateson posed queries which computers can handle well.

He asked: "What are the real economies of moving merchandise in box cars in 100-car trains as against movement in 50- or 25-car trains, or in a piggyback trailer or container? . . . Or of moving freight from a point such as Toledo, Ohio to Tokyo in a container as opposed to traditional shipping methods?" "These," he continued, "are but two of hundreds of questions that can now be more accurately answered (by computers)."

"A second basic trend which should accelerate the growth of containerization," Mr. Bateson continued, "was the significant shifting of plant locations away from the traditional railroad siding in favor of a major highway." "If these new installations are to benefit from the economies of the various modes of transportation," he emphasized, "it **must** be through some method such as containerization or its cousin, piggyback."

He went on to state that, in turn, the railroads particularly will find containerization and/or such new concepts as A. J. Kearney's proposed "Minipiggi Train" increasingly essential if they are to continued to serve this "wandering business." The Minipiggi Train, Mr. Bateson reminded his audience, is a concept of specialized trains equipped to handle highway trailers in scheduled highspeed service. Minipiggi trains promise to offer more economies than existing piggyback operations. The relatively short length of these trains would accelerate the already quick service of conventional-length piggyback trains.

"The competitive position of the truckers," Mr. Bateson pointed out, "has been enhanced in recent years by the greatly expanded highway system itself and the increases in permissible vehicle size and weight. Between 1950 and 1965, U.S. highway mileage increased 10 per cent and average truck speed on rural roads rose almost 17 per cent, to 51.7 miles per hour. In contrast, railroad trackage has been decreasing by some 2,000 miles, or 0.5 per cent every year."

S. Alexander Thomas, a vice president of the American Machine & Foundry Company, expounded on several of Mr. Bateson's points when he told why his company today ships roughly 75 per cent of its non-household items abroad in containers. "We are not all that big," he admitted, "because our total volume of exports from the U.S. is around $35 million per annum. Yet the items we handle read like a mail order catelogue." Bowling balls, welding machines, filter cartridges, tire retreading machines, electric generators, lawn mowers, tricycles, golf clubs, tobacco machinery and a host of other products flow from AMF plants scattered about the country to buyers throughout the world.

"With such a variety of gooods moving from so many inland U.S. points to so many inland overseas distinationations," Mr. Thomas

stated, " it is not surprising that AMF always has been in the forefront of containerization activities." AMF began experimenting with containerization ten years ago, he noted, and adopted it wholeheartedly in 1959 after successfully shipping 72 complete bowling installations, about 30 truckloads, to Puerto Rico. Today the company uses some 600 containers a year, having an average stowage factor of 80 per cent of capacity.

While containerization has eased numerous shipping problems of companies such as AMF, the old documentation bugaboo remains a formidable obstacle to many firms in realizing the benefits of intermodal transport. Mr. Thomas sought to pinpoint part of the problem by citing two laws which, he contended, work together to hamper use of the export letter of credit as a viable tool of international finance. One of these laws prohibits ocean carriers from engaging in inland transportation; the other permits only steamship companies and their agents to issue a valid ocean bill of lading—the document which an exporter must be able to submit to his bank in order to meet the stipulations of a letter of credit. "The end result," Mr. Thomas argued, "is added dockside paper work and, all too often, cargoes which have reached their destination before the exporter has received his needed documents."

To skirt the financing and credit-risk hazards such delays present, AMF has veered away from financing by letter of credit. Today it handles approximately 75 per cent of its exports on an open-account basis. This has worked successfully so far. Last year, for example, AMF had to write off less than $2,500 in unpaid bills on a total volume of about $35 million. Nevertheless, he urged, the letter of credit is too important an instrument of international finance to be lost by default.

Mr. Thomas said in his summary: "Shouldn't we try to cut through the paper problem confronting us? Can we have a through bill of lading similar to an airline ticket? If this were possible, the export shipper, regardless of his location, could take this document and his commercial invoice to the bank and receive payment promptly. And the bank could arrange for distribution of the various transportation charges among participating carriers and/or international freight forwarders."

During the question-and-answer period that followed, Richard Tudhope of Container Express Limited, an English container firm, made the benefits of such a through document clear to his American counterparts. "British shippers," he declared, "can now make use of a document, called the Through Contract of Carriage, which is fully negotiable, and acceptable by banks both for documentary credit and for collateral. Freight traveling under such a contract is also insured from door to door, inclusive of jettisoning or washing overboard, and without any limit of liability."

Getting reasonable insurance rates for this breadth of coverage was one of the most difficult aspects of the problem, Mr. Tudhope admitted. "Marine insurance underwriters don't understand this business," the visitor from England contended, "but they should and can be educated." His firm suceeded after persuading two Lloyds of London marine underwriters to walk with them through the entire transportation system his container service customarily uses—from plant to warehouse to dock, through ship and on to final destination—for a thorough education in the container business.

The other side of the insurance coin was presented the next day by Dale E. Taylor, executive vice president of the Atlantic Mutual Insurance Company and first vice president of the American Institute of Marine Underwriters. His contention was that the transportation industry does not comprehend the insurance business. "If only the container world would understand that **experience** is the key to rating," he stressed, adding that while some branches of insurance can rely on the added assistance of the actuarial sciences, "in marine insurance, we must rely on judgment underwriting."

Mr. Taylor went on to cite four interrelated containerization problems which, he said, are making judicious marine underwriters hesitate to lower their rates. The underwriters' first concern is that today roughly 30 per cent of all containers are stowed on deck, sometimes in stacks five high. As a result, he contended, all too many containers have been lost overboard, damaged by the seas, or delivered with smashed contents. A related underwriting concern is the quality of the containers themselves, their soundness, certification and maintenance. Mr. Taylor suggested that this second problem might be solved by stringent inspection of containers by the recipients at every transfer point and their rejection of any unit not in good condition.

Still another serious underwriting concern cited by the insurance executive was the proper stowage of goods inside the big boxes. Goods bound for a long sea voyage must be both properly packaged and tightly braced and secured inside the container if they are to survive the journey undamaged. Finally, Mr. Taylor questioned the structural integrity of the containerships themselves: "Will they be sufficiently stable on the high seas? Will their slot or cellular structure result in hull weakness?" Since the new containerships are only now coming on berth, the insurers have no past experience on which to rely. Mr. Taylor promised, however, that underwriters will be watching the new ships' performance closely in the years to come.

A rebuttal to Mr. Taylor's views came from the day's last panelist, Marc Felice, editor of "Container News." Although the protection afforded cargo through containerization minimizes damage, and although pilferage is almost nil, cargo insurance premiums have not been reduced in most cases," said the container magazine editor. He added that containerization has been with us to some extent for the last fifteen years, but the insurance companies claim that they do not have as yet sufficient conclusive statistics that would justify a lowering of premiums.

One enthusiastic container user representing the U.S. Post Office was Joseph F. Jones, director of the Transportation Economics & Development Division of his department's Bureau of Transportation. He aroused the special interest of the Congress by describing sweep-

ing acceptance of ocean-going containers for U.S. international mail in recent years: "From zero a short time ago, now 3,00 ,000 pounds of mail move each month in 360 containers from the New York port area to Europe alone." Mr. Jones added: "The expected advantages of containerization have been realized, including: 1) reduced damage, 2) increased security and reduced pilferage, 3) transportation economy, and 4) simplification of billing procedures."

The Post Office's transport economics director cited the containerized export of "National Geographic" magazines as a dramatic example of what can be accomplished by new techniques and simplified paperwork. "Containerized loads of 'National Geographic' magazines, totalling 105,000 pounds a month, move directly from Chicago to England and the Continent with a single billing paid only to the originating carrier, and at a substantial reduction in cost . . . Under the traditional method, 15 separate and distinct handlings occurred between the mailer's plant in Chicago and the loading of the mail on a ship for overseas movement. Eleven separate Post Office forms were prepared and five separate payments made to five transportation firms. Under the direct single-billed container movement, three to six transportation and handling actions are performed, one form prepared and one transportation firm paid."

The Congress also considered the thoughts of the men who are planning and building terminal facilities for the container revolution. Anthony Tozzoli, manager of The Port of New York Authority Marine Planning & Construction Division, described the problems of today's major port builders around the world as being very similar to those of a steamship company operator about to invest in container ships: both are having to make expensive decisions in an era of extraordinarily swift technological change without knowing for sure what effect future technical breakthroughs will have on their investments.

Certain basic facts are clear, Mr. Tozzoli assured his audience. Because fewer ports are used in container systems, it has become more essential than ever that container terminals have the best possible rail and road connections to service hinterlands going beyond their former boundaries. It is also known that container berths require vast amounts of open area for container marshalling yards. "The Port of New York," he continued, "is fortunate in its assurance as a major container port. Other ports are not so lucky. Our port is also most fortunate in having at Port Newark and Elizabeth a waterfront area that's large enough to meet today's container berth space demands, and is served by the best possible road and rail connections." He added: "But beyond this, we are in the same position as any other port. We have had to learn and to be adaptable to change right from the start." Mr. Tozzoli went on to explain that the Authority's standards for adequate container berth length and suitable container marshalling yard acreage have all been revised since the bi-state agency began its pioneering planning for container facilities in the late 1950's, and that even today's standards are subject to change to keep abreast of new ship design. "With all the problems we face in designing container facilities, however," he concluded, "there can be no question that, on a cost-per-ton basis, container facilities show a substantial savings . . . A container berth can very easily handle five times the cargo that a conventional berth can handle within a given period of time."

Thus did the Technical Congress and exhibition floor of Export '68, for a few important days in June, supplement container and inland terminals as proving grounds for new container transport coordination. Each event pinpointed physical progress in the containerization movement, and in addition focused attention on the need for coordinated action in correcting some of the obvious, if intangible, growing pains of the fast-moving container revolution. The events also brought together various factions of the burgeoning container industry which feel their particular interests are misunderstood, and enabled their representatives to communicate their positions to large audiences as well as to individuals.

Thus the interaction of the two concurrent, successful events augers well to correct problems such as those discussed—problems which are the natural elements of swift progress. For, as one spokesman argued with such conviction on the last day of the congress, "Containerization is progress . . . The sooner this is realized by all involved, the better it will be for our further development and, indeed, for that of the whole world."

Port of Kobe Construction and Expansion

Port of Kobe Office of
The 3rd District Port Construction Bureau
Ministry of Transport
Japan

Main Construction Chronology

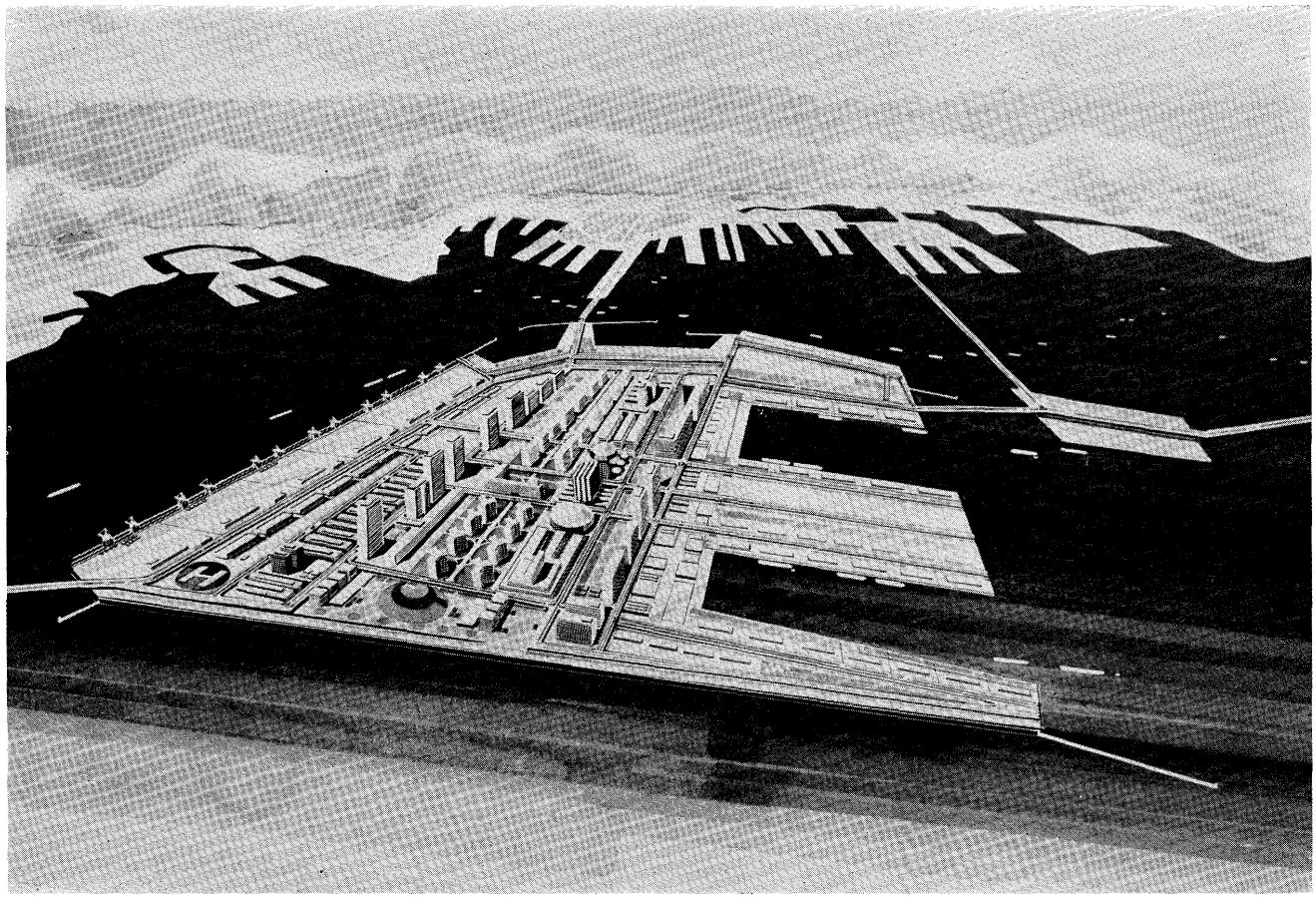
A.D.

812 Emperor Saga makes "Ohwada-no-tomari" constructed.

1180 Repairing Work of "Kyo-gashima" starts under governmental management.

1906 First-term constructing work starts from No. 1 pier of Shinko to western part of the quay wall of No. 4 pier, and No. 3 breakwater, 1,144 meters. (completed in 1922)

1919 The Kobe Construction Bureau, Ministry for Home Affairs, established. Second-



Artist's conception of the Port Island on completion in 1975, covering an area of 420 million m^2 having 6 container berths and 26 liner berths. The first container berth is to go into operation in 1969.

term constructing work starts. (from No. 4 pier of Shinko eastern quay wall to No. 5, No. 6 pier and Hyogo No. 1, No. 2 pier, and from No. 1 breakwater to No. 4 breakwater.)

1927 Reclaiming work of Karumo Island and establishing work of the canal starts. (established in 1931)

1929 Naka-pier construction starts. (completed in 1936)

1951 Kobe City Government becomes the "Port Management Body" for the port of Kobe.

1954 Western quay wall of Shinko No. 8 pier, quay wall construction starts. (completed in 1959)

1958 Hyogo No. 3 pier construction starts. (completed in 1962)

1959 Maya piers construction starts. (scheduled to completed in 1967)

1965 Banana transit shed completed on Hyogo No. 3 pier.

1966 Port Island construction starts. (scheduled to complete in 1971)
Bridge "Maya-ohhashi" completed.

1967 One Hundredth Port—opening Commemoration Celemony of Kobe held in Kobe. The Celemony of Sister Port with Seattle and Rotterdam held.

Main Facilities for Foreign Trade

Area	the Number of Berth	the Depth Water
Shinko Piers	32	9 m~11 m
Hyogo Piers	17	7.5 m~ 9 m
Maya Piers	18	10 m~12 m

Future Projects

Port Island	32	10 m~12 m
Rokko Piers	39	10 m

Maya Piers

These are port facilities for foreign trade having 733,000 square meters' site reclaimed with the soil from Rokko mountain system, from the eastside sea of Shinko Wharf. The total construction cost was 22,000 million yen, and this large scale wharf has 4 piers of 18 berths with a depth of 10 to 12 meters. The construction works started in 1959 and are nearly completed. Numbers 1 and 2 piers are allotted to New York liners for export on a priority basis. The "Maya Ohhashi" Bridge between Maya Piers and Shinko Piers was also completed at a total cost of 800 million yen, which made systematic management capable. The total amount of soil used for reclamation was 6,000 thousand cubic meters. Referring to the con-

struction method, this quay is under construction by execution method of Steel cell which The Third District Port Construction Bureau has newly devised.

This method being patented (structure as port facilities with "Seamless Cylindrical Cell": Patent number 309642), unlike others now adopted, has these benefits (1) lower construction cost (2) higher construction speed (3) with less danger in constructing. Briefly explaining, the structure of Steel Cell quay—wall was developed from the cell quay—wall of the flat steel sheet pile, and the cell welded the steel cylindrically is attached by a big floating crane instead of setting or driving many flat steel sheet piles cylindrically. After setting, sand filling work begins immediately. In consequence of tension arising to directions of the circumference, the cell keeps cylinder shape by sand fill forming the wall. To fill the space between the cells, the arc is set with flat steel sheet piles. After setting the sheet pile, sand is filled. Then on, the construction of upper structure is supported with steel pipe pile, lest the vertical load should be gained on the steel of the cell. Then back-filling is done. And further more the pavement and the annex costruction on the upper side complete the steel cell quay-wall. Cathodic protection by the method of power impressed system is adapted to protect from corrosion of steel materials.

Port Island

Port of Kobe is one of the representative ports in Japan as well as Port of Yokohama and from the viewpoint of historical process and present situation of this port, we have a plan to equip as a trading port for liner ships from now on.

Quantity of exporting and importing goods in 1975 (except oil and ore) is estimated 28 million tons and compared with 12 million tons in 1964, that's more than twice increase. Coping with this furthermore, it is necessary for us to build port facilities suitable for modernization of loading and unloading. This wharf is situated near the center part of the port managing functions which is concentrated at the

Handling status of Ship's Loading and Unloading (Foreign) 1964

(Unit: Measurement tons in thousands)

Loading and Unloading at buoy and anchorage			Loading & Unloading at quayside						(Grand) Total		
Lighter			Cargo loaded and discharged through the piers			Lighter					
Shipment	Discharge	Total	Shipment	Discharge	Total	Shipment	Discharge	Total	Shipment	Discharge	Total
709	3,711	4,420	641	3,396	4,037	4,843	2,500	7,343	6,193	9,607	15,800
28%			26%			46%			100%		

Note: Vessels over 500 tonners.

$$\text{Lighter Rate}\left(\frac{\text{Lighter}}{\text{Lighter}+\text{Through the piers}}\right) \quad 1964$$

	Foreign trade	Domestic trade
Sum	75%	6%
Public quay	82%	3%
Private facilities	23%	1%
At buoy & anchor	100%	100%

Public quay	Percentage
Shinko No. 1 Pier	85%
No. 2	90%
No. 3	91%
No. 4	90%
No. 5	85%
No. 6	90%
No. 7	68%
No. 8	80%

On demurrage status of Kobe Port

(State of vessel sidling for waiting berth)

	1960	1961	1962	1963	1964	1965
Number of overside waiting vessels	263	1,161	1,151	1,000	1,771	1,502
(Number of waiting vessels/ Total of vessels in Port)	(4%)	(18%)	(17%)	(15%)	(25%)	(20%)
Total hours for waiting	2,243	48,635	27,323	21,108	43,706	33,467
Average hours for waiting/ One waiting vessel	9	42	24	21	25	22

Quantity of cargoes handled at the Port of Kobe

(Unit: Measurement tons in thousands)

Year	Grand Total	Foreign Trade			Domestic Trade		
		Total	Export	Import	Total	Shipment	Discharge
1956	13,142	7,353	2,538	4,815	5,790	2,345	3,444
57	15,524	8,431	2,732	5,699	7,093	3,259	3,835
58	13,806	6,823	2,941	3,882	6,983	2,794	4,189
59	16,851	8,855	3,297	5,559	7,995	3,111	4,884
60	20,022	9,917	3,592	6,326	10,105	4,555	5,550
61	23,166	11,710	3,622	8,088	11,456	5,317	6,139
62	24,945	12,826	5,241	7,585	12,119	5,636	6,483
63	28,102	14,269	5,611	8,658	13,833	5,787	8,046
64	33,443	15,800	6,193	9,607	17,642	7,929	9,713
65	34,472	16,353	7,092	9,260	18,119	7,410	10,709

back of Shinko area, the depth water is more than 12 meters and has advantages of being able to correspond to a large vessel without dredging. More than 63 million cubic meters soil is necessary for reclamation and soil of Rokko Mountain system is allotted to this. This soil is air—slaked granite and most suitable for reclamation. This Wharf is, taking the shortest course, linked with a hinter land by a bridge in three demensions from Shinko No. 4 pier and communicated with trunk roads, Kobe urban expressway route No. 1 of Hanshin highway, No. 2 Hanshin national highway.

A revetment and breakwater are already hastened by the Third District Port Construction Bureau. The construction cost of this wharf is estimated at about 70,000 million yen. The berth number is 32 in all, 6 (container) for the western quay —wall and 26 for eastern and northern quay—wall.

Orbiter Probe

IAPH News :

The Long Needed Book

By Austin J. Tobin

Executive Director, The Port of New York Authority
Chairman, Committee on International Port Developmet, IAPH

Mr. Austin J. Tobin

In the three years that the IAPH Committee on International Port Development has been functioning, it has responded to many requests for assistance. These have been of various types. One port wanted on-the-scene guidance by experts in its efforts to establish procedures for efficiently maintaining cargo-moving equipment; another country wanted a survey of all its ports to determine whether they were making the best use of existing resources in planning for the future; another wanted advice on legislation so it could set up effective port administration; others wanted to place staff members temporarily in developed ports to allow them to gain management experience.

As the Committee's program got under way, one of our first discoveries was that there was a dearth of accessible texts or reference material on the general subject of port development. Of course we could secure the assistance of many experienced officials in developed ports and, in fact, did just that. But there was no book available for handy reference at that time into which basic information and knowledge on port development had been assembled. Fortunately this deficiency was remedied last year when the American Association of Port Authorities published Walter P. Hedden's book, "Mission: Port Development."

Mr. Hedden is eminently qualified to write such a book. During the 31 years he was a key member of The Port of New York Authority's staff, Mr. Hedden as Director of Port Development, played major roles in the planning and development of marine, air and highway facilities in the Port of New York and in the Authority's port promotion and trade development activities. Throughout those years I had the privilege of working closely with him and our association was always stimulating to me. After Mr. Hedden retired from our staff in 1953, I had the satisfaction of watching him become a very successful consultant in the field of international port development.

The writing of "Mission: Port Development" was made possible by a grant from the Ford Foundation and the Institute of International Education which enabled Mr. Hedden to devote a full year to organizing his extensive practical knowledge and experience into a very readable reference book on a highly technical subject. The American Association of Port Authorities undertook to publish it because such a volume has long been needed, particularly in the "Puertos Amigos" program which is conducted by the Association in collaboration with the Organization of American States. Among other things, "Puertos Amigos" provides for the interchange of technical port development information and staff training in Western Hemisphere ports.

"Mission: Port Development" is actually a two-part book. The first nine chapters are devoted to the basic principles of port planning and development. Chapters 10 through 14 are case histories of five major assignments in port development undertaken by Mr. Hedden. In other words, Mr. Hedden describes what port development consists of and how it should be accomplished; then he relates how these principles and techniques were applied and what happened as a result of his efforts in Trinidad, Israel, Turkey, Tunisia and Liberia. Mr. Hedden's candid discussion of what he found on revisiting each of the countries some years after he made his studies and recommendations is one of the book's best features.

For those interested in the fundamentals of port development, the book thoroughly covers just about every phase of this subject. Port planning, operations, economics and

Posthuma Committee Meets in Rotterdam

Posthuma Committee Meeting in Congress-hall "De Doelen", Rotterdam. Left to right: standing Ir. F. Posthuma; (face hidden) Comdr. Platt; Mr. E. S. Olcott; Mr. Oosterbaan, Mr. Tsuji; Mr. Barrillon; Comdr. Axelson; Mr. Schultze.

administration are analyzed in detail. Thechnical port problems, technical assistance, and how assistance can be obtained for developing ports are explained by a professional who knows the practical answers. The book also has three appendixes which present examples of the laws needed to establish the legal framework for the efficient development of a port. There are also an excellent bibliography and a good index.

As I said in my introduction to the book, " 'Mission: Port Development' is not intended as a substitute for practical on-the-job assistance by experts, but it contains comprehensive discussion of most of the problems likely to arise in developing the emerging ports." That it is accomplishing its purpose is attested by its acceptance to date. Although the book's appeal is limited to a select audience of those interested in port development, more than half the original printing already has been sold. Most of the world's engineering and construction companies which specialize in waterfront work have added the book to their reference libraries. Many orders have been received from the libraries of colleges and universities, from steamship lines and from government agencies here and abroad.

Since its publication, "Mission: Port Development" has made it much easier for the Committee on International Port Development to respond promptly to many requests for information. Our first action usually is to advise that a copy of the book be obtained.

Copies are available at the office of the American Association of Port Authorities, 601 Southern Building, Washington, D.C. 20005. The price is $10 a copy.

Posthuma Committee

The Rotterdam Meeting of the Committee on Large-sized Vessels was held October 23~25 in the Congress-hall "De Doelen"., Rotterdam, under the chairmanship of Ir. F. Posthuma, Managing Director, Port of Rotterdam-Europoort.

The following members of the Committee were present: Commander S. Axelson, (Rt.), Managing Director, Port of Gothenburg, Royal Navy (Sweden); Mr. C. Barrillon, Director General, Port Autonome de Marseille; Commander E.H.W. Platt, (Rt.), Royal Navy (Great Britain), Director of B. P. Tanker Co., London; Mr. A. E. Schultze, Director of Marine Operations, National Bulk Carriers, Inc., New York.

There were two guest speakers: Ir. W. Langeraar, Rea-Adminral, Royal Navy (Netherlands), Chief of Hydrography, Ministry of Defense; Mr. J. W. Oosterbaan, Deputy Harbour Master, Port of Rotterdam-Europoort. Also present were Mr. T. Tsuji, Managing Director, Taiheiyo Kaiun Co., Ltd., Secretariat Company of The Japan Tanker Association, Tokyo, who took the place of Mr. Gengo Tsuboi, and Mr. E. S. Olcott, Chief of Central Planning Division, Planning and Development Department, Port of New York Authority, who attended on behalf of Mr. Lyle A. King, Port of New York Authority.

Comdr. Platt's business brought him to Japan later on and on November 15 he visited the Secretary General at the IAPH Head Office in Tokyo and discussed the follow-up on the Posthuma Committee meeting with the presence of Mr. T. Tsuji and Mr. Gengo Tsuboi. Comdr. Platt was saying he would hop in and out of Japan over a

couple of years to come as his company (BP Tankers) was ordering huge tankers with Japanese shipyards.

Corrections in Directory

1. Mr. S. M. Khalifa, A.A.C.C.A., A.A.I.A. is the General Manager of the Aden Port Trust. That's a fact, but in the IAPH Membership Directory 1969, page 155, his title is followed incorrectly by (Acting), which should have been removed. We have deleted from all the remaining copies of the Directory on hand, but we would beg all the Directory owners to do the same. Our apologies to Aden Port Trust who have pointed this error to us.

2. Also in the same Directory, please look up the item of The Cairns Harbour Board in page 100. Here, the Official Representative should stand as Mr. Horatio Nelson Whitaker, M.B.E., Chairman. To the right of "Port under Administration:" should be inserted "Port of Cairns", and at the bottom must be added another line "Secretary: Mr. M. J. Sargent". These typographical changes have been requested by The Cairns Harbour Board. Look forward to seeing Mr. Whitaker in person as the Official Representative of The Cairns Harbour Board at the Melbourne Conference.

OAS Port Confab

Washington, D.C.:—The Third Inter-American Port and Harbor Conference of Organization of American States is scheduled to be held in Vina del Mar, Chile, November 15-24, 1968. The following agenda were provisionally approved by the Council of the OAS at the special meeting held on August 2, 1968:

Provisional Agenda

I. **Convention of Mar del Plata**
   1. Consideration of the status of the Convention
   2. Review of the Annex to the Convention

II. **Port Administration and Development**
   1. Convention on unitized cargoes
   2. Delineation of responsibilities in the terminal operations
   3. The role of port management and port labor
   4. Review of the degree of autonomy of port administration systems and the ways in which it could be improved
   5. Evaluation of the needs of the ports of the Americas with a view to greater development and modernization
   6. Coordination of in transit (through) movement of cargo
   7. Port security measures for the handling of nuclear-propelled ships in ports
   8. Free trade zones
   9. Port statistics and costs
   10. Other matters

III. **Port Operations and Cargo Handling**
   1. Review of the establishment and functioning of national port committees
   2. Handling and marking of hazardous cargoes
   3. Formulation of the basic principles for port regulations
   4. Consideration of the adoption of a model manual of standards for port maintenance
   5. Progress made in cargo-loss prevention
   6. Adoption of a systematic and effective program for promotion of port safety
   7. Programs for training port personnel
   8. Technological developments (other than unitizing) in cargo handling, equipment, and methods
   9. Other matters

IV. **The "Puertos Amigos" Program**

V. **Other Matters**
   1. Election of the members of the Permanent Technical Committee on Ports
   2. Consideration of the place and date for the Fourth Inter-American Port and Harbor Conference (Pan American Union)

More Seaway Traffic

Ottawa, October 29, 1968:—Cargo moving through both sections of the St. Lawrence Seaway during the present navigation season has surpassed the traffic level attained for the same period in 1967.

Preliminary figures indicate that, as at October 14 of this year, 36.8 million tons of cargo had transited the Montreal-Lake Ontario Section, an increase of 11.9% as compared to the 32.9 million tons in 1967. For the same period, the Welland Section registered 43.5 million tons this season, that is 10.4% above the 39.4 million tons the previous year.

In making the announcement, the St. Lawrence Seaway Authority noted that general cargo continued to account for an ever increasing share of the total traffic along the waterway. Same-period comparisons show that in 1966, general cargo movements amounted to 10.9% of total tonnage for Montreal-Lake Ontario and 7.7% for Welland. In 1967, the general cargo share increased to 12.7% and 9.0% respectively and this year general cargo has so far reached 16.2% and 12.4% of overall traffic transiting the two sections of the Seaway. (The Lawrence Seaway Authority)

New Wharf Opened

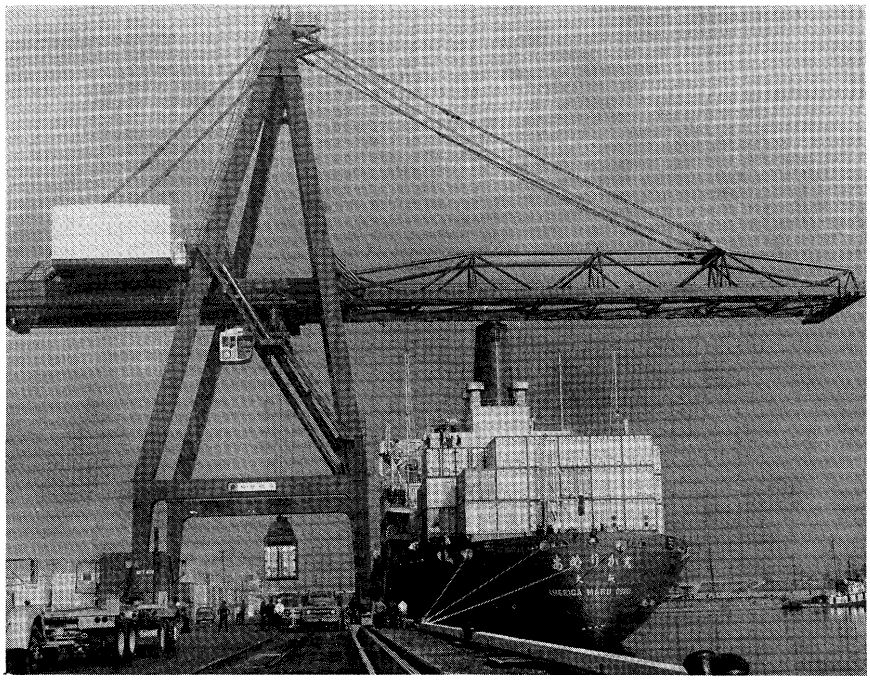
Anchorage, Alaska, October 31:—Anchorage's beautiful summer weather contributed to early completion of Phase I of the Port of Anchorage's Terminal No. 2, according to Port Director H. Russell Painter.

Brief ribbon cutting ceremonies were conducted on October 28, when Mayor George M. Sullivan, assisted by City Manager Robert E. Sharp, as well as members of the Anchorage Port Commission and City Council, opened the 272-foot section of Terminal No. 2.

The $1,400,000 contract was let to Morrison-Knudsen Company in early spring and pile driving started in July. Contract completion was called for November 18, and M-K's Project Manager Russ Hopkins agreed that the exceptional summer weather assisted in the early finish.

The engineering firm of Tippetts-Abbett-McCarthy-Stratton of New York, who designed the Port's Terminal No. 1, was contracted to design the new terminal and George Treadwell, Manager of the Seattle office of the firm, was on hand for the ceremony and final inspection.

Los Angeles Container Terminal



The M.S. "America Maru," first vessel to arrive at the new six-million-dollar East-West Container Terminal at the Port of Los Angeles, unloads her cargo of 20-foot vans under the giant arm of the Port's 40-ton crane, largest in operation in the United States. The 16,000-ton ship, owned by Mitsui O.S.K. Line, carried 691 containers, 511 of which were unloaded at Los Angeles. The Paceco crane has the unique capacity of handling two of the containers simultaneously, at the rate of 80 per hour. The cargo included containers from all four of the consortium of shipping lines using the terminal: Mitsui O.S.K. Line, Kawasaki Kisen Kaisha Line, Japan Line, and Yamashita-Shinnihon Line. It was the maiden voyage for the new vessel and the maiden unloading operation for the new terminal.

As soon as financing details are completed, Phase II of Terminal No. 2 will be bid and completion of this work will give the Port two 600-foot cargo berths. These, coupled with the 600-foot Petroleum Dock, opened in 1966, will make the Port of Anchorage one of the most modern port facilities on the entire Pacific Coast.

Completion of over $1,000,000 worth of work in the Port's Industrial Park was also anticipated before the winter weather sets in, according to Port Director Painter. This EDA assisted project includes extension of the Park's water, sanitary sewer and storm drains, along with paving of Tidewater Road, opening of Terminal Road and Gull Avenue, and construction of 1400-feet of railroad spur to serve lots in the north section of the Park. (Port of Anchorage)

Gulf Outlet

New Orleans, La.: — The U.S. Army Corps of Engineers conducted a public hearing in New Orleans recently to discuss a proposal by the Board of Commissioners of the port of New Orleans to widen the Mississippi River-Gulf Outlet from a bottom width of 500 feet to a width of 750 feet and to deepen it from 36 feet to 50 feet.

Col. William H. Lewis, acting director for planning and engineering for the Board of Commissioners, outlined the costs of the proposed project and the benefits it would bring in terms of navigation, safety and economy.

The 76-mile waterway extends southeast from New Orleans to the Gulf and was opened to navigation in 1963. Ships using it save 40 miles compared with those using the Mississippi River. The existing project for the Outlet was authorized in 1956.

Col. Lewis stated that the current cost estimate of the existing project is $171 million. Some $61 million has been spent in construction through June of this year.

The trend toward larger and deeper draft oceangoing vessels in the past 20 years makes it important that the Outlet be improved to meet the demands of future traffic, Col. Lewis explained. Also a part of the proposal is the building of a new and larger lock connecting the Outlet with the Mississippi River.

The dredging of 340.5 million cubic yards of land for channel expansion, anchorage areas, passing lanes, protection of piers and relocation of pipeline crossings would cost $66.5 million.

Most of the benefits of a 50-foot-deep channel in the Outlet will accrue to the bulk transport of liquid and dry cargoes by tanker and bulk carrier respectively, Col. Lewis stated. Container traffic and other general cargo traffic would be also greatly benefited by the larger channel.

Assuming that an improved usable channel would be available by 1977 and would have an economic life of 50 years, the indicated annual equivalent savings to shippers attributable to the proposed improvement are $53.5 million, or about 13.3 times the annual costs of the improvement.

Besides the Board of Commissioners, various other organizations were on hand to support the proposed project. The Louisiana Department of Public Works, the Waterways Development Committee of the Chamber of Commerce, the American Waterways Operators, Inc., the Crescent River Pilots' Assn., the Louisiana Department of Highways and the New Orleans Board of Trade were among those represented to support the plan.

Col. Thomas J. Bowen was in charge of the hearing. (New Orleans Port Record)

Tonnage Up 16%

Portland, Ore., November 21:— Total cargo tonnage over Portland Dock Commission terminals for the

first three-quarters of the year showed a 16 percent increase over a similar period of 1967.

A tonnage report released today by the Dock Commission's Economic Research Department revealed a total of 1,485,411 revenue tons had been handled on public facilities for the first nine months of the year.

Inbound cargo accounted for 517,-183 tons, while outbound tonnage was up nearly 160,000 tons to 968,-228 tons. Outbound lumber and logs through September represented the highest single commodity group with 635,857 tons, a 35 percent increase over 1967. Inbound general cargo was up 14 percent to 282,188 tons.

Ship calls for the period were down slightly to 916, as compared to 935 in January to September, 1967. Terminal No. 4 led other Dock Commission facilities with a 25 percent increase and 883,317 revenue tons.

The Dock Commission recorded 93 ship calls and 185,558 tons in the month of September. (Portland Public Docks News Release)

Revenue Bonds

Portland, Oregon: — Issuance of public wharf terminal revenue 30 year bonds in the amount of $6,500,-000 was agreed to at the regularly scheduled November meeting of The Port of Portland Commission.

At the meeting the Commission also approved the negotiated sale of the bonds to Blyth & Co., Inc. of New York City, at a net effective interest rate of 5.376%.

The bonds will be used for building and equipping an automated public terminal in the Port's Rivergate Industrial District in North Portland, to be leased by The Port of Portland to Waterway Terminals Company, a subsidiary of the Crown Zellerbach Corporation.

The facility, due for completion April 1, 1969, consists of 551,000 square feet of usable terminal and a covered wharf with automatic elevators to lift cargoes from barges to a conveyor system at warehouse level. It will be located on 60 acres of waterfront property, valued at $13,500 per acre in the lease. The bonds will be retired by the rentals under the lease with Waterway and further secured by a guarantee of Crown Zellerbach.

The general credit and taxing powers of the Port are not involved. This public wharf terminal will provide another major specialized facility at Rivergate to serve both the District and the entire community. (The Port of Portland News Release)

24th St. Terminal

San Diego, Calif.: — The San Diego Unified Port District dedicated the first phase of the 24th Street Marine Terminal October 29 to mark the establishment of maritime cargo-handling facilities in the South Bay section of the harbor.

"This new marine terminal makes National City a deepwater port and gives us a significant role in world trade," Mayor Kile Morgan said as he welcomed a group of civic leaders, businessmen and political leaders to the ceremonies.

L.H. Ruehle, National City's representative on the Board of Port Commissioners, conducted the program held near the main entrance to the new terminal's northern wharf area. He received a strong commendation from Mayor Morgan for his "leading role" in bring the new terminal to fruition.

State Senator James R. Mills, co-author of the Port District Act, called the terminal project the "greatest achievement" of the Port District since its creation in 1963. Senator Mills, who gave the dedicatory address, said the terminal "certainly was beyond our expectations, but not our hopes, when we formed legislation for the Port District." He said the terminal was the first step in full development of San Diego Bay, the overall objective of the District.

At a port Commission meeting the same afternoon, Senator Mills was honored by the Port District Commission for his role in creating the Port District. Board Chairman C.A. "Chris" Larsen presented the senator with a complete set of history books on San Diego, written by Richard F. Pourade.

In a brief commentary on the marine terminal's development, Congressman Lionel Van Deerlin, (D.—S.D.) reminded the audience of the federal government's participation. He said matching funds provided by the Economic Development Administration was granted on the basis of "the bright potential for industry, business, new employment and San Diego's growing importance in the world trade community."

The more than $8 million cost of the terminal has been shared by Port District bond funds and the EDA.

The first phase of the terminal, with 1900 feet of wharf, has been in use for outdoor storage of cargo since early October. The second phase, with 1500 linear feet of wharf, is due for completion in December. (Port of San Diego Newsletter)

India Basin-Islais Creek

San Francisco, Calif., September 30:—The Port of San Francisco is moving ahead with plans for the construction in the India Basin-Islais Creek area of one of the largest and finest container terminals on the Pacific Coast, Rae F. Watts, Port Director announced today.

The 200-acre container terminal will be complete with all the modern developments for this type of facility, including high capacity container cranes, concrete wharves, acres of open storage area for containers, freight stations, rail and truck accesses and water depths of at least 40 feet, Watts said.

Vital to the success of the project is the approval by the Bay Conservation and Development Commission of an application for an additional fill in the area of 55 acres. That application will have an official hearing by the Commission on Thursday (October 3).

The complete project, including the additional fill of 55 acres, already has had the approval of the City Planning Commission, which is planning a park and recreational development in the area. The Port's India Basin Terminal is expected to enhance the recreational area through retention of open basin for water recreational use and public access to sections of the terminal for deep-water fishing.

The Port is also working closely

with the State highway department and division of Bay Toll Crossings for new freeway links in the area and the planned Southern Crossing suspension bridge.

There will be nine berths at the container terminal with several huge cranes spotted for the most efficient loading and discharge operation. Ample space will be provided for storage of containers and accessory equipment, and surface traffic, both motor and rail, will have easy access to all parts of the terminal.

The new freeway extension and Southern Crossing, plus convenient links to present highway and railroad connections, will make the terminal one of the most serviceable.

It is anticipated that the India Basin plan will include a terminal for the LASH (lighter aboard ship) liners of Pacific Far East Line.

The LASH facility will include two berths to dock the ships with concrete deck and large back-up area for container storage, a long cargo transit shed and adjacent lighter loading berths, and an anchorage basin for the lighters. The LASH terminal would be completed in time for the first PFEL ship in late 1970.

The Port Authority is proceeding with soil testing at the India Basin site, engineer's drawings and sales of the bonds for the terminal that may reach a total cost of $45 million.

The development of the India Basin-Islais Creek area is based on the overall waterfront plan adopted by the Port Authority and advocated by the Port's consultants (Arthur D. Little Company) that a large scale shift of San Francisco's cargo-handling activities from outmoded piers in the northern waterfront area to the southern section must take place.

Part of the program to shift cargo activity to the southern waterfront was the recent signing of an agreement between the Port Authority and States Steamship Company for use of 21 acres at the Port's Army Street Terminal.

By moving to Army Street, States will more than double its present terminal facilities presently located at Piers 15-17 and operate from a new and improved terminal that will include two berths, a transit shed 225 feet by 1000 feet, and more than 10 acres of open storage area for containers.

Another important improvement project in the area is the Port's program to build new grain handling facilities at the Islais Creek Grain Terminal.

Under a $4.7 million contract, a new 1,000,000 bushel capacity grain elevator will be built, to double the terminal's present storage capacity, and modern loading and handling facilities to increase its loading capacity to more than 1,200 tons per hour. The terminal is the only grain facility in northern California capable of handling grain carriers with a draft of 40 feet or better, and one of its features will be six mechanized loading spouts that will be arranged to load the large bulk carriers without shifting the vessel.

According to officials of Pacific Vegetable Oil, which operates the grain terminal, the Port of San Francisco should register a total of one million tons of grain per year for export to Far Eastern markets. (San Francisco Port Authority)

'Red Tape' Cutters

San Francisco, Calif., September 18:—The Board of Directors of the National Committee on International Trade Documentation, meeting in San Francisco, today announced the appointment of the Marine Exchange of San Francisco as the official Pacific Coast representative of NCITD.

Through this action, spokesmen for both organizations express the hope that more speedy progress can be made in eliminating and in simplifying the paperwork problems that surround import and export shipments, and in expediting work in this field with foreign countries.

The National Committee on International Trade Documentation is recognized as an outstanding national and international organization supported by private industry, and dedicated solely to solving paperwork problems.

With offices in New York and Washington, and with working arrangements with many similar groups and governmental committees in foreign countries, it is actively progressing many programs to eliminate and to simplify paperwork.

The Marine Exchange in San Francisco, through its Facilitation Committee, has for many years pursued programs to simplify documentation procedures as they relate to ocean shipping and international transportation problems.

In making the announcement of the joint cooperative arrangements by the National Committee on International Trade Documentation and the San Francisco Marine Exchange, Mr. Robert E. Mayer, president of the Marine Exchange, and Mr. Charles H. Beard, chairman of the Board of NCITD, issued the following joint statement:

"With the appointment of the Marine Exchange in San Francisco as the official west coast representative of the National Committee on International Trade Documentation, we are launching a united attack on international trade documentation problems. The national and international objectives of NCITD will be rapidly progressed through this alliance with Marine Exchange and its long and fruitful pursuit of documentation and procedure simplification in international shipping. We are looking forward to a close working relationship through which both organizations will be enabled to accomplish their goals more rapidly."

NCITD's membership consists of more than two hundred private companies, consisting of exporters, importers, all types of carriers, banks, port authorities, insurance companies, and associations. Its administrative work is headed by Mr. Arthur E. Baylis, national director, located in New York. The San Francisco Marine Exchange's work in the documentation field is directed by Mr. Robert Langner, manager, and Mr. Alex Moshkin, chairman of the Facilitation Committee.

To commemorate this new working alliance, a reception for business, international trade, and civic leaders was held at San Francisco's World Trade Club following the meeting. (Marine Exchange of the San Francisco Bay Region)

California M. A. Conference

San Francisco, Calif.:—Election of three California port officials to head

up the statewide program of harbor and channel improvements has been announced by the California Marine Affairs Conference.

Rae F. Watts, San Francisco Port Authority director, was selected new chairman of the 13-year-old navigation group at a meeting of the conference's executive committee. Elected with Watts were Lawrence L. Whiteneck, chief engineer for the Port of Los Angeles—who will serve as 1st vice chairman—and Carl A. Brower, Crescent City Harbor Commission chairman, as 2nd vice chairman.

Watts succeeds Don Nay, San Diego port director, in the conference's top assignment.

Organized in 1956 as the nation's third such regional waterway development organization, the Marine Affairs Conference coordinates requests for Federal navigational studies, improvements and maintenance of existing projects by the Corps of Engineers. Semi-annual testimony is presented to Congress and Bureau of the Budget. Need for longterm planning is also stressed, including provision for coastal harbors of refuge, and channel capacities to accommodate the supersized ships soon to be operating.

Secretariat for the conference is provided by the Marine Exchange, San Francisco. Robert H. Langner is executive secretary. (California Marine Affairs Conference)

CTI Depot in Toledo

Toledo, Ohio:—In another step in the continuing development of services for Port of Toledo users, Container Transport International, Inc. (CTI) has established a container "pool" operation. CTI 20-foot vans are now available within a 24-hour basis to plants throughout the port's hinterland area.

Thomas G. Newman, CTI president, and Louis C. Purdey, the Toledo-Lucas County Port Authority's executive director, jointly announced the new station would assure carriers and shippers in Western Ohio, Southern Michigan, Indiana, Kentucky, and other areas served by Toledo of full-scale container service. Both steel and aluminum containers in a variety of sizes, together with support equipment, will be available in sufficient quantity to meet all requirements, they said.

Jones Transfer Co., whose headquarters is in nearby Monroe, Mich., has been selected to serve as depot and CTI agent in the area. Robert J. Duffey, president of Jones Transfer, commented, "We are glad to have the long experience and expertise in containerization which comes from establishing a relationship with a respected company like CTI."

The container terminal is situated at Manhattan Blvd. & Interstate Highway 75, in the heart of metropolitan Toledo.

CTI plans to build up an initial inventory of 250 containers in Toledo. This supply can be quickly increased when necessary by drawing upon CTI container stations in Chicago, Detroit, or Cleveland. Port officials are conducting a vigorous campaign, making these supply increments quite necessary. Containers will be available on a trip lease or long term basis; back-up units will be on hand to meet periods of high demand.

Anthony Blanco, CTI's director of Midwest operations, will have responsibility for the company's activities in Toledo.

Many of the containers will be handled by "Big Lucas," a huge gantry crane that travels over nearly a mile of straight-line wharf at the harbor. This flexibility coupled with Big Luke's 110-ton capacity makes the crane an invaluable tool in handling containerized cargo. A new 72-ton crane, presently under construction, will soon complement "Big Lucas."

One of the most important containerized commodities which enters the country through Toledo is whisky. Containerized exports such as auto parts, consumer products, and machine tools have created a heavy flow of outgoing traffic over the Toledo docks.

The Port of Toledo is conducting an aggressive campaign in advertising its advantages to both foreign and domestic shippers.

Mr. Purdey states: "The steamship lines serving the East Coast, especially those with containerships in operation or on order, have made it plain that they intend to serve only three or four big East Coast ports. It is their expectation that cargo bound to and from the eastern half of the country will move through these ports and that other ports will be left out in the cold.

"Toledo doesn't buy that suggestion. We're developing an efficient, modern container base. For many shippers in our section of the country, it will be the best one to use. The new CTI container station will help us to achieve this objective. It will enable midwestern manufacturers to continue to reap the savings from shorter overland hauls."

Port Authority and CTI officials are convinced the Port of Toledo will develop use of containerization as an economic tool available to importers and exporters in its hinterland. (Port of Toledo News)

Channel Deepening Completed

Sydney, November 21:—A depth of 36 feet at low water will be declared to be available in the Steel Works Channel at Newcastle on and from Monday next, 25th November, 1968.

This was announced today by Mr. W.H. Brotherson, President of the Maritime Services Board of N.S.W.

He said that the Board decided this at its meeting held in Newcastle this afternoon, on the advice of the Newcastle Harbour Master, Captain, Hopper.

Mr. Brotherson said the Board had now decided to proceed with the dredging to 36 feet, of the channel into Rotten Row serving the bulk berth located there.

This work, when completed, will virtually provide all of the main channels of the Port including the Entrance Channel, with a minimum depth of 36 feet at low water. (The Maritime Services Board of N.S.W.)

Container Terminal ?

Hong Kong, October 10: — The Public Works Department is to investigate the problems which might be met should the site at Kwai Chung reserved provisionally for a container terminal be developed for that purpose, a Government spokesman announced today. The study is designed to gather information on

the conditions of the seabed, the degree of dredging necessary, the sources and quantities of fill needed for the reclamation, the type of seawall required, whether the road systems in the vicinity can cope with the traffic generated by a container terminal, etc. The study is expected to take eight months to complete. The spokesman pointed out that the feasibility study does not mean that Government has decided to proceed with the construction of a container terminal. Nor should it be taken to imply that, if one were to be constructed, it would be built with public funds. He explained that the primary aim of the study is to determine whether the site at Kwai Chung is capable of development as a container terminal, including what is the most appropriate alignment for the seawall and how long it will take to construct the various stages should development proceed. A secondary purpose, assuming that the site is suitable for development, would be to give prospective developers an indication of the scale of costs likely to be involved and the conditions under which Government might be prepared to make the site available for container development. The study will go some way towards meeting the recommendations contained in the Second Report of the Container Committee submitted in October 1967. The Committee recommended that Government should proceed with the planning and development of container facilities at Kwai Chung and that studies should be initiated into the means of financing such development. (Hong Kong Government Information Services)

Book on Bombay

The Kandla Commercial Publications, THX-12, Adipur, Kandla, India, published a hard-cover 168-page book titled "Port of Bombay" First Edition, November 1967 written in English by Mr. Satkartar Batra, at a price of Rupees 20-00 per copy.

The book has maps of Bombay and a 7-page history of the Port (Chapter I). Chapter II gives descriptions of the administration of the Port and the Port's commerce in 4 pages. It gives the import-export total (in thousand D. W. Tonnes) of cargo handled at bunders including mineral oil terminals as follows:

Year	Cargo
1962~63	9,033,986
1963~64	10,367,601
1964~65	10,018,785
1965~66	10,151,922

Subsequent eleven chapters give description of the Port, regulations and requirements, extracts from Dock By-Laws, agents requirements, details of docks wharves and bunders, services and facilities, charges for shipowners, shipmasters, importers and exporters. Chapter XIII gives traffic statistics, and the last chapter is a directory of Government offices, shipping companies, steamship agents, stevedores, freight brokers, other port-related offices, gardens, parks, museums, art galleries and other places of interest.

The book is recommendable to all those interested in the Port of Bombay and students of ports of the world. Apply to the publishers with payment.

'Unit' Method for Export Documentation

from

Melbourne Harbor Trust Port Gazette

August, 1968

The Australian Minister for Trade and Industry, Mr. McEwen, has announced moves which could have far-reaching effects on export documentation in Australia, and could be a development of major benefit to Australian exporters.

The moves, supported by the Export Development Council, are for the introduction of a series of standard aligned export documents—full details of which are contained in a publication of the Department of Trade and Industry called "Standard Export Documents".

Overseas countries which have already adopted the standard layout for trade documents recommended by the United Nations Economic Commission for Europe (E.C.E.) have reported considerable savings in documentation costs, and the possibility of using the E.C.E. layout as the basis for a standard series of export documents to meet Australian requirements is now being examined.

The Minister said that preliminary discussions held by the Department with organisations and government departments involved with export documents had resulted in a great deal of interest and support for the proposals.

Developments which have been taking place overseas in the use of standard aligned series of export documents have become widely known as the "one run" system. The advantage of this technique is that only one master document need be typed, which eliminates much of the repetitive typing and checking of individual forms.

The "one run" system is being used to advantage in many countries. Experience has shown that not only can the cost of completing export documents be reduced and their control and handling greatly improved but additional savings have also become possible because exporters and others can align and prepare their internal domestic documents in the same way.

Some firms overseas have reported savings up to 70% in the costs of export documentation.

For many years, one of the problems facing Australian exporters has been the variety of forms which must be completed for each export transaction.

An examination of a number of export documents will show that many of the details required are

common to each form. However, because each differs in size and layout, there has been no alternative but to complete each form separately.

The basic principle of standardisation is that as many forms as possible should be printed on paper of the same size and common items of information should occupy the same position on each form.

Sweden was credited in 1956 as being the first country to introduce a national standard layout for trade documents, particularly those used in the export trade. Denmark, Finland and Norway later also adopted a standard aligned series of documents.

Sweden brought the matter before the United Nations Economic Commission for Europe, and an E.C.E. Committee for the Development of Trade set up a working party in 1960 consisting of experts from European countries and the United States, and several organisations concerned with trade and transportation.

By 1963, agreement had been reached on a standard size for trade documents, and a layout considered suitable as the basis for the design of standard aligned series of export documents, including a standard "Bill of Lading" aligned to the E.C.E. key.

More than 200 shipping lines in various countries are reported to be using this standard bill of lading. This includes not only shipping lines in E.C.E. countries, but also lines in Africa and Asia.

A standard aligned series of export documents based on the E.C.E. layout key was introduced in the United Kingdom in 1965.

In the United States, a standard format for export documents is in use. It differs from the E.C.E. standard, but discussions are continuing with a view to bringing the E.C.E. and U.S.A. layouts into alignment.

Australia, Belgium, Czechoslovakia, Federal Republic of Germany, Bulgaria, France, Hungary, Israel, Italy, Netherlands, Poland, Rumania, Spain, Switzerland and Turkey are among a number of countries which have either introduced, or are working towards the introduction of a standard aligned series of export documents based on the E.C.E. layout.

In addition to documents used with sea transport, attention has also been given in the E.C.E. to documents used in connection with other forms of transport. A railways consignment note aligned to the E.C.E. layout has been recommended by the International Railway Transport Committee, and is likely to come into use in Europe in January, 1969.

An aligned road consignment note has been prepared by the International Road Transport Union (IRU) and will in all probability be introduced in Europe at the same time as the aligned railway consignment note.

The Department of Trade and Industry has been watching overseas developments in the use of standard external trade documents so that at the appropriate time consideration could be given to the question of a standard series of export documents to suit Australian requirements.

The forms which, subject to consultation with the parties concerned, could be considered for inclusion in a basic Australian series include the bill of lading; mate's receipt; export entry; exchange control; outward wharfage, certificate of origin, insurance certificate, insurance declaration, as well as some other forms.

Because of the support and interest shown in Australia and in view of overseas developments, the Department of Trade and Industry is now preparing a standard series of export documents aligned on the basis of the E.C.E. layout to meet Australian requirements and capable of being completed from a reproducible master document.

Sea-Land's New Service

Tokyo:—Sea-Land Service will initiate fully containerized ocean freight service from Japan to the United States, the Caribbean and Europe in early December, it was announced here Friday, Nov. 1 (Thursday, Oct. 31, U.S. Time).

Charles I. Hiltzheimer, Pacific group vice president, announced that Sea-Land containerships will sail every six days from Yokohama to Seattle, Wash., and Oakland, Calif. At those West Coast ports, the Sea-Land trans-Pacific service will link up with other Sea-Land services to provide containerized service to Alaska, Panama, Puerto Rico, Eastern United States and Gulf ports, Dominican Republic, Virgin Islands and European ports.

"Our Japan service is a logical extension of Sea-Land's existing transportation system," said Hiltzheimer, who was in Tokyo with a group of Sea-Land executives to announce the new service.

"It enables firms shipping from Japan to combine the economies of the world's 'water highways' with the convenience and flexibility of over-the-road pickup and delivery.

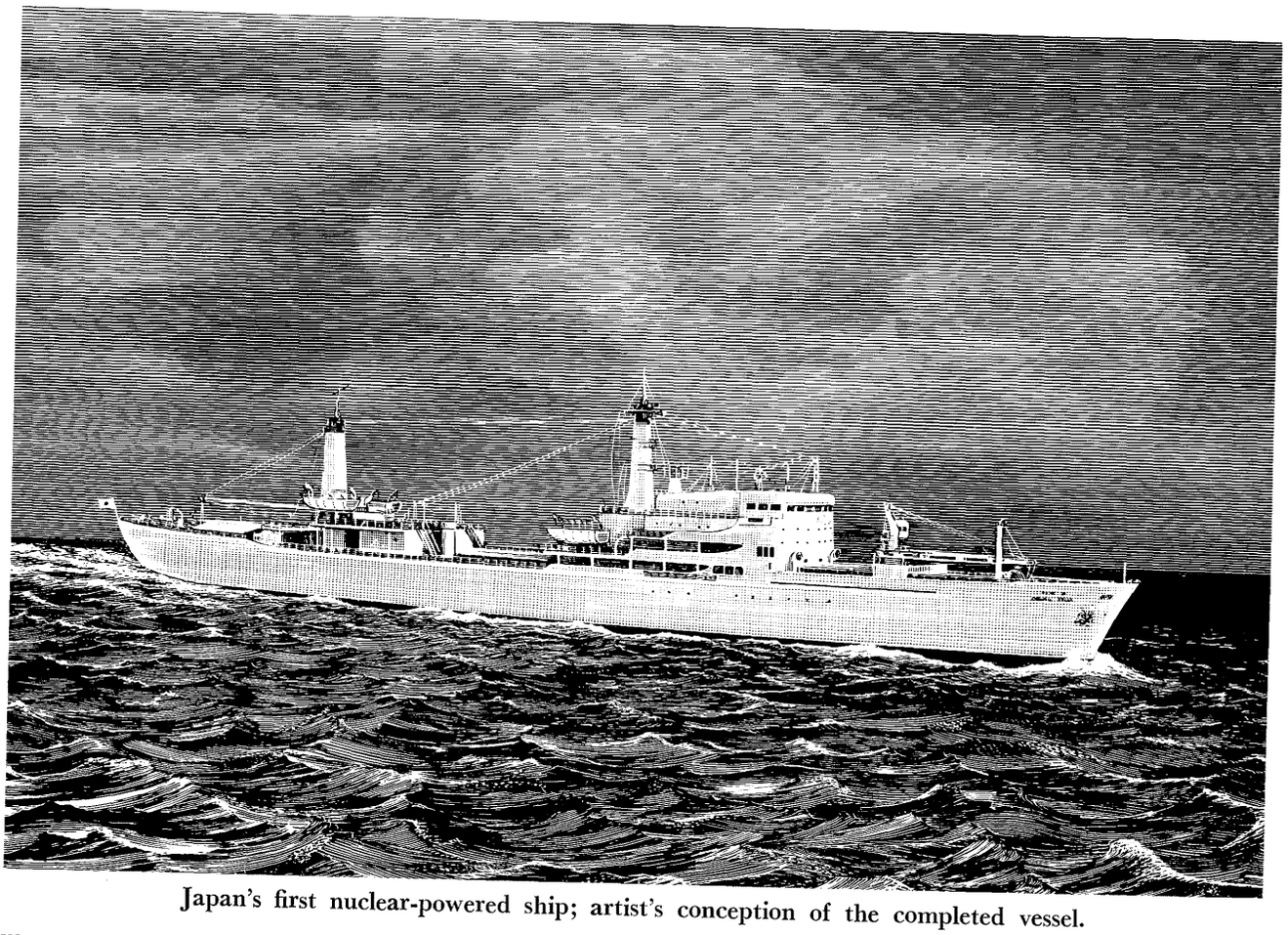
"One of our containers can be loaded and sealed in Japan and unloaded still sealed in Anchorage or Rotterdam, San Juan or Jacksonville, New York or Le Havre or any one of 12 other major world ports. And, of course, Sea-Land's deliveries extend far beyond those ports to inland cities."

Hiltzheimer said that eight containerships will be used on the service from Yokohama and that initial service will be eastbound only since the Sea-Land vessels are committed to hauling U.S. military cargo westbound.

The vessels on the Japan run include four converted C-4Js with capacities of 650 containers each and four converted T-3s, each with a capacity of 476 containers. Tentative plans call for extension of the service to Kobe, probably next spring.

Key Sea-Land executives involved in the new Japan service under Hiltzheimer are J. R. Pyron, general manager, Intercoastal division, Elizabeth, New Jersey; and, in Japan, H. L. Gilbertson, general manager, Far East; Horace B. Simi, Japan branch manager, and P. C. Clarke, operations manager.

Sea-Land's main corporate office in Japan is at 25 Yamashita-cho, Naka-ku, Yokohama. The Tokyo office is in the Shin Kokusai Bldg., 4, 3-chome, Marunouchi, Chiyoda-



Japan's first nuclear-powered ship; artist's conception of the completed vessel.

ku.

Pioneering the concept of integrated truck-ship containerization of freight handling in 1956, Sea-Land began full containership service in 1959.

Today, the company services the ports of Anchorage, Baltimore, Bremen, Cam Ranh Bay, Charleston, Danang, Elizabeth, Felixstowe, Grangemouth, Houston, Kodiak, Jacksonville, Le Havre, Long Beach, Mayaguez, Naha, Panama, Ponce, Rotterdam, San Juan, Stanto Domingo, Seattle, Subic Bay and, now, Yokohama.

Sea-Land currently operates 35 vessels and has six additional containerships in conversion with delivery planned for later this year or in 1969.

The company has more than 25,000 standard 35-foot containers in service. These include open-top, refrigerated, and insulated vans, car-carriers and tank units, along with standard dry vans.

Sea-Land Service, Inc., is a wholly-owned subsidiary of McLean Industries, Inc. (The Ranney Co.)

Japan's 1st Nuclear Ship

Tokyo, Nov. 27:—The keel-laying ceremony for Japan's first nuclear-powered ship has today been carried out at the No. 1 berth of the Tokyo Shipyard of IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) of Japan.

Ordered by the Japanese Nuclear Ship Development Agency, the ship's hull will be manufactured by IHI and the nuclear reactor to be installed in the ship, by Mitsubishi Atomic Power Industries, Inc. (MAPI). She will be the world's fourth nuclear-powered merchant ship, following the ice breaker "Lenin" of U.S.S.R., the cargo vessel "Savannah" of the United States, and the ore-carrier "Otto Hahn" of West Germany, which are now in service as nuclear-powered merchant vessels.

At present, a nuclear-powered vessel cannot compare favourably with a conventional turbine or diesel ship from the standpoint of operational costs, but it is expected that the "Nuclear Ship Age" will arrive in the future through developing the construction techniques and improving the economy of nuclear shipping.

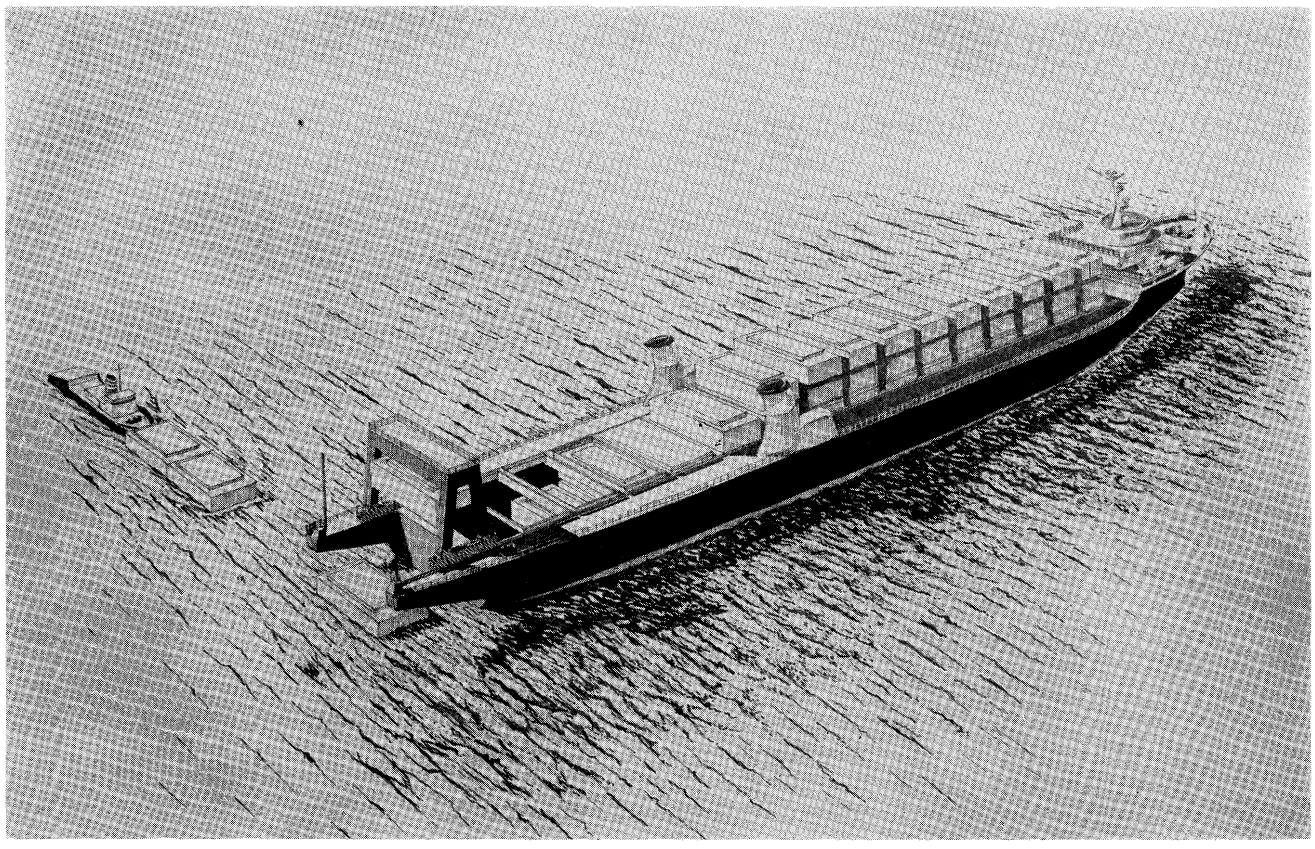
The new vessel is a nuclear-powered research ship to be built for the purpose of obtaining a thorough knowledge of the construction and operation of nuclear ships for the coming "Nuclear Ship Age".

By adopting a pressurized water reactor with a thermal output of 36MW which uses UO_2 as its fuel, the nuclear-powered ship can cruise for about 174,000 miles (equivalent to 7 times around the circumference of earth), at a service speed of about 16.5 knots, with only 2.8 tons of fuel.

Special attention has been paid in her design to safety measures, considering the nuclear reactor installation.

The ship's price, including that of the nuclear reactor, is 5,567,000,000 yen (US$ about 15,463,000).

LASH Ships Ordered in Japan



Her completion is scheduled for around the end of January 1972.

In addition to the ship's hull, the IHI contract includes a turbine, electric machinery, a reactor container and a secondary shield.

Outline of Japan's first nuclear-powered ship:

Construction schedule;
- Keel-laying: Nov. 27, 1968
- Launching: June 1969
- IHI delivery: May 1970
- Completion: Towards the end of January 1972

Contract price; 5,567,000,000 yen (US$ about 15,463,000), of which 2,897,322,000 yen (US$ about 8,048,000) will go to IHI and 2,669,678,000 yen (US$ about 7,415,000) to MAPI.

Principal particulars;
- Usage: Nuclear-powered research ship and cargo vessel
- Ship's type: Flush deck vessel
- Length, o.a.: about 130 m
- Length, b.p.: 116 m
- Breadth: 19 m
- Depth: 13.2 m
- Designed draft under full load: 6.9 m
- Gross tonnage: about 8,350 tons
- Deadweight tonnage: about 2,400 tons
- Service speed: about 16.5 knots
- Speed when auxiliary propulsion machinery is used: about 10 knots
- Cruising range under nuclear power: about 174,000 miles
- Complement: 59 crew and 20 research personnel, totalling 79 men
- Propulsion machinery: an IHI-made turbine (MCR 10,000 PS × 200 rpm, Nor. 9,000 PS × 193 rpm).
- Auxiliary boiler: An IHI-made, 2-dram water-tube marine boiler (18,000 kg/h × 30 kg/cm²G). (IHI)

LASH Ships Ordered

Tokyo:—Uraga Heavy Industries, Ltd. have concluded a contract to build a 43,000 DWT LASH (Lighter-Aboard Ship) type cargo ship with A/S Mosvold Shipping Co., Norway.

This vessel is of the same type as the first LASH ship for A/S Mosgulf Shipping Co., Norway, contracted in January, 1968. The first ship, whose keel is to be laid December 3, 1968, will be completed in September 1969, to become the first LASH ship afloat in history. The second ship is slated to be completed in mid-1970.

The principal particulars of the vessel are as follows:
- Owner: A/S Mosvold Shipping Co., Norway
- Kind of Ship: LASH type cargo ship
- Deadweight: 43,000 LT
- Length (b.p.): 234 m
- Breadth (m'l'd): 32.8 m
- Depth (m'l'd): 18.29 m
- Draft (m'l'd): 11.25 m
- Main Engine
  - Type: Uraga-Sulzer Diesel Engine 9RND90 1 set
  - M.C.R.: 26,000 bhp/122 r.p.m.
- Speed: abt. 20 knots
- Crane Capacity: 500 ton 1 set
- Berges: abt. 70
- Classification: Det Norske Veritas
- Delivery: Middle, 1970
- Hull No.: 928

370,000 DWT Tanker Ordered

Tokyo, Nov. 20:—IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) of Japan has today received an order for a 370,000 DWT super-mammoth tanker, from the Tokyo Tanker Company.

This tanker will be the world's largest, exceeding the 312,000 DWT tanker "Universe Ireland", the world's present largest ship, which was completed last September at IHI's Yokohama Shipyard for National Bulk Carriers, Inc. of the United States and is now in service.

To be built at the No. 2 building dock (Capacity: 400,000 DWT) of IHI's Kure Shipyard, she will be completed towards the end of 1971. After her completion, she will be engaged in carrying crude oil from the Persian Gulf to the Nippon Oil Group's Central Terminal Station (an oil storage complex) now under construction at Kiirp, in Kagoshima Prefecture, Japan.

The new super-mammoth ship will be capable of carrying about 470,000 kilolitres of oil, equivalent to about 2,350,000 drums (Net contents: 200 litres), in a single voyage.

IHI and Tokyo Tanker, for a long time, been examining various types of ship hull form in order to obtain the most economical hull form. For the new tanker, the companies have decided to use a hull form with a draft of 27 meters, which will be more economical than that of the "Universe Ireland".

Principal particulars of the ship are:

Deadweight tonnage: 367,000 LT
Gross tonnage: 185,600 T
Length, o.a.: 345.50 m
Length, b.p.: 330.00 m
Breadth: 54.50 m
Depth: 35.00 m
Draft: 27.00 m
Main engine: one turbine
M.C.R.: 40,000 PS × 90 r.p.m.
Service speed: 14.5 knots

(IHI News)

Record Unloading

Liverpool:—Liverpool dockers unloading timber have been setting new records for their rate of work. Packaged timber unloading began at the specialised berth on the north side of Canada branch dock No. 3 in August 1966. Then in the 16 working days from June 2, 36,000 tons of timber were unloaded from three ships using the berth.

The first, the **Chennai Ookkam,** carried the largest timber cargo ever to arrive in Britain. Nearly 13,000 tons were unloaded from her in four days.

On June 7, the **Eva Brodin** began discharging 9,000 tons of packaged timber and this work was completed early on June 12. Immediately after this the **Captain Damosthenes** arrived and completed the discharge of 11,250 tons of packaged timber and 2,750 tons of plywood.

The Mersey Docks and Harbour Board point out that these large timber carriers followed each other to the berth without causing any congestion at the quay. This proves that the branch dock can easily handle large amounts of timber continuously. The unloading rate reached during work on the **Eva Brodin** was the highest average rate achieved since these packaged timber operations began nearly two years ago. (Port of Liverpool Bulletin)

London Office Moved

Liverpool, September 23: — The London Office of the Mersey Docks and Harbour Board has moved to 39 Pall Mall, London S.W. 1.

The new telephone number of Mr. Erik Hampson, London Representative, and Mr. Peter Duff, Press Consultant, is 01-839-6931, Telex 263086. (Mersey Docks and Harbour Board)

USL Containerships

Liverpool: — The United States Lines vessel "American Resolute" (13,264 tons dead weight), the first ship in their "all container" service to Liverpool, arrives at the Port today (October 2nd). This vessel has two cellular hatches and has a capacity of 350 containers. With the "American Rover" she will provide a weekly service from the United States to the £1 million Gladstone Container Terminal. These two ships will maintain the service until the fully cellular "Lancer" class ships come into use late in November. The Gladstone Container Terminal, which was first commissioned in May, will serve Liverpool's main container traffic until the £32 million Seaforth Dock is completed, early in 1971.

A spokesman for the Mersey Docks and Harbour Board said today that these container facilities at Gladstone Dock had excited world interest and every day new enquiries were being received from prospective users. Negotiations are in progress regarding further services which will be announced soon.

The equipping of the Terminal is now in its final stage. The first of the Stothert and Pitt 35-ton transporter cranes is working and the second will be commissioned next month. A new single span transit shed with an area of 45,000 sq. ft. is already playing a significant role in the speedy reception and delivery of cargo. (Mersey Docks and Harbour Board)

Strike Called Off

London, November 21:—London's 1,400 tally clerks have called off their strike which was timed to begin at 08 00 hrs. to-morrow. They have accepted an assurance from the employers that following to-day's meeting of the London Port Modernisation Committee there would be an employers committee with power to negotiate a new productivity agreement with the tally clerks.

This means that to-day's meeting of the modernisation committee will be held without the threat hanging over it of a full scale stoppage in the port of London.

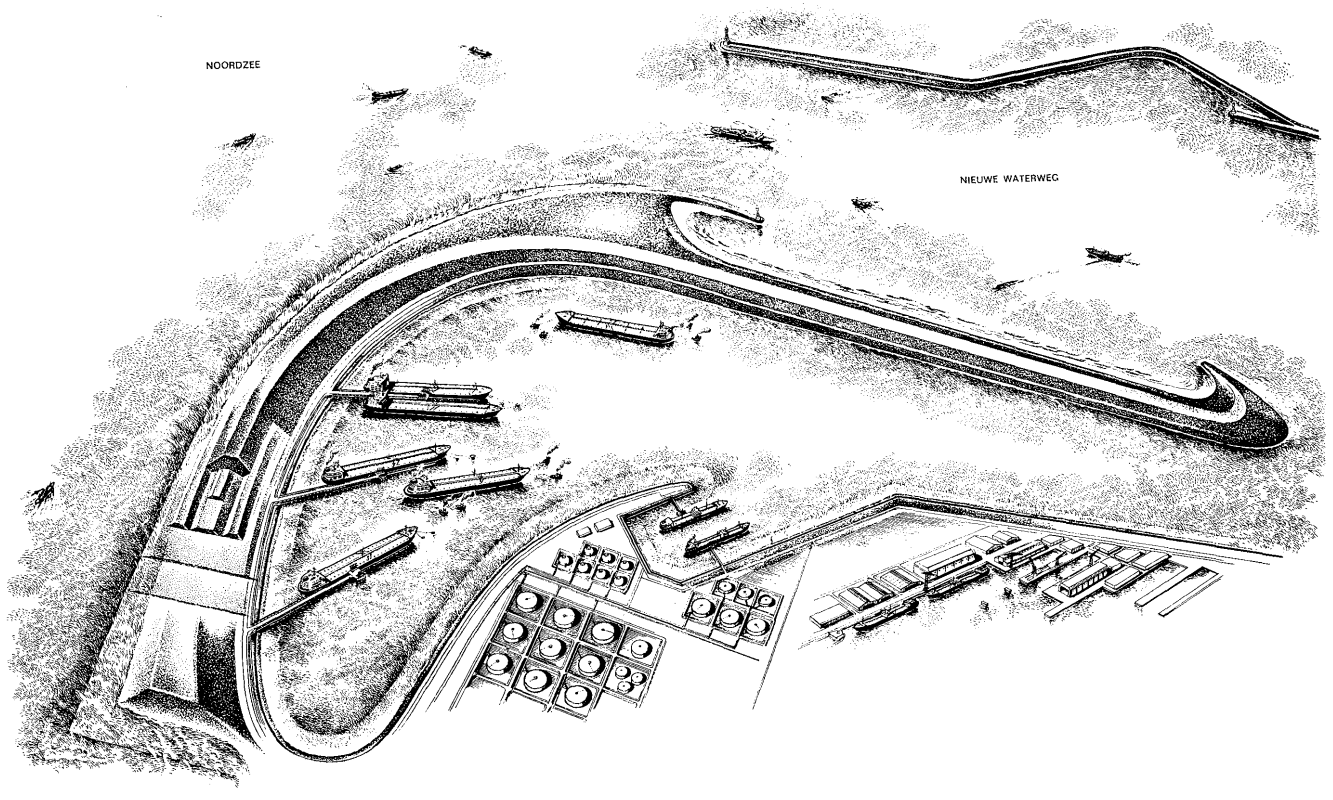
The tally clerks' decision was made at a joint meetin of representatives of the Transport & General Workers' Union and the National Amalgamated Stevedores & Dockers yesterday at Poplar.

To-day, the London port employers are putting to the three dock unions in London their proposals for Phase Two of decasualisation.

These proposals are expected to include the abolition of piecework, the introduction of shift work in London and the raising of the dockers' weekly rate to more than £22.

But in return the employers are

6 Berths for 500,000 Tonners



A glimpse of the future, which is so near: super tankers berthed in the newest Rotterdam harbour area, built into the sea. As comparison, note the sizes of other merchant ships on the New Waterway and those of the oceangoing tugs which assist the super tankers. It is also interesting in this respect to project the super tankers against the oil-storage tanks (of normal size) in the foreground. (Rotterdam-Europoort-Delta 1968 No. 3)

expected to ask for some major concessions from the men.

They are understood to want more flexibility of working from the dockers, and for the men to give up most of the restrictive practices which, they claim, have held up increased productivity since decasualisation. (Lloyd's List)

Container Crane at Hull

London:—The new £6.75 million South East Arm extension to Hull's deepwater King George Dock, due for completion early in the new year, is to have a 40-ton container transporter crane to enable the port to meet the demand which exists from would-be container service operators, says the British Transport Docks Board. Authority for the provision of a crane capable of lifting containers of any size up to a maximum of 40 ft. and weighing up to 40 tons was announced at the monthly meeting of the Docks Board in London yesterday (Tuesday, November 19th).

The new crane, for which tenders will be invited shortly, is to be installed on the South Side of the new dock extension, where a 50 ft. gauge crane track was incorporated in the quay during construction and where some 28 acres of paved standage will be available for container marshalling.

The new crane is expected to be operational early in 1970.

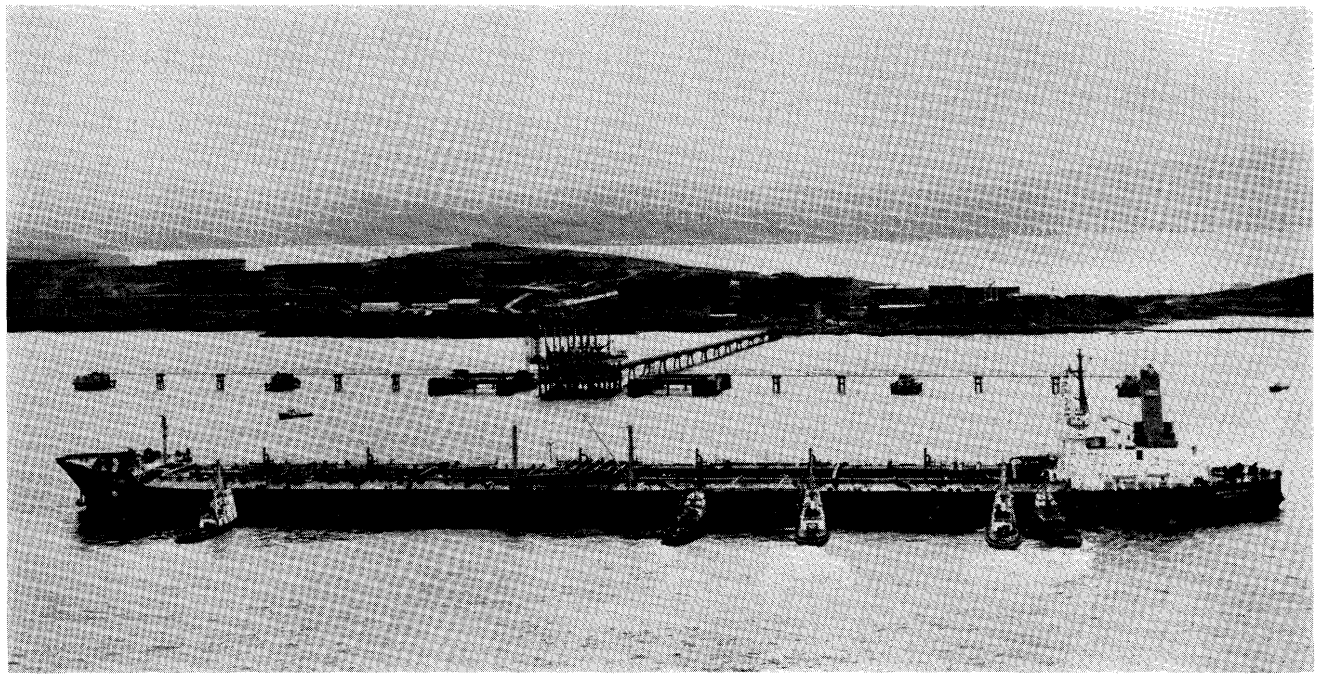
"From the enquiries which have been received, it would seem there is considerable interest in the possibility of operating container services from Hull," said a Docks Board spokesman, "and the container berth will be capable of accommodating the largest class of vessel able to enter King George Dock, up to 25,000 tons.

"Already Hull has achieved a prominent position for container and unit load services in the short-sea trades as a result of its favorable geographical position in respect both of sea routes and economic hinterland. To date the Docks Board have provided specialised terminal facilities at Hull for seven such services and with 24 sailings a week the port expects to handle nearly a million tons of unit load traffic this year. (British Transport Docks Board)

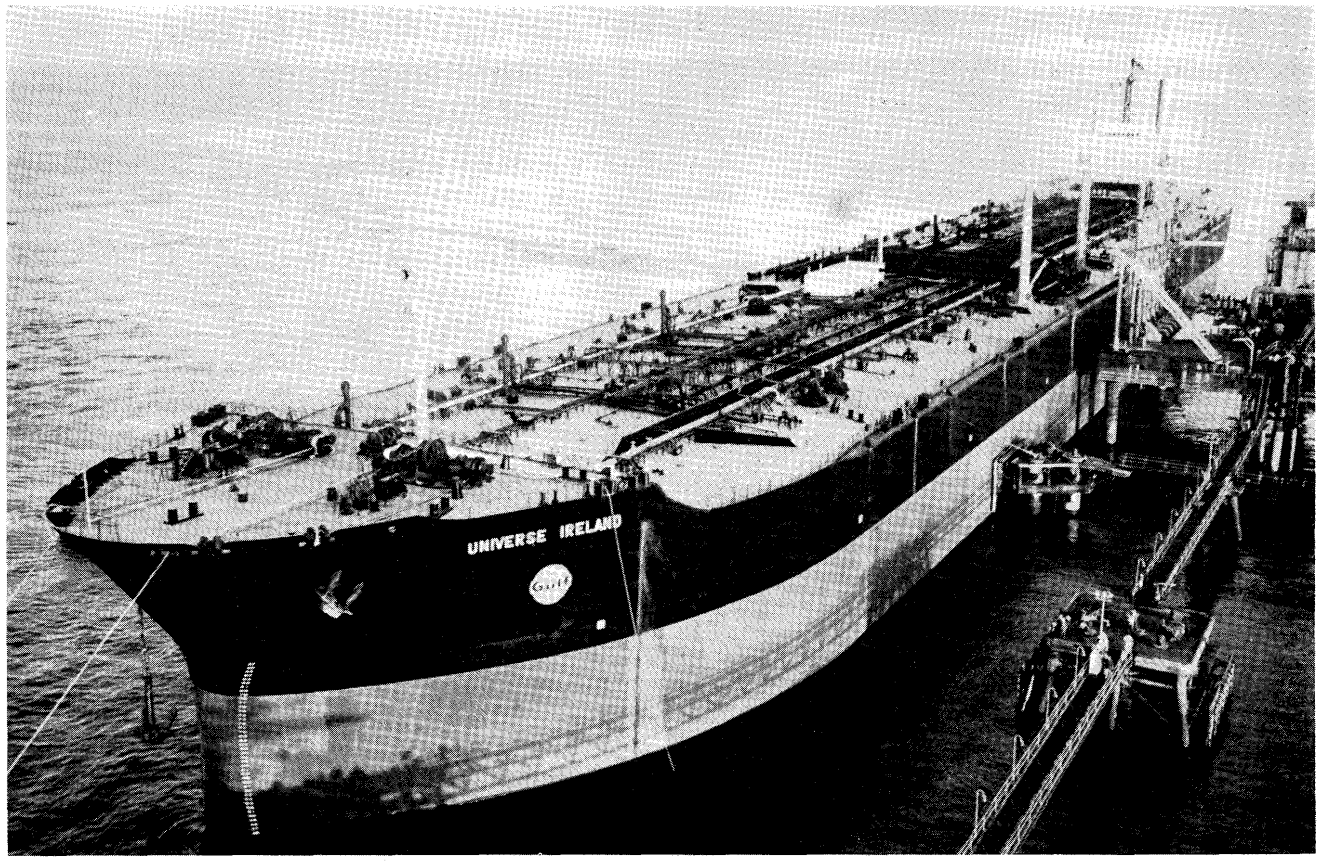
Correction

In Ports and Harbors, November issue on page 18, the title of Table-2 was noted down as Main Particulars of Kokuei-Maru, when this should be corrected to Main Particulars of Kokuei-Maru No. 2.

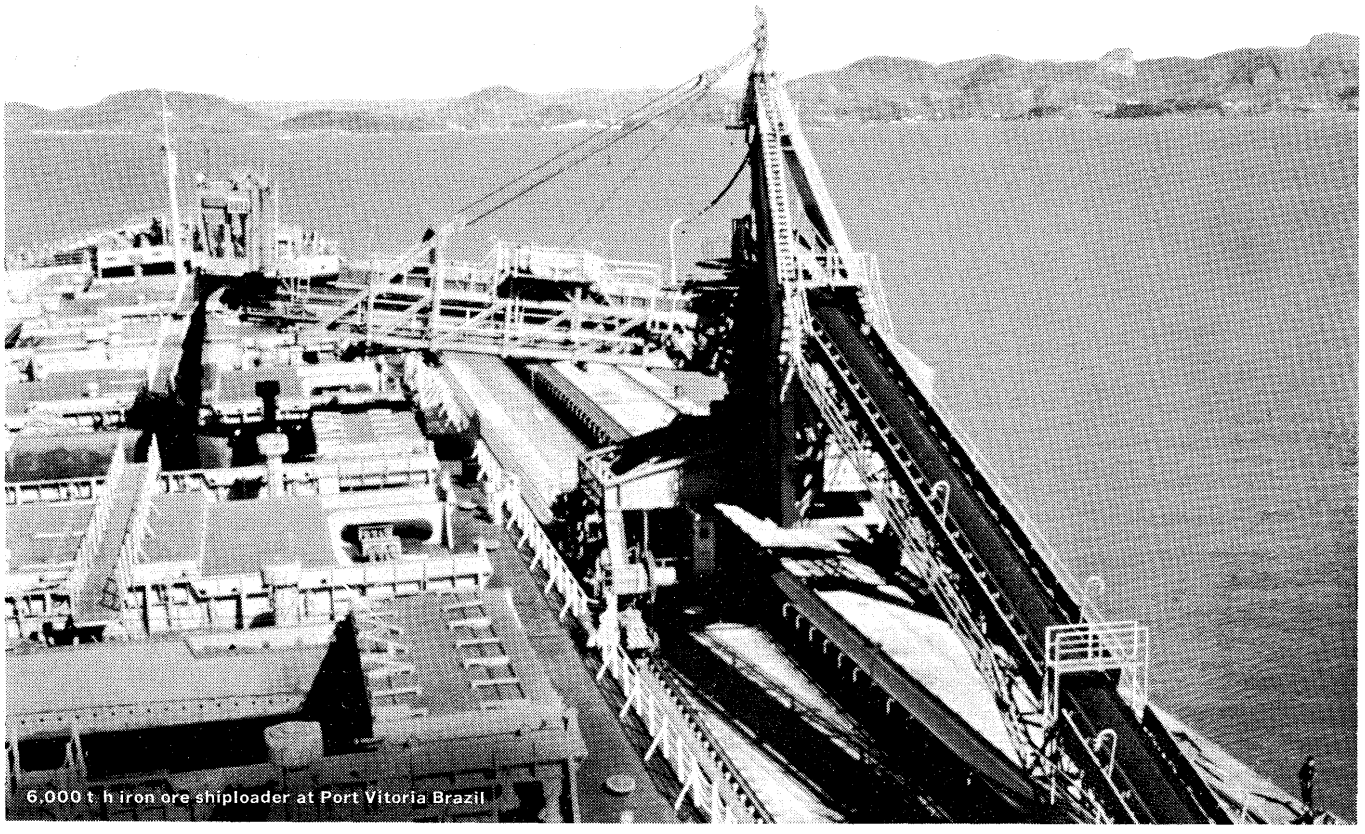
The Bantry Bay Oil Terminal in Action



The world's largest tanker, 312,000 dwt "Universe Ireland", arrived at the Gulf Oil's central terminal station in Bantry Bay, Ireland, October 29, 1969. Above, the tanker is seen being pushed shoreward to the special dolphin jetty. Below, she is seen securely moored just before unloading.



We cover the waterfront



6,000 t/h iron ore shiploader at Port Vitoria Brazil

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As builders of the world's largest tanker—the 210,000 DWT "Idemitsu Maru"—we know quite a bit about what goes into super tankers. We'd welcome the opportunity to show you we're quite knowledgeable about how things should come out of them as well.

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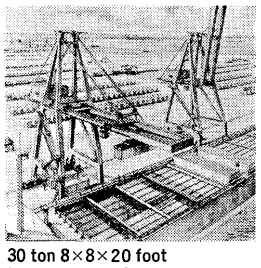
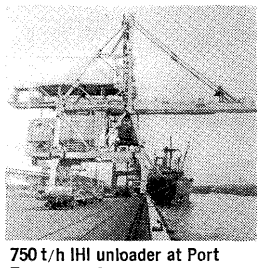
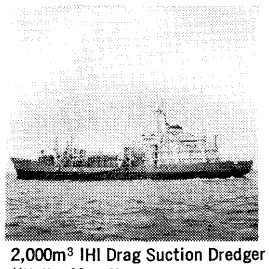
Twenty-five IHI wharf cranes at Calcutta Port, India



30 ton 8×8×20 foot IHI shore container cranes



750 t/h IHI unloader at Port Tacoma, U.S.A.



2,000m³ IHI Drag Suction Dredger "Kaiho Maru"

/0 t/h portable air conveyor

IHI

Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

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