Managing Change: The Organisation of Port Authorities at the Turn of the Twentieth Century

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On 4 November 1913, Anthony George Lyster, the newly-installed President of the Institution of Civil Engineers (ICE), rose to utter the traditional thanks to his distinguished predecessor and equally conventionally to express doubt that he merited the honour bestowed upon him.[1] Lyster then delivered his Presidential Address, one of very few on dock engineering. It is an interesting document, for he had recently retired as Engineer-in Chief to the Mersey Docks and Harbour Board (MD&HB) and thus possessed a great deal of up-to-date knowledge with comparatively few constraints on its use.

The topic was one which many engineers would have felt compelled to avoid, for the preceding twenty years or so had been extremely problematic for the port services industry, both in Britain and overseas. The 1890s was marked by a relative stagnation of revenues for many ports, a phenomenon that coincided with an acceleration in the increase of the sizes of both average and exceptional ships and hence increasing pressure on authorities to modernise or expand their facilities.[2] In Liverpool and Bristol this led to a great deal of expensive digging and soaring debts, while in London it brought on the effective collapse of the port when its constituent companies were unable to raise new capital.[3] It had been a fairly well-kept secret that the MD&MB was on the brink of collapse between 1900 and 1905 for the simple reason that Lyster was spending, and needed to spend, more than was readily forthcoming from either old-style dock bonds or debentures.[4] Even in 1912, when the crisis had largely passed, the Board appointed a special committee to examine its expenditures in minute detail and recommend ways to reduce them. Indeed, one of Lyster's staff was required to calculate the saving that would be effected by painting rather than polishing the copper pipes in the gentlemen's urinal at Riverside Station.[5]

Such difficulties in long-established ports were bound to cause controversies over the best form of port organisation. In Liverpool, for example, the argument was advanced that the problems arose because the Dock Board was aloof, unaccountable and unresponsive to the needs of its customers.[6] When the port had been run by Liverpool Corporation, as it effectively was from 1709 until 1857, it had been immensely prosperous. Indeed, the reason the Board had been formed was jealousy over the profits

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the Corporation made from the docks. To some people, who believed that the docks could once again be prosperous, the obvious solution was to remunicipalise the waterfront. The Corporation even had as its City Engineer a man who had served under G.F. Lyster, the previous Engineer-in-Chief.[7]

Such a suggestion sounds far-fetched, since the Corporation's officers and members did not have the skills or knowledge to run a great port. But the Councillors could be forgiven for viewing matters differently. They had, after all, known little or nothing about either electricity generation or tramways before municipalising them. Both services involved multi-million investments, and because local authorities were able to borrow money at three percent or less, the services yielded a return on capital of between two and three times the interest cost.[8] It was that supposedly unfair advantage of being able to borrow cheaply which gave rise to some noisy objections to the principle of municipal trading, with particular reference to the supply of gas and electricity, in many parts of the country. This may have resulted in part from the hostility which some of the press exhibited to local government: in addition to the critics who regarded municipal trading as unfair competition, there were those who thought it grossly inefficient.[9] The *Daily Mail,* never slow to invoke xenophobia, explained how loss-making municipal enterprise "at once stimulates foreign competition and depresses British manufacturers." The paper also alleged that apparently profitable ventures like Liverpool Tramways only appeared so through misleading accounting methods.[10] To some, local government was in the wrong whether it made or lost money.

Another of the controversies in this troubled period was the relationship between ports and railway companies. In 1830, the Liverpool and Manchester Railway had operated its own omnibus from the town centre to the original passenger terminus at Crown Street, and from then on railway companies consistently had been eager to integrate other services into their systems. Their enthusiasm for buying up canals led to a string of Parliamentary measures to prevent the suppression of competition, and they moved into the ownership of connecting shipping services from the 1840s onwards.[11] The ownership of ports by railway companies had been no less controversial, and their attempts to build ever-greater transport empires were among the causes of the waves of enthusiasm in the early 1840s and the late 1860s for nationalising the railways. When Lyster spoke in 1913, the nationalisation lobby was on the march again.[12] Its reasoning was grounded not in socialism but in resentment at the power of railway companies and a distrust of the purposes to which that power was, or might be, put.

The majority of Presidential Addresses to the ICE were pretty bland, often taking the form of reviews of recent progress in some branch of engineering or addressing mainly internal problems, such as professional training. Lyster's paper is mildly unusual in looking outwards, and highly unusual in discussing controversies relating to the politics of engineering. His comments on the railway industry were, coming from the President of the senior engineering institution, unprecedented.

Lyster divided the various "constitutions" of port authorities into private ownership, public dock companies, railway companies, municipal corporations, trusts or commissions and governments with, as an afterthought, a mention of canal companies. This diversity, he implied, indicated that port management had not "been based on any common conception or standard of suitability, but that, on the contrary," authorities had developed differently in response to local and short-term needs, "resulting in extreme cases...in an absolute contradiction of basic principle." This apparently damning criticism was tempered by the admission that in many cases this rather random evolution had led, through trial and error, to perfectly good solutions. He then considered the various forms of "constitution" in turn, though not under the headings he originally gave. Briefly, dock companies were a valid form of operation in special circumstances, such as the handling of a specific single export or where, as in the case of the Manchester Ship Canal, "local patriotism and enthusiasm" were the main criteria. The collapse of London proved that dock companies were no longer an effective way to run a large general port. Unfortunately, Lyster failed to state the basic principles which were being absolutely contradicted.

Municipal corporations also got fairly short shrift: their members did not necessarily represent port users and may indeed have represented "hotel proprietors, warehouse owners, carters, general labourers and others, [who] use all their influence to maintain some antiquated and costly system of working which favours their callings, but which is directly opposed to the interests of the port and its clients." Moreover, municipal boundaries could be a serious hindrance by becoming a key determinant of the location of docks, a decision he believed should be influenced only by engineering or commercial considerations.

Towards railway-owned ports Lyster was, as might be expected, fairly cool. The ownership of docks by railways enabled unfair competition with single-purpose port authorities, which "presents no economic advantages to the traders or country at large." He admitted, on the other hand, that for some trades the railway companies could provide a better service than anyone else: the companies should definitely not be prevented from owning docks, but they needed to be subject to "proper safeguards."

The discussion of trust-owned ports adopted a completely different tone. Trust ports handled forty percent of the trade of the country, and did it well because, unlike all other forms, trusts represented the interests of everyone who might benefit from the success of the port, whether as shipowners, merchants or suppliers. Members of trusts were gentlemen of "high character and ability" who earned no payment or other direct benefit from membership, but to whom there would be significant indirect benefits from the successful running of the port.

Three pages were devoted to "Continental Management of Docks and Harbours," in which Lyster explained that with a few exceptions the continental practice was for ports to be publicly controlled, whether by a municipality or a provincial or national government. Such bodies suffered from about every possible disadvantage, in that they were run by amateurs not directly accountable to users, and who thus accumulated excessive power which they used unwisely under "political and partisan influences." It is not unreasonable to assume that, released from the responsibilities of his Presidency, Lyster might have added "but then what could you expect from those foreign Johnnies?"

The fact is, of course, that not all major European ports were as underdeveloped as Lyster implied. In 1892, for example, Antwerp's tonnage was only marginally over half that of Liverpool, but by 1912 it slightly exceeded it, and Hamburg had overtaken Merseyside with equal rapidity.[13] Both these ports were, by Lyster's reckoning, administered and funded in a manner which should have been stultifying: by a combination of local and national government acting to some extent on the advice and lobbying of local commercial interests. The reasons for these successes lay in part in the extremely rapid industrial growth of their hinterlands rather than strictly in internal factors, but the fact remains that a number of new ports had sprung up in Britain at various times because such inland growth was being ill-served — or thought it was — by existing ports. Examples include Birkenhead, Immingham and, perhaps above all, Manchester. All were initially unsuccessful, indicating that demand from the hinterland was only one factor that encouraged the growth of ports.

Although Lyster's address was described above as unprecedented by virtue of where it was delivered, outside of this it was nothing of the kind. The issue of how best to run ports had been well aired as a result of the London Docks strike of 1889, when Thomas Mann had mooted the benefits of a unified port authority, an idea subsequently adopted by others. In August 1892, *The Times* published a substantial three-part article on the subject in which almost everything Lyster said was anticipated.[14] The strike had also been a consideration in the 1889 proposal to build the Imperial Docks. This was more than a dock construction scheme: it also involved the invention of a completely novel way of financing and managing a facility.[15] These docks would offer only appropriated berths and the rent would be the only charge. Tenants of berths were to be responsible for loading and discharging, and the Authority would exist only for property maintenance, operation of railways, gates and bridges, and the provision of hydraulic power. It sounded wonderful: the simplification of administration would radically reduce costs and users could choose their level of service. Long-standing port users' grievances, like those produced by the Liverpool master porterage system, would simply vanish.

If there were a widespread belief that services could be provided at virtually no cost to the user — and the Imperial Docks scheme were just another failed manifestation of this view — who would be responsible for directing ship movements to and from the berths? Without an authoritative harbour master with staff spread around the system, each high tide would have produced mayhem as individual captains jockeyed for position. Without a high-powered traffic manager, who would have resolved the endless disputes between shippers and consignees? In Liverpool, as in other ports, a large number of staff was involved in trying to get users, for example, not to obstruct each other's working space.[16] Of course, port authorities could seem ponderously and expensively bureaucratic, as indeed some were, but the simplistic approach of abolishing entire departmental functions neglected entirely to consider why existing systems had evolved as they had.

In 1884, the construction commenced on the new Kidderpur Docks at Calcutta. They comprised a large, ambitious and extremely well-equipped system. The port had been constituted as a trust in 1870, after which constant minor improvements took place until the major project was launched. The main wet dock, of 34.5 acres, provided a minimum depth on its sills of 19.5 feet at low-water spring tides in the dry season. There were impounding pumps to raise the water level artificially, fifty-six movable hydraulic cranes, eleven hydraulic capstans and a 100-ton steam sheerlegs. All the quayside and shed lighting was by electricity; it was, in short, the sort of provision that an accountable body of local merchants and shipowners would be likely to devise.[17] But whether it was wise or necessary to provide all that handling machinery in a locale where labour was cheap was a question which might have been answered differently by another type of authority, as it was at Singapore, where no general cargo cranage was installed.

Bombay provides another striking example of the perceived merits of trust management. The need for a proper wet dock system had been suggested as early as 1857 as part of the Mody Bay Land Reclamation Scheme.[18] A succession of plans came and went over the next decade, by which time the potential of the Suez Canal for direct steamer services between Britain and India was apparent. Even so, nothing happened because private developers and the Indian and Bombay governments could not agree on the size and scope of development — or even, at times, whether any development was necessary. In 1873, the Bombay Port Trust was formed, and in 1875 it received a loan (part of which was interest-free) of 7.5 million rupees from the Indian government. It is interesting that one of the original members, said to have played a leading part in its establishment, was Henry Coke, who later (1885-1892) was a member of the MD & MB. By 1888 the scheme was virtually complete; the critics who had said that wet docks were unnecessary were confounded by the fact that around close to half the shipping entering the port used them rather than the tidal wharves or *bunder*.[19] The trust did not seek to make a profit, but only to raise enough in port dues to operate and maintain the port, pay interest charges, and retain about 100,000 rupees per year for improvements. Members of the trust were nominated rather than elected, and were mainly in either shipping or local trade, several of the latter being wealthy Indians. The port trust appears such a good mechanism that it could survive being dismantled and re-erected in India.

Nearer to Liverpool, Leith provides another example. Long a rather neglected satellite of Edinburgh, an improvement programme was actually in hand when, after the defeat of a suggestion to establish a joint-stock company, the Docks Commission was first set up. It was the happy accident of Edinburgh's insolvency in 1833 that prepared the way for Leith to become an independent burgh, and in 1838 the Docks Commission was given a new statutory constitution which included a stipulation to gladden Lyster's heart: members of both Edinburgh and Leith Councils were barred from serving as Commissioners. There followed a period of enthusiastic construction under James (and later Alexander) Rendel, which included some adventurous technology — the Prince of Wales graving dock employed a centrifugal pump as early as 1863.[20] Extensive improvements to the Clyde and the Tyne were also credited to trust management.

One could go on: the Port of Bilbao got itself into a fairly severe financial mess from which it was released by the establishment of a trust in 1878; exports increased more than four-fold within the next decade.[21] In Singapore the Tanjong Pagar Company built the deepwater wharfage, but in 1907 "a Dock Board...[was] established on lines somewhat corresponding with the Mersey Docks and Harbour Board" and major developments followed. Back in Britain, Blyth exhibited a rags-to-riches story which began with the failure of the Blyth Harbour Docks and Railway Company in 1862; in 1882 the Blyth Harbour Commission was formed, and coal shipments rose from 146,264 tons in 1883 to 1,018,355 tons in 1887.[22]

Lyster was thus not being nearly as controversial as he may have appeared at first. By the time he spoke, the statutory trust was not merely a well-accepted form of administration, but a thoroughly orthodox one. It had a world-wide track record of success, and while it might be going too far to suggest that it was viewed as a panacea for administrative problems, engineers and shipowners certainly leaned in that direction. Both had their reasons for this, centring as one might expect on money.

In a previous paper I looked at the enthusiasm with which shipowners ordered ever-larger and more efficient ships, which in turn enhanced their profits at the expense of port authorities.[23] This reached the truly ridiculous situation where investment in dock modernisation by a port authority could so increase efficiency that the larger tonnage of goods handled actually brought a decline in revenue because the net register tonnage of the ships carrying it went down. It stood what one imagines as being the economics of port investment on its head.[24] The result was that it was only possible to satisfy the modernisation lobby by incurring constantly increasing debts which would never be extinguished from revenue and were bound to become increasingly difficult to service. There was a persistent failure to recognise — or at least to admit — that the majority of new investments in dock construction had a typical life of only about twenty years. After that, they required either major modernisation or designation for use in those less lucrative trades that did not demand new facilities.[25]

The interests of civil engineers were just as simple and direct. When James Charles Inglis gave his Presidential Address to the ICE in 1908, plans were in hand for the construction of its new building, and he mentioned the number of members the ICE had at the various dates at which it had previously outgrown its home: in 1838, 238 members; in 1868, 1681; in 1896, 6906; and in 1908, 8555.[26] When we take into account the arrival of rivals over the period, it was astonishing growth. It was (and is) characteristic of civil engineering that virtually none of the big jobs were done for ready money, so engineers shared with shipowners a direct financial interest in capital debt. We should note particularly the growth in the ICE's membership between 1868 and 1896. During that time the two old bulwarks of the profession, canal and railway construction, had largely collapsed, so what were all these engineers doing? Many were working overseas, building railways and canals anywhere people would pay for them. The changes in shipping, however, meant that the number of dock and harbour projects worldwide expanded dramatically.[27] A simple yardstick is the Cumulative Index to the Minutes of the *Proceedings* of the ICE: between 1837 and 1879 there are four pages of entries for docks, while between 1880 and 1894 there are ten.

There was, however, an inherent logical flaw in the arguments advanced in favour of trusts. The M D & M B normally was cited as the leading example of the benefits of the trust system, most particularly in evidence before the Royal Commission whose report eventually led to the establishment of the Port of London Authority. The examples above all relate to ports which were doing badly and whose fortunes were improved by the establishment of a trust. This was exactly what did not happen at Liverpool. The years leading to the formation of the M D & M B were marked by quite astonishing success in the growth of trade and investment in new facilities.[28] The docks were technically the property of the trustees, who were the members of the Liverpool Corporation, but virtually all the powers of the trustees were delegated to the Dock Committee, of whose twenty-five members, thirteen were Councillors and twelve were elected by the users of the port. The reason for the establishment of the Board lay in the agitation of a number of groups which came together in a temporary alliance. There was the group that owned land in Birkenhead and wanted to develop the bankrupt docks which had been partly built there. There was the railway interest, headed by the Great Western Railway, which wanted facilities not controlled from Liverpool. Finally there was the Manchester interest, which principally wanted lower port charges. The problem with Liverpool docks was not that they were inefficient, insolvent or ineffectually managed, but exactly the contrary: they were highly successful, expanding rapidly and making a good deal of money. The one attempt at competition failed, so jealousy of Liverpool's power and success demanded that where rivalry did not work, Parliamentary aid must be sought.[29]

Partly through being forced to adopt 160 acres of part-built, unnecessary and uneconomic docks in Birkenhead, the Board was never actually able to continue the success of the old Dock Committee.[30] Its rate of growth and share of the world market for port services both fell. The reasons for this are complex and have been investigated elsewhere; for present purposes it is only necessary to recognise that the historical argument that trusts succeeded where municipalities failed is disproved by exactly the example assumed at the beginning of the century to be the definitive proof.[31]

Examples can also be produced in favour of railway management. The Port of Southampton had a Harbour Board, constituted in 1803, which witnessed failures by the Southampton, London and Branch Railway in 1832 and the Southampton Dock Company, which built its docks in 1842. Misled by the usual optimistic idea that docks last forever, they made no provision for modernisation, with the result that the port was in a pitiable state in 1892, when the London and South Western Railway took over. It gained its Act enabling it to make the purchase, against the determined opposition of several other ports, on the basis of a promise to invest a great deal of money. It kept its word and rapidly turned Southampton into a high-profile world port.[32] Railway companies were so large that even the amounts of capital needed for serious port improvements were comparatively easy to find. On the Mersey, for example, there was even an instance of a small railway-owned coal dock being built without needing Parliamentary authority: the Cheshire Lines Committee succeeded in buying a small estate at Otterspool which provided all the land needed, and it completed the work without raising any new capital.[33] At Hull it was railway capital that allowed the construction of the new deepwater docks.[34]

The true reason for preferring trust to railway ownership has already been touched upon. The very qualities which could make railway companies successful port owners — wealth, power and ability to provide integrated services — made them disagreeable to port users and the rest of the industry. There is no doubt that railway companies adjusted their freight rates to subsidise the operation of their own ports. When the promoters of the Manchester Ship Canal gave evidence as to the excessive charges made by the port of Liverpool, the invidious comparisons mainly featured Garston, Fleetwood and Heysham, all railway-subsidised specifically to compete with Liverpool.[35] It had been public knowledge since 1867, when the Royal Commission on Railways made its enquiries, that railway companies were willing to carry goods at a loss to damage competitors and that this applied to ports just as to trains.[36] The Mayor of Hull gave a graphic illustration of the fears of non-railway ports when he pointed out that the North Eastern Railway effectively controlled every port from Newcastle to Berwick and was attempting to gain control of West Hartlepool. Its capital was £30,000,000, so that the foregoing of 0.25% of dividend for one year would produce £75,000, "with which they may crush any number of men who may attempt to oppose them," using what we now call predatory pricing.[37]

The existence of large stretches of coast where all the ports were controlled by a body of such wealth was clearly perceived as against the interests of many of the customers. They were not so stupid as to fail to see that cut prices today might mean monopoly power tomorrow. In short, opposition to railway ownership really falls into the same category as opposition to the Liverpool Dock Committee: it was prompted not by failure but by success, not by admiration but by envy and fear.

If trusts were indeed sometimes advocated as much for their weaknesses as their strengths, they must nonetheless have offered positive benefits. They appeared to offer a high degree of accountability to their customers and thus to maintain a high overall efficiency in the ports they controlled. Pleasing the customers was effectively the only equivalent of what we now call a "mission statement" in the Act which established the MD&MB, and the way to please them was by having them comprise the majority of the governing body. The members, having no interest except to provide optimum service at minimum price, would do so or answer to the dock ratepayers who elected them. As we know, it simply did not work like that: the MD&MB was bombarded with complaints and frequently divided by strife between different interest groups within its own membership. When there were bitter clashes between, say, the cotton and timber trades outside the Board, their representatives would be failing in their duty if they did not reflect those clashes within the Board.[38] That was one area in which members were generally very conscientious. But if we consider what the reaction of the merchant community would have been to a Board comprised entirely of shipowners, or *vice versa,* we can see the benefit of the representational arrangement of a trust.

The standard of management achieved by trusts was variable, not only from place to place but also from time to time in the same port. The reader will by now understand that the favour in which trusts were held actually had little to do with their managerial effectiveness. During the second half of the last century it became impossible for a typical British port to break even.[39] This was quite simply because the pace of change was so rapid that there was no possibility of extinguishing old debts before incurring new and larger ones. The choice lay between increasing corporate debt, subsidy of port facilities from sources other than port revenue, or losing the more glamorous and lucrative trades to other ports. The situation was not peculiar to Britain, for several leading northern European ports were publicly subsidised. The leading Indian ports were unusual among modern steamship harbours in producing a reasonable return on capital, but rather special circumstances applied in that the main ports were so far apart as to hold effective local monopolies.[40] The steamship owner who did not like the dues in Bombay was unlikely to take his business to Calcutta instead.

It is increasingly clear that the main purpose of a port trust became, even if it had not always been, the borrowing of long-term capital at reasonably cheap rates. The qualities needed in members, and the way in which they conducted their business, were not therefore necessarily the same as those required for the successful operation of a port. In particular, a reputation for reliability and financial probity was essential. The idea of the MD & MB defaulting on interest payments in the way the Manchester Ship Canal did was unthinkable, for it would have caused capital to dry up.[41] When the Board appeared to conduct much of its business rather inefficiently, we must remember that the maintenance of creditworthiness was achieved.

Lyster's address attracted wide attention in both the specialist and non-specialist press. At first much the shrewdest comment seems the observation in *The Gazette* that "we cannot dismiss forms of government as of no importance, but it is necessary to bear in mind that substance is more important than form."[42] What, in other words, was all the fuss about? What mattered was how well ports worked, and from Lyster's address it was clear that different ports worked well under various systems. Similarly, we may find ports working badly under different regimes. That argument entirely avoids Lyster's implication that there must be some central philosophy behind the running of ports. In fact, there was such a philosophy, and it was rather unusual: that port services were a public good for which users were expected to pay, but not full price. The only vaguely comparable case seems to be that of fast steamships, where the mail subsidy was followed by subsidies for ships "of uneconomic speed" on the grounds of their supposed utility in case of war. But those were direct subsidies: so different was the case of ports that the suggestion was actually made that shipowners should be compensated for the loss of the mail subsidy by mail steamers being exempted from harbour dues. Moreover, ports were supposed to be better run if they were democratically controlled by their customers. Who, in 1900, would have advanced such an argument in the case of a road, railway or toll bridge?

If the world market for port services was so competitive that ports could not make money, but the British government required a strong port industry in the national interest, the logical course would have been to nationalise a handful of major ports. The idea was never seriously considered because trusts seemed an acceptable answer. So in general they were, but it was an acceptance which failed to recognise that one day the reckoning would arrive, when debt charges accounted for such a large part of revenue that the old problem returned. Change continued and docks had to adapt. By the 1960s, Britain's old large ports were so encumbered with debt and obsolete assets that the transition to new methods varied between traumatic and terminal. That process happened regardless of the nature of the authority: it was no less painful in trust ports like London, Liverpool or Glasgow; in company ports like Manchester; in railway ports like Southampton or Fleetwood; or in municipal ports like Bristol or Preston. What undermined them all, however, was the basic principle of the trust port. Between 1850 and 1914 arguments about the form of port management proceeded at the expense of determining its strategic economic purpose.

NOTES

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1. "Address of Mr. Anthony George Lyster, President," *Minutes of the Proceedings of the Institution of Civil Engineers (Min. Proc. ICE)* CXXV (1913-1914), 4-41.

2. This emerges from accounts of individual ports, cited below, as well as from such works as G. Jackson, *The History and Archaeology of Ports* (Tadworth, 1983). A. Jarvis, "The Port of Liverpool and the Shipowners in the Late Nineteenth Century," *The Great Circle,* XVI, No. 1 (1994), 1-22, addresses the question from the perspective of the port authority, while house histories, such as F.E. Hyde, *Cunard and the North Atlantic* (London, 1975), give the shipowner's view.

3. This is massively documented in Great Britain, Parliament, House of Commons, Royal Commission to Enquire into the Administration of the Port of London, "Report," *British Parliamentary Papers (BPP),* 1902 (1151), XLIII, 222.

4. S. Mountfield, *Western Gateway* (Liverpool, 1964), chapter 8, spells out the development of the problem, which is further treated in A. Jarvis, *Liverpool Central Docks 1799-1905* (Stroud, 1991), chapter 9.

5. National Galleries and Museums on Merseyside, Merseyside Maritime Museum, Maritime Archives and Library, Mersey Docks and Harbours Board (MD&HB), UWUP CI69. At the same time, two telephones were removed from the station at an annual saving of £10 19s 4d.

6. *Liverpool Daily Post,* 16 November 1886 and 28 January 1911.

7. *Liverpool Mercury,* 9 November 1904, contained an interview with "a prominent member of the Liverpool Steam Ship Owners' Association" who advocated this approach.

8. In Liverpool, the Tramways were shown in the published *Annual Accounts* for 1899 as returning 9.7%.

9. On unfair competition, see *Daily Dispatch,* 11 October 1906.

10. *Daily Mail,* 9 October 1906.

11. See, for example, the proceedings of the Select Committees that considered whether the LNWR ought to be allowed to operate steamers

between Holyhead and Ireland *(BPP,* 1847 [456], VIII, 187), and the general question of whether railways should be allowed to build and operate ports and harbours *(BPP,* 1864 [141], XI, 95).

12. The 1844 Regulation of Railways Act contained powers to nationalise. For the 1860s, see W. Gait, *Railway Reform* (London, 1865). Even Samuel Smiles, often wrongly characterised as an advocate of *laissez-faire,* wrote in favour of nationalisation in "The Great Railway Monopoly," *Quarterly Review,* CXXV (1868), 287-329. The final wave brought forth a torrent of polemic, of which the "historical" works of Edwin Pratt in defence of the *statusquo* remain the most familiar.

13. For Antwerp's tonnage, 1831-1912, see K. Veraghtert, "The Expansion of the Port of Antwerp. Cooperation and Conflict between the City, Government and Chamber of Commerce, 1850-1890," in L.M. Akveld and J.R. Bruijn (eds.), *Shipping Companies and Authorities in the 19th and 20th Centuries (The,* Hague, 1989). Figures for Liverpool are available in F.E. Hyde, *Liverpool and the Mersey* (Newton Abbot, 1972).

14. *The Times,* 13, 27 and 31 August 1892.

15. A useful outline of the scheme is in *Fairplay,* 27 December 1889.

16. Disputes frequently became so heated that they were taken right up to Board level. MD&HB, Berth Papers, provides an easily-located selection; UWUP 02, on huts and cocoa vans, is a gem.

17. W.D. Bruce, "The Kidderpur Docks, Calcutta," *Min. Proc. ICE,* CXXI (1894-1895), 88-103. For Singapore, see "Address of Sir William Matthews, President," *ibid.,* CLXXI (1907-1908), 5-47.

18. M. Dossal, *Imperial Designs and Indian Realities: The Planning of Bombay City, 1845-1875* (Bombay, 1991), 151 ff.

19. *Bombay Port Trust Administration Report to 31st March 1889* (Bombay, 1889), x. Sixty-four percent of tonnage used the west docks in 1889.

20. S. Mowat, *The Port of Leith: Its History and **Its** People* (Edinburgh, 1994), 302-312.

21. N. de la Puerta Rueda, *El Puerto de Bilbao como Reflejodel Desarrollo Industrial de Viscaya, 1857-1913* (Bilbao, 1994), 161.

22. D.G. Owen, *The Ports of the United Kingdom* (London, 1948), 170-171.

23. This is a central theme of Jarvis, "The Port of Liverpool."

24. The Belfast Steamship Company's gross tonnage using Liverpool rose by 26.9% between 1892 and 1903, while dues paid fell by 10.9%; MD&HB, *Parliamentary Committee Minutes,* 1 April 1903. This was because the improved berths allowed the use of larger vessels of more modern design. The net registered tonnage, on which dues were charged, consequently became much smaller in relation to the gross registered tonnage, which was a fairer measure both of space occupied and actual carrying capacity.

25. The extreme case is Clarence Dock, opened in 1830 as the first specialist steam dock. Just before its closure in 1928 it was incapable of handling even a medium-sized Irish boat, although it was still busy. By the 1870s its revenue was pitiable.

26. "Address of James Charles Inglis, President," *Min. Proc. ICE,* CLXXV, (1908-1909), 3-29.

27. On the growth and diaspora of the engineering profession, see R. A. Buchanan, *The Engineers: A History of the Engineering Profession in Britain* (London, 1989).

28. Between 1845 and 1855, eighty-five acres of new docks were built, almost doubling the total area. In the same decade tonnage paying dues rose from 3,016,531 to 4,096,160, a remarkable performance in a troubled decade.

29. Mountfield, *Western Gateway,* 4-13.

30. The Birkenhead Docks eventually cost Liverpool £6,000,000 to put to rights and attracted

total revenue consistently less than that of any of the top three or four single docks on the Liverpool side.

31. A. Jarvis, "G.F. Lyster and the Role of the Dock Engineer, 1861-97," *Mariner's Mirror,* LXXVIII, No. 2 (1992), 177-199, suggests that poor engineering played its part, while Jarvis, "The Members of the Mersey Docks and Harbour Board and Their Way of Doing Business, 1858-1905," *InternationalJournal ofMaritime History,* VI, No. 1 (1994), 123-139, argues the "guilt" of the policy-makers.

32. D.L. Williams, *Southampton* (London, 1984), 22-26.

33. MD&HB, UWUP D19.

34. Jackson, *History,* 126-128.

35. *House of Commons Select Committee on the Manchester Ship Canal Bill 1883,* appendix.

36. "Royal Commission on Railways, *BPP,* 1867 (3844), XXXVIII, Part 1, 32, Evidence of William Cawkwell (General Manager, LNWR), question 405, *et seq.*

37. *Ibid.,* Evidence of H.J. Atkinson, question 920.

38. In theory, Board members were not representatives, but in practice they were. See Jarvis, "The Members of the MD&HB."

39. See the catalogues of woe presented by port managers before the "Royal Commission on Shipping Tonnage Measurement," *BPP,* 1882, c. 3380, XXI, 645.

40. See the table in the correspondence on a paper on Madras Harbour, *Min. Proc. ICE,* CXL (1911-1912), 188.

41. D.A. Farnie, *The Manchester Ship Canal and the Rise of the Port of Manchester 1894-1975* (Manchester, 1980), 11.

42. *The Gazette,* 8 November 1913.