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Publisher: Routledge
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UK

Scottish Geographical Magazine

Publication details, including instructions for authors
and subscription information:

<http://www.tandfonline.com/loi/rsgj19>

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Published online: 30 Jan 2008.

To cite this article: Captain Rodwell Jones (1919) Kingston-upon-Hull: A study
in port development, Scottish Geographical Magazine, 35:5, 161-174, DOI:

[10.1080/14702541908541610](https://doi.org/10.1080/14702541908541610)

To link to this article: <http://dx.doi.org/10.1080/14702541908541610>

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THE SCOTTISH GEOGRAPHICAL MAGAZINE.

KINGSTON-UPON-HULL: A STUDY IN PORT DEVELOPMENT.

By Captain RODWELL JONES, Leeds University.

(*With Sketch-Maps.*)

WE gain a useful conception of a town by regarding it as a living organism, capable of growth and decay, and its development as being affected as much by its geographical environment—favourable or otherwise—as by the energy, originality, and foresight of its inhabitants. Such a conception of a town has become a commonplace of modern geography, but to make it more completely fruitful we must press our comparison of town and organism a stage further—in that both, in their development, are subject to the competition of units like to themselves, and in that the requirements of both vary at different stages of their growth.

It is in the light of such a comparison that we will examine the geographical environment which has conditioned the evolution of the port of Kingston-upon-Hull.

We will first remind ourselves of the salient geographical features of the hinterland of the port, treating them in very broad outline and mentioning only such details as ultimately affect or have affected the port itself.

The Humber Estuary (Fig. 1) is the outlet of the Trent and Ouse catchment basin (*i.e.* of one-sixth the area of England and Wales), and in a very special sense this basin was in earlier times the hinterland of the port. Up to the natural gateway, cut by the estuary through the west-facing chalk scarp in the neighbourhood of North Ferriby, the Humber never has a width of less than one mile, and its deep-water channel swings to the marked concavities where now are situated the

FIG. 1.—The Humber Estuary. The oblique shading below Hull shows the position of the 30-foot channel.

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ports of Hull and Immingham. The tidal range is very considerable,¹ and, apart from these two places, low water usually reveals great stretches of sandbank, which have always rendered localities on the estuary side inaccessible to shipping.

On such wide estuaries, with their big tidal range, strong tidal currents (3 to 4½ knots at Hull), and lack of shelter, early settlement dependent in any way on shipping would only be possible where the entrance of some minor stream gave the necessary channel of approach and shelter from storms. Such conditions led to the little shipping settlements of Hedon, of Beverley,² and of Hull itself.

First Stage of Port Development.—A plan of Hull in the fourteenth century in the British Museum shows a chain-guarded harbour formed by the river Hull just where it enters the Humber proper, and also the Hull side wharves, the old walls and the moat—a cut developed from an old stream, and joining in a crescent the river Hull to the Humber. The citadel offered protection from the river side, and in those days there was still room within the walls for many gardens.

In the earliest stage of settlement Hull was merely a place of shelter, the Wyk or harbour of the Danes. So much of the land quite near to the town was marshy, and Holderness was generally so isolated by the Yorkshire moors and wolds, that Hull never had much trade overland until railway development. In its earliest stages it had to compete with the seaports of Lincoln (*via* the then old Fosse), Doncaster, about the limit of the navigation of the Don, and York, near that of the Ouse; and also of Selby and Gainsborough, lower down the Ouse and Trent respectively. But very early it derived importance from the fact that even the small ships of those times were often unable to reach the river ports proper, though these could be attained by river craft with goods which had been transhipped at Hull.

Second Stage of Port Development.—Thus we are brought to the second stage of the development of the port, in which it became the chief point of transhipment as between river and ocean craft. Before dealing further with this aspect of the port, let us consider the geographical conditions which made such development possible. Above the junction of the river Hull and the Humber, the estuary narrows considerably to the natural gateway through the chalk ridge, which is plainly defined

¹ About 19 feet at Hull, and 19 feet 6 inches at Immingham.

² *Notes on Beverley.*—The river Hull, a tidal stream, is navigable some distance above Hull town, and it is only in accordance with the general order of port development that we should find the older settlement at or about the limit of navigation. From the ninth to the twelfth centuries Beverley (Fig. 3) was much more important than Hull. It was the port of Holderness, but without river improvement far in advance of anything the times could offer, it could not become the port of the Trent and Ouse basin as was possible in the case of Hull. The town itself is situated on the chalk about one mile from the marshy surroundings of the river Hull, with which it is connected by a canal—the Beverley Beck—opened in the fourteenth century after the weirs which had been allowed to obstruct navigation on the river Hull had been removed.

We shall see that the river Hull, for the two miles in which it flows through the city, is a centre of very great activity, but above this it is to-day chiefly important as providing a means whereby the very large number of trawlers built at Beverley are floated to Hull.

right down to the water's edge at North and South Ferriby. The consequent constriction of the estuary (one mile here in width), together with the inconstant relation between the flood times of the Ouse and Trent, have been instrumental in the formation of a large number of banks—*e.g.* Whitton Sand, Oyster Ness Sand, and Read's Island. Just above Whitton Sand the Trent joins the Ouse, which runs from Selby almost due east to this point with only the wide bendings of a tidal river.

The land north and south of this stretch is very low-lying, and much has been reclaimed under the direction of Dutch engineers.

Exceptions to the complete evenness of the Ouse plain are the morainic deposits, notably the great crescent passing through York, and, secondly, the isolated outcrops of older rock from underneath the alluvial deposits at Crowle, Thorn, Snaith, etc., where the consequent slight rise of level above marshy surroundings probably accounted for early settlement at these places.

But, ignoring details, the salient fact is that just above the junction of Trent and Ouse we enter a great plain extending some forty miles north-west to Boroughbridge, the limit of navigation on the Ure, and sixty miles to Nottingham in the south.

It is sharply contained on the east by the Oolitic and chalk scarps revealed in the Cleveland Hills, Yorkshire Wolds, and Lincoln Edge—hilly areas which forbid easy access to the sea save by the estuary itself; while on the west the many south-east flowing tributaries were never navigable above the low scarp of magnesian limestone which runs from north to south through Yorkshire and Nottinghamshire.

Light will be thrown on the difficulties of early road traffic, and the consequent importance of river navigation, circuitous and uncertain though it was, if we consider some of the well-established trade-routes which centred on Hull in pre-canal days. The considerable towns of Gainsborough, Bawtry, Lincoln, Nottingham, Selby, York, Tadcaster, and Boroughbridge traded naturally enough by river route with Hull, but it is with some surprise that we learn of large quantities of goods from Chester and Lancashire, in their journey to London, being brought to the Trent by pack-horse as far as Burton, and thence by river for transshipment at Hull. Or, again, we may instance the heavy traffic between the Sheffield district and London, which was to a considerable extent maintained by pack-horse from Sheffield to Bawtry, the one-time river port on the Idle, and thence by the Trent for shipment at Hull. In the second stage of its growth, then, we see Hull the natural collecting and distributing centre for the river-side towns of the fertile Trent and Ouse plain, and for industrial districts at no great distance from parts of this navigable system.

Third Stage of Port Development.—The localising of industries in positions specially favourable to production, which was a feature in the change from cottage to factory conditions, and from hand to power production, involved and was dependent upon increasing transport facilities. It was the provision of such facilities in Yorkshire, under the pressure of a growing industrialisation, which influenced the growth of Hull in its third stage.

The upper portions of the Ouse tributaries—that is to say, where they cross the carboniferous limestone, millstone grit, and coal measures—have a steep gradient, and they were extensively used for power-mills before the steam-engine had been rendered practicable. This was

— Limits of unimproved river navigation of pre-canal days
 above 250 feet

H. Hull. B. Beverley. Y. York. T. Tadcaster. Se. Selby. L. Leeds. Do. Doncaster.
 S. Sheffield. Ba. Bawtry. G. Gainsborough. L. Lincoln. Ne. Newark.
 N. Nottingham. D. Derby. Bu. Buxton.

FIG. 2.—The Trent-Ouse Plain and its marginal uplands.

notably the case in the Sheffield area for the iron industry. Again, where the Aire and Calder, the most considerable of the Ouse tributaries, cross the Pennine uplands, the limestone has not been exposed, as is the case north and south of this area, and, consequently, the upper streams of this basin supplied not only power but plentiful soft water, two important factors in the settlement there of the West Riding woollen industry. Much might be said on these heads, but it is only

necessary to point out now that the later use of steam power in these industries, though it withdrew the centres of production farther down the valleys, and fastened them on the coal field proper, yet left them in the main above the limits of navigation, and therefore cut off from direct water communication with the sea.

Now bear in mind the fact that extensive scientific road-making hardly preceded the railway era, and that the badly made, badly repaired, parochially managed roads of the seventeenth and eighteenth centuries were quite unsuited to the rapid growth of traffic of this period, and we may realise what anxiety there was to connect the West Riding centres of production to the nearest navigable points of the Ouse or of its tributaries. Thus the first considerable river improvement scheme in Yorkshire was concerned with the deepening of the Aire and Calder rivers, and with avoiding meanders by means of cuts, so that navigation might reach the industrial centres of Leeds and Wakefield, which two towns were thus connected to Hull by waterway in the very early eighteenth century. One of the main reasons for the undertaking was in order that the products of the woollen industry might more easily reach Hull for transhipment to London and the Continent.

A little later, in 1728, the improvement of the Don navigation, almost to Sheffield, brought the iron industry of that district into direct communication with Hull, and incidentally led to the decline of the Idle and Bawtry route, previously mentioned. The early improvement of the lower Aire was never satisfactory, and in 1774 an entirely artificial waterway was made from Huddesley across country to Selby, thus adding to the importance of that town.

Finally, in order to attain a more direct route to a point on the Ouse which should be navigable for ocean-going vessels, the great canal from Knottingley to Goole was built in 1826, with large docks at the latter place. Here we have an instance of a very considerable town settlement resulting immediately from an entirely artificial work.

The promoters of the cross Pennine canals made great show of the advantage which would accrue from a through water connection between Liverpool and Hull, and incidentally between the industrial areas of Lancashire and Yorkshire, mentioning very properly the differentiation of production and requirements of the two areas as a potential factor in traffic. But as a matter of fact the actual cross Pennine routes, with their stairs of locks, narrow tunnels, and great reservoirs, consequent upon increasing gradient, were much the most difficult and expensive to engineer. They were consequently built last and, hardly preceding the railways, they never had much through traffic, and carry almost nothing to-day. Such goods as these canals now bear are confined to the industrial areas some distance on either side of the summit levels.

The complete canal system converging upon the Humber is shown in Fig. 3. It has been of great importance in the development of Hull, but in looking at the map we should remember that only the Aire and Calder and South Yorkshire systems have much importance to-day.

Thus to the Trent and Ouse plain, which had naturally the most extensive navigable river system in England, were added many miles of

artificial waterways connecting the Yorkshire, Derby, and Notts coal field with the one very considerable port between the Tyne and Thames; and providing, at a period when no other such effective transport facilities existed, for the necessary exchange of agricultural and industrial products, and for the growing traffic of the West Riding with London and with continental ports.

Fourth Stage of Development.—Before dealing with the geography of

FIG. 3.—The Canal System which converges on the Humber. The estimated limit of the coalfield is shown by a dotted line.

the modern port we would note a fourth stage of development in which two great changes are evident. The increase in the size of vessels and particularly the use of iron in their construction, together with the increasing volume of trade, made it necessary to supply means whereby ships could be in harbour for considerable periods without grounding, and cargoes could be dealt with at quayside without change of level. These considerations led to the dock era in ports of tidal range.

Referring back to our note on old Hull (p. 163), we find the town confined by a crescent of moat, and this depression joining the Hull to the Humber became the site of the earliest docks. Thus the Humber Dock was opened in 1807, Princes 1827, the Railway 1846, and then, when these proved insufficient for the volume of traffic, Victoria Dock was cut out of the unoccupied low land to the south-east of the town. For further increase no land in the immediate vicinity was available, but engineering science of this date was well enough equipped to deal with the problem of a great embankment in the estuary itself, piling up the water against the town in the long line of the St. Andrew's (1883) and the Albert and William Wright (1869) Docks.

The town was now completely surrounded by docks, and the later deep-water accommodation had perforce to be constructed farther down the stream—the Alexandra (opened in 1886), and farther down again, the great new joint dock opened in 1914. This last is the joint property of the N.E.R. and Hull and Barnsley Railway Companies. The Alexandra Dock belongs to the Hull and Barnsley Railway Company, and the remaining Hull docks are the property of the N.E.R.

It is quite beyond the scope of this paper to go into reasons for the decline of British canals in competition with the railways. It will be a sufficient comment upon the importance of Hull's position if we point out that among the earliest of the disconnected unorganised fragments of track with which the railway era in this country opened, were those connecting Hull to Selby and the Industrial West Riding. Railway construction was easy here across the Ouse plain, and there was just room to push forward to Hull between the chalk scarp of Hessle and the estuary without either tunnel or serious gradient. The later Hull and Barnsley line had to seek a partial gap farther north, *via* North Cave, and even so a tunnel was necessary (Fig. 1).

The canals in agricultural areas—for example, the Market Weighton, Pocklington, and Ripon canals, and also the trans-Pennine system near the summit levels—have so suffered in competition with the railways as to be practically derelict.

Modern Trade of Hull.—So far we have endeavoured to account for the town growth of the past, relating it chiefly to the waterway connections of its hinterland. We must now indicate the leading features of its present trade and show how these can be related to its geographical position. We must call a few figures to our aid. First of all, how does Hull stand in relation to other British ports as to the value of its trade?

	Import.	Export.	Total.
1st, London, .	253·8	157·9	411·7
2nd, Liverpool, .	175·5	195·1	370·7
3rd, Hull, .	49·8	34·7	84·6
4th, Manchester, .	35·3	20·9	56·2
5th, Glasgow, .	18·5	36·2	54·8
14th, Goole, .	8·4	10·3	18·8

Such figures (which represent millions of pounds) are only one way,

and not a very satisfactory one, of gauging the trade of the port. They are unsatisfactory here because they neglect the great coastwise traffic enjoyed by Hull, and neglect also the greater portion of the fish traffic. Only imported fish—that is, mostly Norwegian herring—affect these figures, and further, they give insufficient indication of the immense traffic of bulky but comparatively cheap commodities, such as coal and timber and grain. Even so, Hull figures as the third port of Britain either on a value or a tonnage basis. Now let us see what the character of this trade is.

Imports.		Exports.	
Total £49,800,000		Total £34,700,000	
Wheat, barley and maize, .	9·8	Machinery, .	4·25
Wool, ¹	2·0	Cotton goods, .	5·2
Butter,	3·6	Coal,	3·3
Bacon,	1·5	Wool goods, .	3·0
Oil (seeds),	7·4	Oil,	1·1

The port resembles London in the very general nature of the cargoes carried, in the excess of the imports over exports, in the large proportion which food-stuffs bear to the total value of its trade, and in the very extensive off-loading into lighters. A brief table will give us a basis of comparison for the imports at some of our larger ports. (The figures, as before, are in millions of pounds.)

	London.	Liverpool.	Hull.	Manchester.
Wheat,	7·7	10·1	7·4	3·7
Bacon,	1·5	4·7	1·5	0·12
Butter,	7·8	0·01	3·6	0·00
Meat,	17·3	14·0	0·5	0·23
Oil-seed,	3·8	1·67	7·4	0·18
Sugar,	7·9	4·0	1·0	1·0

The very extensive trade in butter, bacon, and sugar is carried on almost entirely with the near continental ports, and the smaller steamers concerned in this trade use chiefly the crescent of older docks. We should note that in the case of oil-seed, wheat, and timber we are dealing with quantities comparable to those imported at London and Liverpool; indeed in the case of oil-seed the import is second only to that of Marseilles. The huge timber import is mainly a result of the connections of the port with the great coal field, and the import of the pit props is little less than that at Cardiff or Hartlepool.

¹ *Note on the Raw Wool Import at Hull.*—The most noteworthy anomaly in the trade of Hull is the small raw wool import. Thus—Hull 53 mill. lbs.; London 495 mill. lbs. (a very large fraction is re-exported), though by far the greater portion of the London import comes eventually to the West Riding. In this connection we must remember that London is the wool market of Europe, whereas direct import to Hull or Goole is usually only in cases where the material is actually bought by agents in Australia. This practice is growing both in the English and continental industry, and with the requisite shipping facilities we may look for increasing import at Hull. A considerable quantity of wool is brought to Hull coastwise from London. This does not appear, of course, in the Hull import figures.

The import of wheat and of oil-seed is related to the inland navigation which has been so constant a factor in the progress of the port.

We should remember that when little grain was imported and transport facilities were wanting, locally grown grain was milled at a vast number of water and wind-mills scattered all over the land. More recently we have subsisted very largely upon imported grain which has come overseas in large vessels to our bigger ports. Now a big port is of necessity a good distributing centre, and further, it must be a place where coal and therefore power is readily available. It is obviously more economical to distribute the flour from a comparatively few great power mills, than to distribute the imported grain to an enormous number of small mills, and thence the flour to the consumers. Thus it is that the industry is almost entirely localised at the huge mills of a few great ports or at good distributing centres in water communication with such ports. In the case of Hull, the wheat is imported as shown in the following table for 1913 :—

Americas, . . .	1·6	} Millions of qrs.
Karachi, . . .	1·7	
Russia, . . .	0·5	
Australia, . . .	0·35	
Calcutta, . . .	0·13	

It is brought into the deep-water docks, and thence off-loaded into the lighters which swarm in all the Hull docks, and remind one of the dependence which the port still has upon its waterway connections. The lighters take much of the grain from the docks to the great mills situated on the river Hull itself, which, though no longer the harbour proper, is crowded with barges and has both banks fully occupied for nearly two miles with flour mills, seed-crushing mills, and warehouses. Very large quantities are water-borne to the mills at Selby and York. Indeed, grain and coal are the only two important traffics on the Ouse river navigation, which is rendered unsatisfactory by shifting banks above Goole.

Mills at Tadcaster, Wakefield, Leeds, and Gainsborough receive considerable supplies by water, and the railway sendings are comparatively small. Oil-seed is in much the same case, though this commodity is not so widely distributed as wheat. The seed is sent by lighters from the deep-water docks to crushing mills on Hull side, or by water to the huge mill, probably the largest of its kind in the world, at Selby. The resulting cattle-food cake, fertiliser, and oil are widely distributed both by water and rail.

As another instance of the localising of an industry dependent upon modern conditions we may take the fish trade. The majority of Hull trawlers are big vessels, often absent for three weeks at a time, and requiring therefore large stocks of coal and ice, for the fish trade of this port is mostly concerned with the distant grounds of Iceland and the

White Sea.¹ The modern industry requires facilities for the provision of these stocks and for the repair of trawlers, and, most important of all, for the rapid distribution of the catch. Such facilities will usually only exist at a big port, and the modern industry is increasingly centred at such, and is dwindling at the older fishing settlements, which could not supply such conveniences. The St. Andrew Docks are entirely given over to this traffic, and are fully equipped with railway sidings, fish quays, coal-hoists, ice-factories, repairing slips, fish refuse works, and a box-making factory. Huge as is the figure for the Hull catch as given in the official publications, it really underestimates the interest of the port in the trade, for it neglects the great import (1·4 mill. cwts.) by fast steamer of loosely packed herring from Norwegian fiords. The curing of these at Hull is an industry in itself.

It neglects also the great quantity of fish (1·4 mill. cwts.) caught in the North Sea, by trawlers equipped and manned by Hull. The whole of this catch is taken by fast carriers to Billingsgate, and is the only fish water-borne to that market, though enormous quantities arrive by train. This is a branch of the trade quite peculiar to Hull.

Not more than a bare reference need be made to the larger geographical factors which influence our fishing industry. The shallow waters of the West European continental shelf, with its off-shooting ridge through the Faroes and Iceland, have been fishing grounds throughout history, but they were accessible from all British ports, though some obvious advantages lie with the East Coast stations. We are more concerned to point out that the equipment and resources of Hull as a great general port have enabled it with a very few other suitably equipped and situated stations to attract the greater part of the enormously increased catch of recent years, an increase which must be related to the use of the trawl, to the use of power on trawlers and drifters, and at least as much to increased facilities for rapid distribution.

The distant fishing so characteristic of Hull is nothing new to the port. Centuries ago Hull boats visited these grounds, and took the salted products to the Catholic countries of Southern Europe. This branch of the industry is represented to-day. On the flats west of St. Andrew's Dock one may see—in suitable weather—large quantities of heavily salted cod being dried for export, mainly to Mediterranean ports.

In competition with the increasing efficiency of continental stations, we may notice a very recent tendency for our trawlers to land their catches at continental ports, and our general supremacy in the traffic is evidenced by the great percentage (about three-eighths) of our total catch, which is exported (mostly herring pickled in barrels, or "Klondyked," *i.e.* loosely packed in salt and ice) to the Baltic and near continental ports.

¹ Really the entrance to the White Sea, *i.e.* the Barentz Sea. Hull trawlers visited these grounds first in 1906, and the valuable catches of plaice encouraged extensive fishing here. This reached a maximum in 1911, but there has been a serious falling off in the last few years, and fewer boats visited the ground in 1912 and 1913, for a catch of less valuable fish hardly pays for the voyage.

The following table is a quantitative index of the salient features of the fish industry at Hull:—

England and Wales Landings, 14·4 cuts. (mill.)

Of which Grimsby	3·8	In addition Hull imports
Yarmouth	1·8	1·4 (mostly herring),
Lowestoft	1·7	and Hull fleets take to
Hull	1·7	London 1·4. No other
Fleetwood	·8	station has figures
Tyne	·6	comparable to these.
Milford	·58	So Hull is really the
Swansea	·20	second fishing port.

Hull is not pre-eminently a centre of herring fisheries, as are the Scottish stations, and Yarmouth and Lowestoft, the greater portions of the catches of which are salted or cured and exported. Nevertheless the herring catch is big (about one-eighth of the total).

The greater number of trawlers engaged in East Coast fisheries are not built at Hull, where the valuable space devoted to shipyards is used in the construction of larger boats, but at the riverside yards of Beverley, Goole, and Selby, where no other class of boat is built.

The most recent development of Hull is connected with its coal export traffic. Here again figures are the briefest indication.

	(Tons 10 ⁶)	
1913—U.K., . . .	90·5	
Tyne, . . .	16·3	Half the Humber ex-
Humber, . . .	11·4	ports from Hull.
S. Wales, . . .	21·6	

Hull has not the historic connection with coal export exhibited by ports (notably Tyneside) which are situated practically on coal fields, and its importance in this direction is rather to be related to the quite recent extensive eastward development of the Yorkshire, Derby, and Notts coal field (see Fig. 3).

Over one hundred and fifty pits send coal to Hull for export, fifty of them in large quantities (25,000 tons), but actually one half is forwarded by a dozen of the latest and largest pits in the Doncaster area.

The waterways (Aire and Calder and S. Yorkshire) send a large quantity (450,000), but take little part in the big increase of recent years. *E.g.*:

	<i>Via River.</i>	<i>Via Railway.</i>
1902	·61	2·56
1907	·68	5·8
1912	·46	6·5

Foreign countries receive coal from Hull as shown in the following table, and, as might be expected (particularly in Germany), the coal is very generally for use near the foreign receiving port. Only a small portion is carried inland, and that usually by water.

In 10 ⁶ tons.	1913.	
Russia, . . .	1·5	Other countries in very small quantities. (Note low position of Mediterranean countries, France, etc., and esp. the large S. Wales export to these countries.)
Germany, . . .	·8	
Holland, . . .	·4	
Sweden, . . .	·4	
S. America, . . .	·26	
Italy, . . .	·19	
Egypt, . . .	·23	
France, . . .	·31	

The docks, particularly the Alexandra, William Wright, and New Joint have all up-to-date coal shipping appliances, special attention being given to the prevention of coal breakage.

Competition for coal shipment from the Yorkshire, Derby, and Notts coal field exists at Goole, Grimsby, and Immingham.

	Export.	Coastwise.	
Hull,	4·6	1·0	= 5·6
Goole, ¹	1·3	1·4	= 2·7
Immingham,	1·8	·14	= 1·94
Grimsby,	1·2	·03	= 1·23

The building of a deep-water dock at Immingham quite especially equipped for dealing with coal as well as with general commodities was viewed with some apprehension by those with interests at Hull. The newer harbour undoubtedly has a shorter lead to the more easterly portion of the coal field, and the export there is rapidly developing, but as yet Hull figures have not been adversely affected.

In closing this brief review of the growth and present activities of the port of Hull, it is advisable to recapitulate the outstanding stages of development.

Firstly.—We saw the tiny marsh-surrounded settlement existing only because of the shelter offered by the little creek of the river Hull. At this stage, and for the requirements of the time, its situation was obviously inferior to that of such up-river ports as Gainsborough or York, and even to that of its older neighbour Beverley.

Secondly.—Very early the advantage of deep water consequent upon a position near the estuary mouth more than compensated for the disadvantages of distance from the more populous areas, and Hull became a point of transhipment for river craft trading with towns on the navigable portions of the Ouse and Trent basins. In the period immediately preceding extensive canal construction, *i.e.* in the first quarter of the eighteenth century, it is noticeable that difficulties of road transport deflected to the Trent, Ouse, and Hull water route much traffic from North Central England which would have gained London more directly by an overland route.

¹ Most of this comes by the Aire and Calder canal to Goole, and is the chief traffic of the canal. It is borne in compartment boats locally known as "Tom Puddings." These are hoisted bodily out of the water and overturned, through a spout, into the hold of the collier.

Thirdly.—A network of canals, of which the Aire and Calder was and is the most important, brought the industrial West Riding into direct water communication with Hull.

Fourthly.—The advent of deep-water ports and docks consequent upon the increasing size of carriers did not affect Hull adversely, for the port is situated at the most marked concavity of the estuary, and has natural deep water. The immediate surroundings of the city, too, were such that the engineering of at any rate the earliest docks was not a very difficult problem. Railways amplified and emphasised the lines of communication already existing, and then were instrumental in widening the hinterland of the port.

In the modern port we noted

- (a) The effect of an industrial hinterland on the prevailing classes of traffic—the great import of food-stuffs and export of manufactured articles.
- (b) The very considerable part which some of the waterways take in the trade of the port even to-day, particularly in the cases of wheat, oil-seed, and coal.
- (c) The influence of the port *qua* port in localising there great milling and fishing industries.
- (d) The extension of South Yorkshire coal field, which has caused the Humber to become an exporting area comparable in point of quantity exported to that of Tyneside or South Wales. Of this Humber shipment more than half is dealt with at Hull.

MODERN JAPAN.¹

ACCORDING to his publishers' list this is the fourth book on subjects connected with Japan and the Far East which has come from the pen of M. Bellesort, and this one appears at an appropriate time when the question of Japan and of its future relations with European countries and peoples are of absorbing interest. The writer handles his theme with admirable French clarity and perception; and he also covers so much ground in his book that it is difficult to give a clear and concise idea of its contents within the limits of a brief article. It may be mentioned that his notes date from the time which immediately preceded the war, and that he left Japan on the same day that the Emperor sent his ultimatum to Germany. The book divides itself into four parts. The first deals with "The Heroes and the Gods," and in it "The Last of the Samurai" is embodied in the person of the late Marshal Nogi, who, after his victorious campaign against the Russians in Manchuria, was appointed by the Emperor to take charge of a

¹ *Le Nouveau Japon*, by André Bellesort. Paris: Librairie Académique Perrin, 1918. Price 3 fr. 50 c.