

~~12. Country commercial causes will be tried as is usual at the Assizes.~~

BY ORDER.

APPENDIX B.

~~RULES OF SUPREME COURT, ORDER 30, RULE 7, REFERRED TO ON PAGE 372.~~

~~“On the hearing of the summons, the Court or a Judge may order that evidence of any particular fact to be specified in the order shall be given by statement on oath of information and belief, or by production of documents or entries in books, or by copies of documents or entries or otherwise as the Court or a Judge may direct.”~~

2.—*Canals and Waterways of Western Europe.*

BY E. A. MONTMORENCY MORRIS, ESQ., M.A.

[Read Friday, December 15th, 1905.]

A HISTORY of the waterways of the world would tell a great part of the story of early human migration and the rise and growth of commercial intercourse. In early days, it was by rivers rather than by forest tracks that primeval peoples became acquainted. Roads and canals followed as the first artificial highways, and, finally, with the application of steam power, came the rail-road. With the advent of the railway, canals played a much smaller part in the economy of transport; and throughout the world, with the exception of the Low Countries, business men ceased to attach much importance to the canal as a factor in the transport system. But as time went on, and the capacity of railways in solving the question of goods traffic was recognised to be limited, attention was again given to inland navigation. The digging of the canal across the Isthmus of Suez, a colossal feat of engineering at the time, aroused the world, and set men thinking, that perhaps, after all, the day of canals had not passed. From that time until to-day, but more especially during the last fifteen years, there has been a considerable revival of interest, in Europe and in the United States, in the question of canals and inland waterways. It came to be recognised that it is not only in the item of cheapness that water transport excels. It possesses other advantages. As General Rundall, R.E., pointed out in the memorandum, “The Policy of Water Carriage in England,” which he put in when a witness before the Royal Commission on Canals in 1883, canal traffic has the following good points:—

1. It admits of any class of goods being carried in the manner, and at the speed, which proves to be most economical and suitable for it without any interference with any other class.

2. The landing or shipment of cargo is not necessarily confined to certain fixed stations, as is obligatory on railways, but boats can stop anywhere on their journey to load and unload.

3. The boat itself often serves as a warehouse, in which an owner may keep his cargo till sold.

4. The dead weight to be moved in proportion to the load is much less in the case of canal carriage than that of railway. The ordinary railway truck weighs nearly as much as the load put on it, whereas a cargo boat will carry four or five times its own weight.

5. The capacity for traffic is practically unlimited, even in the case of canals with locks, provided the locks are properly designed.

6. In the case of either State or private canals, unless worked by the owners of the canal, there is no necessity for maintaining an enormous and expensive apparatus or establishment, as all that can and would be carried on by separate agencies and by district capital, thus avoiding a large expenditure in the first cost, and subsequent maintenance of rolling stock.

7. The almost total absence of risk and the reduction of damage to cargo in transit to a minimum. In order to reap the fullest advantages of water carriage, however, it will be necessary, just as it is in all undertakings, not only to construct the most perfect instrument possible, but also to take care that it is most carefully and wisely managed afterwards.

Besides their direct usefulness, canals and waterways perform another service of much value. Their power of regulating freight charges is very considerable. Professor E. R. Johnson of Philadelphia gives an illustration showing the real and effective influence of waterways on railway rates. "Liege and Antwerp are connected by a line of navigation 156 kilometres long, that comes in competition with two railroads somewhat shorter in length. The water rates often come as low as 2 francs 15 centimes to 2 francs 30 centimes per ton for the entire distance. In order to compete, the rail-roads carry at their lowest rate between Liege and Antwerp. In train load lots of 200 tons, for exportation by sea, they charge only two francs a ton."

"This is a special rate, all others being enough higher than by boat to enable the waterways to secure a good volume of freight. Again, the cheapest freight rates by rail to be found in the world are those for grain between Chicago and New York; and why? Because the cheapest inland water

transportation rates in the world, are those between the same points."

Having thus briefly indicated the part which waterways play, and should play, in a national economy of transport, and having noted the renewed interest and activity displayed regarding the use of canals, we will turn to a consideration of what is to-day being done by the United Kingdom and some of the chief foreign countries to secure for waterways their due position and influence in the respective national transport systems.

United Kingdom.

Before attempting to trace the more recent developments, and the salient features of the canal question in England and Ireland, it may be well to examine the appended table, which gives some particulars regarding the British canal system, and the part it plays in our transport economy.

—	Length of Naviga- tion	Traffic Con- veyed	Total Revenue.	Net Profit.	
CANALS AND NAVIGATIONS NOT BELONGING TO RAILWAY COMPANIES					
England and Wales ..	m. ch.	Tons	£	£	
..	{ 1888,	2,025 67	27,715,875½	1,439,343	578,275
..	{ 1898,	2,208 2	32,513,800½	1,895,506	573,305
Scotland	{ 1888,	69 40	69,744	12,011	Loss, 4,075
..	{ 1898,	69 40	158,739	14,640	1,324
Ireland	{ 1888,	513 38	489,194	89,369	17,828
..	{ 1898,	490 43	676,034	108,148	23,631
Total, United Kingdom	{ 1888,	2,608 65	28,274,813½	1,540,723	592,028
	{ 1898,	2,768 5	†33,348,573½	2,018,294	598,260
CANALS AND NAVIGATIONS BELONGING TO RAILWAY COMPANIES					
England and Wales ..	{ 1888,	1,024 25	6,609,304	437,080	101,577
..	{ 1898,	959 14½	4,913,085½	331,305	22,280
Scotland	{ 1888,	84 25	1,386,617	57,178	30,579
..	{ 1898,	83 61	1,064,595	52,369	23,539
Ireland	{ 1888,	96 0	30,386	6,495	2,039
..	{ 1898,	95 69	32,140½	6,566	418
Total, United Kingdom	{ 1888,	1,204 50	8,026,307	500,753	134,195
	{ 1898,	1,138 64½	6,009,820½	390,240	46,237
GRAND TOTAL ..	{ 1888,	3,813 35	36,301,120½	2,041,176	726,223
	{ 1898,	3,906, 69½	†39,358,394½	2,408,534	644,497

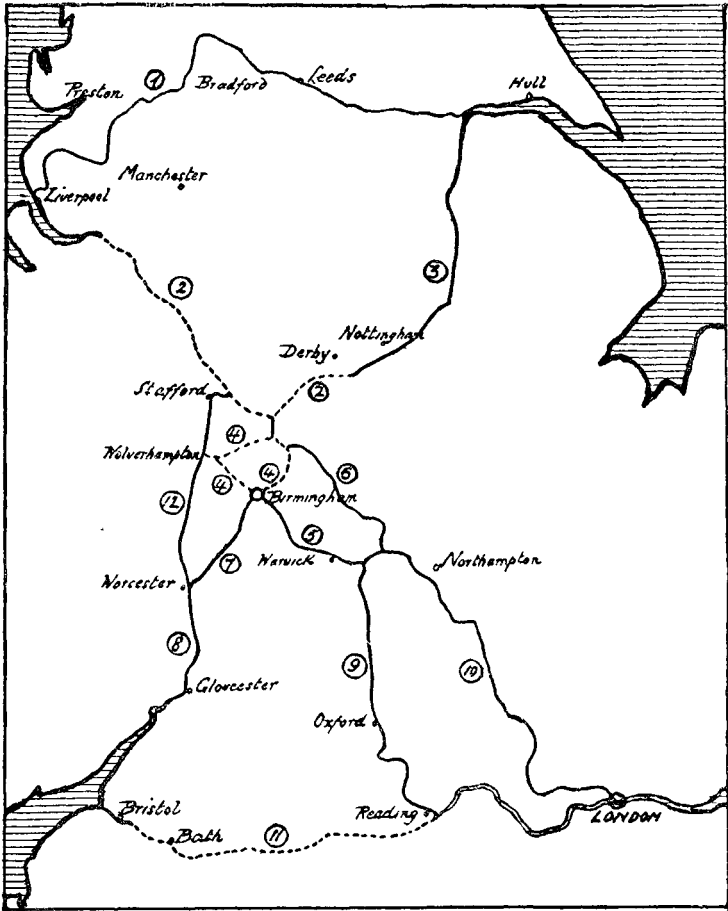
† Not including 1,142,477 tons of traffic passing free of toll on the Manchester Ship Canal.

England.

Until recently, if attention was devoted to England's waterways, it was only to deplore their forlorn condition. In fact, canals were discussed in a despairing fashion—as good things lost, and lost largely as a result of a bad system. It will be remembered, that the late Sir Courtenay Boyle, at the International Congress on National Navigation, held at Paris in 1892, very well summed up British canal policy:—"The State has stood by and allowed, as far as possible, complete liberty, both to the proprietors of canals and to the business men who make use of them, and it has done no more. The result of this non-intervention is that our canal system comprises such varieties of gauge, depth and regime, that the carriage of merchandise, from one end of the Kingdom to the other by water, presents the greatest difficulties. The necessary transhipments became so numerous as to increase to a very considerable degree the cost of transport."

Of late, however, proposals of various sorts for the revivification of the English canal system have been put forward. To take one of the latest public pronouncements on the question, the Associated Chambers of Commerce at its last session in London, in February of this year, carried a resolution declaring its approval of the "improvement and extension of the canal system of the United Kingdom to be carried out by means of a public trust, and, if necessary, in combination with local or district public trusts, and aided by a Government guarantee." The same resolution directed the Executive Council of the Associated Chambers to take all reasonable measures to secure early legislation upon the subject.

Early in May, a Bill—Canals Bill (Bill No. 11, Session 1905)—was introduced into the House of Commons. This Bill was withdrawn on May 26th, but it was substituted by Canals (No. 2), Bill (Bill No. 260, Session 1905), presented by Sir John Brunner. . This Bill proposed to constitute a strong central canals trust, for the purpose of obtaining Provisional Orders authorising the Trust to take over, improve and manage certain specified canals which form a chain of navigation between the principal ports in England. The promoters of the Bill also proposed to obtain powers to acquire other canals. The object of the promoters is declared in the prefatory Memorandum to the Bill to be a "consolidation of interests and management, so as to improve the facilities for water carriage, and to establish a complete system of intercommunication." This Bill, too, had to be withdrawn (on July 17th) as the examiners of Private Bills decided that the regulations had not been



DIAGRAMMATIC MAP TO ILLUSTRATE THE "CANALS (No. 2)" BILL, 1905.

complied with, no advertisements having been inserted in the manner laid down in respect of Private Bills.

Despite the fact that the Bill has thus temporarily been put back through not complying with the Standing Orders of Parliament, the promoters do not propose to abandon their efforts to secure reform in the administration of the English waterways. On the contrary, they are still pushing forward their project. They have already secured the co-operation of the Mansion House Association on Railway and Canal Traffic, and are engaged in procuring the support of Chambers of Commerce and business organisations throughout the country. Meanwhile the President of the Board of Trade has been asked to appoint a Royal Commission to inquire into the whole subject. The delay will not be disadvantageous, as in some respects the Bill was open to criticism, and the scheme was very ambitious.

The Bill proposed to acquire some 938 miles of important canal routes connecting London with the Bristol Channel, the Humber and the Mersey. The accompanying diagrammatic map and list of canals will give some idea of the importance of the scheme. Some of the canals concerned are owned by independent canal companies, and some by railway companies. In the map the canals owned by railway companies are shown by dotted lines.

List of Canals and Key to the Map.

- (1.) Leeds and Liverpool Canal.
- (2.) Trent and Mersey Canal (N.S.R.)
- (3.) Trent Navigation.
- (4.) Birmingham Canal.
- (5.) Warwick and Birmingham Canal.
- (6.) Coventry Canal.
- (7.) Worcester and Birmingham Canal.
- (8.) River Severn.
- (9.) Oxford Canal.
- (10.) Grand Junction Canal.
- (11.) Kennet and Avon Canal (G.W.R.)
- (12.) Stafford and Worcester Canal.

When these canals are acquired, the idea is to make them fit for the traffic of large barges of from 300 to 500 tons burden, similar to those used on the great Continental canals.

The Bill proposed that the Trust should consist of thirty-seven trustees to be appointed as follows :—By the Treasury, seven ; by the Board of Trade, seven ; by the Board of

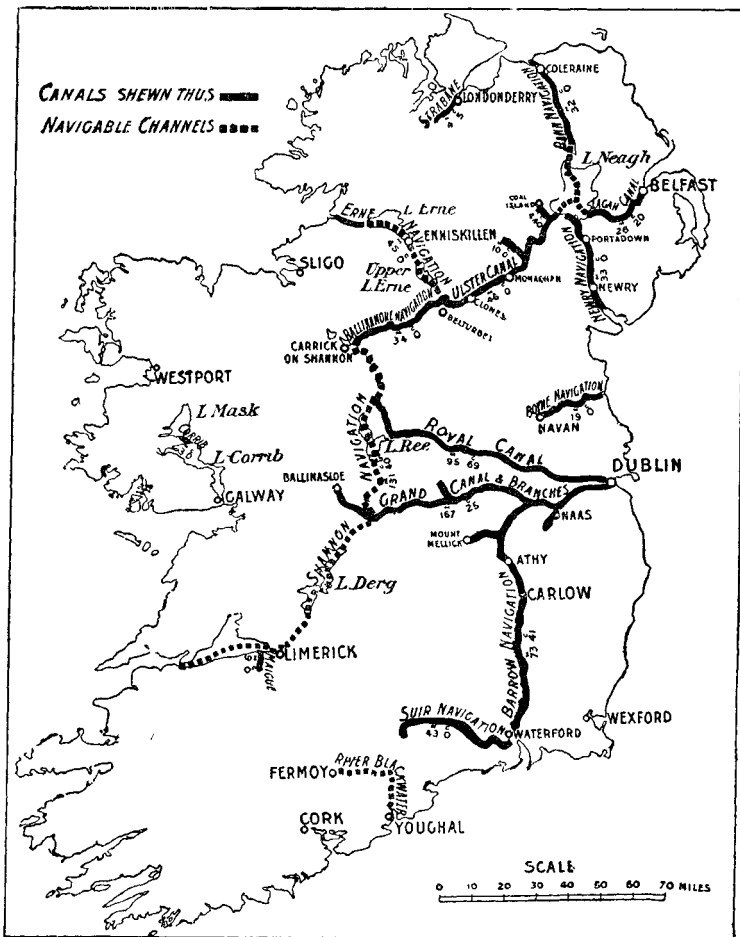
Agriculture and Fisheries, seven; by each of the port authorities of London, Liverpool, Hull, and Bristol, two; by the Association of Chambers of Commerce of the United Kingdom, two; by the Central and Associated Chambers of Agriculture, two; by the Mining Association of Great Britain, two; and by the Mansion House Association on Railway and Canal Traffic for the United Kingdom, two.

The trustees were to be empowered to elect a President and Vice-President from their own body, but it was expressly stipulated by section 2, sub-section 4, that no chairman, director, manager, or other official of a railway company shall be eligible for the office of trustee.

Turning to a consideration of the financial aspect of the scheme, it is found that it was proposed to issue canal stock under Treasury guarantee, bearing interest not exceeding $3\frac{1}{4}$ per cent., per annum. In determining the sum to be paid by each company, the court of arbitration was to take into account the manner in which the canal had been administered, but no allowance was to be made on account of the sale being compulsory.

Ireland.

“Make Canals in Ireland,” said William of Orange, “and you will make a second Holland.” Indeed, few countries are better naturally adapted than Ireland for a system of inland waterways. A somewhat elevated coast line, with numerous outlets for rivers, surrounds a central plain, only slightly raised above the sea level, and free from any considerable elevation. A large part of this central plain consists of bog, which might be drained by canals cut through them, and it was with the idea of constructing drainage works, almost as much as with the intention of opening up means of transport, that the first Statute for making canals in Ireland was passed. An Act of Parliament of the year 1715 (2 George I., Chapter 12), drew attention to the need of canals to drain the central bog, and to provide means of transport across it, for the bog roads then, as now, could not bear heavy traffic. It was entitled “An Act to encourage the draining and improving of the Bogs, and unprofitable low grounds, and for easing and despatching the inland carriage, and conveyance of goods, from one part to another within this Kingdom.” The scheme of drainage and navigation sanctioned by this Act was of truly national proportions, but it was executed in a somewhat spasmodic and piecemeal fashion. The interests of arterial drainage and the interests of navigation were not always reconcilable, and a good deal of misdirected effort was caused by hesitancy between the relative importance of one and the other. Thus, when the two trunk lines across Central Ireland—the Grand Canal and the



MAP SHOWING THE IRISH CANALS AND NAVIGATIONS.

Royal Canal—came to be made they were carried above the level of the bogs, and so did not serve the purpose of drainage canals. However, on the whole, the scheme was a sound one, and the accompanying map shows that much has been done to realise the best possibilities of an Irish canal system. The comparative failure of the Irish canals is perhaps due, as the late Dr. Coyne suggested in an article dealing with the subject, more to the successive shiftings of responsibility for their conduct and maintenance between State Departments, mixed Boards, local Companies, and private Companies, than to any intrinsic fault in the system itself.

In the map the continuous lines show the canals and canalised rivers, and the dotted lines indicate lake and river navigations. Apart from the canals, there are about 170 miles of navigable channel on the Shannon, about 60 miles on the Barrow, and about 30 miles on the Blackwater. The appended table, taken from a Board of Trade "Blue-book," gives some particulars as to the present state of Irish Canals.

TABLE.—Showing in respect of each CANAL or NAVIGATION in IRELAND the LENGTH of NAVIGATION, the Number of LOCKS, and the MAXIMUM SIZE of BOATS that can use the CANAL or NAVIGATION.

Name of Canal or Navigation.	Length of Navigation.	No. of Locks.	Maximum Size of Boats that can use Canal or Navigation			
			Length	Width.	Draught	Headway
Boyne	m. ch. 19 0	20	ft. in. 70 0	ft. in. 14 3	ft. in. 4 6	ft. in. 7 0
Grand .. .	209 18	86	61 0 68 0	13 6	4 6	9 0
<i>Lagan, Ulster, and Coal-</i> <i>island Canals—</i>				13 4	4 0	8 0
Lagan	26 20	27	62 0	14 6	5 6	6 3
Ulster	46 0	26	62 0	11 6	5 0	6 0
Coahsland	4 40	7	62 0	14 6	5 0	6 0
Lower Bann .. .	32 0	5	110 0	18 6	6 0	—
Newry	18 0	13	64 0	15 1	5 2	9 3
Royal .. .	95 69	46	70 0	13 1	4 6	10 0
Shannon	131 40	20	73 0 100 0 66 0	14 9	4 10	12 0
				29 0	6 0	15 6
				13 0	4 6	11 6
Strabane	4 5	2	70 0	16 6	5 0	—
Total, Ireland ..	586 32	252				

From this table it will be seen that the Grand Canal Company controls the greatest length of waterway—indeed it is the largest canal system in the United Kingdom. It

may be said also to be the most successful of Irish canals. Its shareholders receive a steady and comparatively satisfactory dividend, but part of the revenue is derived from lands owned by the Company, and from the sale of water to large brewing firms. The average yearly traffic over the system is about 300,000 tons. The Grand Canal proceeds from the south of Dublin westward to the Shannon at Shannon Harbour, and thence on the other side of the Shannon to Ballinasloe, with branches to the Liffey, Robertstown, Blackwood Reservoir, Monasterevan, St. James's Well, Athy, Mountmellick, Edenderry, and Kilbeggan. The southern branch of the canal reaches the Barrow at Athy. The other canal having its terminus at Dublin is the Royal Canal. This canal, which is over 95 miles long, passes through County Dublin, between Counties Kildare and Meath, and through Counties Westmeath and Longford to Tarmonbarry, where it joins the Shannon. For 76 miles of its course the canal runs alongside the Midland Great Western Railway, and the Railway Company are proprietors of the Canal, having acquired it just sixty years ago by the Act 8 and 9 Vic., Chap. 119. The average yearly traffic is about 32,000 tons. The traffic on the other canals averages pretty much as follows:—Boyne Navigation about 5,000 tons; Lagan, Ulster, and Coalisland Canals about 220,000 tons; Newry Navigation about 32,000 tons; Shannon Navigation about 84,000 tons; Strabane Canal about 24,000 tons. Thus the total traffic of Irish Canals and Inland Navigation amounts to about 700,000 tons. Part of this, however, is reckoned at least twice over on account of its passing over more than one system. Probably the true total would not exceed 600,000 tons. If we analyse the total of 700,000 tons, we find that this tonnage is made up of about 250,000 tons carried by canal companies (over 220,000 tons of this total is carried by the Grand Canal Company), and rather more than 450,000 tons carried by "bye-traders."

The scope of my paper does not allow me to dwell further on the question of Irish canals, but for further information as to capital, traffic, profits (or losses), etc., of the Irish Canals, I can cordially recommend to my auditors the article by the late Dr. Coyne, published in the *Banking, Railway, and Canal Statistics of Ireland for the year 1901* (Cd. 1032, 1902), to the Report of the Royal Commission on some Irish Canals held in 1882 (c. 3173—1882), to the Report on the Barrow Navigation (c. 4666—1886), and to the Board of Trade Report on the Canals of the United Kingdom (Cd. 19—1899)

France.

In France, where the canal system is one of the best in Europe, practically the whole of the waterways system is the

property of the State, which, in accordance with the recommendation of the French Canal Commission of 1872, maintains the canals and navigations out of the public funds, and free of all tolls. In the seven years following the Franco-German War, 1871-1878, France, notwithstanding the strain otherwise thrown on her finances, spent over £10,000,000 on the waterways and their outlets. In 1879, a new and comprehensive scheme was drawn up with the object of obtaining, either by transforming the existing waterways or constructing new ones, the greatest possible length of channel of the kind described as "first-class waterways." Such waterways are those accessible throughout to large barges—like the Flemish ones of about 300 tons burden—and accordingly having a minimum depth of about 6 feet 6 inches, locks at least 17 feet wide, and 127 feet long, and bridges not less than 12 feet high. In the execution of this programme £18,000,000 was spent in the years 1879-1900. The total length of "first-class waterways," was thus increased from 906 miles to 2,930 miles, including 401 miles of newly constructed canals. Again in 1901 a new and exhaustive scheme was projected, and in 1903 part of it involving an expenditure of over £10,000,000 was authorised by the Chamber. Most of this money is being spent on improving the navigation of the Garonne, the Orleans, and other canals intended to link Cibleux with Orleans, and Cette and Marseilles with the Rhone. Since 1841 France has spent over £100,000,000 on the construction and improvement of inland waterways, and now contributes about £1,250,000 annually for upkeep and staff. The total length of French navigable waterways is 7,456 miles. Of this total 3,045 miles are canals, 2,930 miles being of the type described as "first-class waterways," and 4,411 miles are river navigations.

Turning to the statistics of water traffic we find that the total weight of merchandise shipped by inland waterways in 1878 was 20,000,000 tons. This had risen in 1898 to 32,000,000 tons, and it is now close on 38,000,000 tons.

The past twenty-five years have also seen considerable progress in methods of traction. The system still generally in use is the towing of boats by horses, in some cases kept on the barges, in others supplied by the enterprise of localities bordering on the waterways. On the canals of the north, where the traffic is great, the State has found it necessary to interfere so as to ensure a regular supply of horses at reasonable rates. Tug boats have, however, come into increased use, and a great economy has been thus effected, especially where, as in the case of the Seine from Paris to Rouen, the locks are large enough to contain the whole of the craft in tow at one time. On rapid streams like the Rhone, it has been found profitable to employ tug-boats advancing by the aid of a chain laid

along the bottom of the navigation, the steam power required being less than in ordinary steam tugs. Successful experiments have also been made with an electric trolley somewhat similar to that used with tramways, on the Bourgoyne canal.

Belgium.

Among the countries of Europe in which inland navigation plays an active part in the commercial and industrial enterprise of the nation, Belgium occupies a leading place, the total length of its navigable waterways amounting to 1,360 miles. As the total area of the country is only 11,373 square miles, there is the high proportion of one mile of waterway to every eight and one-third square miles of territory. This high average is mainly due to the great natural physical advantages offered by such important water highways as the Scheldt with its tributary the Lys, and the Meuse and its tributary the Sambre. Not content, however, with the great advantages provided by Nature for internal communication by water, the people of Belgium saw in their rivers a basis for a far-reaching network of canals by which the Belgian producer could be materially assisted in competition for the world's markets. To show what importance the State attaches to canals it is only necessary to point out that about 83 per cent. of the navigable waterways are under direct State control. Thus, of the 1,360 miles of canals, over 1,120 are administered by the State. In the canals conceded to private owners, the State is also a large shareholder. Immense sums of money have been voted for the improvement and upkeep of the navigable waterways, and during the past twenty-four years more than £16,000,000 have been spent on canals and ports. The result of this policy is, as Mr. Consul-General Hertslet, points out in a recent Consular Report, that goods can be sent in barges of 300 tons carrying capacity, direct from the factory to the seaport, or other place of destination, without transshipment. The producer, thus saved the expense incurred by such transshipments, finds himself in the position of being able to make a profit greater by this amount, or to underbid those of his foreign rivals, who may not enjoy such peculiar advantages. This remark applies in a double sense, for a gain is made on the transport of the raw material as well as on that of the finished article.

In order to form a clear idea of the great utility of the canal system of Belgium, it is from its heart, from the great port of Antwerp as a centre, that the survey must be taken. Antwerp holds a leading position among the great ports of the world, and this is due, not only to her splendid geographical situation at the centre of the ocean highways

of commerce, but also to her practically unique position as a distributing centre for a large portion of North-Western Europe. For the distribution and collection of merchandise the network of railways and canals which converge on Antwerp offers transport facilities of which the world of commerce has not been slow to avail itself.

The proof of this lies in the steady growth of the volume of barge traffic. In 1902 the number of barges arriving at the port of Antwerp amounted to 31,850, with a tonnage measurement of 5,705,731 tons, and of these 25,886, measuring 3,710,813 tons, were engaged in purely Belgian traffic, whilst 5,964, measuring 1,994,918 tons, were engaged in the transport of merchandise from Holland, Germany and France. The clearing returns were even larger, the total number of barges leaving Antwerp amounting to 33,250, measuring 5,939,674 tons. Of this number 26,435 barges, measuring 3,686,585 tons, came from industrial centres in Belgium, and 6,815, measuring 2,253,089 tons, from various places in Holland, Germany, and France. An examination of the corresponding statistics for 1882 shows that the volume of barge traffic at the port of Antwerp has during the last 20 years increased by some 17 per cent. as regards the number of boats engaged. In tonnage the increase is far more remarkable, the figure for 1902 showing an advance of about 270 per cent as compared with those for 1882.

An idea of the freight rates on Canals and Railways may be obtained from the following table :—

TABLE OF AVERAGE FREIGHTS. PER TON OF COAL.

FROM—	Distance by Canal	TO—	By Canal		By Rail,† 1903.
			1888	1903.	
	Miles		s. d.	s. d.	s. d.
Antwerp ..	250½	Cologne	6 7½	2 3*	6 5
Antwerp ..	418½	Mannheim	9 2	4 6*	12 0
Antwerp ..	504½	Strasburg (via France)	..	8 9†	11 0
Antwerp ..	500½	Strasburg (via the Rhine)	..	6 0*	..
Antwerp ..	86½	Charleroi ..	2 4	2 3½†	3 ½
Antwerp ..	98½	Liege ..	2 9	2 9†	3 6
Antwerp ..	105½	Mons ..	2 11	2 6†	3 5
Antwerp ..	287½	Paris ..	..	7 0†	11 6½
Charleroi ..	45½	Brussels	2 0½	1 10½†	2 11½
Charleroi ..	110½	Ghent ..	3 0	2 8½†	3 0
Charleroi ..	270	Nancy	5 10½	5 0†	8 6

* In 50-ton lots. † In full loads ‡ In 10-ton loads
NOTE.—The 1888 freights from Antwerp to Strasburg and Paris are unknown.

Germany.

During the earlier period of the development of railways in Germany—indeed, up to 1875—there existed a feeling in that country, as elsewhere, that transport by canal was

bound to decline, it being thought impossible that canals could compete with the extensive railway systems. Soon after the war, however, when statesmen began to turn their attention, at least in part, from political to commercial conquest, they recognised that there were still possibilities in canals, and that inland waterways could be used to facilitate the commercial growth of the new empire. This recognition was stimulated by the dissatisfaction felt with the comparatively high rates of the railways, but the rapid extension in the use of the waterways was mainly due to the great increase of technical knowledge in connection with river and canal works. This knowledge led also to the adoption of improved kinds of boats, and better appliances for haulage. From 1880 onwards it has been held in Germany that the old style of canal, with small craft and slow towage, cannot hope to be economically satisfactory, and that waterways, to become of practical use, must be able to accommodate large vessels of from 450 to 600 tons, and towed by some form of power more rapid than horse-traction. In fact, in most parts of Germany, the chief inland waterways, both natural and artificial, have been adapted to steam traffic by replacing the many small locks by a few large ones. During the ten years 1890-1899, a sum of nearly £15,000,000 was expended on inland waterways, mainly on the canalisation of rivers. The actual length of the waterways in 1900 was 8,798 miles, divided thus:—

	MILES.			
Rivers	5,776
Canals and Rivers	1,451
Canals	1,510
North Sea Canal	61
				8,798
Total	8,798

Early this year a most elaborate programme of inland navigation, involving an expenditure of close on £17,000,000, has been sanctioned by the Prussian Diet. The scheme includes the construction of a canal between the Rhine and the Dortmund-Ems Canal, already in existence, the carrying out of additional works on the Dortmund-Ems Canal, the construction of a canal connecting this latter waterway with the Weser, and the canalisation of the Lippe. Besides these works, a connection, available for large craft, is to be made between Berlin and Stettin, the waterway between the Oder and Weser is to be improved, and the Oder is to be canalised between Glaz Neisse and Breslau. Nor does this mark the limit of German Canal development. The Prussian Diet has passed a resolution urging the Government to in-

roduce Bills for the canalisation of the Moselle, Lahn, and Saar Rivers in West Prussia, and for the construction of the Masuric Canal in East Prussia. Then, too, for some years past the Wurtemberg Government has been preparing a scheme to construct a canal from the Rhine, starting at Mainz, utilising the Neckar and joining the Danube at Lauingen. By this, goods could be carried at cheap rates from the Near East, from the Black Sea to the North Sea.

Austria-Hungary.

According to the latest published statistics (1900), the internal navigable waterways of Austria-Hungary have an approximate length of 7,100 miles, of which about 3,600 miles are merely available for rafts, whilst the remaining 3,500 is adapted for boat navigation. Further details are not easily accessible, but this is a matter of little importance, as the development and improvement of the internal waterways of Austria-Hungary in the past is completely overshadowed by the new scheme for the construction of a network of canals in both parts of the Dual Monarchy. Early in 1901 a Bill was introduced into the Reichsrath of a most extensive character. According to this Bill it was proposed to construct :—

1. A connection between the Danube and the Oder.
2. A canal from the Danube to the Moldau, near Budweis, together with the regulation of the latter river from Budweis to Prague.
3. A canal connecting the Danube-Oder section with the upper part of the Elbe, and the canalisation of the latter river, as far as Melnik.
4. A navigable canal to unite the Danube-Oder with the basin of the Vistula and with the navigable portion of the Dniester.

The work was to be begun in 1904, and completed in 20 years. The total cost was estimated at £36,000,000. The Bill was too ambitious, and before it could be passed it was submitted to extensive alterations. None-the-less, by the law of the 11th June, 1901, £10,000,000 were voted for the modified scheme. Of this sum £3,000,000 are to be devoted to river regulation work, and £7,000,000 to the actual construction of canals. The first period of construction is reckoned from 1904 to 1912, and at the expiration of that time a new credit may be demanded for the completion of the work.

Holland.

I have placed Holland last, not because its inland navigation system is unimportant—the waterways-system of Holland is the most efficient in the world—but because any comparison between the conditions of railway and water traffic in other countries, more especially Great Britain, and those which exist in Holland, must be illusory, owing to the great difference in the conditions affecting the two systems of transport in Holland, and all other countries. To fully explain these differences would be to write an important chapter in the politico-economic history of Holland. It must suffice to say here that a glance at the map of the Netherlands will show the great number of waterways which intersect the country, especially in the lower-lying districts, as well as the great rivers forming the arteries connecting Holland with the neighbouring countries of Germany and Belgium.

Long before the construction of railways, these waterways were the traffic-carriers of both goods and passengers throughout the land, at rates of transport so low that competition on the part of any other known means of transport was, and remains, a nearly practical impossibility, so far as local goods traffic is concerned.

Fifty years ago there were only three existing lines of railway of any importance in Holland, and all three of these lines had a hard struggle for existence.

When, about the years 1859-60, the urgent necessity for the construction of railways throughout the whole of Holland, to prevent the country falling into a condition of isolation, began to be clearly understood by both the Government and the nation, it was seen that private enterprise could not, from the circumstances of the case, be relied upon for the provision of a remedy. The existence of such abundant and excellent waterways and canals, and the evident impossibility of inducing private capital to undertake a competition with them, forced upon the Government and the nation the adoption of a plan by which the construction of a considerable net-work of railways should be assured.

The State railways were constructed at the cost of the nation, and after considerable discussion as to the means of working them to the best advantage, they were handed over to a private company, expressly promoted and constituted for the purpose, the State providing the permanent way and the buildings, while the company, calling itself the "Company for the Working of State Railways," provided rolling-stock and *personnel*, and worked the new lines to the best advantage.

The above explanation is necessary if the relation between the railways of Holland and the waterways is to be fully

understood. It will be perceived that within certain limits the Railway Companies are, in many cases, in a position to establish tariffs, which railways constructed by private capital could only charge at a loss, seeing that the Companies working the State lines have not to provide anything for interest or sinking fund on the capital expended on lands, permanent way, or buildings. The reduction of rates is practically limited by the actual cost of transport only. Yet as far as local inland goods traffic is concerned, it is only by the most strenuous exertions, by the combination and grouping of goods for special districts, and by the reduction of rates to the lowest possible limits, that the railways can compete with water carriage, as a glance at the following table will show.

WATER FREIGHTS						Distance in Miles	
Ore	.	Rotterdam-Ruhrort	..	..	Per ton	1 3	156
"	..	Amsterdam-Ruhrort	.	..	"	1 3	156
Coals	..	Ruhrort-Amsterdam	.	..	"	1 6	156
"	.	" Rotterdam	..	..	"	1 6	156
"	..	Amsterdam-Arnheim	.	..	"	1 6	75
"	..	" Utrecht	..	..	"	1 0	25
RAILWAY FREIGHTS.							
Coals	.	Essen-Amsterdam	.	..	Per ton	4 7	126
Ore	.	Amsterdam-Essen	.	..	"	5 0	126

In view of the extreme importance of the waterways, it is needless to say that the Netherlands Government looks after them with the most anxious care. Thus, in the period 1862-1901, almost £12,000,000 was expended on the improvement and maintenance of the river-navigations, and in the period 1878-1900, over £5,000,000 was expended on the State Canals.

Thus we see, that throughout Europe an active policy is being pursued to develop the use of waterways and canals. It may be noted, too, that even Russia, in spite of her manifold troubles, economic and political, has started a survey for the long-talked-of canal from the Baltic to the Black Sea. It is clear that the chief countries of the Continent recognise the importance and the economy of water transport. The object lessons are numerous; the benefit of thirty years' experience is at our disposal; and yet little has been done towards remedying what is surely a grave defect in our economic system. It is, of course, possible to overdo the argument from foreign analogies. Conditions at home and abroad are often dissimilar, and in a country mainly

agricultural, and not thickly populated, the traffic may not perhaps warrant the expenditure necessary to bring our canals up to the standard of the important navigations of the great industrial States of the Continent. Yet, it is difficult to consider the practical testimony of the great European countries as to the importance of water transport without wishing to see the lessons of foreign experience applied to the development of our own system of canals and waterways.

3.—*The Land Purchase Problem.*

BY W. J. JOHNSTON, M.A., LL.B., Barrister-at-Law.

[Read 23rd February, 1906]

IT is a far cry from the turbulent scenes in the Legislative Assembly of 1790 to the quiet, almost dull, offices of the Estates Commissioners in 1906; and yet the changes that in the one case were effected with noise and bloodshed, and those that are taking place in the other with calmness and goodwill, are very similar in their character, and are likely to have many resemblances in their results. The peasant proprietary that is at present being ground out slowly but surely by the mills of the Estates Commissioners, is likely to have many of the characteristics of, and something of the same destiny as the peasant proprietary that was the direct result of the Revolution in France; and I think it is no exaggeration of language to suggest that at the present time a Revolution is taking place in this country—silently, peacefully, effectively—which is bound to bring about tremendous social and industrial changes, and which, in my opinion, is fraught with the greatest good to the people of Ireland.

I am inclined to think that we in this country do not adequately realise what is happening. I am certain that at any rate the people of England and Scotland do not really understand what is taking place in Ireland at present. We and they know, of course, in a general sort of way, that the Act of 1903 was passed, and that a hundred millions of money is being expended in land purchase; but what that really portends is not for an instant realised. Under such circumstances, I think that no apology is needed on my part for introducing a discussion on the subject in this Society—a subject, as I will show, of the greatest statistical and social interest since the time of the question of Catholic Emancipation.