COMMERCIAL. No. 7 (1903).

REPORTS

and further reports

FROM

HIS MAJESTY'S REPRESENTATIVES

ON

NAVIGABLE INLAND WATERWAYS

IN

AUSTRIA-HUNGARY, BELGIUM, FRANCE, GERMANY, AND THE NETHERLANDS.

27/7

Presented to both Houses of Parliament by Command of His Majesty.
August 1903.

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The Marquess of Lansdowne to Sir E. Monson, Sir F. Lascelles, Sir F. Plunkett, Mr. Phipps, and Sir H. Howard.

Sir, *Foreign Office, February* 25, 1901.

I TRANSMIT herewith copies of letters from the Association of Chambers of Commerce respecting internal navigable waterways, and I request that you will furnish me with a report on the progress made in France, Germany, Austria-Hungary, Belgium, and the Netherlands in this respect.

I am, &c.

(Signed) LANSDOWNE.

Inclosure 1.

Association of Chambers of Commerce of the United Kingdom to the Marquess of Lansdowne.

1, *Great College Street, Westminster,*

My Lord, *January* 17, 1901.

I AM requested by the Executive Council of this Association to express to your Lordship the desirability of the Foreign Office obtaining Reports from Her Majesty's Consuls in France, Holland, Belgium, Germany, and Austria relative to the internal navigable waterways of these countries, and especially as to the following points:—

1. As to the capital expended during the past twenty-five years in developing and improving the waterways, and the methods by which they have been improved.

2. As to the tolls chargeable upon traffic and the manner in which interest on capital expended is provided for.

3. As to the results which have followed improved means of transport by water—

(*a.*) With regard to the railways;

(*b.*) With regard to the seaports; and

(*c.*) With regard to the trade and commerce of the country.

The subject of developing the internal waterways of the United Kingdom has for some time past been under the consideration of the Chambers of Commerce, and it is thought that if the information above indicated could be obtained as to the experience of continental countries it would be of considerable service in suggesting methods for utilizing to a greater extent than at present our existing waterways.

The Executive Council trusts that your Lordship may favourably consider this proposal.

I have, &c.

(Signed) EDWARD W. FITHIAN,
Secretary.

Inclosure 2.

Association of Chambers of Commerce of the United Kingdom to Foreign Office.

1, *Great College Street, Westminster,*
Sir, *February* 21, 1901.

I HAVE the honour to inform you that I brought your letter of the 22nd January, respecting Reports from Her Majesty's Consuls in certain European countries relative to internal navigable waterways, before our Executive Council at their meeting on Tuesday last. They have considered the three Reports inclosed with your letter, and beg to point out in reply that, so far as regards France, they do not contain any statistics after 1893, and as regards Germany, very little information indeed after 1892. At that period, according to the German return, 6,197,600*l.* had been voted for the improvement of the inland ports and waterways, and 1,852,750*l.* had been spent, leaving still available 4,344,850*l.* The Dortmund-Ems Canal had only been just begun; it is now completed, and the effect of that and other great works should now be known. The Council desire the information contained in the Reports named to be brought down to date and amplified. The German Report, No. 345, is a very able one, but nothing is contained in it with regard to the results claimed for the recent expenditure for improvement of the waterways more recent than a Memorandum laid before the Prussian Parliament in 1890.

It would be useful to know how interest on capital expended is provided for, how far, and in what manner the State has been

aided by local subscriptions or guarantees, and the results which have followed improved means of transport by water with regard to railways.

The Council hope that the Secretary of State for Foreign Affairs will be pleased to obtain Reports, as above desired, in addition to those referred to in our letter of the 17th January.

I have, &c.

(Signed) EDWARD W. FITHIAN,
Secretary.

Replies to preceding Despatch.

AUSTRIA-HUNGARY.

No. 1.

Mr. Milbanke to the Marquess of Lansdowne.—(*Received June* 24.)

My Lord, *Vienna, June* 20, 1901.

In accordance with the request contained in your Lordship's despatch of the 25th February last, I have the honour to forward to your Lordship herewith a report, which I have received from Mr. Bennett, Commercial Attaché to this Embassy, respecting the internal waterways of Austria-Hungary, with special reference to their modern development and improvement.

I have, &c.

(Signed) RALPH MILBANKE.

Inclosure in No. 1.

Report by Mr. Bennett on the Internal Navigable Waterways of Austria-Hungary, with special reference to their modern Development and Improvement.

Austria.

According to the latest published statistics (1900) the internal navigable waterways of Austria possess an approximate total length of 4,000 miles, of which 2,356 miles are merely available for rafts, and the remaining 1,644 miles for ordinary navigation. Out of the total length of 4,000 miles, only 806 miles, or about 20 per cent. of the distance, are navigable for steamers not exceeding a draught of 6½ feet.

The subjoined Table gives a detailed list of the navigable waterways of Austria:—

Name of River or Canal.	Where situated.	Approximate Length of Navigable Portion in English Miles.			
		Rafts only.	Ordinary Navigation.	Total.	Steamers.
Ager	Upper Austria	22	...	22	...
Almfluss	,, ,, ...	23	...	23	...
Anfora Canal	Austrian Littoral	...	7	7	7
Aussa	,, ...	...	13	13	13
Becwa	Moravia	65	...	65	...
Biero Canal	Austrian Littoral	...	4	4	3
Bestritza	Bukowina...	39	...	39	...
Bug	Galicia	40	...	40	...
Bystrzyca–Nadwornaer	,, ...	14	...	14	...
,, –Solowinaer	,, ...	8	...	8	...
,, –Vereinigte	,, ...	13	...	13	...
Cetina	Dalmatia	...	4	4	...
Czeremosz	Galicia and Bukowina	92	...	92	...
Danube	Upper and Lower Austria	...	214	214	214
Danube Canal	Lower Austria	...	10	10	10
Dorna	Bukowina...	20	...	20	...
Dniester	Galicia	50	197	247	197
Dragogna	Austrian Littoral	...	3	3	...
Drave	Tyrol, Carinthia, Styria	112	112	224	...
Dunajee	Galicia	94	24	118	...
Eisack	Tyrol	6	...	6	...
Elbe	Bohemia	122	68	190	68
Enns	Styria, Upper and Lower Austria ...	72	35	107	...
Etsch	Tyrol	16	62	78	...
Gail	Carinthia...	49	...	49	...
Ill	Tyrol	4	...	4	...

Name of River or Canal.	Where situated.	Approximate Length of Navigable Portion in English Miles.			
		Rafts only.	Ordinary Navigation.	Total.	Steamers.
Inn	Tyrol and Upper Austria	34	92	126	...
Kerka	Dalmatia	...	8	8	8
Laibach	Carniola	...	14	14	...
Lend Canal	Carinthia	...	3	3	...
Lomnica	Galicia	41	...	41	...
Luznitz	Bohemia	49	...	49	...
Maltsch, Pachersbach, Schwarzau.	,,	45	...	45	...
March	Moravia and Lower Austria	77	73	150	...
Moldau	Bohemia	103	152	255	51
Möll	Carinthia	55	...	55	...
Mur	Styria	126	20	146	...
Naranta	Dalmatia	...	12	12	12
Naser (Nazarka)	Bohemia	19	...	19	...
Natissa	Austrian Littoral	...	8	8	5
Oder	Silesia	...	17	17	...
Ombla	Dalmatia	...	2	2	2
Poprad	Galicia	37	...	37	...
Primiero Canal	Austrian Littoral	...	15	15	12
Pruth	Galicia, Bukowina	78	...	78	...
Przemza	Galicia	...	14	14	14
Quieto	Austrian Littoral	...	12	12	...
Rhine	Vorarlberg	...	24	24	3
Rosega Canal	Austrian Littoral	...	621	621	621
Salza	Styria	7	...	7	...
Salzach	Salzburg and Upper Austria	35	50	85	...
San	Galicia	87	74	161	...

Sann	Styria	42	...	42	...
Save	Carniola and Styria	34	37	71	...
Sazawa	Bohemia	86	...	86	...
Sdobba	Austrian Littoral	...	6	6	...
Skawa	Galicia	31	...	31	...
Sola	,,	46	...	46	...
Steyr	Upper Austria	29	...	29	...
Stryj	Galicia	51	...	51	...
Suczawa	Bukowina	69	...	69	...
Swica	Galicia	41	...	41	...
Tanew	,,	8	...	8	...
Terzo	Austrian Littoral	...	2	2	...
Timavo	,, ,,	...	1	1	1
Traun	Upper Austria	19	46	65	...
Vöckla	,, ,,	16	...	16	...
Vistula	Galicia	...	183	183	183
Waltawa	Bohemia	71	...	71	...
Wislok	Galicia	98	...	98	...
Wisloka	,,	56	12	68	...
Zermagna	Dalmatia	...	6	6	6
Ziller	Tyrol	3	...	3	...

The only statistics available with reference to the development and improvement of the waterways in Austria comprise a period of fifty years, from 1848 to 1898. During this time the total sum expended on river regulation in this half of the Dual Monarchy amounted approximately to 500,000,000 crowns, or about 21,000,000*l.* Of this amount 142,411,422 crowns or about 6,000,000*l.* were expended in connection with the regulation of the Austrian Danube.

The appended Table describes the principal river regulation works carried out in Austria during the period above referred to :—

River and Portion regulated.	Date.	Cost in Sterling.	How Financed.
		£	
Danube (Lower Austria).			
(*a.*) Ennsmündung–Theben, 144 miles long	1849–1869	586,740	Government grant.
(*b.*) Ditto, with exception of regulation at Vienna ...	1870–1882	497,311	Ditto.
(*c.*) Regulation at Vienna, Nussdorf–Fischamend, 16 miles long	1870–1882	2,550,000	State ... ... One-third Province ... ... One-third Vienna ... ... One-third
(*d.*) From the Isper to Theben, 115 miles long ...	1882 to end of 1901	2,000,000	£ Yearly contributions ... State ... ... 58,334 Province ... 16,666 Danube Regulation Fund. 25,000 Total ... 100,000
(*e.*) Austro-Bavarian frontier at Passau to Puchenau	1853–1897	43,742	Government grant ... ... 43,400 District interested 342
(*f.*) Puchenau–Mauthausen	1853–1897	131,150	Government grant ... ... 110,725 District interested remainder.
(*g.*) Mauthausen–Mouth of Isper	1853–1897	125,000	Government grant ... ... 124,500 District interested remainder.
Inn (Upper Austria).			
From the mouth of the Salzach, near Rothenbach, to the Austro-Bavarian frontier near Passau, 40 miles long	1853–1897	138,584	Government grant ... ... 138,366 District interested remainder.

River and Portion regulated.	Date.	Cost in Sterling.	How Financed.
		£	£
Traun (Upper Austria).			
(*a.*) Steeg–Ebensee, 20 miles long	1892–1897	14,021	Government grant... ... 11,550 District interested remainder.
(*b.*) From Stadl to junction with Danube	1853–1897	117,042	Government grant... ... 115,608 District interested remainder.
Elbe (Bohemia).			
(*a.*) Little Elbe, from Königgrätz to Melnik, 10 miles long	1864–1897	76,120	Provincial funds and districts interested.
(*b.*) Upper Elbe, from Melnik to Saxon frontier, 68 miles long	1848–1897	672,755	Government grant.
Moldau (Bohemia).			
(*a.*) Upper Moldau, from Eleonorenhain to Budweis, 4 miles long	1848–1897	53,264	Provincial funds ... ... 41,036 Government grant remainder.
(*b.*) Budweis–Melnik	1848–1897	1,065,280	Government grant... ... 990,280 Provincial funds remainder.
(*c.*) Moldau–Elbe Canalization: Prague, Melnik, Aussig	1897	103,334	Government grant... ... 70,000 Provincial funds remainder.
Vistula (Galicia and Silesia).			
(*a.*) Schwarzwasser–Bialka	1885	2,522	Government ... ... 50 per cent. Province ... ... 50 ,,

(*b.*) Drahomischl to frontier below Schwarzwasser ...	1886	2,214	Government ... ... 30 ,, Province ... ... 70 ,,
(*c.*) From mouth of Kopidlobach to the bridge at Drahomischl	1886–1898	23,234	Government ... ... 45 ,, Province ... ... 40 ,, Riparians... ... ... 15 ,,
(*d.*) Illownitza–Lobnitz–Neinzendorferbach... ...	1886–1894	13,600	Government ... ... 30 ,, Province ... ... 40 ,, Municipalities ... ... 10 ,, Real estate owners ... 20 ,,
(*e.*) Section from Görzow to Cracow, 47 miles long	1884–1898	365,095	Special Government grant.
(*f.*) Section from Cracow to Austro–Russian frontier at Niepolomice, 17 miles long	1864–1898		
(*g.*) Section from Niepolomice to Popowice on the Russian side of Zawichost, 114 miles long ...	1864–1898		
Dunajee (Galicia).			
(*a.*) Upper portion, from Czorsztyn to Zglobice, 91 miles long	1864–1898	84,332	Government ... ... One-third Province... ... ... One-third District interested ... One-third
(*b.*) Lower portion, from Zglobice to the Vistula, 24 miles long	1864–1898		Special Government grant.
San (Galicia).			
(*a.*) Section from Lisko to Jaroslau, 142 miles long ...	1871–1898	205,032	Government ... ... One-third Province ... ... One-third District interested ... One-third
(*b.*) Section from Jaroslau to the mouth, 74 miles long	1864–1898		Special Government grant.

River and Portion regulated.	Date.	Cost in Sterling.	How Financed.
		£	
Dniester (*Galicia*).			
(*a.*) Section from Rozwadow to Zurawno, 51 miles long	1893–1898	53,334	Government ... ... 60 per cent. Province and district ... 40 ,,
(*b.*) Section from Zurawno to the Russian frontier at Okopy, 196 miles long	1863–1898	134,770	Special Government grant.
Etsch (*Tyrol*).			
(*a.*) Kastelbell–Galsaun, 1½ miles long	1896–1897	10,000	Government ... ... 50 per cent. Province ... ... 20 ,, District interested ... 30 ,,
			£
(*b.*) Meran–Sacco, 66 miles long	1879–1896	904,332	Government ... ... 533,334 Province ... ... 170,000 Southern Railway ... ... 76,665 District interested ... 124,333
(*c.*) Sacco–Borghetto	1883–1888	42,750	Government ... ... 60 per cent. Province and district ... 40 ,,
Rhine (*Tyrol*).			
			£
(*a.*) Protective and dam works from the Liechtenstein boundary to the Boden See, 24 miles long ..	1848–1894	240,000	Government ... ... 210,000 District 30,000
(*b.*) Extension and strengthening of inner dams ..	1884–1891	74,583	Government, aided by province and district interested.
(*c.*) Regulation of river in Austrian territory ...	1895–1907	422,470	Government grant.

Mur (*Styria*).			
From Graz to the Hungarian frontier, 77 miles long	1875–1891	235,000	Government ... ... 40 per cent. Province ... ... 40 ,, Districts interested ... 20 ,,
Drave (*Carinthia*).			
From the Tyrolese frontier at Nikolsdorf to Völkermarkt, 110 miles long	1884–1893	208,334	Government ... Nine-fifteenths. Province ... ... Four-fifteenths. District ... ... Two-fifteenths.
Narenta (*Dalmatia*).			
From the Bosno-Herzegovinian frontier to the mouth, 12 miles long	1881–1888	600,000	Government grant.

The methods employed in the regulation of rivers in Austria—as well as in Hungary—have a twofold object in view. Firstly, the regulation works are carried out in the interests of navigation by deepening the channels; and secondly, in the interests of agriculture, by preventing, as far as possible, the overflowing of river banks in time of high water or floods.

In order to accomplish this double object a system known as "Mittelwässer Regulirung," that is, a regulation of the river on the standard of normal water conditions, has been in vogue, according to which the river beds have been widened and deepened so as to facilitate navigation on the one hand, and on the other to give sufficient room for the carrying off of surface water in time of flood.

This system, however, has failed to produce a uniform depth in the channel regulated during periods of low water owing to the fact that at such times the current is constantly changing from one bank to the other. Now the periods of low water in many rivers, notably in the Danube, occurring at the very time when shipping traffic is at its height, it has been found necessary to supplement the "Mittelwässer Regulirung" above mentioned by a system which insures a uniform depth of channel at low water. This system of low water regulation consists in making a narrower channel within the wider channel of the "Mittelwässer Regulirung" by means of which the stream is concentrated and the low water channel thereby considerably deepened.

In cases where the system of low water regulation does not give satisfactory results, then canalization is resorted to as with the Moldau and the Elbe. At the present time the canalization of the former river is proceeding from Prague to its junction with the Elbe at Melnik; and of the latter from Melnik to Aussig.

The low water system of regulation was introduced from Germany, where in the eighties it was employed with great success in the Rhone and in the Weser near Bremen. In Austria it was first put into practice between 1880 and 1890 in the regulation of the Drave near Oberdrauberg in Carinthia, and later of the Danube near Linz in Upper Austria, of the Moldau in Bohemia, and finally of the Danube near Vienna. In the year 1895 a plan was drafted for the low water regulation of the whole length of the Danube in Lower Austria. This project has now been extended to Upper Austria; so that, when the work is completed, the Danube from the Bavarian frontier at Passau to the Hungarian frontier at Theben, will be navigable at low water for boats drawing 18 decim. (5·904 feet) of water.

The capital hitherto expended in Austria on the regulation and improvement of the waterways is "à fonds perdu," and no tolls are levied on navigation.

Owing to the rapid development of the railway system at the beginning of the latter half of the nineteenth century.

river traffic in Austria-Hungary, as elsewhere, lost for some time the importance which it had previously possessed, and it almost seemed that on some rivers it would come to a complete standstill. To this circumstance may be ascribed the fact that it is only of comparatively recent date that earnest attention on the part of the State has been given to river regulation, for it has become evident in the face of the ever-increasing traffic that the railways are not in a position to grant those cheap rates which economic interests demand, more especially for the carriage of bulky merchandize of small value.

By the Law of the 11th June, 1901, 250,000,000 kronen, or over 10,000,000*l.*, were voted for the commencement of the construction of a network of navigable canals in Austria, and for the necessary river regulation connected therewith. Of this sum, 75,000,000 crowns, or over 3,000,000*l.*, are to be devoted to river regulation works, and the remainder to the actual construction of the canals. The first period of construction is reckoned from 1904 to 1912, at the expiration of which, a new credit will be demanded for the completion of the scheme. Particulars respecting this projected system of canals may be obtained on application to the Commercial Intelligence Branch of the Board of Trade.

With the project of new navigable canals on a large and comprehensive scale in Austria-Hungary—not to mention Germany—the question of inland navigation is entering upon a new and important phase, and is at the present time largely absorbing public attention in the Dual Monarchy.

As to the effect which the development of the Austrian waterways has so far had on the railways, seaports, and general commerce of the country, no data can be obtained, and it may be said in the absence of very important hydrographic developments that peculiar circumstances preclude any accurate observation. In the first place Austria does not possess a closed network of waterways, and in the second, her only seaport—Trieste—is not connected with the river system of the country.

The river shipping traffic of Austria, however, is steadily on the increase, and seems to respond to the efforts made by the State to facilitate it. A striking example of this progress is afforded by the Danube Steam-ship Navigation Company, the most important line plying on the Austrian Danube. Thus the total quantity of merchandize loaded and unloaded at Austrian Danube ports—

		Tons.
From 1886–1890 amounted to	...	1,263,731
,, 1891–1895 ,,	...	1,208,033
In 1896 alone ,,	...	1,476,525
In 1897 alone ,,	...	1,424,621
1898 ,,	...	1,370,456
1899 ,,	...	1,327,845
1900 ,,	...	1,503,165
1901 ,,	...	1,470,407

that is to say, since 1896 the yearly freight carried by the Company in Austrian waters exceeded by an enormous margin the total freight of the years 1886 to 1890.

Hungary. The internal navigable waterways of Hungary possess an approximate total length of 3,082 miles, of which 1,178 miles are merely available for rafts, and the remaining 1,904 miles for steamers.

The bulk of Hungarian river traffic naturally falls to the Danube: firstly, because this stream—a natural link between east and west—forms a universal highway; and secondly, because all the waterways of the country connect with the Danube, on whose banks Budapest, the commercial and industrial centre of Hungary, is situated. The Hungarian Danube is navigable throughout, but amongst its numerous tributaries, only parts of the Drave, Save, Körös, Maros, Bosut, and Temes are available for steam-ship navigation.

The following Table gives a detailed list of the navigable waterways of Hungary:—

APPROXIMATE Length of Navigable Portion in English Miles.

Name of River.	Rafts.	Steamers.
	Miles.	Miles.
Danube—		
From Dévény to Roumanian frontier	602	602
Mosony Branch	11	11
Irsckujvár Branch	8	...
Szent-Endre Branch	19	19
Mohacs Branch	35	...
Nyitra from Naszvád	9	...
Vág	197	...
Garam	91	...
Sió	96	...
Drave from Legrad to Danube	154	...
Drave from Zakany to Danube	...	142
Save from the frontier to Danube	435	...
Save from Sziszek to Danube	...	374
Bosut from Lyubotin to mouth of Danube... ...	25	25
Kulpa from Károlyváros to Save	84	...
Temes from Pancsova to Danube	2	2
Theiss from Tisza-Ujlak to Danube	600	...
Theiss from Tisza-Füred to Danube	...	286
Szamos from Szatmar to Theiss	61	...
Bodrog from Sarospatak to Theiss	19	...
Körös from Bekes to Theiss	136	...
Körös from Gyoma to Theiss	...	79
Maros from Maros-Ujvar to Theiss	228	...
Maros from Arad to Theiss	...	73
Lake Balaton	76	76

Name of River.	Rafts	Steamers.
Canals.	Miles	Miles.
Béga from Temesvar to Theiss	72	72
Franzens from Bezdan to O'Becse	76	76
Franzens from Kis-Sztapar to Ujvidik	42	42
Canal from Baja to Bezdan	27	27

In Hungary, as in Austria, except at the Iron Gates, no navigation tolls are levied, and the capital expended in developing and improving the waterway is sunk for the common weal, and no direct interest on the invested capital is looked for.

At the Iron Gates, however, in accordance with clause 57 of the Treaty of Berlin, a regular Schedule of tolls are levied. This Tariff, which came into force in September, 1899, is intended to provide the Hungarian Government with interest and amortization on the capital expended in the regulation of the Iron Gates, and, in addition, to defray the cost of their administration and maintenance.

The receipts under the Tariff as yet only average some 21,000*l.* per annum, whereas the annual State expenses connected with the Regulation Works amount to 70,833*l.*, made up as follows :—

	£
(*a.*) Annuity paid for the amortization of loan of 1,875,000*l.*	62,500
(*b.*) Maintenance and superintendence of works	8,333
Total	70,833

In Hungary the extension of the national railway system has proceeded side by side with the increased facilities in navigation, so that it would be difficult to say what effect these facilities have exercised upon the railways. Cheap rates, however, granted by the railways have attracted a good deal of tonnage, which probably would otherwise have been carried by river, so that it may be said that the shipping traffic on Hungarian rivers has not yet developed in proportion with the increased facilities in navigation caused by modern river regulation works.

In thirteen years, however, the river traffic of Hungary has increased from 2,520,000 tons to 3,640,000 tons, as the following statistics show :—

Hungarian River Traffic.

Year.	Tons.
1888	2,520,000
1889	2,530,000
1890	3,100,000
1891	2,840,000
1892	3,000,000
1893	3,450,000
1894	3,260,000
1895	2,620,000
1896	3,840,000
1897	3,400,000
1898	3,530,000
1899	3,420,000
1900	3,400,000
1901	3,640,000

The regulation of rivers in Hungary, as in Austria, can exert no direct influence on the seaports, inasmuch as none of the rivers regulated reach the sea on Hungarian territory.

A project, however, is on foot to bring Fiume, the only Hungarian seaport, into direct communication with the river system of the country by the aid of a canal between the Danube and the Save. Improved railway communication with Fiume has had an extraordinary influence on the trade of that port, and if the Danube–Save Scheme is eventually carried out, a still greater development may be looked for. Thus the trade of Fiume amounted—

	Tons.
In 1870 to	116,746
1880 ,, ...	285,728
1890 ,, ...	814,714
1899 ,, ...	1,146,943
1900 ,, ...	1,177,800
1901 ,, ...	1,191,000

This rapid development must, however, be attributed in the first place to the increased railway facilities, and in the second, to the fact that over 5,000,000*l.* has been expended of recent years in harbour improvement works.

The development and improvement of the internal navigable waterways of Austria-Hungary as outlined in this report are completely overshadowed in importance by the projected construction of a network of navigable canals in both halves of the Dual Monarchy.

At the present time Austria practically possesses no canals, whilst the few which Hungary claims in no way meet the demands of modern navigation. The construction of the canals projected would be calculated to revolutionize the existing

means of internal navigation in the Dual Monarchy, and to produce an effect on the trade and commerce of the country which modern river regulation works have certainly failed to bring about.

(Signed) A. PERCY BENNETT.

Vienna, June 15, 1901.*

No. 2.

Sir F. Plunkett to the Marquess of Lansdowne.—(Received August 6.)

My Lord, *Vienna, July* 29, 1901.

In accordance with the request contained in your Lordship's despatch of the 25th February, and in continuation of my despatch of the 20th June, I have the honour to transmit herewith a translation of a note which I have received from the Ministry for Foreign Affairs giving information regarding the work of canalization for the regulating of rivers in Hungary.

I have, &c.

(For the Ambassador),

(Signed) M. DE C. FINDLAY.

Inclosure 1 in No. 2.

M. Szecsen to Sir F. Plunkett.

(Translation.)

In continuation of its note of the 30th April last, the Ministry of Foreign Affairs has the honour to give the following information on the subject of works of canalization and regulation of rivers in Hungary.

The Hungarian Government has spent, between 1876 and 1900, the following sums for works in connection with the regulation of rivers (see Inclosure 2).

In addition to these sums, Hungary has spent, for the regulation of the Iron Gates and other cataracts on the Lower Danube, the sum of 45,000,000 kronen (1,875,000*l.*).

Further, the sum of 300,000,000 kronen (12,500,000*l*). has been expended for the construction of dams by the Societies composed of interested persons living on the banks of the Danube, Theiss, and their tributaries. Accordingly, the total sums expended in Hungary during the above-mentioned period for the regulation of rivers and construction of dykes amounts to 527,000,000 kronen (about 21,958,330*l.*).

The above-mentioned works are divided into cuttings, works

* Subsequently revised and brought up to date.

for the protection of the banks, the construction of winter harbours, the regulation of river beds, *i.e.*, dredging, building of stone dams and quays, removal of rocks below the surface of the water, with the object of deepening the river bed and maintaining a regular breadth.

Toll on an open river is only levied on the Iron Gates Canal and along the other cataracts in that part which have been regulated according to the traffic in virtue of Article LV of the Treaty of Berlin.

These tolls are as follows :—

1. On each empty or laden freight-steamer, tug, row-boat, or sailing-boat, 20 heller per ton of 1,000 kilog., estimated on the full freight capacity, *i.e.*, tonnage, as set forth in the manifest of the said craft.

2. On the merchandize conveyed in the freight-ships, tugs, rowing and sailing-boats, a shipping tax of 18 heller per 100 kilog. is levied.

Exceptional reduction is made in favour of coal, quarried stone, gravel, cement, lime, bricks, wood (carpenter's and fuel), manures, and petroleum carried in full cargoes. On these substances the toll is 6 heller per 100 kilog.

[The revenues from these taxes from the 1st September, 1899, to the 31st December, 1902, amounted to 1,729,694 kronen (about 72,000*l.*) on 879,433 tons.*]

As the Hungarian Government has to pay 62,500*l.* yearly to the sinking fund of the loan raised to cover the cost of the conservancy works at the Iron Gates, and as, moreover, the maintenance of the shipping officials, whose duty is to supervise the traffic in the canal, necessitates an outlay of more than 200,000 kronen (about 8,330*l.*) yearly, and, finally, owing to fact that the repairs and necessary works absorbed in the year [1902 265,000 kronen (about 11,040*l.*)*], it is clear that the taxes levied at the Iron Gates do not by a long way cover the cost of regulation, although the existing International Treaties respecting the regulation works at the Iron Gates empower Hungary to levy shipping taxes to the amount of the actual costs of the said works.

On the other reaches of the Danube and on its tributaries no shipping taxes are levied, so that the sums spent in the work of regulations yield no direct return.

The water traffic affects railway freight tariffs in so far that the transport by rail from stations situated on navigable rivers is done at cheaper rates than from those which do not lie on navigable waters.

The question of the influence of water communication on seaports does not arise in Hungary, as no waterway leads at present to the Hungarian coast.

(Signed) SZECSEN.

Vienna, July 23, 1901.

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* Brought up to date.

Inclosure 2 in No. 2.

LIST of Amount of Expenditure on Works of Canalization and Regulation on Hungarian Rivers.

	Kr.	H.
Danube...	76,865,907	79
Theiss	52,391,598	50
Körös	14,644,829	29
Temes	747,369	68
Maros	1,325,846	15
Bodrog...	1,063,052	24
Drave	5,583,857	59
Save	1,592,733	23
Franzens-Canal	2,661,986	83
Smaller rivers	5,538,618	40
Administration and maintenance of works	20,197,779	61
Total	182,613,579	31

Approximately 7,608,899*l*.

No. 3.

Sir F. Plunkett to the Marquess of Lansdowne.—(Received May 4.)

My Lord, *Vienna, May* 1, 1903.

I HAVE the honour to return herewith the revise of Reports on the navigable inland waterways of certain European countries, and to inform your Lordship that the Paper, as far as Austria-Hungary is concerned, has been again revised by Mr. Bennett, and may now be regarded as completely up to date.

I have, &c.
(Signed) F. R. PLUNKETT.

BELGIUM.

No. 4.

Mr. Phipps to the Marquess of Lansdowne.—(Received April 22.)

My Lord, *Brussels, April* 20, 1901.

WITH reference to your Lordship's despatch of the 25th February, I have the honour to transmit herewith the translation of a Memorandum which the Ministry of Finance

and Public Works has courteously prepared, replying to the various points on which information is sought by the Association of Chambers of Commerce of the United Kingdom on the subject of the internal navigable waterways of Belgium, as set forth in their letter to your Lordship of the 17th January last.

The Appendix 2* to the "Guide du Batelier," which accompanies the Memorandum, contains information respecting every navigable river and canal of the Belgian system, as well as the tolls chargeable on the traffic and the places on every section where these tolls are levied, and Mr. Macleay has interpolated in the Memorandum some further information on these points.

I have, &c.
(Signed) CONSTANTINE PHIPPS.

Inclosure in No. 4.

Memorandum on the Internal Navigable Waterways of Belgium.

(Translation.)

Capital expended in improvements.

1. THE capital expended by the State during the period extending from 1875 to 1900 on the improvement and up-keep of the navigable waterways, harbours, and coasts may be estimated at a total of 400,000,000 fr. (16,000,000*l.*).

Methods adopted for improving.

The methods adopted for improving the waterways comprise:—

(*a.*) In the case of navigable and canalized rivers—

Regulating and adapting the river beds with a view to obtain uniformity;

Straightening and shortening the watercourses by making new cuts, &c.;

Strengthening the banks, refacing embankments, stone pitchings, and quay walls;

Construction of towing-paths;

Improvements to dams and locks;

Building houses for the staff intrusted with the care and working of all the engineering appliances.

(*b.*) In the case of canals—

Enlarging, widening, or deepening different sections;

Rebuilding or improving the locks;

Strengthening the banks, refacing and renewing stone pitchings;

Construction of quay walls for commercial purposes;

Improvement of towing-paths;

Building houses for lock and bridge keepers;

Improving the supply of water.

* Sent to Library of House of Commons.

(*c.*) In the case of harbours and coasts—

Dredging with the view to improving the passes and channels at the entrance of harbours;

Construction of jetties, piers, stone embankments, &c., destined for the protection of the coasts;

Building and up-keep of the sea walls, including stone pitchings, promenades, &c.;

Management and up-keep of the dunes forming part of the Royal demesne, including levelling, plantations, road-making, &c.

Administration of the waterways.

The State administers the far greater portion of the system of internal waterways, viz., 1,800 kilom. (roughly, 1,118 miles) out of a total length of 2,196 kilom. (1,372 miles); but as will be seen on p. 88 of the accompanying copy of Annexe II of the "Guide du Batelier" certain portions of the waterways are administered by the provinces, some by communes or municipalities, and a very small portion has been conceded to Companies, Associations of Land-owners ("wateringues"), and individuals.

From pp. 92 to 131 of the "Guide du Batelier" will be found details of every river and canal forming part of the Belgian system, including the length of the navigable portion, the width, the number of locks, &c., also the size and composition of the towing-paths and other special information.

Tolls.

2. As regards the tolls chargeable upon traffic full details will be found for every navigable river and canal of the system on pp. 134 to 179 of the "Guide," under the heading "Conditions of Navigation."

The tolls on the navigable waterways which are under the Administration of the State are fixed by the Government in virtue of the Law of the 1st July, 1865. They are levied on a scale of so much a ton per kilom., *i.e.*, at so much on every ton of freight for every kilom.

As a general rule the tidal rivers are exempt from tolls. On the other waterways the toll is fixed at ·016 fr. for the "rivières canalisées," *i.e.*, rivers which have been rendered navigable by means of locks, &c., and at ·005 fr. for the canals.

As regards the waterways administered by Companies, the tolls are fixed on different bases, according to the terms of the Concession.

Examples of different tolls levied.

As an example of a tidal river the Escaut Maritime (the Scheldt below Ghent) is exempt from tolls.

Meuse Canalisée the toll is ·0016 fr. per ton per kilom.

The canal from the Meuse to the Scheldt the toll is fixed at ·005 fr. per ton per kilom.

The canal from Blaton to Ath (conceded to a Company) the tolls are fixed at ·024 fr. on every ton of freight carried; ·008 fr. per ton of the tonnage capacity of the vessel, and ·008 fr. per ton of the tonnage capacity on a vessel returning empty.

Interest on capital expended.

The State does not derive any interest from the capital expended on the improvement of the waterways, inasmuch as the working and use of this means of transport are left to private initiative. At the most the tolls levied on navigation may be said only partly to reimburse the State for the expenses incurred in keeping the system of navigable waterways in working order.

Results of the improved means of transport by water.

3. During the period 1880–1900 the extension of the trade of Belgium has been enormous.

The traffic on the navigable waterways has grown from 225,000,000 tons per mile in 1880 to 560,000,000 tons per mile in 1900, being an increase of 150 per cent. Over the State railways, the tonnage of freight transported has increased from 14,000,000 to 40,000,000 tons, *i.e.*, has almost trebled. In the seaports the sailings and arrivals combined have shown the same progression, inasmuch as the figures reached a total of 17,100,000 tons of shipping in 1900, against 5,000,000 only in 1875. Finally, the value of the general commerce of Belgium has risen during the same period from 4½ milliards of fr. to over 7 milliards; or from 180,000,000*l.* to 280,000,000*l.*

As regards railways.

Seaports.

General commerce.

It is impossible to estimate, even approximately, the extent to which the improvement of the waterways has contributed in this great development of traffic; there are too many factors reacting one on the other, which have to be taken into account in attempting such a calculation.

But it may be justly claimed that in providing the country with a system of navigable waterways and cheap transport, in multiplying the points of contact between road, rail, and water transport and thus facilitating transhipments, in rendering the seaports easier of access and in stimulating the erection of numerous commercial and manufacturing establishments, this work of improvement has been one of the principal factors of the commercial prosperity of the country

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No. 5.

Sir C. Phipps to the Marquess of Lansdowne.—(*Received June* 11.)

My Lord, *Brussels, June* 10, 1903.

I HAVE the honour to inform your Lordship that in March last I addressed a note to the Belgian Government, inclosing the Report on the navigable inland waterways of Belgium (which was based on information previously supplied by the Ministry of Finance and Public Works) with the request that the statements therein contained might be brought up to date for the use of His Majesty's Government.

I have now the honour to return the Report in question, containing the necessary corrections and emendations.

I have, &c.
(Signed) CONSTANTINE PHIPPS.

FRANCE.

No. 6.

Sir E. Monson to the Marquess of Lansdowne.—(Received October 14.)

My Lord, *Paris, September 14, 1902.*

WITH reference to your Lordship's despatch of the 25th February, 1901, I have the honour to inclose a Report prepared by Mr. O'Beirne on the recent improvements in the French navigable waterways.

I have, &c.
(For the Ambassador),
(Signed) M. DE BUNSEN.

Inclosure 1 in No. 6.

Report by Mr. O'Beirne on recent Improvements in French Navigable Waterways, and their Results.

THE information asked for by the Chambers of Commerce with regard to the improvements recently made in the French internal waterways falls under the following heads:—

(1.) The capital recently expended in developing and improving the waterways, and the methods by which they have been improved.

(2.) The tolls chargeable upon traffic, and the manner in which interest on capital expended is provided for.

(3.) How far and in what manner the State has been aided by local subscriptions or guarantees.

(4.) The results which have followed improved means of transport by water:

(*a.*) With regard to the railways;

(*b.*) With regard to the sea ports:

(*c.*) With regard to the trade and commerce of the country.

These different points, with some others connected with them, will be treated so far as possible in the order in which they have been named.

Expenditure from 1871 to 1878.

In the seven years following the Franco-German war, 1871-1878, France, notwithstanding the strain otherwise thrown on her finances, spent 9,640,000*l.** on the improvement of her waterways and maritime ports. The chief works accomplished during this period in connection with the waterways were the construction in part of the Canal de l'Est,† the "canalization" of the Saône, and the increase of the depth of the Seine and of the canals of the Departments of the Nord and Pas de Calais.

Expenditure from 1879 to 1900 and work accomplished.

In 1879 a new and comprehensive scheme was drawn up, in which the principal object aimed at was to obtain, whether by transforming existing waterways or by constructing new ones, the greatest possible length of channels of the type laid down for first-class or principal waterways. Such waterways were to be accessible throughout to Flemish barges of about 300 tons burden; and with that object they were to have a minimum depth of 2 metres (6 ft. 7 in.), locks at least 5·20 metres (17 ft. 1 in.) wide by 38·70 metres (127 feet) in length, and bridges at least 3·70 metres (12 ft. 1½ in.) in height.

In execution of this programme 18,000,000*l.* were spent in the years 1879–1900. The total length of first-class waterways was increased from 906 miles to 2,930 miles, including 401 miles of newly constructed canals.‡ The Canal de l'Est was completed, a new canal was constructed from the Oise to the Aisne in order to permit of boats circulating between the coal-fields of the Department of the Nord and the industrial regions of the East without passing through the bed of the River Aisne, and the Havre-Tancarville Canal was dug to enable river craft descending the Seine to reach the port of Havre without entering the wider part of the river at its mouth.

The principal natural waterways of the country, the Rhône, the Saône, the Marne, and the Seine, were radically transformed.

On the Rhône, a river with a very rapid current and very shallow in parts, the water was concentrated in a narrow channel by means of longitudinal dams, and the flow of water was regulated by means of transverse dams. The depth of water which formerly fell at certain points as low as 0·40 metres (1 ft. 4 in.) is now everywhere at least 1·15 metres (3 ft. 9 in), and between Lyons and Arles the depth of 1·60 metres (5 ft. 3 in.), formerly only obtainable for about 250 days in the year, is now maintained almost continuously, and the navigation is hardly ever completely interrupted.

* 1*l.* is taken as equivalent to 25 fr.

† See map, Appendix .

‡ See Mr. Consul Payton's description of the canal elevator near St. Omer. (Appendix.)

On the Saône, the Marne, and the Seine, which have a slower and less irregular current than the Rhône, the system of "canalization" was employed, and, while costlier, yielded far more complete results. Movable "barrages," which are withdrawn when the rivers are in flood, prevent the level of the water from falling in times of drought, and the different sections of the river formed by these "barrages" are connected with locks. The depth of the Seine has been by these means brought to 3·20 metres (10 ft. 5 in.) between Paris and Rouen, a distance of 152 miles, and locks have been constructed of sufficient length and breadth to permit of a train of barges in tow of a tug-boat passing through at once.

The total length of French waterways at present classed as navigable comprises 7,330 miles of river and 3,045 miles of canal. But of this only 7,456 miles are effectively available for navigation, and 2,919 miles, as we have seen, are of the type classed as "principal waterways."

Cost of works accomplished.

The construction of the Canal de l'Est cost 4,000,000*l.* for 268 miles, or about 14,924*l.* per mile. This, as we shall see, is much below the usual figure; but the relative cheapness of the Canal de l'Est is accounted for by the fact that it lies in part along a river bed. The canal from the Oise to the Aisne is 29 miles in length, and cost 1,400,000*l.*, or about 48,276*l.* per mile. The Tancarville Canal, which was exceptionally expensive, is only 15½ miles long, and cost 1,000,000*l.* or about 64,516*l.* per mile. It is estimated that the canal from the Marne to the Saône, still under construction, which will be 94 miles in length, will cost 3,400,000*l.*, and that another canal under construction, that from Montbéliard to the Haute Saône, 51 miles in length, will cost 1,400,000*l.* For the two, taken together, the estimated cost is about 33,103*l.* per mile.

Turning to the cost of works of improvement on natural waterways, we do not find that they have so greatly the advantage in point of cheapness over works of construction as might have been anticipated. The money spent on the Rhône between Lyons and the sea since 1860 (including the short St. Louis Canal from Arles to the Mediterranean) amounts to 3,240,000*l.*, or 15,360*l.* per mile, and the result is only a very mediocre waterway. On the Seine, from Paris to Rouen, irrespective of the works before 1878, 2,680,000*l.* have been spent since that year in order to obtain the uniform depth of 3·20 metres (10 ft. 5 in.), *i.e.*, 17,631*l.* per mile. To this should properly be added the cost of the Tancarville Canal, which was made for the benefit, not of sea-going vessels, but of the river craft.

Improvement in methods of traction.

The past twenty 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 crowded canals of the north the State has found it necessary to interfere so as to insure a regular supply

of horses at reasonable rates. Tug-boats have come into increased use, and a great economy has been effected where, as in the case of the Seine from Paris to Rouen, the locks are so large as to contain the whole of the craft in tow at one time. On rapid streams like the Rhône it has been found profitable to employ tug-boats advancing by the aid of a chain laid along the bottom of the river, the steam power required being less than in ordinary steam-tugs, and successful experiments have been made over short distances with an endless running cable laid along the bed of the channel, and also with an electric trolley somewhat similar to that used with tramways.

Future works projected.

Of the new works projected in 1879, the canals which have been mentioned above—Marne–Saône and Montbéliard–Haute Saône—are the only two still remaining under construction, the rest having been either completed or abandoned. The Government plans for the future are embodied in a measure which provides for the expenditure of about 2,400,000*l.* in the course of the next sixteen years in continuing works of improvement already begun on waterways, and no less than 19,160,000*l.* on new works, whether of construction or improvement. Under the first category, 480,000*l.* are provided for improving the canal connecting the Scheldt with the coal-bed of the Pas-de-Calais and with the North Sea, 520,000*l.* are to be spent on the River Seine, and 240,000*l.* on the Rhône. This river still has ten stretches with a depth of less than 1·50 metres (4 ft. 11 in.) in times of drought, and sixteen stretches less than 1·60 metres (5 ft. 3 in). These are to be improved by the methods successfully used hitherto. The most expensive of the new works planned is the Canal du Nord-Est, estimated to cost 5,240,000*l.*, to facilitate communication between Dunkirk, the northern coal region, and the eastern industrial region; 4,920,000*l.* are provided for the canal from the Loire to the Rhône, about 81 miles long, and specially costly owing to the nature of the ground; 3,640,000*l.* for a canal directly connecting Marseilles and the Rhône, to obviate the necessity now existing of boats going round by sea from Marseilles to the mouth of the St. Louis Canal at Port-de-Bouc. The River Loire, now practically useless for navigation from Nantes to Orleans, is to be deepened between Nantes and Angers to a minimum of 1·20 metres (3 ft. 11 in.). Among the less important works is the Moulin–Sancoin Canal, 30 miles in length, to cost 640,000*l.*

Tolls and other charges.

The French waterways at present in the hands of public bodies other than the State form only an insignificant fraction of the whole; they include the canal from the Sambre to the Oise, 41½ miles long, the Canal de l'Ourcq, and certain other short lengths of canals connected with the city of Paris. Practically the whole of the waterways system is the property of the State, which maintains it out of the public funds, free of all tolls. The system of tolls was in force up to the year 1880,

They were fixed in 1867 at the following rates per ton per kilometre :—

	Rivers.	Canals.
	Francs.	Francs.
Weighty materials	0·0012	0·0024
First-class materials (cereals, wines, and manufactured goods)	0·0024	0·006

Since 1880 the tolls have been abolished on the State canals; but local bodies are allowed, in certain cases, to charge a low "droit de stationnement."

Capital: how found.

The money spent on the improvement of waterways in the period 1878 to 1900 was found in the last resort almost wholly by the State. It was provided for in part in the annual budgets, and in large part by the issue of 3 per cent. State loans; in some cases it was advanced by the local bodies interested and refunded to them in annuities not paying interest, an arrangement which permitted of the funds being found more quickly than could otherwise have been done, but did not prevent the burden from falling ultimately on the State. An exceptional instance is offered by the city of Paris and the Seine Department, which contributed a large sum towards the cost of improving the Seine River.

Future plans for finding capital.

The new Government proposal adopts the principle that a part of the burden should be borne by the local bodies interested (Departments, Communes, &c.). In the case of the continuation of works previously commenced, the local bodies may, the law provides, be called upon to contribute in a proportion to be subsequently determined. In the case of new works it is provided that they shall contribute at least half the cost. With a view to their reimbursement it is provided that they can, on demand, obtain a concession for towing, and, further, they can charge tolls not exceeding the maxima fixed, as follows :—

Where the tolls are based on the tonnage of the boat and the distance carried, $\frac{2}{10}$ths of a centime* per kilom. per ton.

Where the tolls are based on the weight of the goods and the distance carried, 4 centimes for "first-class materials," 1 centime for less valuable goods.

They can also charge a "droit de stationnement $2\frac{1}{2}$ centimes per ton per day.

Reduction of rates consequent on improvements.

The great improvement effected in the French waterways system since 1878 has been attended by a large reduction in the cost of transport, especially on the northern canals and the Seine. On the former, freights have fallen about 25 per cent. in the last twenty years, and have been recently reduced to about 1·8 centimes per ton per kilom. in the direction of Paris, and less

* 10 centimes are nearly equivalent to 1*d*.

on the return journey. On the Seine, freights for heavy goods are about 20 per cent. lower than they were in 1883.

Increase of water traffic.

Turning to the statistics of the water traffic, we find a striking increase during the period under review. The total weight of merchandize shipped by the inland waterways rose from 20,000,000 tons in 1878 to 32,000,000 tons in 1898. The average distance over which the goods are carried has, of course, risen with the enlargement of the system of connected channels of the first-class type; and the aggregate kilometric tonnage (tonnage multiplied by distance carried in kilometres) rose from 2,000 millions in 1880 to 4,000 millions in 1896 and nearly 4,500 millions in 1899. If we measure the density of traffic on the different waterways by dividing the kilometric tonnage by the length of the channel, we find it to be greatest over the network of canals between Paris and the Belgian frontier, which receives the traffic of Paris, the coal fields of the Nord and Pas-de-Calais, and the industrial regions of Northern and North-Eastern France. The River Seine, from Paris to its confluence with the Oise, carries the trade between Paris and the north, as well as that between Paris and the west, and has the greatest intensity of traffic of any of the inland waterways. From its confluence with the Oise to the sea, the Seine divides with the Ouest Railway the traffic between Paris, Rouen, and Havre, this traffic deriving great importance from the foreign trade passing through Havre. The kilometric tonnage of the Seine has risen, with the improvements in its depth, locks, the systems of traction, &c., from 322,910,000 in 1880 to 903,697,912 in 1899.

From Paris the northern system of waterways is prolonged south and south-east, through the centre and east of France by the Upper Seine, the Canal Latéral à la Loire and the Canal du Centre (or, alternately, the Canal de Bourgogne), and the Saône, to the Rhône at Lyons and down the Rhône past Valence and Arles, by the St. Louis Canal to the sea at Port-de-Bouc, near Marseilles; while the Rhône is connected with Bordeaux by the Rhône-Cette and Midi Canals and the Canal Latéral à la Garonne, traversing the south of France. The volume of trade of the great system of waterways thus spreading over northern France, and running from Paris through central, eastern, and southern France, decreases progressively as we come further south from Paris, and in a very marked proportion when we reach the inferior channel afforded by the Rhône. Generally, it is noticeable that almost the whole increase of the water traffic in the past twenty years has been absorbed by the 2,919 miles of channels classed as the "principal waterways."

Increase of railway traffic.

While the water traffic rose as we have seen, the traffic by rail has also increased, though far less rapidly in proportion. The following Table compares the increase in traffic by the two methods:—

KILOMETRIC Tonnage.

	Rail.	Water.
1883	11,000 millions	2,000 millions.
1900	16,500 ,,*	4,675 ,,

A comparison between the density of traffic on the waterways between Paris and the Belgian frontier and the corresponding railway lines shows the business done by water to be slightly greater.

If, again, we compare the total of goods arriving and shipped by rail and water respectively at Paris, Dunkirk, Havre, and Rouen, we find the traffic divided tolerably equally between the two systems of transport, with a slight advantage in favour of the railway, which takes 51 per cent. of the traffic of Paris, 52 per cent. of that of Rouen and Havre, and 58 per cent. of that of Dunkirk.

Comparative cost of transport by rail and water.

Although the waterways have thus rapidly come in the past twenty years to absorb an important share of the internal traffic of the country, we must not at once infer that they afford in reality a more economical means of transport than the railways. The fact that the waterways, which are maintained free of tolls by the State, can offer lower rates than the railways, which are not in the same position, is, of course, by no means conclusive on the point. On the contrary, Mr. C. Colson, a former Director of the Railway Department of the Ministry of Public Works, and probably one of the best authorities on this subject, estimates that in most cases in France the net cost of transport (the cost, that is, exclusive of any profit for the Railway Company, or the proprietor or lessee of the canal), is appreciably higher by water than by rail. Since this question lies at the root of the whole controversy as to the economical value of waterways, it may be worth while to follow Mr. Colson's calculations somewhat into detail.

The net cost of transport by water is represented approximately by the freight paid to the barge-owners, since competition prevents the latter from making any profit over and above a return on their small capital, their own remuneration and keep, and their current expenses. On the best channels the freight is about 1 centime per ton per kilometre, oftener above than below this figure.

On the railways the running expenses ("dépenses d'exploitation"), of a goods train, according to the Returns published in 1896 are 2·27 fr. (1*s.* 9½*d.*) per kilom, and taking the average tonnage carried at 94 tons we should have a cost of transport

* Provisional return.

of 2·42 centimes (nearly $\frac{1}{4}d.$) per ton. But this estimate of expenses includes certain items which are not comprised in the one centime cost of water transport, and which should be omitted for the purpose of this comparison. Such are—

The up-keep of the line and cost of administration (which items are borne by the State in the case of waterways).

The cost of loading and unloading (which is generally borne by the proprietor or consignee in the case of waterways).

Omitting these items Mr. Colson estimates that the running expenses of a goods train, including interest on the value of the rolling-stock, are about 1·50 fr. (1*s.* $2\frac{3}{8}d.$) to 2 fr. (1*s.* $7\frac{1}{8}d.$) per kilometre.

On the other hand, the average tonnage carried in the case of the railways competing with the chief waterways greatly exceeds 94 tons. That figure is arrived at by taking the average of all trains, including those running on mountain lines and subsidiary lines, which can never come into competition with canals. On the chief lines, which actually compete with the waterways, the average tonnage carried by a goods train (including trucks returning empty) Mr. Colson puts at 300 tons, and thus arrives at a net cost of transport of from $\frac{6}{10}$ to $\frac{8}{10}$ of a centime per kilom. per ton by train, as against 1 centime per kilom. per ton by water.

Effect of free competition between railway and canal.

It would follow that in a war of rates between a railway and a canal owned by a Company which depended upon tolls for its profits, the railway could always lower its charges to a point ruinous to the waterway. And this is what actually occurred in a struggle some years ago between the Canal du Midi and the Midi Railway Company, which ended in the lease of the canal to the Railway, after which the Railway found it profitable to attract most of its traffic to the railway as being the more economical mode of transport.

Disadvantages under which French railways compete.

In France, however, where the canals are owned by the State and kept up free of tolls, the railways compete under specially unfavourable conditions. In lowering its rates to underbid a canal, the Railway Company always has to consider the loss entailed by the reduction on that part of its traffic which it holds safe from the canal in any case. The French railways have practically no prospect of being able by any reduction to drive the canals altogether out of the business, and thus often find it to their interest to keep their rates relatively high, even where by reducing them they would obtain some part of the business now handled by the waterways. We may take as an illustration the case of the coal supply of Paris. The rates by water from the Nord and Pas-de-Calais have varied in the past year from 6 fr. (4*s.* $9\frac{5}{8}d.$) to 5 fr. (4*s.*) per ton, the journey taking twenty days. The rates by train are about 6 fr. 70 c. (5*s.* $4\frac{3}{8}d.$) per ton, which represents over 3 centimes per kilom., and no doubt the railway could lower its rate considerably without making a loss; but then it would lose largely on the portion of its coal traffic which it retains in any case owing to the

situation of the consignees or the conditions attaching to the consignment.

The railways, in France, are further hampered by the Government control over their rates, which is constantly used to favour the canals. If a Railway Company wishes to secure the traffic connected with a particular commercial establishment, it is compelled to make the same rates for all other establishments served by the same station. It is not allowed to lower rates temporarily, nor, in some cases, to a point less than 20 per cent. above the canal rates, nor is it permitted to make tariffs which are considered unduly to favour the importation of foreign goods.

It is not only in the case of heavy goods that the railways are at a disadvantage in competing with the waterways. In one sense they are at a greater disadvantage in the case of goods of medium value, because the railway rate being higher per ton for the more valuable merchandise, the excess over the canal rate, which, as we have seen, is roughly the bare cost of transport, becomes of greater importance. A case of traffic of medium value being successfully contested by the waterway is offered us by the competition between the Seine River and the Ouest Railway, a line which affords a good example of the difficulties with which French railways have to contend. The river traffic from Havre and Rouen to the confluence of the Oise (we take this portion of the river so as to exclude the independent current of traffic coming from the north down the Oise) is composed only to the extent of about 25 per cent.* of heavy goods (minerals and building materials) there being 11 per cent. of industrial products, 16 per cent. wood, 40 per cent. of agricultural and food products, chiefly imported from abroad. The railway rates on the articles forming the bulk of the traffic are two to three times as high as the river rates. Yet it is not profitable to the Railway to lower its rates on most of the articles concerned because of the loss this would entail on the traffic which it retains in any case; in the case of wines and cereals, the railway would be prepared to make a large reduction, but it is not allowed to do so for fear of the establishment of what is considered a "tariff of penetration." In the result, the improvement and cheapening of navigation on the Seine since 1880 had the effect of completely arresting the increase of the railway traffic between Mantes (near the Oise confluence) and Rouen.

Effect of competition of canals on railways.

The railways being handicapped in the various respects described, we shall expect to find that those which are in direct competition with the waterways have suffered considerably in the struggle. And, on the whole, this is the result shown by the traffic returns of the different lines. The following Table gives the kilometric tonnage of the four principal railways in the years 1880 and 1890:

* These figures are for the year 1896.

KILOMETRIC Tonnage (ordinary Goods Train).

	1880.	1899.
Nord	1,692,282,018	3,162,215,735
Est	1,298,380,244	2,024,086,474
Ouest	955,209,413	1,286,971,661
P.L.M.	3,701,684,950	5,198,924,700

We may take the Nord, Est, and Ouest Companies as the three most severely in competition with the waterways. The Nord, as will be seen from the above Table, notwithstanding the competition of the waterways, has almost doubled its kilometric tonnage between 1880 and 1899. And if we look at more detailed returns than those given in our Table, we find the section Paris–Amiens–Lille shows an increase in kilometric tonnage of 644,000,000 to 875,000,000, the Lille-Calais-Dunkerque section of 84,000,000 to 172,000,000. But then the Nord line is specially favoured, carrying, as it does, the traffic between Paris and the richest industrial province of France.

On the other hand, the Est, though also subserving a great industrial region, offers an example of a line suffering from the competition of the water routes. The increase of kilometric tonnage is only from 1,298,000,000 to 2,000,000,000. The important section to the eastern frontier, Paris–Avricourt, shows a falling off of 403,000,000 to 257,000,000. Similarly, in the case of the Ouest, while the total kilometric tonnage increases only from 955,000,000 to 1,286,000,000, the section Paris-Rouen, which has the formidable rivalry of the Seine to deal with, shows an increase only of 188,000,000 in 1885 to 220,000,000 in 1899.

Turning to the Paris–Lyon–Méditerranée, which we may take as an example of a line relatively little interfered with by waterways owing, among other circumstances, to the poor navigable qualities of the Rhône, we find a very great increase in kilometric tonnage, about equal to that shown by the Est, and much surpassing that of the other lines. In 1899 the kilometric tonnage reaches the enormous total of 5,100 million. It is true that a comparison of the kilometric tonnage is here somewhat misleading, because the Paris–Lyon–Méditerranée has a far greater length of line than any other railway; but the gross weight of merchandise carried by it in 1899 was 26,000,000 tons, second only to the Nord with 31,000,000, and far in excess of any other line in France; and we may reasonably ascribe this great development in part to the comparative immunity of the line from the competition of waterways.

A comparison of rates on the different lines does not serve to throw much additional light on the question of the effect of waterways on railways:—

AVERAGE Rate per Ton per Kilometre (ordinary Goods Train).

	1880.	1899.
	Centimes.	Centimes.
Nord	5·47	4·18
Est	5·61	4·74
Ouest	6·14	5·57
P.L.M.	6·25	5·21

We find, it is true, that the Nord shows the greatest reduction in its rates (5·47 centimes to 4·18 centimes), no doubt the result of the competition of the water routes. But the Ouest and Est have both lesser reductions than the Paris–Lyon–Méditerrannée, though both more severely pressed by the same competition. The fact is that the various reasons above indicated often prevent the railways from cutting down their rates to protect their business from the canals. The average fall in rates on ordinary goods on the six principal French lines between 1880 and 1899 is from 6·07 centimes to 4·85 centimes.

On the whole, the returns seem to show that the competition of the canals has been injurious to the French railways most affected by it. But it must be borne in mind that this is the result, not of free competition between the two routes, but of Government control exercised in favour of the waterways.

Result of improvements in waterways on seaports.

The advantages derived by a seaport from having its railway service supplemented by waterways are of a very obvious kind. Where, as in France, the waterways are enabled to compete with the railroads, they not only provide cheap transport themselves, but also tend to lower the railway rates; the canal barges, by loading and unloading directly from sea-going ships, effect a large economy in the cost of manipulation involved in the case of the railway, and the barges also offer a cheaper means of storage than the railway warehouses. The French seaports which are connected with inland navigable channels have no doubt benefited in these different ways by the improvements recently effected in the inland navigation; but the advantages which they have enjoyed in this respect are not, it must be confessed, very clearly reflected in the statistics of trade of the different ports. The following Table gives the exports (in tons) for the years 1886 and 1900 from the four French ports having the largest weight of exports:—

EXPORTS (in Tons).

	1886.	1900.
Marseilles	815,840	1,145,906
Bordeaux	490,884	806,196
Dunkirk	102,649	463,471
Havre	211,442	274,019

Marseilles, the port having the largest tonnage of exports, is, as we have seen, not immediately connected with the system of waterways; and its development cannot therefore be referred to improvements in the inland navigation. Dunkirk enjoys the great facilities of transport offered by the northern system of canals, and shows, as might have been expected, a large increase in its export trade; but then this port is specially favoured by its position, which makes it the natural point of exportation for the products of the richest industrial region of France, and it is difficult to say how far the increase of its trade is due to these natural advantages, and how far to the services rendered it by the waterways. On the other hand, Havre shows a quite inconsiderable increase in its exports, although it has the advantage of the first class facilities provided by the Seine, on which, as we have noticed, great improvements have been carried out in recent years, and where the cost of transport has been notably reduced. Bordeaux again has a large increase of exports; but this cannot be ascribed, to any great extent, to the beneficial effects of recent improvements on waterways, because the system of inland channels with which it is connected (Garonne—Canal Latéral à la Garonne—Canal du Midi) is still very imperfect, and besides these two canals were leased until 1898 to the Railway Company, which attracted the traffic to the railway line by specially lowering its rates.

It would evidently be impossible to draw any precise conclusions from these figures as to the results which improvements in waterways have produced in the trade of the different seaports. We can only assume in a general way that where such improvements have resulted in better and cheaper transport facilities the seaports which are in connection with the waterways system have necessarily profited. That the representative bodies in the ports are fully alive to the advantages to be derived from inland water transport is clear from the eagerness which they have shown (as, for instance, in the case of Marseilles and the projected canal from that port to the Rhône) to contribute to the cost of canals bringing them into connection with the other navigable channels.

Result of improvements in waterways on trade and commerce generally.

We now come to the last, and also, without doubt, the most important of the questions propounded by the Chamber of Commerce; as to the results, that is, of the recent improvements in the waterways on the trade and commerce of the country generally.

We have seen that the improvements made in the past twenty years in the French waterways have been attended by a great development of the water traffic, and that the railway traffic has also largely increased in the same period, though far less rapidly in proportion. We have seen also that the cost of transport by water has been greatly lowered as the result of these improvements, and that railway rates have likewise fallen, while remaining much higher than the water rates. It may be taken for granted that the increase of traffic is the result, in large part, of the fall in rates; and we conclude, therefore, that the improved waterways by the increased facilities and cheapness of transport they offer themselves, and the influence they have had in lowering railway rates, have contributed largely to developing the trade of the country. It should be observed, however, in passing, that the commerce, though benefiting largely, has not benefited to the fullest extent by the improved waterways, because the railways being in relations of competition and not of co-operation with the canals, have opposed the establishment of the requisite means of intercommunication between the two modes of transport.

But the further question arises whether the same increase in facilities and cheapness of transport could not have been obtained in a more economical manner than by the works of construction and improvement which have been carried out on the waterways. Might not the result which the State has attained by building and maintaining canals to compete with the railways have been secured at less expense by other means?

It has been estimated that the capital expended up to 1896 in the construction and equipment of the great French railway lines, including stations, warehouses, &c., and the cost of rolling-stock, represents roughly 27,520*l.* per mile; which will be found, on reference to the figures given above, to be somewhat below the cost of constructing a not particularly expensive canal. We have seen that the net cost of transport by rail on the principal lines is, according to Mr. Colson's estimate, appreciably less than by water; and though we may count as a partial set-off the superior cost of keeping up a railway line, the balance of cheapness remains on the side of the railway in respect of working expenses as well as of initial outlay.

In regard to the facilities offered, again, the railways have the advantage, for, though the waterways present certain special advantages as to space available for loading and discharging, cheapness of floating storage, economy in transshipment from sea-going vessels, &c., the railway has the overwhelming merits of greater speed, ability to handle a larger

body of traffic in a given time, and security from interruption.

We see, then, that where the State has created canals to compete with the railroads, it would actually have been cheaper, and also more advantageous, to build entirely new competing railway lines. Even in the case of a natural waterway specially adapted for navigation, such as the Seine, the money which, as we found, has been expended to obtain first-class navigable conditions represents the cost of establishing a new railway line on a cheap scale and under favourable circumstances. On the other hand, the expense of enlarging the capacity of an existing railway line is small as compared with that of building a new line even under the cheapest conditions; and therefore if the State, instead of using its funds to create, improve, and maintain waterways to compete with the railroads, had applied them to increasing the capacity of existing railways, and had used its controlling powers to bring railway rates to the level which they have actually reached under competition, it would seem that the same results would have been attained at a large saving of public money.

The difficulties and objections that may be found in the way of such a solution it would be outside the scope of the present Report to discuss. What our brief examination of the French waterway system appears to establish is that the method which France has followed to arrive at better and cheaper transport is theoretically far from being the most economical possible.

(Signed) HUGH O'BEIRNE.

Inclosure 2 in No. 6.

Extract from Report by Mr. Hearn, His Majesty's Consul at Bordeaux.

Bordeaux.

THE navigable waterways of South-West France are all natural courses with the exception of the Canal du Midi and the Canal Latéral à la Garonne, which runs from the Garonne at Castets to the Mediterranean at La Nouvelle, south of Cette, as well as viâ Cette to the Rhone. The want of canals and the unsatisfactory state of the rivers, so far as navigability is concerned, have aroused much interest of late, and, in the spring of 1901 a Society was formed to study the improvements which might be made in the River Garonne and adjacent waterways.

Société du Sud-ouest Navigable.

This Society, which took the name of "La Garonne Navigable," has now been strengthened by Societies or Committees formed in other towns in this district, and their first Congress was held in Bordeaux in June last, when the

question of navigable rivers and canals in South-Western France was discussed and considered, and the title of the Society changed to "Le Sud-Ouest Navigable." The object the Society has in view is a comprehensive one, and the mere recapitulation of the programme will show how little South-Western France is able to supply information as to the results of improvements in the means of transport by canals or other navigable ways.

Objects of the Society.

The requirements of the Society are seven, viz. :—

1. Replanting of the watersheds in the central shed, the Pyrenees and the Lannemazan Plain, dams, and weirs. This would render navigation easier, floods less frequent and disastrous, irrigation more general, and the use of electric force more possible.

2. A channel of a uniform depth at all seasons in the Garonne, between Castets and Bordeaux.

3. The increase in length to 76 metres (250 feet) of all locks in the waterways of the Lateral Canal, the Canal du Midi, the Rivers Dordogne, Isle, Tarn, Lot, Baïse, and Drot.

4. Improvements in all waterways which are too often only theoretically navigable.

5. The junction of the Garonne with the Loire.

6. The construction of the Canal des Landes, which would join the Adour and the Garonne, and bring about a transformation in that forest-clad district.

7. Improvements in the material and the staffs employed.

One of the honorary Presidents of this Society is also President of the Bordeaux Chamber of Commerce and a Director of the Midi Railway Company, which last has no desire to have to compete with canals and has put its tariff so low along the line that runs parallel with the Canal du Midi, as to virtually close the canal to traffic, as far as the port of Bordeaux is concerned.

Loi Baudin. 1901.

The following is the description and estimate for the improvements of the inland water communication between the Mediterranean and the Atlantic as prepared for the Baudin Law of 1901.

The Canal du Midi and the Canal Latéral à la Garonne are the natural prolongation the one of the other, and were made with the same object, of joining, by an inland navigable way, the coasts of the Mediterranean and the Atlantic. The canals are respectively 274 and 215 kilom. long (170 and 133½ miles). The Government took them over in 1898. The Canal du Midi was made from 1667 to 1681, and the Lateral Canal from 1838 to 1856. The facilities for navigation on the two canals differ considerably. They are less on the Canal du Midi, and the largest boats which can navigate the Lateral Canal could not navigate the other.

Size of boats on canals.

The following are the largest dimensions of boats that can work on the canals.

	Canal du Midi.	Canal Latéral.
Length, including rudder	28 metres (92 feet) ...	30 mètres (98½ feet).
Extreme breadth ...	5 m. 25 c. (17 ft. 3 in.) ...	5 m. 80 c. (19 feet).
Draught	1 m. 80 c. (5 ft. 10 in.) ...	2 metres (6 ft. 6 in.).
Height above water-line, cargo included	2 m. 60 c. (8½ feet) ...	2 m. 50 c. at sides, 3 m. 50 c. amidships, 8 ft. 3 in. and 11 ft. 6 in.

The supply of water to the canal is insufficient. The most urgent work to be undertaken is to place, as far as possible, these two canals in the condition fixed by the Law of the 5th August, 1870, the length of the locks remaining for the present limited to 28 and 30 metres (92 feet and 98½ feet) are as follows:—

Deepening of the lock giving access to the Garonne at Castets.

Reconstruction of the forty-two most obstructing bridges on the Canal du Midi.

Deepening of the branch to La Nouvelle (Mediterranean coast).

Formation of a reservoir at Alzan.

Improvements in going through Toulouse.

Increase by 20 centim. (8 inches) in the depth of the Canal du Midi.

Straightening of curves.

This is estimated to cost 7,000,000 fr. (280,000*l.*). Later on it may be necessary to complete these improvements by making the Canal du Midi as navigable as the Lateral Canal, and by making two tow-paths along the 45 kilom. (28 miles), where there is at present only one.

The cost of this second series of works would reach 13,000,000 fr. (520,000*l.*)

The Garonne between Castets and Bordeaux. This part of the Garonne, 50 kilom. long (31 miles), forms the commercial prolongation of the two canals, and should be made as navigable as they are.

When the canals are dredged, boats will be able to navigate them with a draft of 1 metre 80 centims. (5 ft. 10 ins.), while at low water in the Garonne, in numerous places there is often less than a metre of water (3 ft. 3 in). The dredging of this length of the river would cost 3,000,000 fr. (120,000*l.*).

The dimensions of the locks on the waterways of this district are as follows:— Size of locks in South-west France.

	Length.	Breadth.
River Tarn ...	33 metres (108 ft. 3 in.)...	5 m. 20 c. (17 feet).
River Dordogne ...	32 metres (105 feet) ...	6 metres (19 ft. 6 in.).
Canal du Midi ...	31 metres (101 ft. 8 in.)...	5 m. 74 c. (18 ft. 10 in.).
Canal Latéral ...	30 m. 65 c. (100 ft. 6 in.)	6 metres (19 ft. 6 in.).
River Lot	30 metres (98 ft. 5 in.) ...	5 m. 20 c. (17 feet).
River Baïse	28 m. 20 c. (92 ft. 6 in.)... to 32 m. 20 c. (105 ft. 8 in.)	4 m. 30 c. (14 ft. 1 in.).
River Isle	24 m. 25 c. (79 ft. 6 in.)...	4 m. 50 c. (14 ft. 9 in.).
River Drot... ...	22 m. 10 c. (72 ft. 6 in.)...	4 m. 80 c. (15 ft. 9 in.).

Before any great improvements can be made in inland navigation, it is considered necessary that all these locks should be made of a uniform maximum size, of, as recommended by the "Société du Sud-Ouest" 76 metres by 7 or 8 metres (250 feet by 23 or 26 feet).

At the Congress of the "Sud-Ouest Navigable," a protest was unanimously approved which has been made to the Minister of Public Works in February last, against the scanty allowance of 10,000,000 fr. (400,000*l.*) to this part of France out of a total vote of 497,640,000 fr. (19,900,000*l.*) for inland navigation works. This district comprises about one-fifth of France, and is only allotted about one-fiftieth of the amount voted. Protest by the Society.

Inclosure 3 in No. 6.

Extract from Report by Mr. Payton, His Majesty's Consul at Calais.

To secure the full development of the coal-fields of the two Northern Departments, it is thought that the existing canal system should be improved, at an expenditure of at least another million sterling, especially in opening to the north more convenient outlets toward Paris, the east, and the centre of France, by the construction of two new routes; the Northern Canal, which will permit the traffic toward Paris to avoid the chain of locks and the tunnels of the St. Quentin Canal, and the canal from the Escaut to the Meuse, which will put the great coal-district of the Nord and Pas-de-Calais in direct communication with the metallurgical region of the north-east. Calais.

With a few exceptions, all the waterways are administered by the State.

The development of navigable waterways, so administered, for the whole of France is 7,456 miles. Their traffic in 1898 gave an average tonnage of 609,500 tons per mile.

The Nord and Pas-de-Calais system has a length of 330 miles, with average traffic of 1,594,700 tons per mile, or nearly treble the proportion for the whole of France. The proportion of coal was over 63 per cent. of the total merchandise carried.

A noteworthy improvement was that of the canal elevator at Arques, near St. Omer, where the difference in level between two waterways was said to be 12 metres, or about 13 yards, and barges were formerly transferred from one canal to another through a succession of seven locks.

This system has been superseded by the present elevator, consisting of two large "bacs," or flat-bottomed barge-shaped receptacles, which are lowered under the barges to be transferred, and then raised or lowered by hydraulic power from one level to the other. The "bac" contains sufficient water to float a barge loaded up to 400 tons, without any displacement of its cargo. When the operation is completed, the "bac" sinks, leaving the barge free on the higher or lower waterway to which it has been moved.

A Report on the canals of the Nord and Pas-de-Calais, published in 1900, states that, with improvements in the general system, boats now travelling only 1,500 to 1,800 miles in the year should cover 3,000, and the price of freight between Lens and Paris, now 4*s.* to 5*s.* 6*d.*, should be lowered to 3*s.*, to enable French coal to compete successfully with British coal on the Seine, and Belgian, and German coal in the east of France.

On the canals of the Nord and Pas-de-Calais, the proportion of coal to that of all goods carried was 67·74 per cent., and on those of the Nord, going to Paris, 45 per cent. The increased production in the two Departments had been considerable.

From a report of proceedings of the Calais Chamber of Commerce in 1901, it appears that the Minister of Public Works inquired concerning existing connections ("raccordements") of canals with railways, impeded or abandoned new junctions of commercial importance, and their chances of finding lessees among Chambers of Commerce, Shipping and Dock Companies; and he was informed that the connection of the lines of the Northern Railway with the Calais dock system was not completed, and consequent heavy charges for cartage had driven trade to other ports.

Inclosure 4 in No. 6.

Extract from Report by Mr. Taylor, His Majesty's Consul at Dunkirk.

Dunkirk.

In the year 1872 the total quantity of goods carried to and from Dunkirk by canal amounted to 256,804 tons. In 1882 this amount was only exceeded by some 46,000 tons. During the following ten years, the quantity carried by canal shows a constant and large increase, except in 1890, amounting in 1892 to a total of 1,041,697 tons. The largest quantity that ever entered and left Dunkirk by canal was in 1898, when it amounted to 1,220,135 tons, as compared with a movement of 1,719,600 tons by railway. In 1901 the amount was 1,106,727 tons by canal and 1,743,950 tons by rail.

Not only is such a large proportion of the traffic carried by canal, but merchants also use the canal rates as a lever to bring down the railway charges, which charges, I am told, are much below those current in England.

The following Table shows the quantity of goods carried to and from Dunkirk by railway and canal in the years 1872 and 1882 to 1901 inclusive.

Year.	Canal Traffic in and out.	Railway Traffic "Petite Vitesse" in and out.
	Tons.	Tons.
1872	256,804	505,400
1882	302,264	991,500
1883	345,190	1,021,000
1884	585,834	1,040,200
1885	694,082	1,099,700
1886	813,321	1,071,900
1887	849,593	1,079,800
1888	948,650	1,207,100
1889	960,859	1,295,400
1890	866,939	1,465,400
1891	996,635	1,596,500
1892	1,041,697	1,434,900
1893	1,101,281	1,455,300
1894	1,110,824	1,427,100
1895	990,694	1,273,100
1896	1,003,683	1,397,300
1897	1,079,606	1,429,800
1898	1,220,135	1,719,600
1899	1,077,561	1,674,900
1900	1,047,093	1,771,775
1901	1,106,727	1,743,950

In May 1884 direct canal communication was opened with the Freycinet dock by means of the lock of the canal of the

"Ile Jeanty," and it will be seen by the above Table that there was a large increase in the movement of goods by canal from that date.

The principal goods transported by canal are wood, wheat, coal, oil seeds, maize, ores, rice, nitrate, sugar.

The principal goods transported by railway are maize, oats, oilseeds, wines, barley, coal, wood, ores, pig-iron, oils, wool, flax, cotton, nitrate, oilcakes.

There is no doubt that the prosperity of Dunkirk is largely due to the canals which connect it with the industrial centres of the north of France, also with Paris and central France.

Inclosure 5 in No. 6.

Extract from Report by Mr. Liddell, His Majesty's Consul at Lyons.

Lyons.

It is often asserted that the excessive speed of the current of the Rhône makes towage too costly; but this is not the case. Towage on the Rhône amounts only to 6 millim. per kilometric ton, a price that represents as nearly as possible the cost of towage on the ordinarily frequented canals in France. On the Saint Quentin Canal, however, with a traffic of 5,000,000 tons, the cost is only $3\frac{1}{2}$ millim.

It is considered that if the improvements to the Rhône navigation are completed at a cost of 250,000*l*., the cost of towage would come down to that of the canals.

The cost of transport is confined between two limits—a minimum limit, which is the cost price, and a maximum limit, which is the highest rate the goods can bear. If there is no competition, freights attain the maximum limit; but if there is competition, they, on the contrary, reach the minimum. The river navigation has consequently compelled the railways to forego the benefits derivable from their authorized tariffs, and to replace them by lower rates; and the railways are therefore hostile to intermediate connection with the river ports as tending to increase competition, though they regard with equanimity such connection at their termini.

Sea-going barges were made use of in the south of France as early as 1852, but these barges cannot navigate above Avignon and Sorgues. But there are also composite barges which navigate between Marseilles and Châlons, and which are expected to be able to get up as far as Gray. This will enable them to carry goods a distance of 370 miles without transhipment.

During the last thirty-five years these barges have con-

veyed 11,500,000 tons* of merchandise in the region of Marseilles.

The sea-going barges are of various types and sizes, carrying from 350 to 500 tons, and costing 2,400*l.* to 3,600*l.* The composite barges carrying 250 tons at sea and 325 tons in the river, cost 2,400*l.*

Great advantages are gained by avoiding transhipment from canal-boats to sea-going vessels, by using barges of cheap construction which lie loaded at the port, and by escaping the expense and delay of discharging goods into warehouses and the attendant rehandling. Take coal for example. It costs 5*d.* per ton to tranship from the lighter to the ship's bunkers, whereas, if stored, reloading, towing and depositing in bunkers amounts to 1*s.* 11½*d.* The saving by employing lighters is, therefore, 1*s.* 6½*d.* per ton.

Inclosure 6 in No. 6.

Extract from Report by Mr. Warburton, His Majesty's Consul at Nantes.

ALL the improvement which has taken place in the water transport of this district has occurred between the port of Nantes and the Ocean; there has been none for many years in the inland waterways, and I have therefore to deal only with the results which have followed the deepening of the River Loire and the construction of a maritime canal facilitating the access of shipping from the sea. Nantes.

These improvements began in the year 1880, when, owing to the depression which had existed for some years in what was then the principal trade of Nantes (the import and refining of sugar from Réunion and the Antilles), the only way of saving the city from ruin lay in finding some means of increasing its general commerce which was hampered by the want of a waterway deep enough to allow large vessels to reach the port.

This was first attempted by dredging the Loire in 1880 but the effect only became apparent in 1884, when tonnage and

	Tons.
* Compagnie de Navigation du Rhône	6,500,000
Compagnie des Salins du Midi	2,200,000
Syndicat d'Exportation des Charbons Français ...	350,000
Syndicat des Agglomérés du Sud-est	1,500,000
Compagnie d'Alais du Rhône	120,000
M. d'Ollières	300,000
M. Talon	200,000
Messrs. Savon Frères	400,000
Total	11,570,000

imports began to increase and continued to do so steadily but slowly until 1893.

In this year the maritime canal which had been under construction for some time was opened, and gave access between Nantes and the sea to ships drawing 19 feet of water (in ordinary tides.

Progress then became rapid, and the results were as follows :—

(*a.*) With regard to railways—

The amount of goods carried through the railway stations at Nantes in the year 1889 (the earliest I have been able to get) was 300,000 tons.

From 1882 to 1893 it increased slowly as the effect of the dredging of the Loire made itself felt to 350,000 tons in 1893.

In 1893 the canal was opened and from that date the traffic rose rapidly year by year until in 1901 it reached 750,000 tons more than doubling itself.

On the other hand the railway station of St. Nazaire, which would have carried the traffic if the vessels had not been able to reach Nantes, did not lose any traffic through the competition of the canal, but increased its return of goods carried from 350,000 tons in 1887 to 550,000 tons in 1893; and again after the canal was opened in 1893 to 700,000 tons in 1901.

(*b.*) With regard to the seaports—

It is difficult to state what has been the effect in this case because it has been a question of competition between the Ports of Nantes and St. Nazaire, in which the former has been trying to divert shipping from the latter, and has succeeded in doing so, by improving the waterways between them, and this must injure St. Nazaire either by reducing its trade, or by preventing it from increasing as much as it would have done, if the large ships which were formerly obliged to stop there had not been able to load for Nantes direct, as they do now.

The result, however, has been that the tonnage has remained the same at St. Nazaire as it was in the year before the canal was opened (1892), whereas it rose at Nantes from less than 200,000 tons in 1892, to 750,000 tons in 1901, being an increase of 550,000 tons since the opening of the canal, the whole of it going to the port of Nantes, which it was intended to benefit.

No. 7.

Sir E. Monson to the Marquess of Lansdowne.—(Received March 26.)

My Lord, *Paris, March* 25, 1903.

I HAVE the honour to return herewith the revise of Reports furnished by His Majesty's Representatives on the subject of navigable inland waterways, with certain corrections bringing the Report for France up to date.

I have, &c.

(Signed) EDMUND MONSON.

GERMANY.

No. 8.

Mr. Buchanan to the Marquess of Lansdowne.—(Received June 30.)

My Lord, *Berlin, June* 28, 1902.

WITH reference to your Lordship's despatch of the 25th February, 1901, I have the honour to forward to your Lordship herewith a Report which I have received from Mr. Gastrell, Commercial Attaché to this Embassy, relating to the waterways of Germany; a Memorandum, stating why certain special points asked for by the Association of Chambers of Commerce are not included, is also forwarded herewith. The unavoidable delay in furnishing this Report is also explained.

I have, &c.

(Signed) GEORGE W. BUCHANAN.

Inclosure 1 in No. 8.

Report by Mr. Gastrell on the Inland Waterways of Germany.

Former Reports on waterways.

THE subject of inland waterways in the German Empire was fully dealt with, up to the year 1894, in the Report furnished by Mr. Whitehead (No. 345, Miscellaneous Series, of 1894), then Second Secretary in Her Majesty's Embassy at Berlin. In it the improvements made in the Prussian waterways from 1880 to 1890 were dealt with in detail. In fact, little of interest can be added to the full statement then made as to the general position of German waterways at that date. The Prussian Government have, however, recently issued a further statement on the progress made from 1890 to 1900,

which will form the subject of this Report. Other information is also added, so as to bring the matter up to date as far as possible.

Information, not repeated here, regarding canals and their development in recent years, is also to be found in my Report, No. 490, Miscellaneous Series, 1899 (published by the Foreign Office), on "The Development of Commercial, Industrial, Maritime and Traffic Interests, 1871 to 1898, under the head of "Traffic Interests" (pp. 23 and 24, and 48 to 51).

A map showing the whole system of waterways in Prussia is attached to this Report.

PART I.—*General.*

PART I.
General.

German Empire.

The question of the state and capacity of the inland waterways of every country is important to its economic development, as they afford a satisfactory method of transport, far cheaper than that by the railways for many raw materials and for certain classes of bulky goods which do not require such rapid carriage from one place to another as the generality of the more valuable and highly manufactured products.

Public opinion and canals.

During the earlier period of the development of the railways, up to 1875, there existed in Germany, as in most other countries, a feeling that inland transport by water was doomed to languish, it being thought impossible that it should ever be able to compete with the extensive railway systems. Even the best informed persons, in the early days of the German Empire after 1871, only believed in a survival of canal transport as competing, in certain districts, with the high roads. Since 1875, however, public opinion gradually looked more favourably on the possibilities of a development of the inland waterways.

Provisions of German Constitution as to waterways.

The Constitution of the German Empire had prepared the way for facilitating inter-State communication by water by § 9 of Article 4, which placed under the supervision of the Imperial authorities, and made subject to Imperial legislation—

"The waterways, common to several States, for floating timber and shipping traffic, the maintenance of their condition, and the river dues and other navigation charges."

Article 4 of the Constitution further provided that—

"In all the seaports and on all navigable and artificial waterways of the single Federated States the merchant shipping of all of them will be freely admitted and equally treated."

"On all the natural waterways dues can only be levied for the use of those special institutions ('Anstalten') which are erected to facilitate traffic. These dues, in so far as they are for the navigation of such artificial waterways as belong to the State, may not exceed the necessary expenses for the erection and maintenance of such institutions. This provision

applies also to the floating of ratts in so far as this takes place on navigable waterways."

It is, however, to be remarked that no indication is given of the manner in which these dues are to be reckoned, and as to whether they are to include interest on the expended capital. Moreover, there is no definition furnished of "natural" and "artificial" waterways; but, as a matter of fact, in Prussia and other federated States, canalized rivers are considered to belong to the latter class, and dues are actually collected on them.

The former Rhine and Elbe duties, as also the special dues on timber-rafts, have long been given up. The vessels on the inland waterways are not subject to any regulations as to size, except where there are locks. Special Regulations have been issued for certain rivers, and Treaties have been made with certain foreign States providing for freedom of navigation. The Inland Navigation Laws have been amended so as to bring them more into harmony with the laws dealing with navigation at sea. Freights are regulated both by a special Imperial "Law on Inland Navigation," of the 15th June, 1895, and by the Commercial Code ("Handelsgesetzbuch").

Rights of State regarding waterways.

The rights of the owners of the banks on public waterways have been considerably limited. The State has now the power, in return for fair compensation, to utilize the banks and alluvial deposits as far as may be necessary; and it can also remove islands and rocks. The owners are forbidden, under penalty, to deal with such property in any way opposed to the interests of the waterways. Alluvial deposits, created by the building of works on any waterway, belong to the owner of the adjoining bank; but they can only be occupied and used with the river authorities, and on payment of the cost. The direction of the shipping, harbour, and river police is in the hands of the Minister of Commerce, the "Oberpräsident," and the "Regierungspräsident."

Reasons for reaction in favour of canals.

One of the reasons that brought about a reaction in favour of extending the canal system was the existence of some dissatisfaction with the comparatively higher rates of the State Railways, and many persons were glad to avail themselves of the low freights on the waterways which were not under the control of the railways. The rapid extension of waterways was due to the great increase of technical knowledge in connection with river and canal works, to the improved forms of ships and to better appliances for haulage. At a very early date it was realized that the old style of canal, with small craft and slow towage, was no longer able to compete at all with the railways, and that the waterways, in order to become of practical use, must be able to accommodate larger vessels of about 450 to 600 tons, towed by steam-tugs. In fact, in most parts of the Empire the chief inland waterways, both natural and artificial, had to be adapted to

steam traffic, by replacing the many small locks by a few large ones.

Length of German waterways in 1900.

The actual length of the waterways in 1900, within the German Empire, was, according to Imperial statistics, 8,798 miles divided thus :—

	Miles.
Rivers	5,776
Canalized rivers	1,451
Canals	1,510
	8,737
North Sea Canal	61
Total	8,798

The various lengths in miles and the depths in feet of each waterway, whether natural or artificial, are given in the Table on p. 63 (Annex No. 2). Another Table on p. 60 (Annex No. 1), shows the number, kind, and size of the ships navigating the German waterways in 1882 and 1897 respectively. The development in that period has been remarkable. The number of steamers increased from 830, representing 33,155 tons,* in the former year to 1,953, with 104,360 tons, in the latter year, there being among them an increase from nine to fifty-six of ships of over 300 tons. The number of other vessels rose from 17,885, representing 1,625,111 tons to 20,611, with 3,266,087 tons, in the same period, there being among them an increase from 687 to 2,463 vessels of over 300 tons.

Part II.—*Prussia.*

Part II. — Prussia.

In the valuable Report drawn up by Herr von Thielen, Minister of Public Works, which has recently been issued, on the "Administration of the Public Works in Prussia," during the period 1890 to 1900, there is much information with regard to waterways. The following is an account of the works carried out by the Prussian Government.

Improvements effected in the Natural Waterways.

Improvements effected in natural waterways.

In the course of the years, 1890 to 1900, the natural waterways of the Kingdom of Prussia have been mostly improved by carrying out various works to adapt the rivers to local requirements. In order to carry out properly organized works, many technical projects were drawn up, such as :—

* *Note.*—These are not registered tons, but tons of 1,000 kilog. =2,204·6 lbs. instead of English ton of 2,240 lbs.

(*a.*) The 1879 Law for improving the Vistula, Oder, Elbe, Weser, and Rhine. Various Government Bills to effect this.

(*b.*) The 1880 Law for improving the Spree and Havel, Moselle, Pregel, Memel, &c.

(*c.*) The 1882 Law for improving the Warthe, Unstrut, and Saale, Ems (from Greven to Emden).

The total sum granted under these three Laws was 4,498,900*l.** The greater part of it was expended before the year 1890.

The regulation of the Rhine, under the 1879 Law, from Bingen to the Dutch frontier, has been completed; and the whole sum of 1,100,000*l.* has now been expended. The work from Mainz to Bingen has been accomplished at a total cost of some 97,400*l.*

The regulation of the Moselle, under the 1880 Law, was completed by 1891 at a slightly increased cost.

The regulation of the Elbe was almost completed by 1890 for the sum of 430,000*l.*; a further 20,000*l.* being added in 1893.

The regulation of the Oder was effected by 1890 at a cost of 340,000*l.*; a further 25,000*l.* being added in the period 1887 to 1893, and 80,000*l.* in 1888 for the canalization of the Upper Oder.

The object of the above three Laws was to keep the waters of these rivers, even at the lowest period, in a broad and deep stream sufficient to allow of navigation at all times of the year. In some years, however, such as 1892 and 1893, it was impossible to do so owing to the extraordinary want of water. Objects of these Bills.

The unexpectedly rapid increase of shipping, both in size and number, especially in steamers, had made the question of affording suitable facilities for navigation all the more difficult. On this account greater attention than before had to be paid to the regulation of these rivers at low water, so that, in 1894, another Bill was laid before the Prussian Landtag providing for an additional expenditure of 1,062,350*l.*, covering works on the Ems, Weser, Elbe, Oder, Warthe, Pregel, and Vistula, &c., of which over one-half went to the regulation of the last-named river.

The canalization of rivers has taken place whenever the necessary breadth and depth of the waterway cannot be otherwise obtained. The Main, canalized by 1886, required further work in consequence of increased traffic, which was effected at a cost of 149,250*l.* between the years 1891 and 1894. For the canalization of the Fulda over the 17⅓ miles length between Cassel and Münden, 189,262*l.* was granted from 1890 to 1894; the town of Cassel also gave 36,500*l.* The Lower Spree was

* All conversions in this Report are made at 20 marks to 1*l.*

canalized at a cost of 270,000*l.*, granted in 1880; and the course of that river in Berlin itself, to which the town gave 160,000*l.*, was dealt with under a Law of 1888. The Government granted 173,770*l.* for this object. Since 1894 the Spree has been navigable for large ships up to 500 tons. The Upper Oder over the 52¾ miles from Cosel to the mouth of the Neissen was canalized under a Law of 1888, and another of 1890, at a cost of 1,155,855*l.*, so as to accommodate ships carrying 400 tons of cargo.

Increase of Harbours of Refuge, &c.

Increase of harbours of refuge, &c.

In the years 1890 to 1900, thirty harbours of refuge have been built or extended. The Prussian Government has given 198,125*l.* towards their cost. It has been laid down as a principle that the State shall provide safe accommodation for ships in times of flood and ice, while all conveniences for transhipment, and loading and unloading railways and roads of approach, are to be provided by the "Gemeinden" or townships, or by those specially interested in shipping. There are, however, some exceptions.

Increase of shipping facilities.

On account of the increased shipping, resulting from the improvement of the waterways, the "Gemeinden," various Companies, and certain private persons have built various new quays or improved those formerly existing. These have been supplied with all modern conveniences for loading, unloading, and warehousing, at a cost of nearly 3,000,000*l.*, of which some 900,000*l.* alone was spent at Cologne. Besides these, extensive wharves have been established at various towns.

Traffic has been much developed by railway connections with the waterways, especially by the construction of light railways or of connecting lines, built with the help of the State.

A complete "Guide to German Waterways" has been published for the information of shippers and freighters. For the Rhine, Elbe, Ems, Weser, Vistula, Pregel, and Memel, special hydrographical reports are also published.

Dues on Inland Waterways.

Dues on inland waterways.

By a Decree of the 31st December, 1894, it was provided that, from 1895, the administration of the revenue accruing to the State—from tolls for bridges, navigation, harbours, and locks, &c.—should come under the "Bauverwaltung," or Department of Works, instead of being under the Ministry of

Finance, as previously, a step which greatly facilitated inland navigation. The system of levying dues was also changed. For the future, the tolls were to be based on the weight and nature of the goods carried, instead of being calculated on the capacity of the vessels themselves. Goods are now shipped under a fixed tariff, the rate of which every merchant knows beforehand. In order to secure a proper working of this system, a law was passed on the 2nd May, 1900, providing for penalties to be imposed for fraudulent evasion of the tariff Regulations. When the collection of transport dues was transferred to the Department of Works the fees amounted to 165,000*l.*; they have since steadily risen to 267,985*l.* in 1899.

The general practice, as regards the levying of dues, is to leave the navigation on the open river free, while imposing charges in many cases for the use of harbours and wharves. On many important rivers freedom from dues is secured by special Treaties, as well as under Article 54 of the Constitution. On some canalized rivers fairly high dues are charged. On all canals regular charges are made for the navigation.

Public opinion differs as to the extent to which dues can be properly collected. One view is that interest on the capital invested in the waterways should be provided entirely out of the navigation dues; while another view is that all expenditure (except for the cost of furnishing special facilities) should be paid by the State in order to provide absolutely free waterways on the same footing as high roads. At the present time the small sum collected in dues is very far from representing even a fair rate of interest on the yearly outlay on the construction of well-kept waterways.

New Tariff of dues on Prussian waterways

A new tariff for vessels and rafts on the waterways between the Elbe and Oder will come into force on the 1st January, 1903. And by that date, others drawn up upon the same model will be ready for the other waterways (with the exception of the Dortmund-Ems Canal and several small unimportant canals). The object of the Government is to obtain an increase of about 25 per cent. in the receipts, and this tariff is to be in force experimentally for three years.

Cost of Waterways, 1890 to 1899.

Cost of waterways.

The expenditure on waterways in the ten years 1890 to 1899 has been as follows:—

	£
Out of ordinary recurring expenditure	5,795,780
Out of extraordinary non-recurring expenditure...	3,826,900
Out of loans	5,327,640
Total	14,950,320

The ordinary expenditure was distributed thus—

	£
For inland waters and harbours ...	5,001,850
For contingencies	527,950
For the "Ruhr" district (special administration)	437,845
For canals, &c.	303,295

The extraordinary non-recurring expenditure included—

	£
For the regulation of the larger rivers ...	1,298,385
,, ,, ,, smaller ,, ...	802,395

The sums paid out of the proceeds of loans included—

	£
For the construction of canals... ...	4,036,595
For the canalization of rivers	1,145,045

It may here remarked that the ordinary recurring expenditure on waterways rose from 698,325*l.* in 1890, to 882,895*l.* in 1899.

Recent Progress due to Improvements in Waterways.

Recent progress due to improvements in waterways.

With the continued improvement and extension of the waterways and harbour accommodation, between the years 1890 and 1899, inland shipping developed considerably from 1887 to 1897, as is well illustrated by the following typical figures for the Rhine district only.

The number of steamers there rose from 275 of 17,000 tons to 418 of 38,900 tons, and that of sailing-vessels and of towed ships (without motive power or sails) from 2,731 of 570,900 tons to 3,076 of 1,157,000 tons. The average tonnage of the former increased from 62 to 93 tons, and of the latter from 209 to 376 tons. The largest ship on that river in 1887 was

one of 1,200 tons (about 98½ yards long by 11 broad); by 1897 the dimensions had become 1,600 tons in tonnage (about 98½ yards long by 13 broad). Since that year the size has increased still further. The largest vessel towed is now about 109½ yards long by 13 broad, with a tonnage of 2,340 and a draft of 9 feet (2·75 metres). The largest freight steamer is (about 93 yards long by 9¾ broad), with a tonnage of 975 and a draft of over 7 ft. 10 in. (2·4 metres).

The statistics of traffic on the waterways show a remarkable advance from 1889 to 1898.

RETURN of Inland Ships arriving at certain Towns.

At—		1889.		1898.	
District.	Town.	Number of Cargo Vessels.	Number* of Metric Tons of Goods carried.	Number of Cargo Vessels.	Number* of Metric Tons of Goods carried.
Rhine	Mannheim ...	6,229	1,694,700	12,935	3,715,900
Rhine	Cologne ...	2,915	311,300	4,135	683,700
Rhine	Ruhrort ...	12,578	558,700	14,056	1,572,400
Elbe ...	Magdeburg ...	6,393	1,049,400	6,932	1,492,200
Spree ...	Berlin ...	38,152	4,351,600	34,640	5,031,300
Oder ...	Breslau ...	6,353	296,400	9,317	448,700

* Of 2,204 lbs. each.

Measures to protect Agricultural Interests.

Measures to protect agricultural interests.

After the great floods, at the end of the eighties and at the beginning of the nineties, many people attributed the consequent damage to the works for regulating the waterways: a Special Committee was, therefore, appointed in 1892 to inquire into the matter. It reported that the system followed in the matter of regulating and canalizing the Prussian rivers had not been the cause and that it did not require any modification. It, however, recommended certain measures for improving the flow of water in flood time, so as to lessen the risk of damage. These works were duly carried out for the Elbe, Oder, Vistula, Spree, and Havel, at a cost of some 1,050,010*l.* In addition, during the past ten years, a regular system for giving early information as to floods has been organized for all rivers and their chief branches; and it has proved to be most effective. Notice of high or low water or of the approach of ice is at once communicated by telegraph, telephone, post-card, or messenger to interested persons or districts; in some cases this

is done through the Press. In the Elbe and Vistula districts a special telegraphic and telephonic system was established between 1890 and 1894 at a cost of over 10,000*l.* On the Rhine, Elbe, and Oder, it is now possible to give due notice of floods, &c., based on the close study of the upper reaches of the rivers.

Whenever danger is apprehended, either through high water or ice, a special service of men is employed for the particular stretch of river.

A large number of additional ice-breaking ships have been placed on the Prussian rivers Elbe and Vistula in late years. As regards the Rhine, an Agreement with the Netherlands Government dated the 24th August, 1893, provided for joint action in cases of high water and ice on that river.

Extension of Ruhrort Harbour.

Extension of Ruhrort Harbour.

An important Law has just been passed by the Reichstag (June 1902) for a large extension of the harbour of Ruhrort at a cost to the Prussian State of 350,000*l.*, which is to be raised by a loan, the 3½ per cent. interest on which is to come out of the funds accruing from the Ruhr Harbour charges and the shipping frequenting it. An additional 1 per cent. is to be set aside as a sinking fund from 1907 onwards.

Ruhrort, lying close to the north of Duisburg on the Rhine, is one of the oldest river harbours and shipping places in the Rhenish-Westphalian coal districts. The moneys hitherto expended on the various extensions of this harbour have always been furnished by a special fund belonging to the State, known as the "Ruhrort Shipping Fund," started in 1805, and not from the General Prussian State Funds.

The total expenditure now proposed will amount to some 663,840*l.*, of which 190,000*l.* will be taken from the capital of the "Ruhr Shipping Fund," and 350,000*l.* will be a loan from the State; the rest will be supplied out of the surplus receipts during the next four to five years while the harbour is being constructed.

The present extension has been necessitated by the enormous development of the traffic there in the last twelve years, as is shown by the following figures. The goods traffic has risen from 3,435,818 tons in 1890 to 6,782,820 tons in 1901, or 97 per cent.; and, on the Rhine close by at Emmerich, the increase has been from 5,883,236 tons in 1890 to 13,191,845 tons in 1900, or 124 per cent. The transport of coals, it may be mentioned, in the district of Dortmund has risen from 35½ in 1890 to over 59½ million tons in 1900, which fact shows the great industrial progress in late years and its influence on the Rhine shipping for the conveyance of fuel alone.

New Canals since 1894.

It may here be mentioned that the new canals opened since 1894 (the date of the last Foreign Office Report) are:—

	Year.	Total Cost.		
		£	*s.*	*d.*
The Kaiser Wilhelm Canal ...	1895	7,754,795	15	0
The Dortmund-Ems Canal ...	1899	3,431,432	19	0
The Elbe-Trave Canal ...	1900	1,154,406	16	0

Besides these a short canal was made from Danzig to the Frischen Haff ("Elbinger-Weichsel"); and the important canalization of the Upper Oder, from Cosel to Breslau, must not be forgotten.

The Königsberger Sea Canal, to enable sea-going ships to go right up to Königsberg from Pillau, as well as the deepening of the waterway from Stettin to Swinemunde, from 19½ feet to 23 feet, to facilitate the passage of sea-going vessels, fall within that period.

Projected Canals in Prussia.

Projected canals in Prussia.

The Prussian Government have, for some years past, been strongly in favour of an extension of the canal system in order to ease the yearly increasing burden that is being thrown on the railways; and this conviction has induced them to draw up the Midland Canal Bill in 1898, presented in 1899, but eventually rejected by the Prussian House of Deputies.

The Prussian Government have always been of the opinion that an extensive and growing canal system is not opposed to the interests of the State railway system; but that, on the contrary, the two complete one another, and should work well together in the interests of the public. The Prussian Minister of Public Works has publicly declared that the assistance of the waterways was necessary to the railways, in order to be able to deal with the rapidly increasing traffic.

1899 Rhine–Elbe Canal.

This Bill comprised the construction of a ship canal connecting the Rhine, Weser, and Elbe, consisting of the following parts:—

1. A canal from the Rhine, in the neighbourhood of Laar, to the Dortmund-Ems Canal in the neighbourhood of Herne.

2. Various works to improve the Dortmund-Ems Canal from Dortmund to Bevergen.

3. A canal from the Dortmund-Ems Canal in the neighbourhood of Bevergen to the Elbe, in the neighbourhood of

Hemrichsberg, below Magdeburg (Midland Canal) with branch canals to Osnabruck, Minden, Linden, Wülfel, Hildesheim, Lehrte, Peine, and Magdeburg, including the canalizing of the Weser from Minden to Hameln.

The total cost was put at 2,264,900*l.* for No. 1, 203,350*l.* for No. 2, and 10,570,985*l.* for No. 3.

In addition, the State of Bremen, at its own expense, undertook the canalization of the Weser, from Minden to Hameln, at a cost of 2,150,000*l.*, though in Prussian territory.

The leading idea was to amalgamate the detached eastern and western waterways of North Germany, and especially to connect the Dortmund-Ems Canal with the waterways of the Rhine, in order to give the latter an outlet to the sea viâ a German port, Emden, in addition to that through the Netherlands. The junction of the northern waterways would also have a great influence on the South German system; for the carrying out of this project would place the Rhine-Main-Danube connection in direct communication with all the rivers of Northern Germany.

1900 Prussian Amended Canal Bill.

This original Bill not having been favourably received, an amended Bill was laid before the Prussian House of Deputies early in 1900. In it extensive concessions were made to its opponents; and the whole project was extended so as to include the supplementary works considered necessary by them.

Thus, the Rhine-Elbe Canal was to remain the same as before, efforts being made to extend the network towards the Eastern Provinces. The Warthe, Netze, and Brahe, and the Bromberger Canal were to be so improved as to allow vessels of 400 to 500 tons to pass from the Rhine to the Vistula, and then, by making use of the "Frischen and Kurischen Haffs," to Königsberg and Memel. An attempt was to be made to raise the depth of water on the Upper Oder to over 4½ feet so as to obtain a good waterway from Cosel to Berlin and Stettin. The waterway between the latter town and Berlin was to be much improved. The regulating of the Lower Oder was also to receive great attention, in connection with the Berlin-Stettin Canal. The completion of the "Masurischer" Canal, planned in 1874, but not then carried out, had also been intended, but was afterwards abandoned. The regulation of the Spree and Lower Havel was included. In fact, the Government tried to include all the recent projects for improving the most important waterways.

Cost of 1900 Canal Bill.

The cost of the Rhine-Elbe part of this Bill, as described above in the original Bill, remained at 13,039,235*l.* In addition, 2,075,000*l.* was to be granted for the Berlin-Stettin section, 1,131,550*l.* for the waterway from the Oder to the Vistula and for the Warthe, and 205,000*l.* for the improvement of the waterway between Silesia and the Oder-Spree Canal. The total sum asked for, therefore, under the new Bill was

16,450,785*l.* This Bill is still pending before the Landtag in June, 1902.

Other prominent projects are:—

The canalization of the Moselle-Saar.

The connection of Leipzig with Bresa, on the Elbe, and thus with the northern waterways.

A canal from Schwerin to the Baltic.

A canal from the Dortmund-Ems Canal to the Weser, viâ Oldenburg.

Other projects regarding waterways.

The improvement of the Rhine from Mannheim to Strasburg at a cost of 600,000*l.* All the final arrangements for beginning this great work are now completed. It is a most important project, as it will cheapen goods traffic not only to Switzerland and South Germany, but also to some parts of Italy and France. A depth of 6½ feet at low water is to be obtained.

(Signed) WILLIAM S. H. GASTRELL.

Berlin, June 28, 1902.

Annex No. 1.

RETURN of Ships employed on Rivers, Canals, "Haffs" (and Coasts)* of over 10 tons in German Empire in 1900.

(Following have been omitted: in 1882, 130 vessels of 2,105 tons; in 1887, 134 ships of 1,996 tons; in 1892, 98 vessels of 1,544 tons; and in 1897, 129 ships of 2,033 tons on account of peculiarities in statistics.)

Description of Ship.	On December 31—	Number of Ships.	Tonnage of Vessels.						
			Number of Metric Tons.	Number of Ships whose Tonnage consisted of—					
				Under 20.	20 and up to 50.	50 and up to 100.	100 and up to 150.	150 and up to 300.	300 and over.
Ships, total of...	1882	18,715	1,658,266	2,595	4,740	4,775	3,672	1,764	696
	1887	20,390	2,100,705	2,551	4,956	3,774	5,460	2,136	1,112
	1892	22,848	2,760,553	2,682	5,101	3,647	6,326	2,901	1,721
	1897	22,564	3,370,447	2,505	4,579	3,214	6,277	2,851	2,519
Consisting of—									
1. Sailing-vessels	1882	17,885	1,625,111	2,411	4,523	4,643	3,623	1,733	687
	1887	19,237	2,049,413	2,314	4,723	3,593	5,370	2,067	1,101
	1892	21,318	2,688,596	2,313	4,711	3,412	6,210	2,824	1,698
	1897	20,611	3,266,087	1,986	4,075	2,936	6,150	2,750	2,463

* When not included in the statistics of sea-shipping.

Description of Ship.	On December 31—	Number of Ships.	Tonnage of Vessels.						
			Number of Metric Tons.	Number of Ships whose Tonnage consisted of—					
				Under 20.	20 and up to 50.	50 and up to 100.	100 and up to 150.	150 and up to 300.	300 and over.
2. Steamers*	1882	830	33,155	184	217	132	49	31	9
	1887	1,153	51,292	237	233	181	90	69	11
	1892	1,530	71,957	369	390	235	116	77	23
	1897	1,953	104,360	519	504	278	127	101	56
Classes of Steamers—									
(*a.*) Passenger	1882	311	11,067	91	103	62	8	10	...
	1887	492	19,666	146	160	100	31	12	...
	1892	677	24,672	210	208	127	30	18	...
	1897	816	27,713	262	236	134	35	16	3
(*b.*) Goods	1882	95	12,359	3	15	23	26	20	7
	1887	128	18,295	...	8	38	36	36	9
	1892	141	23,689	1	14	23	45	39	18
	1897	191	36,490	20	26	24	40	41	33
(*c.*) Towing	1882	345	8,781	83	93	46	15	1	...
	1887	461	12,524	85	60	39	23	21	1
	1892	635	22,155	141	161	80	41	20	3
	1897	876	38,502	219	233	112	50	44	19

Description of Ship.	On December 31—	Number of Ships.	Tonnage of Vessels.						
			Number of Metric Tons.	Number of Ships whose Tonnage consisted of—					
				Under 20.	20 and up to 50.	50 and up to 100.	100 and up to 150.	150 and up to 300.	300 and over.
(*d.*) Cable (chain)	1882	65	30	3	...	...	...	...	...
	1887	50	22	2	...	...	...	...	...
	1892	50	598	2	...	3	...	...	1
	1897	42	775	3	...	6	2	...	...
(*e.*) Steam ferries	1882	14	918	4	6	1	...	...	2
	1887	22	785	4	5	4	...	...	1
	1892	27	843	15	7	2	...	...	1
	1897	28	880	15	9	2	...	...	1

* Includes 40 propelled by petroleum motors, 23 driven by benzine motors, and 1 steam.

Annex No. 2.

RETURN of all German Waterways in 1900.

Description of Waterways. NOTE.—(a.) Free rivers. (b.) Canalized rivers. (c.) Constructed canals.	Total Length of Navigable Parts.	Distances navigable by Ships having a Draft of—				
		5 Ft. 9 in. (or 1·75 Metre).	4 Ft. 11 in. (or 1·50 Metre).	3 Ft. 3 in. (or 1 Metre).	2 Ft. 5½ in. (or 0·75 Metre).	Under 2 Ft. 5½ in. (or 0·75 Metre).
	Miles.*	Kilom.	Kilom.	Kilom.	Kilom.	Kilom.
Memel and district ... ... (a.)	169	...	210·67	56·88	5·65	...
Memel and district ... ... (b.)	12	...	20·50	...	...	...
Memel and district ... ... (c.)	21	...	34·87	...	...	...
Rivers flowing into the "Kurischen Haff" ... ... (a.)	39	...	57·51	...	...	5·70
Connection between the Memel and Pregel districts ... ... (c.)	11	...	19·00	...	...	...
Masurian waterways ... ... (a.) (Free river and lakes)...	90	...	...	146·00	...	...
Masurian waterways ... ... (c.)	11	...	...	18·00	...	...
Pregel and district ... ... (a.)	142	...	102·38	127·05	...	...
Rivers flowing into the "Frischen Haff" (a.)	19	...	11·30	8·80	12·00	...

*Fractions of miles are ignored in this column.

Description of Waterways. NOTE.—(a.) Free rivers. (b.) Canalized rivers. (c.) Constructed canals.	Total Length of Navigable Parts.	Distances navigable by Ships having a Draft of—				
		5 Ft. 9 in. (or 1·75 Metre).	4 Ft. 11 in. (or 1·50 Metre).	3 Ft. 3 in. (or 1 Metre).	2 Ft. 5½ in. (or 0·75 Metre).	Under 2 Ft. 5½ in. (or 0·75 Metre).
	Miles.	Kilom.	Kilom.	Kilom.	Kilom.	Kilom.
Elbing – Oberland – Drewenz – Schullingsee Canal ... ... (a.) (Free river and lakes)...	102	...	...	165·42	...	...
(b.)	6	...	...	10·10	...	...
(c.)	24	...	...	39·79	...	...
Vistula and district... ... ... (a.)	315	15·90	231·63	153·62	...	107·07
(b.)	7	...	12·76	...	...	...
(c.)	11	...	17·90	...	...	...
Connection between Vistula and Oder... (c.) Bromberger Canal ...	24	...	...	39·36	...	...
Waters on coast of Baltic, west of the Oder ... ... (a.)	282	...	184·60	28·30	...	232·50
Oder and district ... ... (a.)	998	401·84	426·89	672·20	58·38	48·66
(b.)	327	82·00	161·02	285·80	...	...
(c.)	32	7·50	...	45·21	...	...
Coast rivers north of Elbe ... ... (a.)	170	...	160·60	110·50	...	3·00
(b.)	24	...	39·20	...	...	...
Connections between Oder and Elbe ... (c.)	93	66·65	84·17	...	...	...
Elbe and district ... ... (a.)	1,181	519·18	545·28	653·57	184·00	...
(b.)	398	38·91	83·10	470·03	...	49·24
(c.)	310	...	...	325·67	...	174·60
Connection between Elbe and Weser... (c.)	16	...	...	11·40	...	16·10
Weser and district ... ... (a.)	427	114·91	330·60	239·63	...	3·00
(b.)	193	...	...	142·95	168·16	...
(c.)	22	...	...	36·32	...	...
Coast waters between Weser and Ems (a.)	4	...	...	7·70	...	...
Connection between Weser and Ems ... (c.)	25	...	40·20	...	...	...
Ems and district (except Dortmund–Ems Canal ... ... (a.)	283	75·28	...	382·53	...	...
(b.)	68	...	...	109·92	...	...
(c.)	461	78·00	10·00	605·46	47·66	2·26
Dortmund–Ems Canal ... ... (a.)	13	23·52	...	...	...	...
(b.)	29	48·80	...	...	...	...
(c.)	115	186·44	...	...	...	...
Rhine and district ... ... (a.)	1,075	435·92	142·77	712·83	123·55	316·59
(b.)	361	32·64	17·74	531·08	...	...
(c.)	234	...	68·26	309·90	...	...
Connection between Rhine and Danube (c.)	90	...	...	146·86	...	...
Danube and district ... ... (a.)	462	...	...	449·65	...	295·67
(b.)	20	...	...	32·90	...	...
		Miles.	Miles.	Miles.	Miles.	Miles.
Total ... ... (a.) Free rivers ...	5,776	985	1,493	2,430	238	628
(b.) Canalized rivers ...	1,450	125	207	982	104	31
(c.) Constructed canals	1,509	209	170	980	29	120
North Sea (Kaiser Wilhelm) Canal	61	61	...	...	...	...
Grand total	8,797	1,382	1,871	4,393	371	779

Inclosure 2 in No. 8.

Memorandum by Mr. Gastrell on Report on German Waterways.

THE Report asked for on "Internal Navigable Waterways" in Germany, in the Foreign Office despatch of the 25th February, 1901, for the information of the Association of Chambers of Commerce of the United Kingdom, could not be drawn up until this year, as the official data on which to found it up to 1900 had not been published. Late last autumn the Prussian Government issued a detailed statement of the work carried out on Prussian waterways from 1890 to 1900, which has furnished me with valuable information (inserted in Part II of my Report). Part I, dealing with German waterways in the whole Empire, is based on other information.

The General Report now furnished by me brings the question of waterways up to date, since the publication in 1894 of the last Foreign Office Report on the subject. It has, however, not been possible to obtain satisfactory data from official sources on any of the special points (1 to 2) mentioned particularly in the letter of the 15th January, 1901, from the Association of Chambers of Commerce, until the present month, when these very points have been carefully gone into in a work by a high official of the Prussian Ministry of Public Works, a copy of which is inclosed in original herewith;* the data contained therein have not been included in the General Report, because, at a very early date, an English translation of it will be published, which will later be forwarded. As to point 3, raised in that letter, dealing with the results which have followed the improved means of transport, there has been nothing officially published, and it is a question on which different views have been taken by the private persons who have published anything on it. At the Ministry of Public Works, however, I was told that a very correct statement, dealing in particular with the results that have generally ensued as regards the seaports of Germany, had recently (in 1901) been published in the "Revue d'Économie Politique" by a Frenchman, M. Albert Aftalion, and that it might be looked upon as reliable. A copy of it is, therefore, inclosed herewith.*

Copies of the various Reports presented to the Prussian House of Deputies, giving the work done on the Prussian waterways from 1892 to 1900, are inclosed.*

The draft Bill (now passed as a Law) for the extension of the Ruhrort Harbour on the Rhine, together with a statement of the reasons which have caused it to be made, is inclosed herewith.*

Copies of the draft Bill, with eight inclosures and maps, providing for the great extension of the Prussian waterways,

* Sent to Library of House of Commons.

laid before the Prussian House of Deputies in 1901, but not yet been sanctioned by it, are also forwarded.*

Various books, containing valuable information on the subject of waterways (in German), are also inclosed.*

(Signed) WILLIAM S. H. GASTRELL.

Berlin, June 28, 1902.

No. 9.

Sir F. Lascelles to the Marquess of Lansdowne.—(Received March 23.)

My Lord, *Berlin, March* 19, 1903.

I HAVE the honour to inform your Lordship that there is no further information respecting navigable inland waterways in Germany to be added at present to Mr. Gastrell's Report on the subject, dated June last.

I have, &c.

(Signed FRANK C. LASCELLES.

NETHERLANDS.

No. 10.

Sir H. Howard to the Marquess of Lansdowne.—(Received June 1.)

My Lord, *The Hague, May* 29, 1901.

WITH reference to your Lordship's despatch of the 25th February last, I have the honour to transmit herewith a Report by His Majesty's Consul at Amsterdam on the waterways and Railways of Holland, together with the details of the amounts expended on the former. These latter statistics were furnished by the Netherlands Minister for Foreign Affairs.

Mr. Robinson fears that his Report may not be as complete as the Association of the Chambers of Commerce of the United Kingdom may desire; but there is no doubt that it is a most interesting, lucid, and comprehensive paper, which shows his great and intimate knowledge of this complex question, and which I feel sure the Association will appreciate.

I have, &c.

(Signed) HENRY HOWARD.

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* Sent to Library of House of Commons.

Inclosure 1 in No. 10.

Memorandum by Consul Robinson on the Railways and Waterways in Holland, 1901.

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.

As late as forty years ago there were only three existing lines of railway of any importance in Holland:—the Dutch-Rhenish Railway, connecting the ports of Amsterdam and Rotterdam with the Rhenish provinces of Germany and with the German lines of railway in general; the Dutch Iron Railway, owning an isolated line of rail connecting the six populous towns of Amsterdam, Haarlem, Leiden, the Hague, Delft, Schiedam, and Rotterdam: and the Grand Central Belge Railway, connecting Rotterdam with Antwerp and Belgium, but not directly connected with either the Dutch-Rhenish or the Dutch Iron Rail Company's lines.

All three of these isolated lines had in those days a hard struggle for existence. The Dutch-Rhenish line, running for most part of its length parallel to the River Rhine, from the German frontier to Rotterdam, could only obtain a goods traffic in competition with this magnificent waterway by carrying goods at exceedingly low rates of freight, by offering advantages to forwarding agents, and by the exercise of the strictest economy. The Dutch Iron Rail Company had to rely on the passenger traffic between the large towns on its route; goods traffic was almost entirely non-existent. The Grand Central Belge had a very small goods and passenger traffic between Holland and Belgium, rendered all the more difficult by the hiatus at the Moerdyk, which had then to be crossed in a steamer.

When, about the years 1859–60, the urgent necessity for the construction of railways throughout the whole of Holland began to be clearly understood by both the Government and the nation, to prevent the country falling into a condition of isolation and decay, a decay which was already beginning to show itself in the provinces and cities of North Holland, it was clearly 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. This plan was carried out, so far as can now be judged, with excellent judgment, and has proved itself the salvation of a country otherwise irretrievably doomed to decay in many districts. The cities of the northern provinces have renewed their youth; those interesting towns called by a well-known French author in a book of travels issued some fifty years ago, "The Dead Cities of the Zuiderzee," are no longer moribund, but in most instances full of a brisk and vigorous life.

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 surplus of receipts over expenditure, exclusive of that on capital account, is divided in certain proportions between the State and the Company. The latter has paid fair, but not large, dividends to its shareholders, while the amount received by the State has never sufficed to cover more than 1 per cent. per annum on the capital which it has expended.

In later years the State acquired the Dutch-Rhenish Railway and the Netherlands Central Railway, running between Utrecht and Zwolle. A new arrangement was made in 1890, by which the working of the then existing State lines was divided between the Company for the working of State Railways and the Dutch Iron Railway Company, which Company still continues to exist as a separate private concern. This rearrangement, though it does not absolutely exclude competition between the two systems, where such is practicable does not encourage it, and the rates charged by each on the through traffic from Holland to Germany, and from Holland to Belgium and *vice versâ*, are not ostensibly competitive; practically, however, there is a sharp competition for goods traffic between the two Companies.

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. In some instances, where

large and regular consignments of raw materials are carried over long distances, as is the case with the coal and coke from Westphalia to Holland, and the ore from Holland to Westphalia, which compensate each other economically, the railways can fully hold their own with the waterways: and coal, for obvious reasons, will always choose rail in preference to water carriage, even at somewhat higher rates of freight for the former.

It was only about the years 1878–1879 that the Company working the State lines began to turn its attention more energetically to the encouragement of a *local* goods traffic. Up to that date such traffic was practically almost non-existent on the railway lines. The amount earned by the Dutch State Railways from their goods traffic now exceeds that received from passengers, but this is to a great extent a consequence of their international goods traffic. 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. The chief competing waterway constructed for goods traffic of late years is the so-called Merwede Canal, connecting the port of Amsterdam with the Rhine. This important canal has doubtless had a very favourable influence upon the prosperity of the port, as may be seen from the statistics of the traffic on it since it was opened in 1892. The total tonnage of Rhine and local traffic using the canal in that year was 1,420,257 tons, and had increased in 1899 to 4,433,257 tons. The tonnage of Rhine craft alone increased from 322,046 tons in 1892 to 1,000,101 tons in 1899. This great increase in tonnage does not, however, indicate any corresponding decrease in the goods traffic of the competing railway lines, on the contrary the quantities of goods reaching and leaving Amsterdam by railway show also a marked increase. It is not possible to show by statistics what influence the opening of this Canal had on the traffic of the competing railway lines. As far as inland traffic is concerned the railways doubtless suffered to some comparatively slight extent, but their international goods traffic remained almost entirely unaffected.

On the whole it may be stated that the waterways have profited to a much greater extent proportionately by the general increase in goods traffic than the railways. Much of this is owing to the great improvement in the manner in which the water traffic is now carried on. The number of small goods steamers and tugs employed on the waterways has immensely increased, and the saving in the time employed in transport has been correspondingly great. At present we seem to be on the verge of a revolution in water carriage, owing to the introduction of the cheap, small, and practical petroleum motors, which can be fitted to almost every description of craft, and which are at present so much in demand for this purpose

that it is impossible to secure delivery of new motors for several months to come.

The water in the canals is now kept open during a much longer period in winter than formerly, by reason of this increasing steam traffic, and this, too, is also to the disadvantage of the competing lines of railways.

From the above explanation it will be clearly seen that any comparison between the conditions of rail and water traffic in Great Britain and those which exist in Holland must be illusory, owing to the great difference in the circumstances affecting these modes of transport in both countries.

The annexed statement shows the amounts expended by the State during the past forty years in the improvement and canalization of the rivers traversing the country, and during the past twenty-three years in the construction of new canals and waterways.

(Signed) W. C. ROBINSON.

Amsterdam, May 25, 1901.

AMOUNTS expended in the Improvement and Maintenance of the Waterways during the Period 1862–1901.

I.—*Rivers.*

	Length in Miles (about).	Amount Expended (about).
		£
Upper Rhine (Dutch), Pannerden Canal, Lower Rhine, and Lek	82	853,220
Waal	53	986,042
Yssel and waterway from Zwolle to sea... ...	80	452,442
Upper, Lower, and New Merwede	28	1,507,584
Dordrecht waterway	40	400,384
Limburg and North Brabant Meuse, not including cost paid by Belgium for left bank on frontier	166	993,400
Alteration of course of the mouth of the Meuse ...	20	2,303,267
Waterway from Rotterdam to the sea	20	3,897,060
Dutch Yssel	13	49,670
Blackwater and mouth of the Yssel at Zwolle ...	18	99,708

II.—*State Canals.*

(During the Period 1878–1900.)

	Length in Miles (about).	Amount Expended (about).
		£
Canal through Drenthe	27	115,900
Meppel Canal to sea	7	61,475
Willemsvaart Canal	1½	21,200
Apeldoorn	34	90,270
North Holland	50	292,883
North Sea Canal, including works at Schellingwoude	17	1,544,133
Canal from Amsterdam to the Waal (Merwede Canal)	44½	1,997,000
Voornsche Canal	6½	112,800
South Willemsvaart and Dieze, not including the cost on Belgian territory	80	369,892
Canal from Terneuzen to Ghent, not including cost on Belgian territory	20½	297,133
South Beveland Canal	5	136,133
Canal through Walcheren	8⅓	226,542

No. 11.

Mr. Leveson-Gower to the Marquess of Lansdowne.—(Received April 4.)

My Lord, *The Hague, April 2, 1903.*

I HAVE the honour to transmit herewith some supplementary remarks by Mr. W. C. Robinson, His Majesty's Consul at Amsterdam, on his Report of 1901 on the navigable inland waterways of Holland.

I have, &c.

(Signed) ARTHUR F. G. LEVESON-GOWER.

Inclosure in No. 11.

Report on Navigable Inland Waterways in the Netherlands.

Supplementary Remarks to Report of May 25, 1901.

I WISH in the first place to point out that, with the exception of the relatively insignificant charges for bridge and lock dues,

all the navigable waterways of this country are free from tolls, so that inland navigation is practically quite unencumbered.

Inland water carriage does not, as a rule, involve any transhipment, shippers and consignees both very generally themselves residing on the banks of the canals, whereas goods forwarded by rail have, as a rule, to be transhipped at each end; hence the advantages of water over rail carriage in respect of cost of inland transport in this country are obviously very great.

For long distances, however, heavy goods carried in international traffic can, as has been repeatedly proved, compete with even the most favourably situated waterways on at least equal terms, more especially where there exists a return traffic of the same description from the original place of destination, as in the case of the carriage of coal from the Westphalian coal-fields to the seaports of Holland, with a return traffic of iron ore from these harbours to the Westphalian iron works.

In these cases the position is the reverse of that which obtains in the inland traffic. Coal shipped by the Rhine waterway from the coal districts of Westphalia, and ore shipped by the same route from Dutch ports to the Westphalian iron works, have in each instance to be transhipped at the Lower Rhine ports of Ruhrort and Duisburg, and the local railway freight to or from the colleries or iron-works has to be added to the costs of transhipment; so that although the water freight from the Dutch ports to the Rhine harbours, or *vice versâ*, is very moderate, the Dutch railways are still able to compete with the waterway in both directions.

I annex a short schedule of the rates at present existing for some of the leading articles, from which it will clearly appear that competition between rail and water, when both meet on absolutely equal terms, is not conceivable; but in special circumstances, such as are given above, the railway can sometimes hold its own.

Should the canal, long projected in Germany, traversing the industrial and coal district of Westphalia, from Dortmund to the Rhine ports, be eventually carried out, the position would be materially changed, and the Dutch railways would inevitably lose a large proportion of their international heavy goods traffic.

(Signed) W. C. ROBINSON.
His Britannic Majesty's Consul.

Amsterdam, March 28, 1903.

				Distance in Miles.
Water Freights.				
			s. *d.*	
Ore	Rotterdam–Ruhrort ...	Per ton	1 3	156
,, ...	Amsterdam–Ruhrort ...	,,	1 3	156
Grain ...	Rotterdam–Ruhrort ...	,,	1 6	156
,, ...	Amsterdam–Ruhrort ...	,,	1 6	156
Coals... ...	Ruhrort–Amsterdam ...	,,	1 6	156
,, ...	,, Rotterdam ...	,,	1 6	156
,, ...	Amsterdam–Arnheim ...	,,	1 6	75
,, ...	,, Utrecht ...	,,	1 0	25
Grain and seed	,, Wormerveer	,,	1 0	19
,, ,,	,, Alkmaar ...	,,	1 1	25
,, ,,	,, Groningen ...	,,	2 1	107
Railway Freights.				
Coals... ...	Essen–Amsterdam ...	Per ton	4 7	126
Ore	Amsterdam–Essen ..	,,	5 0	126

APPENDIX TO REPORTS

FROM

HIS MAJESTY'S REPRESENTATIVES

ON

NAVIGABLE INLAND WATERWAYS

IN

AUSTRIA-HUNGARY, BELGIUM, FRANCE GERMANY, AND THE NETHERLANDS.

Presented to both Houses of Parliament by Command of His Majesty.
August 1903.

MAP SHOWING

THE

TONNAGE OF NAVIGABLE WATERWAYS AND PORTS.

IN 1897.

MINISTRY OF PUBLIC WORKS.

EXPLANATORY REMARKS.

In the case of Rivers and Canals the width of the coloured bands represents, on a scale of 1 millimetre to 100,000 tons the density of traffic in both directions over the different sections (i.e. the kilometric tonnage divided by the length of the section) in 1897.

In the case of Seaports the width of the bands represents, on the same scale, the effective tonnage entering and leaving the port (Foreign and Coasting trade included) in 1896.

When the bands are sufficiently broad for the purpose they have been divided by a dotted line into two strips representing the up- and down-stream traffic in the case of fluvial navigation, the outward and inward traffic in the case of seaports.

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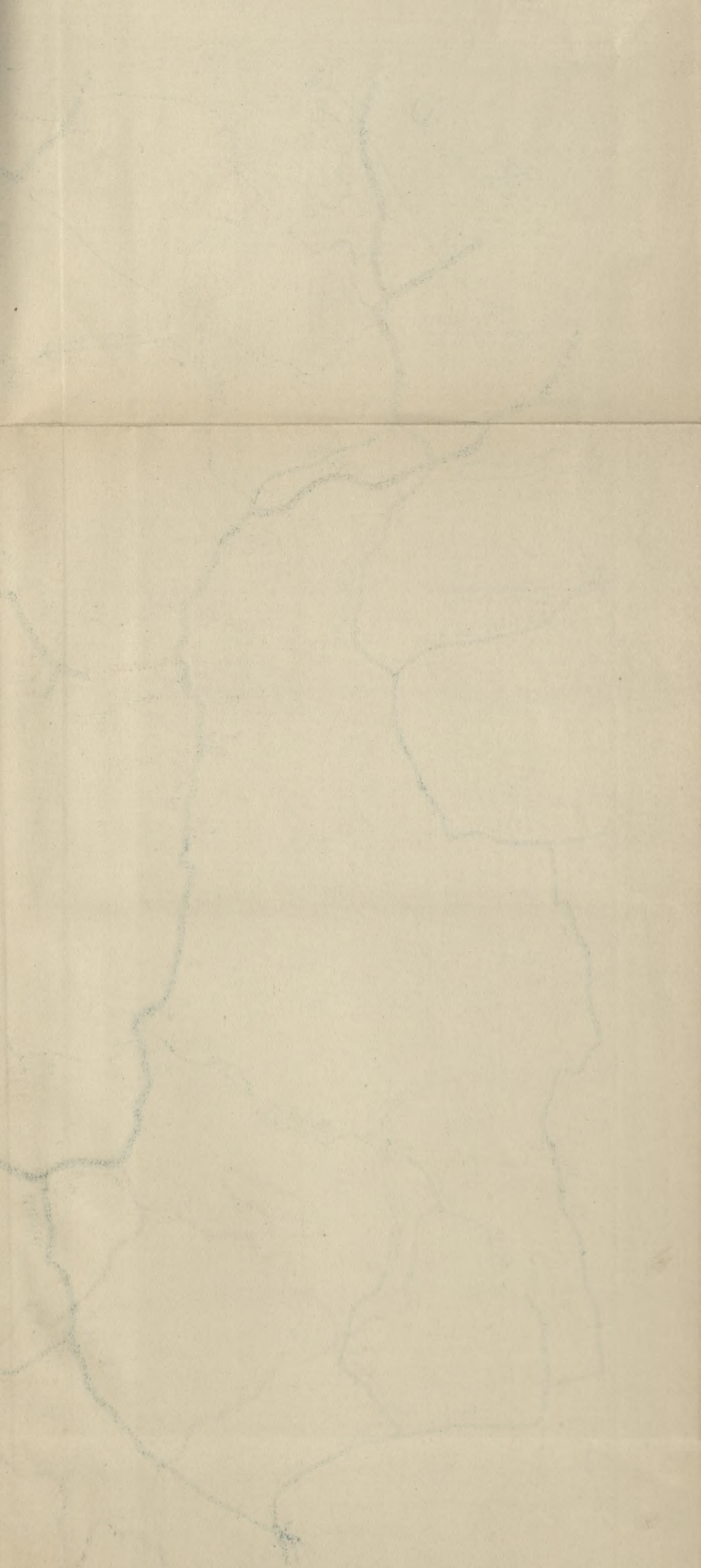

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