

INDUSTRIAL RECONSTRUCTION IN POLAND

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BY

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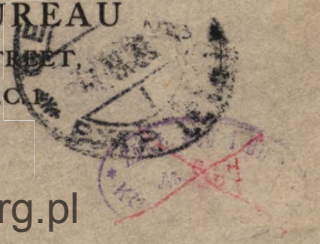
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INTRODUCTION

THE mobilization of Polish industry depends on currency stability, improved transport conditions and an abundance of available coal. The fluctuations of the currency render manufacturing calculations impossible, at the same time favouring trade speculation and profiteering; the want of transport facilities prevents the mobilization of goods accumulated in the factories, and, finally, the lack of coal hinders the complete mobilization of the factories, although there is a sufficient stock of raw material in hand to enable this to be done. The textile industry, for instance, has sufficient cotton to set in movement almost the entire industry of Łódź, but want of coal renders this impossible. Nevertheless, in general, Polish industry is steadily getting back to work, although necessarily this can only proceed slowly. It is no easy matter to obtain figures in support of this assertion. Conditions are continually changing and executive organs do not yet work so smoothly as in other countries. Besides which, the long distance and interruptions in communication render all statistical data more or less stale, so that figures can only give an approximate reality.

• In general, however, one has the impression that the reconstruction of Polish industry is advancing and that, if circumstances permit, it will before long be brought to a normal state. The number of unemployed has

considerably decreased and is still steadily decreasing. The productivity of the workers has also decreased, but not more so than in other countries. This is the result of the war, of the bad technical condition of the factories, of the bad nourishment and psychical depression of the workers. But at present productivity is considerably improving, and in some branches of industry is even higher than it was before the war. For instance, before the war, in the textile industry, 20 spindles fell to the lot of one operative and to-day 28.

The following table represents the state of industrial reconstruction in 1919 :

Industry.	Number of Workmen Employed.		
	Before the War.	On January 1, 1920.	Per cent. as compared with Pre-war Figures.
Mining	28,300	36,900	130
Metallurgical	18,650	5,450	29
Metal	52,415	7,151	14
Mineral	40,900	12,200	30
Textile	168,016	38,900	23
Paper	7,000	4,000	57
Chemical	8,550	3,220	38
Tanning	8,020	2,614	32
Provisions	33,200	14,370	43
Wood	9,540	—	—
Total	374,591	124,805	34

The present condition of the most important branches of industry within the Polish State for which we have succeeded in gathering together exact data is given in the following pages.

COAL INDUSTRY

In spite of the unheard-of difficulties of housing and provisioning, the number of coal-miners has increased by 60 to 75 per cent. in comparison with 1913. Both the Government and the mining enterprises are devoting all their energies to hasten on the renovation of the mining institutions. As a result of this administration, and also of more highly productive work, the output of coal in the Polish basins is gradually increasing, as will be seen from the table on p. 7.

The production of coal in Poland within its present boundaries is in a better state than, for instance, in Upper Silesia, where the output for 1919 was 64 per cent. of that of 1913, or in France, where the output equalled 54 per cent., and this in spite of the fact that the army of occupation did considerable damage to the mines in Poland. The German Army on its retreat from the environs of Warsaw destroyed all winding and lifting machines in the Dąbrowa basin, which accounts for the low output of 3,000,000 tons in 1915.

During the occupation by the Central Powers, the highest output was recorded in 1916, when the mines in the Dąbrowa basin produced about 5,200,000 tons of coal. Owing to increased difficulties arising from the long protracted war, the production gradually decreased, so that the total output in 1918 was only 4,400,000 tons.

The Cracow coal basin was affected by the recent war to a considerably less degree. The 1917 production was practically equal to the pre-war output and amounted to 1,900,000 tons, dropping, however, in 1918, to 1,600,000 tons.

COAL FAMINE IN POLAND

The production of coal in Congress Poland and in Galicia does not suffice to cover the requirements of the countries at present constituting the Polish State, and so Poland was to receive a yearly amount of 8,000,000 tons of coal from Upper Silesia. The production of coal in Upper Silesia, however, decreased by 36 per cent. in 1919; therefore, taking this fact into account, the indispensable contingent of coal for Poland from that district should have been fixed at 5,120,000 tons per annum, or 427,000 tons per month. In the meantime the Reparations Committee only assigned to Poland 250,000 tons of coal per month from Upper Silesia, or 175,000 tons less than her due. According to the latest information, the Coal Sub-committee in Paris has assigned a lump amount of 450,000 tons of coal to Poland, in spite of her claim to 750,000. The following table proves how inadequate is this amount of coal to meet the requirements of the country:

COAL BALANCE-SHEET IN 1920

In Thousand Tons

	Jan.	Feb.	March.	April.	May.
Available Coal—					
Sent from Dabrowa Basin ..	—	360	375	343	325
Sent from Cracow Basin ..	—	85	90	85	83
Sent from Cieszyn Basin ..	—	10	45	48	29
Sent from Upper Silesia Basin	—	245	265	250	250
Total	—	700	775	726	689
Requirements	—	1,371	1,478	1,474	1,451
Deficit	—	671	703	748	762
Deficit per cent. of requirements	—	49	48	51	52

This deficit falls most heavily on industry. The

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proportion between the requirements of industry and the coal available is as follows :

DEFICIT OF INDUSTRIAL COAL

In Thousand Tons

	Jan.	Feb.	March.	April.	May.
Requirements	—	412	504	494	510
Available	—	108	132	152	151
Deficit	—	304	372	342	359
Deficit per cent. of requirements	—	74	74	69	70

This state of affairs prevents Poland from properly mobilizing her factories. The coal famine particularly affects the textile industry, the most important branch of Polish industry working for export trade. This industry has a supply of raw materials assured in part exchange for manufactured goods, and the only thing necessary to bring its productivity up to a pre-war level is coal. The textile factories of Lodz receive scarcely half the coal required, which obliges them to reduce the output of work in the mobilized workshops. The consequence is that the textile industry is not working at one-third of its real capacity, employing 47,000 operatives instead of 178,000, and having in activity 750,000 spindles and 5,000 looms, instead of 2,600,000 and 30,000 respectively.

OIL INDUSTRY

The oil industry was not much devastated by the war, and was able to continue its existence and its output of products so great in demand in foreign markets.

Nevertheless, this industry has had to work under

COAL OUTPUT IN THE LATE CONGRESS POLAND AND GALICIA (see p. 4)

	Hard Coal.				Brown Coal.		
	Dabrowa Basin.		Cracow Basin.		Congress Poland.	Galicia.	Total.
	As compared with the Quarterly Output in 1913.	Metric Tons (in 000).	As compared with the Quarterly Output in 1913.	Metric Tons (in 000).			
	Total.	Metric Tons (in 000).	As compared with the Quarterly Output in 1913.	Metric Tons (in 000).	Metric Tons (in 000).	Metric Tons (in 000).	Total.
First quarter, 1919 ..	996	58%	331	67%	41·0	—	107%
Second quarter, 1919..	1,071	63%	318	65%	37·0	—	93%
Third quarter, 1919 ..	1,191	70%	346	70%	45·0	—	117·5%
Fourth quarter, 1919..	1,355	79%	413	84%	50·0	—	131%
Total, 1919 ..	4,613	68%	1,408	71%	173·0	—	112%
First quarter, 1920 ..	1,204	70%	362	72%	58·6	3	160%

very difficult conditions : on the one hand, technical material necessary for further development was wanting, and on the other hand, the paucity of our rolling-stock did not allow of rock oil being exploited to its fullest extent : the lack of cisterns and locomotives resulted in the refineries obtaining insufficient rock oil for productive purposes, or in their being obliged to curtail their productivity owing to the difficulties of transport.

In addition, it must be remembered that our richest oil basin, Boryslaw-Tustanowice (in the Drohobycz district), as well as the less productive but promising Bitkow basin (Stanislaw district), representing upwards of 93 per cent. of the total rock oil output in Galicia, were under Ukrainian administration for the first five months of last year, and that, consequently, Polish State economics, inasmuch as they refer to the whole oil industry, embrace a period of scarcely seven months.

The total output of rock oil in Galicia in 1919 amounted to 83,063·9 cisterns of 10,000 kgs. The output of the Drohobycz, Stanislaw and Tustanowice oilfields decreased considerably, either as a result of the bad technical state of the shafts or of the exhausted condition of the mines. A smaller decrease of production is seen in the Boryslaw oilfields, while the Mraznica fields show an increase from 720 waggons in May to 907 waggons in August and 859 in November.

On account of the want of coal in the whole of Poland, the oil-mines had to use oil to work the shafts ; 4,760 waggons of rock oil were used for this purpose during the year (upwards of 670 of the output), representing the caloric power of about 100,000 tons of coal, and, further, they burnt upwards of 300 cubic metres of gas, representing the caloric power of about 500,000

tons of coal. Owing to the diminution of the quantity of gas in the Boryslaw-Tustanowice basin, the quantity of rock oil burnt increased, to the detriment of its proper use, viz. to be worked up into valuable oil products.

For the sake of comparison, we quote the following table of production of rock oil during the last eleven years :

1909	..	..	..	205,315	cisterns of 10,000 kgs.
1910	..	..	..	176,142	” ”
1911	..	..	..	145,303	” ”
1912	..	..	..	118,650	” ”
1913	..	..	..	107,104	” ”
1914	..	..	..	87,802	” ”
1915	..	..	..	73,009	” ”
1916	..	..	..	89,870	” ”
1917	..	..	..	84,973	” ”
1918	..	..	..	82,294	” ”
1919	..	..	..	83,064	” ”

An important factor to complete this balance is the working up of the raw products, which in 1919 was not satisfactory, seeing that the oil dispatched during the past year to the refineries for working up only amounted to 24,210 waggons, or scarcely one-third of the total output. From these 24,210 waggons of rock oil the refineries only obtained about 17,000 waggons of oil products, counting upwards of 10 per cent. loss through the manufacturing processes, and about 20 per cent. loss caused by the use of rock oil and waste products as fuel in the refineries through lack of coal.

The oil output in 1920 is shown by the table from the *Polish Economic Bulletin* on p. 10, in which may be found interesting items of information on the oil industry in Poland.¹

THE IRON INDUSTRY

From the moment that the former Congress Poland fell into the hands of the Germans and Austrians in

¹ *The Polish Economic Bulletin*, London, June 1920, p. 103.

OUTPUT OF ROCK OIL (IN CISTERN KILOGRAMMES) IN GALICIA FOR THE MONTH OF
FEBRUARY 1920

Mining District.	Date.	Gross Output.	Used as Fuel.	Waste Product.	Net Output.	Comparison with January 1920 (+ or -).
Jasło ..	Feb. 1920	395·8573	65·5315	1·1892	329·1366	-28·4249
Drohobycz ..	Feb. 1920	5,464·5853	851·2005	420·0689	4,193·3159	-337·8473
Stanisław ..	Feb. 1920	184·7790	1·6686	3·5416	179·5688	-5·0953
Total ..	Feb. 1920	6,045·2216	918·4006	424·7997	4,702·0213	-371·3675

STATE OF THE POLISH IRON INDUSTRY IN 1913 AND 1920

	Blast Furnaces.		Martin Furnaces.		Rolling Mills.		Workmen Employed.
	In Activity.	Average Monthly Out- put in Tons.	In Activity.	Average Monthly Output in Tons.	Number of Rolling Mills in Activity.	Average Monthly Out- put in Tons.	
At the end of 1913 ..	11	35,000	32	49,000	9	39,000	21,500
In November 1918 ..	—	—	—	—	4 (partly)	About 800	2,400
At the end of 1919 ..	2	In Dec. 3,130	3	In Dec. 4,700	4	In Dec. about 2,400	5,250
Middle of March 1920 ..	4	About 4,200	4	About 5,500	4	About 2,400	6,000

1914-15, the Polish iron industry experienced troublous times, of which we are still feeling the effects.

The conditions under which the iron industry developed under the government of the Czar were none too favourable, but even under such hostile conditions the Polish iron industry had a *raison d'être*. The following figures show a continual growth of productivity in the foundries of Congress Poland during the years preceding the war :

Date.	Pig Iron in Tons.	Partially Manufactured in Tons.	Wholly Manufactured Iron and Steel in Tons.
1910	251,000	409,600	358,460
1911	350,000	456,800	390,000
1912	392,000	520,700	427,480
1913	420,000	595,300	467,100
5 months, 1914	178,000	262,200	229,100

The following table gives the increase in the output of pig iron and iron ingots of one blast furnace and one Martin furnace :

For the Month of December.	Blast Furnaces in Activity.	Average Production of one Blast Furnace in Tons.	Martin Furnaces in Activity.	Average Production of one Martin Furnace in Tons.
1906	10	1,670	27	924
1910	8	2,850	26	1,363
1912	10	3,620	31	1,382
1913	11	3,280	32	1,722

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Before the war there were in Congress Poland nine foundries with fourteen blast furnaces, eleven of which were in activity in 1913 and produced in round figures 418,760 tons of pig iron.

The iron and steel obtained from the Martin furnaces or the converters was rolled in the rolling-mills, from which there emerged an output in 1913 of about 467,100 tons of wholly manufactured products. At the end of 1913 about 21,500 hands were employed in the iron industry.

The war temporarily put an end to the development of the Polish iron industry, and by degrees the foundries came to a standstill. The Germans and Austrians began to export all the stores of raw material, and subsequently, with the intention of completely ruining the industry, carried off all copper, brass, nickel, and the entire electric plants, dismantled the machines, etc.—in one word, no plant was left of which the most essential parts were not wanting. At the moment of the German and Austrian evacuation the output was 800 tons per month, and all the foundries together employed about 2,400 hands.

The amount of coal required at the beginning of last year was 4,000 to 5,000 tons per month; the available quantity, however, never exceeded 50 per cent.

The position was still worse as regards coke. The first blast furnace started work on July 24, 1919, and by January 1, 1920, a few others were in working order.

The joint output of iron and steel in 1919 amounted to 16,180 tons. The greatest obstacle to steel production was and still is lack of coal, by reason of which several furnaces have from time to time to suspend operations. The lack of crude iron is also more and more noticeable in the output of the Martin furnaces.

With increased activity of the Martin furnaces, work at the rolling-mills began to run on more normal lines. The total output of the rolling-mills in 1919 amounted to about 16,000 tons of manufactured iron, and at the end of 1919 about 5,250 workers were employed.

During the few months of this year the iron industry has made further steps in advance.

The table on p. 10 gives a comparative picture of the general state of the Polish iron industry before the war, at the time of the evacuation of the war occupiers, and at about the middle of March 1920.

METALLURGICAL INDUSTRY

Before the war this industry held the second place in Congress Poland and gave employment to 61,236 workers.

The value of the output of the large enterprises alone amounted to 100,000,000 rbs.

The metallurgical industry suffered more than any other during the war, especially in the domain of German occupation. Better off were the manufactories of agricultural machines in the domain of Austrian occupation, where the devastation was not so ruthless. In January 1920 they employed 2,000 workmen, about 45 per cent. of the pre-war number (4,500).

Before the war Poland exported machines to Russia to the value of 12,000,000 rbs. and worked iron to the value of 4,000,000 rbs.

Complete mobilization of the metallurgical industry will follow later on, after the completion and the modernization of the plant in existing factories.

The metallurgical industry was considerably less developed in Galicia than in Congress Poland. In 1913 about 12,000 workpeople were employed in this

industry. The value of the total output equalled 35,000,000 crowns, and about 20 per cent. of this was exported.

Half of the establishments were at work in 1918.

Mechanical industry is very little developed in Posnania, as a result of Prussian policy, which tolerated only one industry, i.e. the by-production of agricultural produce. Including other artisans, Prussian statistics give 20,000 hands as employed in the metallurgical industry.

Figures deduced from general Prussian statistics show that there are 11,043 workmen employed in the metallurgical industry in West Prussia (including artisans).

TEXTILE INDUSTRY

The textile industry suffered for a long time from want of raw materials: cotton, wool and flax. At present there is a sufficient quantity of raw material in hand to mobilize nearly the whole industry of Lodz and Bielsk. Unfortunately, as I have already mentioned, the want of coal hinders the mobilization of this most important industry. Textile productions are for Poland export articles *par excellence*. Precise data as to the actual state of activity of this industry are wanting. Interesting items of information thereon are frequently given in the numbers of the *Polish Economic Bulletin*; not sufficient time has yet elapsed to make a complete synthesis of this industry. The conditions at the end of 1919 are shown by the table opposite, from the *Polish Economic Bulletin*.¹

Since then the conditions of this industry have considerably improved. Many factories have been started in Lodz and also in Czestochowa, Kalisz and Bielsk.

¹ *The Polish Economic Bulletin*, London, March-April 1920, p. 4.

POLISH TEXTILE INDUSTRY IN 1919.

	Number of Factories	Spindles.				Looms.				Workmen (according to the kind of Industry).				Workmen (according to District).			
		Before the War.	Working at Present.	Per cent.	Before the War.	Working at Present.	Per cent.	Before the War.	Working at Present.	Per cent.	Before the War.	Working at Present.	Per cent.	Before the War.	At Present.	Before the War.	At Present.
COTTON.																	
Congress Kingdom ..	47	1,435,000	500,000	34·8	35,100	7,400	21·0	70,000	17,800	25·4	148,200	34,400 (23·2 per cent.)	15,300	7,900 (51·6 per cent.)	15,000	4,500 (30 per cent.)	
Teschen District ..	—	—	—	—	990	—	—	—	—	—	—	—	—	—	—	—	
Bialystok District ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total ..	47	1,435,000	500,000	34·8	36,090	7,400	20·5	70,000	17,800	25·4	148,200	34,400 (23·2 per cent.)	15,300	7,900 (51·6 per cent.)	15,000	4,500 (30 per cent.)	
WOOL.																	
Congress Kingdom ..	145	925,600	140,000	15·2	24,000	2,500	10·4	58,000	11,500	19·7	148,200	23,000	26·4	15,000	7,000	46,800	
Teschen District ..	92	100,000	58,000	58·0	3,400	1,250	36·7	14,000	7,000	50·0	148,200	23,000	26·4	15,000	4,500	46,800	
Bialystok District ..	134	94,750	41,230	43·5	2,150	1,350	62·8	15,000	4,500	30·0	148,200	23,000	26·4	15,000	4,500	46,800	
Total ..	371	1,120,350	239,230	21·3	29,550	5,100	17·2	87,000	23,000	26·4	148,200	23,000	26·4	15,000	7,000	46,800	
FLAX, HEMP, AND JUTE.																	
Congress Kingdom ..	3	35,200	5,350	15·2	—	\$12	—	12,800	3,000	23·4	148,200	23,000	26·4	15,000	7,000	46,800	
Teschen District ..	1	9,600	6,000	62·5	295	110	37·3	1,300	900	69·2	148,200	23,000	26·4	15,000	4,500	46,800	
Bialystok District ..	—	—	—	—	—	—	—	—	—	—	148,200	23,000	26·4	15,000	4,500	46,800	
Total ..	4	44,800	11,350	25·3	—	—	—	14,100	3,900	27·6	148,200	23,000	26·4	15,000	4,500	46,800	
DYEING WORKS.																	
Congress Kingdom ..	63	—	—	—	—	—	—	7,400	2,100	28·3	148,200	23,000	26·4	15,000	4,500	46,800	
Total ..	485	2,600,150	750,580	29·0	—	12,500	—	178,500	46,800	26·2	148,200	23,000	26·4	15,000	4,500	46,800	

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We can but say that about half the textile industry is already mobilized.

The factories at Lodz are working partly on Government orders and producing goods from cotton provided by the Government. The state of this branch of the industry for the first half of March 1920 is shown by the following table, also taken from the *Polish Economic Bulletin*.¹

THE COTTON INDUSTRY AT LODZ

Date.	Textile Fabric Produced.	In Activity.		Workmen Employed.
		Spindles.	Looms.	
March 1	22,443,482 metres	64,150	4,450	6,337
March 15	23,411,645 metres	15,387	3,885	5,388

WOOD INDUSTRY

The total forest area under forest culture in the whole extent of ethnographic Poland amounts approximately to :

	Hectares.
Congress Poland	2,702,000
Austrian Poland	2,173,000
Prussian Poland	1,768,000
Total	6,643,000

Working with a hundred years' rotation, the yearly felling area may be calculated as 66,500 ha. Taking the average production per hectare as 200 m³ of felled timber, we have in the above-mentioned territories in round numbers 13,300,000 m³, which, with the

¹ *The Polish Economic Bulletin*, London, June 1920, p. 101.

probable production of the Eastern Confines, calculated as 13,000,000 to 14,000,000 m³, represents about 27,000,000 m³ of felled timber.

Calculating that 50 per cent. of the above quantity will meet the requirements of the home market, the remainder, amounting to about 13,500,000 m³ of unhewn timber, can be assigned for exportation; to this amount about 4,000,000 m³ will be contributed by Congress Poland, about 1,500,000 m³ by Austrian Poland, and about 500,000 m³ by Prussian Poland.

Wood from Congress Poland and Galicia is exported almost exclusively to Germany. During the last few years the exportation of wood from Galicia by the rivers Dniester and Pruth via Galatz and Odessa to the Caucasus (for the mines) has increased, also to Italy, France, and even to South Africa.

Germany, in the same degree in which she endeavours to facilitate the importation of unhewn timber, obstructs by severe import duties the importation of manufactured wood from the former Austrian province. These duties are six times higher than the duties on unhewn timber, while the relative value of these two categories is more or less 17 : 1.

The above conditions explain the low state of development of the wood industry in Congress Poland, where only 15 to 20 per cent. of the wood produced is worked up.

The excessive import duties levied by the Germans on Polish manufactured wood have encouraged the very great development of the sawmill industry in the territories of the former Prussian provinces, where sawmills have been established in the vicinity of the frontier of Congress Poland, Teschen, and Danzig, which was

and still is the most important centre of Poland's wood industry and commerce.

The present state of the wood industry is shown by the following table containing the number of sawmills, carpenters' and coopers' establishments, veneering factories and manufactories of furniture, frames, etc., in different provinces.

			Number of Establishments.	Number of Workmen.
Congress Poland	..	..	879	17,259
Austrian Poland	..	..	284	12,469
Prussian Poland	..	..	7,084	30,350

The turnover of wood between Prussian Poland and Congress Poland and Galicia together is as follows :

			Export. Tons.	Import. Tons.
Edged wood	..	..	210	345,811
Wood for mines and fuel	..	..	2,605	244,153
Finished wood	..	..	271	65,614

Danzig always has and always will play an exceedingly important rôle in the sphere of wood industries ; 80 to 85 per cent. of the wood transported from Poland and Lithuania is worked up in Danzig. Pre-war wood industry in Danzig was represented by eleven sawmills.

During the last few months twenty new establishments of this kind have been founded, so that the output of the sawmills in Danzig is one and a half times greater than in Congress Poland.

PAPER INDUSTRY

I described the state of the paper industry in the *Polish Economic Bulletin*.¹ I may add in supplement

¹ *The Polish Economic Bulletin*, London, March-April 1920, pp. 2-4.

to this article that at present in Congress Poland there are nine out of ten factories and twelve out of twenty-seven machines in activity. At the end of last year, 1,500 workmen out of 4,000 were employed. Owing to the want of coal and raw materials the production to-day is only 25 per cent. of the pre-war output. At the same time the productivity of the workers has decreased by 15 to 50 per cent., while their wages have increased by 50 to 100 per cent.

In 1913 the cellulose factory at Wloclawek employed 737 hands ; at the end of December 1920 only 549.

The output of cellulose amounted to—

		Unbleached. Tons.	Bleached. Tons.
November 1913 ..	..	1,600	750
November 1918 ..	..	700	700
November 1919 ..	..	200	450

The paper industry is well developed in the provinces of the Kingdom of Poland and Galicia. The provinces of Posnania and of West Prussia, indeed, do not themselves manufacture any paper, but import it from the factories in Germany and Upper Silesia ; yet these same Prussian provinces consume comparatively the greatest quantity of paper per head of population, as there are 76 important daily Polish papers having a very great sale. It is an established fact that the yearly consumption of paper in the Kingdom of Poland was lately 10 lb. per head, in Galicia 15 lb., and in Posnania also 15 lb. In view of this fact the paper industry in Poland has very great possibilities of development.

There are only two paper factories in West Prussia,

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while there are many very important paper factories in Upper Silesia, the yearly output of which amounts to almost 70,000,000 tons.

The Polish paper industry consists of great enterprises, and their working capital, amounting to 100,000,000 marks (£5,000,000 nominal value), is almost entirely owned by the Poles.

In 1913 there were in the Kingdom of Poland nineteen paper factories, of which ten were paper factories in the proper meaning of the word, and nine pasteboard factories. These factories employed 5,099 workpeople, namely:

District.	Number of Factories.	Number of Workpeople Employed.
Warsaw	11	3,262
Piotrków	4	941
Kielce	3	826
Radom	1	70
Total	19	5,099

There were altogether 20,000 workpeople employed in the paper industry on Polish territories.

The paper produced in the Kingdom of Poland consists of almost all varieties of paper, except the special kinds of paper which are imported from abroad.

With regard to the natural suitableness for the paper industry, Galicia is in a much better situation than the Kingdom of Poland, as she has more woods and quick rivers.

Generally speaking, the paper industry is dependent upon the quantity of rags, pulp of wood and cellulose.

With regard to rags, the available quantity of them in the Kingdom of Poland cannot satisfy the demand, and thus a certain quantity of rags was imported into the country from abroad, namely, the better kinds of cotton rags from Germany, and flax and hemp rags from Russia. But at the same time Poland exported part of the imported cotton rags to Russia, especially white rags, and part of the linen rags to Austria and Germany. Thus, in 1911, the Kingdom of Poland exported 101,000 cwt. of rags to Russia and 50,000 cwt. to other countries, while it imported 210,000 cwt. from Russia and 312,000 cwt. from other countries. At present, after the Union of Poland has been effected, a great quantity of rags will be available for the Polish paper industry in Galicia.

As regards the wood pulp, the yearly output of this article in the Kingdom of Poland amounted to 208,000 cwt., with an average value of £33,960.

At the same time a certain quantity of wood pulp was imported to the Kingdom from Lithuania and other foreign countries, and a certain quantity was exported, especially to Russia. Thus, in 1911 the Kingdom of Poland exported 127,000 cwt. of wood pulp and cellulose to Russia, and a very small amount to other foreign countries, while it imported 103,000 cwt. of wood pulp and cellulose from Russia (mostly Lithuania), and 200,000 cwt. from other countries. At present half of the amount of wood pulp usually imported from abroad can be supplied by Galicia, the Polish province formerly belonging to Austria and

now united with the Kingdom of Poland. The possession of a distinctive seaport in Danzig will, no doubt, contribute very much to promote the Polish paper industry, as it will render it possible for Poland to import the wood pulp, a very bulky article, containing about 50 per cent. of water, from the northern countries as well as from the Baltic provinces at a reduced price, and thus to diminish the cost of production of the paper.

There is in the Kingdom of Poland only one cellulose factory—in Wloclawek. The yearly output of this factory amounts to 225,000 cwt., which were entirely exported to Russia. At present this factory is managed by the Polish Government, and it is stated that it has a large quantity of cellulose in stock.

There are also two cellulose factories in Upper Silesia, in the district of Opole. Nevertheless, a certain quantity of this article was imported into the Kingdom of Poland from abroad, especially from Baden, Germany (Waldorf Company, Ltd., having its seat in Mannheim).

The yearly production of paper manufactured in the Kingdom of Poland exceeded the normal demand for it, paper thus constituting the staple industry of a large export trade. The production just before the war amounted to 13,000,000 roubles (£1,300,000) for the year.

According to the figures given by the Ministry of Industry and Trade, there were in the Kingdom of Poland ten paper factories, with twenty-seven paper machines, and nine pasteboard factories. The yearly production of these factories, as well as the proportion

of quantities exported to Russia, is shown in the following table :

Number of Machines.	Kind of Paper Manufactured.	Output in Tons.	Quantities Exported to Russia. Per cent.
4	Cigarette paper	2,640	90
3	Newspaper printing paper ..	9,000	50
9	Book, writing, drawing paper ..	27,000	75
8	Wrapping paper	24,000	50
9 factories of pasteboard		5,000	—
Total		67,640	—

The Kingdom of Poland imported a certain quantity of wrapping and newspaper printing paper from White Russia, Finland, and Baltic provinces, while it exported to Russia the better sorts of paper as well as paper necessary for the manufacture of cigarettes. The better kinds of paper and the luxurious paper were imported from Germany, Austria, France and Italy. The quantity of the imported paper amounted to 60,000 tons, part of which, namely 30,000 tons, was re-exported.

The situation of the paper industry is even much better in Galicia, where the raw material is abounding and there are many quick rivers to be used as water power in the sawmills. There are big factories in Czerlany, Sassów, Zywiec. The production of these factories was to a great extent (from 45 to 55 per cent.) exported to Austria, Eastern and Western Europe, Balkan States, Turkey, and even to South

America. The value of the exported paper amounted to 6,000,000 Kr. (£270,000) for the year.

The production of the paper factories in Galicia consists especially of paper and paper tubes used in the cigarette factories. The greater part of those factories manufacture the pulp of wood as well.

Generally speaking, the Polish paper industry was developing before the war in unfavourable conditions, because of the lack of a sufficient amount of raw material, good waterways, and of bad custom tariffs, introduced by the Partitioning Powers ; but these conditions will improve in time, for the Polish Nation has decided to do everything in order to set in working order the economic fabric of the new Polish Republic. The war has largely contributed to the disintegration of the paper industry, because the Russians and Germans took with them many different parts of machines in brass and copper, machinery beltings, raw materials, cables, electric motors, etc. The full mobilization of this industry will require some time. Many different parts of machinery must be imported from abroad, and many accessory fittings as well. There is also a great penury of felt, brass rivets, American resin, etc.

The situation in Galicia and in Silesia is much better than that of the Kingdom of Poland, because the paper factories in Galicia are seated in the western part of this province, which has not been invaded.

In the Kingdom of Poland, of the twenty-seven machines mentioned above, only twelve are working at present, and their output amounts to 25 per cent. of the amount of paper manufactured before the war in this part of Poland.

In order to help the other industries built up on

paper supply, the Polish Parliament was lately obliged to suspend for three months the tariffs collected on paper imported to Poland. But this situation is improving gradually, and the Polish paper industry has now a monthly output of 95 waggons of printing paper, of which 25 waggons might be exported. Very soon the output of this kind of paper may be increased to 110 waggons, and after Silesia is united to Poland, the printing paper will constitute a large article of export trade. Let us not forget that the provinces of West Prussia and Posnania, which, as mentioned above, use such a great quantity of printing paper, may develop their own paper industry if only the conditions of transport are improved by the new Polish Government, a measure already under contemplation.

Naturally, a certain amount of good varieties of paper will continue to be imported to Poland as before, and we fail to understand why they should not be imported from England.

Not only the manufacture of printing paper, but also the production of wood pulp has a great future in the new Polish Republic, as well as all the other industries built up on paper supply, and the waste materials of that industry, rationally utilized, may give rise to a flourishing toy industry.

SUGAR INDUSTRY

The 1919-20 sugar campaign only came to an end at the end of February. The output of sugar was considerably affected by the fact that the sugar beets had several times been frostbitten and consequently lost 6 to 7 per cent. of their sugar properties through decomposition. The result was that the output of sugar for the 1919-20 campaign scarcely amounted to

65 to 70 per cent. of the expected output. Instead of the 500,000 quintaux métriques which, in proportion to the quantity of sugar beets at the disposal of manufacturers, ought to have been produced in Congress Poland, the actual output only amounted to 350,000 q.m. of crystallized and brown sugar.

The forecast for the production of sugar in Posnania at the beginning of the campaign was 950,000 q.m. of raw sugar, but in consequence of the freezing of the sugar beets and the fuel difficulties, the actual production was not quite 600,000 q.m. This considerable reduction in output took place in spite of the fact that the area under sugar beet culture was somewhat more extensive in 1919-20 than in 1918-19. In round numbers there were 87,000 ha. under culture in Congress Poland and 125,000 ha. in Posnania. Sugar beets were not cultivated in Galicia nor in Teschen Silesia, as all three sugar factories in these districts were stationary in 1919-20.

FORECAST OF AREA UNDER SUGAR BEET CULTURE
IN 1920-21.

Thanks to advantageous conditions for sugar beet culture resolved on by the Diet on March 25, 1920, the sugar factories were in a position to make contracts for a larger area of culture in 1920-21 than in 1919-20. The forecast of the area under culture in the whole State contracted for by the sugar factories is as follows :

	Ha.
Congress Poland	118,000
Posnania, Pomerania and Upper Silesia ..	410,000
Galicia and Teschen Silesia	4,450
Total	532,450

A medium production resulting from the above area should be 30,000,000 q.m. of sugar beets and 3,600,000 q.m. of raw sugar.

POTATO BY-PRODUCTS INDUSTRY

In completion of the article published under this title in the *Polish Economic Bulletin*,¹ I may add that this industry has at present fifty-three starch factories in activity in Congress Poland, three of which have a yearly output of more than 50,000 Korzec (about eight gallons). Besides these, there are five syrup factories in activity and ten out of sixteen desiccating factories which came into being during the war.

The consumption of starch per annum in Congress Poland amounts to 750,000 poods (1 pood = 36 lb.). The surplus stock of starch used to be exported to Russia and Germany, and a considerable amount of potato syrup was also exported to Russia.

Poland occupies one of the first places in the world as regards the industrial by-products of potato, and Posnania has precedence of the other Polish provinces in this industry.

Potato culture is in the foreground of agricultural economy in Posnania—the area under potato culture before the war was about 290,000 hectares, or 22 per cent. of the whole area of arable land. At that time the annual yield of potatoes averaged 42,000,000,000 metric quintaux. After providing for the necessities of consumption (man and live stock), about 5,000,000,000 metric quintaux of the crop went to the distilleries and about 6,700,000,000 quintaux to the drying houses, potato mills and syrup factories for manufacture into

¹ May 1920, pp. 48, 49.

white and raw starch, syrup, dextrine, flakes, meal, chips and dried potatoes.

About 221 of these establishments were in activity before the war :

- 17 drying establishments manufacturing chips.
- 19 industrial establishments manufacturing flakes.
- 124 agricultural establishments manufacturing flakes.
- 11 industrial establishments manufacturing white starch and meal.
- 12 agricultural establishments manufacturing white starch and meal.
- 38 agricultural establishments manufacturing raw starch.

Respective quantities employed : 3,500,000,000 metric quintaux for manufacture into flakes, meal, dried and chipped potatoes ; 3,200,000,000 metric quintaux for manufacture into starch, syrup and dextrine ; total, 6,700,000,000 metric quintaux, representing 15 per cent. of the average annual yield.

These industries in former Congress Poland were not in such a flourishing condition, seeing that, from an area of 1,013,000 hectares under potato culture, with a yield of about 97,000,000,000 metric quintaux, the following quantities were used in the manufacture of by-products :

- About 6,660,000 m.q. in 490 distilleries.
- About 1,160,000 m.q. in 53 starch factories.
- About 660,000 m.q. in 5 syrup factories.

Total, 8,480,000 metric quintaux.

In other words—

- 1·22 per cent. of average yield of potatoes in starch industry.
- 0·70 per cent. of average yield of potatoes in syrup industry.
- 0·42 per cent. of average yield of potatoes in drying industry.
- 7·00 per cent. of average yield of potatoes in distilling industry.

Total, 9·34 per cent. of average yield of potatoes.

In Galicia there were 900 distilleries, which absorbed all the potatoes not required for immediate consumption

—about 7,660,000 metric quintaux per annum. Besides this there was one starch factory, the output of which we do not take into consideration.

Taking the data of all the Polish territories together, we obtain the following table, which shows the state of the principal branches of our industry in dry potato by-products as compared with some other countries :

	Poland.	Germany (without Poland).	Russia (without Poland).	Holland.
Area under potato culture (hectares)	1,303,000	3,350,000	4,500,000	165,000
Average annual yield (million metric quintaux)	139,000	452,000	320,000	20,000
Potatoes for dried manufactures (million metric quintaux)	3,840	2,500	—	500
Output in flakes, meal, chips and dried potatoes (metric quintaux)	935,000	600,000	—	125,000
Potatoes for starch, syrup manufactures, etc. (million metric quintaux)	5,730	41,480	5,440	7,340
Output in starch, flour, syrup (metric quintaux)	637,100	1,860,000	870,000	1,070,000

The foregoing shows that, if we calculate the percentage of the manufacture of dry potato by-products, Poland takes the second place, just after Holland, at the head of all the countries occupied in this industry.

The production of these articles was always an important item in our export trade. Posnania in particular exported nearly all her output in starch, for which she had little use in the interior of the country, seeing that she had no home industry in textile fabrics.

SPIRIT INDUSTRY

Spirit manufactories are completely dependent on the delivery of alcohol from the Monopoly Direction,

which distributes the entire output of the distilleries. The contingent of alcohol received by the different manufactories scarcely equals 20 per cent. of their productive capacities ; to this must be added want of coal, bottles and corks.

In 1919, twenty manufactories belonging to the Distillers' Union were fully equipped, but of these only fifteen were in activity and, besides these, ten others not belonging to the Union.

Two and a half times fewer workpeople were employed and the productivity of labour decreased by 20 to 35 per cent. The monthly pre-war output of 200,000 bottles of 0.6 litre fell to 100,000 bottles of 0.6 litre, although, instead of seventeen manufactories in activity before the war, there were twenty-five in activity in 1919.

ANNEX

THE INDUSTRIAL CONDITIONS OF THE UKRAINE WEST OF THE RIVER DNEIPEP

According to statistics drawn up by the Russian Ministry of Commerce and Industry on basis of investigations for the years 1910-12, the industrial conditions in the Ukraine west of the river Dniepr were as follows :

NUMBER OF FACTORIES

I. FORMER PROVINCE OF WOLYNIA.

	Factories.	Workmen.
Wool industry	5	188
Flax and hemp industry	2	126
Paper industry	16	1,768
Wood industry	108	3,820
Metal industry	22	554
Mineral industry	43	6,430
Alimental industry	99	12,267
Chemical industry	3	93

II. FORMER PROVINCE OF PODOLIA.

	Factories.	Workmen
Wool industry	15	578
Paper industry	2	97
Wood industry	7	154
Metal industry	9	420
Mineral industry	10	501
Alimental industry	230	28,541
Chemical industry	2	150

III. FORMER PROVINCE OF KIEFF.

	Factories.	Workmen.
Wool industry	9	396
Paper industry	39	3,130
Wood industry	60	1,948
Metal industry	59	6,621
Mineral industry	70	5,986
Alimental industry	288	57,059
Chemical industry	12	703

TOTAL FOOD PRODUCTION

The chief branches of the alimental production which formed the basis of the industry of the Ukraine west of the river Dniepr are as follows :

I. FORMER PROVINCE OF WOLYNIA.

	1910.	1911.	1912.
<i>Flour products (tons).</i>			
Wheat flour	43,080·68	47,227·62	43,505·86
Rye flour	9,108·44	9,818·55	7,690·34
Barley flour	340·67	260·80	177·67
Buckwheat flour	13·04	14·67	13·04
Other kinds	5,245·34	5,538·74	3,986·98
Bran	11,564·85	13,103·57	13,087·27

	1909-10.	1910-11.	1911-12.
<i>Sugar (tons).</i>			
Refined sugar	24,712·10	24,964·31	40,611·45
Granulated (white)	42,554·41	76,604·48	80,034·63

<i>Alcohol (hectolitres, standard 100 per cent.).</i>			
	200,000	258,384	204,484

II. FORMER PROVINCE OF PODOLIA.

	1910.	1911.	1912.
<i>Flour products (tons).</i>			
Wheat flour	84,482·90	93,002·91	90,173·2
Rye flour	5,923·42	6,397·75	5,038·3
Barley flour	97·80	81·50	84·7
Bran	27,245·45	30,516·86	28,303·3
	1909-10.	1910-11.	1911-12.
<i>Sugar (tons).</i>			
Refined sugar	49,639·02	61,702·43	39,658·7
Granulated, white ..	177,213·60	376,792·43	356,701·5
Granulated, yellow ..	169·52	568·87	—
<i>Alcohol (hectolitres, standard 100 per cent.).</i>			
	204,588	315,802	306,210

III. FORMER PROVINCE OF KIEFF.

	1910.	1911.	1912.
<i>Flour products (tons).</i>			
Wheat flour	174,223·81	198,781·76	160,521·43
Rye flour	28,448·39	21,315·51	24,422·07
Various	5,085·60	9,775·11	9,615·37
Barley flour	27·71	40·75	32·60
	1909-10.	1910-11.	1911-12.
<i>Sugar (tons).</i>			
Refined sugar	191,997·70	190,674·14	149,928·38
Granulated, white ..	202,030·95	451,167·70	433,624·01
Granulated, yellow ..	9·78	—	14·67
<i>Alcohol (hectolitres, standard 100 per cent.).</i>			
	156,060	229,032	249,720

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