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THE POMERANIAN VISTULA

BY

MIECZYŚLAW RYBCZYŃSKI

PROFESSOR OF HYDRAULIC ENGINEERING
IN THE POLYTECHNIC INSTITUTE OF WARSAW



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TORUŃ (POLAND)

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WATERWAYS CONNECTED WITH THE POMERANIAN VISTULA



CHAPTER I

THE ECONOMIC HISTORY OF THE VISTULA

The economic, cultural and political development of every country is closely bound up with the conditions of life with which it has been endowed by nature as also with the changes which such factors undergo during the course of centuries. Amongst these conditions, the system of waterways plays no mean role, this applying especially to the larger rivers and their valleys.

If we look back into the dim past, to the beginnings of our geological epoch, Pomerania appears as an area just freed from the bondage of the last, prolonged Ice Age — as a broad belt of very irregular drumlin hills, the northern slopes of which bordered on the sea whilst at the foot of the southern ones a great post-diluvial river flowed from east to west along the primaeval Toruń—Eberswald valley. With time, the rivers flowing to the sea deepened their channels and their beds receded little by little towards the south until they reached the level of the post-diluvial river, “beheading” it and diverting a part of its water to their own beds.

In this manner, perhaps during some geological cataclysm, the Vistula broke through to the sea and its huge masses of water with time eroded a wide and fertile valley which offered a convenient passage to the sea from the great valley-belt of East-Central Europe. The Vistula, and with it Pomerania, acted as a route linking up the wide plains of the hinterland with the rest of the world; this state of affairs has lasted to the present day albeit conditions have changed and to-day not only river traffic but also all other kinds of transport pass through the valley of the Vistula.

One of the first uses of the Vistula was to facilitate the passage of tribes settled inland to the sea: the oldest-known settlers in Pomerania came from the south. This is confirmed by archeological remains of the Stone Age found in the vicinity of Toruń and which point to a close connexion with the Świder culture of Mazovia¹ (modern Central Poland) just as later finds bear the mark of Great (West) Polish and Lusatian Slavonic cultures with only a few faint traces of Scandinavian culture apparent.

The ties joining Pomerania with the rest of the country inland are further confirmed by the findings

¹ J. Kostrzewski: "Prehistorical Culture", article in *Polish Pomerania*, vol. I *Baltic Inst. Records*, Toruń 1929 (in Polish).

J. Kostrzewski: "Le rôle de la Vistule dans le préhistoire de la Pologne", *La Pologne au VII-e Congrès International des sciences historiques*. Warsaw 1933.

of philological research and by the records of the old chroniclers. Suffice it to state, however, that the oldest geographical name met with in Pomerania and mentioned by Pliny the younger, Ptolemy and Wulfstan the Wanderer, is that of the Vistula (Vistla, Visla, etc.) shown to be of Slavonic origin by Prof. Rudnicki.²

THE VISTULA AND POMERANIA IN POLAND'S HISTORY

From the time that Poland first appeared on the arena of history, Pomerania has always been closely bound up with her. As long ago as in the 10th century, Mieszko, Prince of Poland (962-992), waged war against the Danes in order to retain Jomsburg (Wolin, Julin) at the mouth of the Oder: in this he was successful and by the peace of 985 A. D. the Danes recognized his title to the disputed area. The Lower Vistula country served as the centre for St. Adalbert's evangelization of Pomerania and Prussia, whilst the bishopric founded in 1000 A. D. at Kołobrzeg was placed under the authority of the Polish archbishop at Gniezno.

Poland lost West Pomerania (bordering with the Oder) in the 12th century and this territory became a vassal state of Germany from that time. Poland's only connection with the sea was now along the valley of the Vistula.

² *Slavia Occidentalis* VI-IX, Poznań, 1927-1930.

Soon, however, even this area became the scene of fighting for control of the sea-coast. Conrad, Duke of Mazovia, had incautiously invited the Teutonic Knights of the Virgin Mary to defend his lands against the raids of the pagan Pruzzi (Prusy) and Lithuanians; in time, the Knights grew in power to such an extent that about the end of the 13th and the beginning of the 14th century a prolonged conflict arose as a result of the attempts they made to cut Poland off from the sea. The struggle was concluded in 1466 when, by the Peace of Toruń, Poland's right to Danzig, Pomerania, West Prussia and Ermeland was recognized and confirmed by the Knights themselves. This state of affairs lasted until the first dismemberment of Poland in 1772, with only short breaks caused by the Swedish Wars.

The struggle for access to the sea has, with varying degrees of intensity, lasted during the whole period of Poland's chronicled history. The cause for this is primarily to be sought in the fact that from the very dawn of history in that part of the world, the Vistula has been the only convenient artery connecting up the fertile plains of East-Central Europe with the outer world. Even in prehistoric times, the ancient and historical amber-trade routes led either along the banks of the Vistula or were on the river itself: this is borne out not only by the records of chroniclers (Arabian geographers and others) but also by the

finding of Roman, Arabian and Hebrew coins in excavations made in the valley of the Vistula. During the Middle Ages the chief trade routes were by land and mostly led to or from the east. One of these routes passed through Poland (through Cracow and Lwów) and had branches leading through Lublin and Radom to Toruń, thence by the Lower Vistula³ to the sea. The terminal point of the water route was at first Trusso (the present-day town of Elbing) and, later, Danzig.

These trade routes were mostly used for the transit-passage of a commodity trade in which Polish merchants were also very active. Export from Poland was small in volume but large quantities of cloth and fish were imported. (Kołobrzeg was an important centre for dried and smoked fish sent inland to Poland as early as the year 1000 A. D.) The towns lying on the Vistula in time received goods-depot privileges from the Crown (the earliest granted being that of Sandomierz in 1236); the charters so bestowed by the King conduced greatly to enhance the wealth and power of the towns so favoured. Commercial agencies of the Lübeck merchants were founded at Danzig in 1238: the relations thus set up with the Hanseatic League resulted in the city joining the League in 1366, a number of other Pomeranian towns following suit.

³) The term "Lower (or "Pomerania") Vistula" is applied to the part of the river flowing through Pomerania.

THE ECONOMIC IMPORTANCE OF THE LOWER VISTULA

In the 13th century the export of timber was commenced with shipments of Mazovian wood and later of Carpathian yew, whilst the export of corn through Danzig arose during the 14th century. At first the volume of export trade was inconsiderable and only a few score vessels yearly loaded with grain left Danzig. But the economic upheaval which took place in Europe towards the close of the Middle Ages, the decline of trade with the East, and the rising demand for corn in West Europe caused the corn trade to develop at a very great pace. Thus, during the period 1480-1490, between 600 and 700 vessels annually cleared from Danzig mostly destined for Baltic ports. For these reasons inland navigation in Poland began to receive increasingly greater attention. The addenda of the Nieszawa Diet [1447], those of the Piotrków Diet and those of the later ones contain many mentions of measures for the proper organization of the various river systems, dredging and even regulation works being enacted. At that epoch much was done with regard to the Montau apex of the Vistula delta which diverts part of the river current to the Nogat distributary. The continued demand for corn led to the introduction of the manor system in Poland, where it first appeared in the regions watered by the Lower and Middle Vistula.

The rapid growth of the corn trade was likewise favoured by the opening of the Baltic Sea, as a result of which the number of countries having direct trade relations with Poland increased considerably. About four-fifths of this trade was concentrated at Danzig. An average of 1,200 vessels entered Danzig every year at the close of the 16th century and at the beginning of the 17th century, the peak figure of 1,867 ships having been reached in the year 1618. Dutch and English vessels occupied the chief places in this traffic.

From the middle of the 17th century, with the catastrophical wars afflicting Poland at that time and with the breakdown of economic life brought in their wake, river traffic on the Lower Vistula began steadily to decline. Only once, during the reign of King John III (Sobieski), did the returns of goods traffic rise to their former high level (to about 400,000 tons); at the beginning of the 18th century imports brought upstream, for the first time exceeded exports carried down. The period of state reform inaugurated during the second half of the 18th century resulted in sounder conditions arising: goods turnovers at Danzig again reached the 300,000 ton mark, whilst the construction of the Królewski and Ogiński Canals then undertaken (and planned to increase the area served by the Lower Vistula from 74,430 sq. miles to 188,400 sq. miles) justified the most optimistic expectations for the future.

But Poland's age-long foe appeared on the scene at that juncture and proclaimed economic war. Even before the first partition of Poland, Frederick II had, in defiance of all the tenets of international law and usage, established a Customs house at Kwidzyn (Marienwerder) from which vantage point he used the potent force of cannon to exact a 10 per cent. *ad valorem* duty on all goods passing along the Vistula (1765). Thanks to the pressure exerted upon him by Poland and Russia he was forced to abandon his illegal undertaking but not before the volume of goods traffic passing that point had fallen to 200,000 tons per annum.

Having later annexed Pomerania in 1772 (but not Danzig), during the first partition, Frederick then legally, as far as the dismemberment of Poland was legal, took over the Customs House at Fordon where he levied an enhanced duty of about 12 per cent. *ad valorem* on all goods passing that point, the duty thus charged by him being nearly ten times greater than that levied in Polish times. At the same time, the King of Prussia resolved to realize a Polish project — that of constructing the Bydgoszcz Canal. The object in view, in his case, was to divert to Stettin the entire goods traffic passing to the sea from Danzig. He was determined to ruin Danzig and his efforts were rewarded with almost complete success. By 1782 the export of corn through Danzig fell to 25,000 tons

although goods traffic through Elbing and Königsberg grew apace. It was only during the period 1788—'93 that the King of Prussia, Frederic William, decided to apply, for political reasons, a less relentless policy as regards Polish trade: as a result, although the territory of Poland had been curtailed, the goods turnovers of Danzig rose to 200,000 tons. At that epoch, Poland's total export came to 600,000 tons and assured her a favourable balance of trade although only one-third of her foreign trade passed through Danzig instead of the four-fifths noted before.

After the third partition, when the north-western part of the Kingdom of Poland, together with Warsaw and the Middle Vistula fell into Prussian hands, the Lower Vistula regained a part of its hinterland and this was immediately reflected in the goods turnovers of the Port of Danzig, and corn exports through that port rose to 250,000 tons in 1802. This improvement, however, was short-lived, for, during the Napoleonic Wars, the figure dropped to 40,000 tons in 1806 and as low as 25,000 tons in 1815.

THE LOWER VISTULA AND POMERANIA UNDER GERMAN RULE

When the Congress of Vienna undertook the delimitation of the new frontiers of the countries of Europe after the Napoleonic Wars, it endeavoured to minimize the economic difficulties which were sure to arise as

a result of the changed conditions: freedom of navigation upon the rivers of the former Polish Commonwealth was guaranteed to the inhabitants of the partitioned state. This resolution of the Congress was of great significance for the sea-borne export of farm produce from Poland as navigation on the Lower Vistula was then obviously of prime importance to that trade. But it so happened that it was just in this domain that the decision of the Congress remained but a scrap of paper: Prussia, having secured a reduction in the Customs tariff on its manufactured goods exported to the Kingdom of Poland, raised the duty on agricultural produce passing in transit through Pomerania to Danzig. As a result the export of corn through that port fell year by year and reached the record low level of less than 20,000 tons in 1822.

At that time the financial and economic policies of Poland were in the hands of that able and eminent statesman, Prince Lubecki, Minister of Finance of the Kingdom of Poland. He checkmated the plans of Prussia by setting up a plan for a water route (along the Narew, through the Augustowski Canal, along the Niemen river and the Windau Canal) which was to connect up the Kingdom of Poland with the sea (at the port of Windau) and so avoid the Lower Vistula. But before the works necessary for putting this plan in action were commenced, Prussia concluded a new commercial treaty (in 1825) which envisaged better

treatment of Poland's economic interests. The favourable effects of this step soon became apparent: the volume of goods traffic on the Lower Vistula increased very quickly: corn exports (again used by us as a standard of comparison) grew to 150,000 tons and with only slight fluctuations remained at about that level until 1843.

About that time a serious competitor to water transport appeared: the first railways were constructed. The Warsaw—Vienna line was commenced as long ago as 1834 but it was not opened for traffic until 1848. The construction of a railway line from Kovno to Libau was planned at the same time: by using that line, goods, brought up through the then finished Augustowski Canal and the Niemen, could reach the sea. The Windau Canal scheme as a result fell through. In these conditions the further growth of navigation on the Vistula could not be expected to proceed: it had inevitably to diminish, although the turnovers of the Port of Danzig continued to grow thanks to the treaty of 1843 which had given important privileges to Russian corn transported by rail. For these reasons the Vistula-borne export of corn from the Kingdom of Poland shrank year by year until by 1883 it died away altogether.

Incoming goods ceased to use the water route still earlier. As from 1835, the number of ships entering Danzig in ballast increased steadily until they finally

often outnumbered those laden with goods in the ratio of two to one.

On the other hand, a steady increase was shown by exports of roundwood floated down the river in rafts. In some years, up to a thousand vessels were loaded with timber at Danzig. Germany, however, decided to take advantage of the situation and to gain control of the foreign trade in timber. She decided to export nothing but finished or semi-manufactured wooden goods produced from roundwood brought in from over the frontier. With this object in view, German interests set up sawmills and factories working up timber in Pomerania and in the vicinity of the Bydgoszcz Canal; in addition roundwood was sent to Central Germany via that canal. Just before and during the World War, a special timber-port was constructed at Toruń by Germany, its object being not only to encourage and facilitate local working up of Polish timber in the works which were to arise near the port, but also to act as a distributing point for the railway transport of timber to Germany itself. In the second half of the 19th century, the number of timber rafts crossing the German frontier every year oscillated between 1,500 and 2,000, of which however, only about one-third and later only a quarter reached Danzig.

The neglect of the water routes in favour of the railways did not, however, last very long. The enorm-

ous economic development of Europe during the past century as a result of inventions and a growth in overseas trade, caused a revival of interest in waterways as a medium offering cheap and easy facilities for goods transport. This movement appeared with force in England and in France where new canals were built or old ones improved, whilst in Germany it found its chief expression in the regulation of the rivers. The Lower Vistula was not overlooked in the entirety of this action.

The result of these measures was an enormous increase in the volume of water-borne goods traffic. The Lower Vistula, however, cut off from its natural hinterland by Customs barriers, gained comparatively little by the improvement in navigation conditions. Thus, whilst 5,200,000 tons of goods passed through Breslau on the Oder in 1913 (as against 200,000 tons in 1883), only about 600,000 tons were reported for the Lower Vistula in the record year of 1912 (as against 100,000 tons before the river was regulated). The whole of this increase, moreover, was due solely to a growth in local domestic traffic: as 134,000 tons passed through Toruń in 1887 and only 140,000 tons in 1912 this indicates that the volume of goods transported by the Vistula to and from Central Poland remained constant in spite of the better navigation facilities. Even transports of timber, although encouraged by the Germans, increased only very little in



volume (about 30 per cent.). The highest figure for timber imports was that of 59,350,000 cub. feet in the year 1906.

For all these reasons the role of Danzig as a port under German domination became a very minor one indeed. Amongst the German ports it fell to fifth place and on the Baltic was outstripped even by Stettin. On the other hand, its strategical significance, as a naval base assuring German hegemony on the Baltic steadily grew greater and greater.

The economic history of the Lower Vistula briefly reviewed here, clearly shows that there are not only very close ethnical but also strait economic bonds connecting Pomerania with the rest of Poland, which furnishes an enormous hinterland served by the Lower Vistula, its mouth and generally by the valley of that river. The Lower Vistula area can only benefit by serving this hinterland when it is bound by close political ties with the rest of Poland. The same applies to Danzig and its port. Whenever these ties become loosened or fall apart, a period of stagnation ensues for navigation on the Lower Vistula and for the Port of Danzig. These ties have all the more significance for Danzig as the hinterland of that port is not restricted to the area served by the system of inland waterways but is further extended by a railway system which covers a considerably larger area of the country behind it.

Germany fully realized this fact and her tactics during the War and during the peace negotiations were all directed not only towards maintaining the whole Vistula delta but even to extend her influence over the hinterland served by the Lower Vistula.

It is highly probable that Germany's plans originally were to annex a considerable portion of Central Poland and to gain control of the Middle Vistula at least as far as Warsaw. Evidence of this is furnished by the fact that immediately after the occupation of Central Poland during the Great War a special bureau was set up for research on the regulation of the Vistula from Warsaw to Toruń. As the War dragged on, the planned annexation was transformed into "strategically essential corrections of the frontier", whilst economic gains were to find their expression in a treaty of peace with Russia the terms of which were prepared by the German Governor-General of Warsaw, whilst those paragraphs dealing with the Vistula were drawn up with the collaboration of the German high authorities at Danzig. The postulates approved by the appropriate executive authorities can be summarized as follows:

1. Freedom of navigation in the whole Vistula basin, including tributary streams;
2. Navigation fees to be permitted only on the regulated (i. e. German) portion of the Vistula;
3. Russia to bind herself to regulate the Middle Vistula within a fixed time-limit.

During the peace negotiations at Versailles, Germany tried to smuggle her postulates through in disguised form. Ostensibly desiring to respect Wilson's peace condition of Poland having access to the sea, the German delegates proposed the internationalization of the Vistula and its tributaries, leaving Pomerania, however, in German hands, although goods traffic was and is mainly routed by the land and not by the water route. In addition, the German proposal contained the three points given above and a number of other measures, which, appropriately applied, would have enabled the German river fleet to monopolize all navigation in the Vistula basin. These postulates included such as the right to withdraw captain's and pilot's licences in cases of infringements of navigation, Customs or fiscal regulations; the right to inspect and approve of vessels as regards suitability for navigation on given sectors of the river, as also to examine river transport personnel as regards skill, experience and ability in navigation, etc. There can be no doubt that these regulations, as applied by the German administration, would have been just as efficient a means for paralyzing Polish trade and navigation on the river as was the cannon mounted by Frederic II at the Kwidzyn Customs House.

The allied and associated powers at Versailles rejected this very unusually drawn-up plan for assuring Poland free access to the sea. But the draft remains,

nevertheless, as an indisputable proof of Germany's real aims and intentions: in her action for regaining Pomerania, she has not been so much concerned with spatially joining up East Prussia with the Reich (as that province is in reality not separated from its mother-country in point of communication) but primarily and above all she wishes in that manner to weaken and economically to subdue Poland in order to further her plans for expansion towards the east.

CHAPTER 2

THE PRESENT STATUS OF THE LOWER VISTULA

JURIDICAL STATUS

In accordance with the stipulations of the Treaty of Versailles, Poland secured Pomerania excluding, however, Danzig, which, together with its immediate hinterland, as during the Napoleonic Wars, became a free city. Since, according to the spirit and letter of the Treaty and Wilson's fourteen conditions for peace, Poland was to receive free and unhampered access to the sea, the lines of communication within the Free City were placed under Polish management and the whole area in question placed under the Polish Customs administration. The conduct of Danzig's diplomatic affairs was also entrusted to Poland.

The fundamental stipulations of the Treaty, under the pressure of certain Western European powers, appeared in changed form in the Polish-Danzig Convention signed in Paris on October 9th, 1920. The Convention enacted the forming of a Port of Danzig Authority having half its members Poles and a half Danzigers with the representative of a neutral state

as chairman. As the Danzig Vistula and the mouth of the river were placed under the care of this body, it can hardly be stated that the full suzerainty granted Poland by the Treaty as regards the mouth of the Vistula was realized, although she received a direct voice in the management of the Port of Danzig.

During the negotiations for the Polish - Danzig Agreement which was to be concluded as a further step after the signing of the Convention, Poland proposed the setting up of a single management of the whole of the Lower Vistula: in exchange, Poland was prepared to grant Danzig citizens equality of rights with Polish citizens on all the waterways of the Polish Republic. This eminently reasonable and even generous offer fell through, however, owing to the uncompromising attitude taken up by the representatives of the Free City.

In this wise, the mouths of the Vistula remain either under foreign control (as is the case with the Nogat) or under that of the Port of Danzig Authority where all decisions are as a regular rule made by the chairman. For a number of years the Danzigers scrupulously avoided sending their river fleet on to the inland waterways of Poland, using their vessels either for navigation within the territory of the Free City or on the territory of East Prussia. This policy evokes the impression that the Danzigers wished to lend colour to the enunciations of German propaganda:

that navigation on the Vistula was dwindling away; that Poland does not need the water route to Danzig and that in any case the river-system is unsuitable for navigation as a result of neglect on the part of the Polish authorities. During the years which have followed, evidence has not been lacking that the authorities of the Free City have seen fit to adopt an attitude which has been more of a convenience to the Reich than beneficial to the Danzigers. There can be no doubt that this is due to the fact that the City Fathers are for the most part new-comers from the Reich and not native born and bred citizens of Danzig.

THE TECHNICAL CONDITION OF THE LOWER VISTULA

When the Polish Republic took over the Lower Vistula, its condition was far from satisfactory. Although the basin of the Vistula has an area of 74,600 sq. miles (193,254 sq. km), and thus is but little smaller than that of the Rhine, in spite of the regulation of the lower reaches of the river by the Germans before the War, navigation during low levels of water encountered and had to cope with considerable difficulties and obstacles. It will suffice to quote the opinions of Germans themselves on this point. For example, Dr. Hermann, speaking in the Prussian Landtag on February 1st, 1918, stated the following: "The Vistula is, it is true, contained within a single

river-bed. But that is all that can be said. The river valley looks wild. The interests of navigation were not sufficiently considered when regulating the river. The flow of water is not maintained at a uniform level as with other regulated streams but fluctuates between both extremes. Sandbanks lie untouched at many points and vessels have constantly to seek new channels. And when a low level of water ensues, navigation is almost completely stopped: vessels with a cargo of barely 100 tons can then scarcely make headway. The present state of affairs is such that it is difficult to conceive any worse one when we consider the possibilities of what could be done by supplementary, properly conducted regulation-works being put through with a due regard for the interests of navigation."³

The reason for the admittedly faultily carried out river regulation works is not far to seek: mistaken and fallacious principles were accepted and applied during the course of the work; proper hydrological studies fixing the normal profile of the river were not conducted; the course of the stream was straightened out excessively; spur jetties were almost exclusively applied. These charges are confirmed by Prof. Ehlers⁴ whilst the former Director of River-

³ *Schriften des Weichelschiffahrtsvereins*, Danzig 1918.

⁴ Ehlers: *Regulierung geschiebeführender Flüsse insbesondere der Weichsel*, Berlin 1915.

regulation, Herr Niese⁵ could see no hope of amelioration but in the conduct of supplementary regulation works which would embrace low-water conditions within the existing channel.

Before the War the German press, backed up by some of the German hydraulic engineers, ascribed the formation of sand-bars and islets in the regulated part of the Vistula as being solely due to the lack of regulation works on the Middle Vistula and to the masses of sand brought down from thence. This opinion is very conclusively disposed of by Prof. Ehlers in the work cited herein: he considers this allegation to be mistaken and baseless; he states that this is so "as a river can only bring down as much sand as the power of its current can carry. The extent of such carrying power depends on the gradient and depth of the channel: the gradients on both sides of the (former) frontier are identical and the depth of the regulated part of the river greater; as a result, the Lower Vistula should easily bear away any quantity of sand brought to it by the Middle Vistula." In an examination of the character of the sand-banks and islets forming on the Vistula, Prof. Ehlers gives their average distance from one another during 1900—'07 as 922.2 metres (2,997 feet) and their movement downstream as being between 310 and 690 metres

⁵ A. Niese: Vorschläge zum weiteren Ausbau der Weichsel. *Zeitschrift für Bauwesen* 1918.

(1,007—2,242 ft) per annum with a mean figure of about 500 m (1,500 ft). The chief reason for the formation of the sand-bars and islets is stated by Prof. Ehlers to be the steepness of the embankments of the regulation works evoking great erosion of the river-bed.

The present writer believes that the chief factors to blame in this connexion are: the excessive straightening out of the river; the application of unsuitable meander-radii and the almost exclusive use of jetties which cannot keep the main current to their bank. Moreover, the normal profile of the new river-channel was determined on the basis of insufficient hydrological data. The breadth of the river and the dimensions of cross-sections were calculated by Severin in 1830 on the basis of a survey of twenty-seven cross-sections at a period of medium-water the average field of which came to 10,000 sq. ft; taking the necessary depth of 8 ft., Severin calculated a breadth of 1,250 ft for the Nogat distributary, i. e., one of 375 metres, as later fixed in round numbers. Maintaining the same depth and wishing to route two-thirds of the water through the main distributary and one-third through the Nogat, the breadths of 812 ft (250 metres), and 406 ft (125 metres) were applied below the Nogat. In spite of very extensive hydrological studies conducted subsequently, the width of the river was not changed during Prussian times: all that was

done was to narrow the width above the Drwęca river to 975 ft (300 metres); but this was likewise done without necessity or justification as the very inconsiderable flow of water from that tributary could by no means call for such a relatively great change in the width of the Vistula.

When in 1880 improvement works were undertaken on a large scale, only those depths were calculated which would result within the channel planned during low-water. These computations yielded the theoretical result that at medium-water a depth of 5.48 ft (1.67 metres) would appear and so permit the uninterrupted navigation of 400-ton vessels having a draught of up to 4.7 ft (1.47 metres). In practice, however, the downward moving sand-bars have caused the main channel to become so tortuous that depths of up to 33 ft (10 metres) have appeared at the bends whilst sand shoals have arisen at the transit points⁶ and often reduce depths there to less than one metre with a consequent stoppage of all navigation. Herr Niese

⁶ Transit or passage points (points of inflexion of the main current) are those points of the main channel of a river where the current changes its course from convex to concave (or vice versa) when winding its way from one bank to another. The depths at these points are always smaller than those at the bends of the river where the outer curve of the main current erodes the bottom more deeply than the inner one. As river navigation is obviously governed by the most shallow places in the course of the main current, these unavoidable transit points, which have a general tendency to silt up, require the greatest attention in river regulation.

states that in the years 1900—'09, 400-ton vessels could navigate on only 129 days in the year, i. e., just at the period of medium-water, for which level, too, Severin's cross-sections were calculated. In 1903, 210 shoals and a like number of sand-bars were counted on the Lower Vistula and it was estimated that they usually occupied about two-thirds of the regulated channel. Since the sand-bars, and therefore the main channel, constantly change their position, the need arises for constant remarking of the course of the main current by means of shore-signals.

The vagaries of the current not only hinder navigation but also tend to place the regulation-works in jeopardy, as, for example, when 33-foot depths appear at the jetty-heads. Thus it is that after periods of high-water, the number of destroyed or damaged jetties is very great; and then, when for any reason whatsoever, their repair and maintenance is neglected (as, e. g., during time of war), the state of the river must deteriorate.

Concurrently with improvement works and the building of supplementary dikes, the German authorities conducted certain fundamental works in the Vistula delta. In 1847, the Vistula, as a result of its course being dammed up by ice-packs, broke its way through the sand-dunes near Neufähr and entered the sea at a new spot, some seven miles (12 km) from its former mouth. In order to enable ships to reach

Danzig, the abandoned river-bed was cleared up and closed by sluice-gates near Danzig-Krakau. When, however, during the course of improvement works later conducted, the volume of sand brought down by the Vistula increased, it was feared that ice-packs would again arise and dam up the channel: it was then decided to excavate a new distributary for the river by the simple extension of its bed to the north through the chain of dunes at Schievenhorst. The work was completed in 1895 and the Danzig and Elbing distributaries were closed by means of locks 200 feet in length and 40 feet broad. Thanks to this additional shortening of the river's course, the gradient increased and became very much steeper during high-water, thus causing enormous erosion of the river-bed and consequent considerable damage to the river-regulation works.

The final works conducted in the Vistula delta was the closing of the Nogat distributary. Prolonged, constant and very costly work in dividing up the volume of water brought down by the Vistula failed to yield the results expected. The mass of water passing through the Nogat fluctuated very widely and constantly: the entrance was being constantly damaged or eroded. This led to the Waterways Board taking the radical step of closing the entrance to the Nogat by means of a lock and of regulating the flow of water to a fixed volume by means of sluice-gates used in

maintaining the water level at a constant figure; in addition, the Nogat itself was regulated in order to facilitate navigation. These works were finally completed as late as 1915, during the Great War.

This mode of solving the problem could not but have its effect on the main distributary of the Vistula, whose channel (below the Nogat) had been planned to hold only two-thirds of the high-water volume. Although the line of dikes was evened up and the brushwood on the banks removed in order to make the Lower Vistula better able to contain larger volumes of water, the steps taken proved insufficient and every period of high-water is marked by enormous erosion of the river-bed, often approaching the 65-foot sounding. At the same time, the marine section of the Vistula is steadily advancing its limit and has now passed Rote Bude.

The results of these changes only began to make their influence felt after the War. Due to them, the flood of 1924 caused such damage that large sums of money had to be expended in maintenance work on the Danzig distributary of the Vistula. The influence of the works conducted in the Vistula delta is exercised on the longitudinal profile of the river and, as it stretches farther upstream, can cause considerable difficulties to navigation, especially in view of the submerged, river-bed deposits of diluvial gravel in the neighbourhood of Grudziądz.

The shortening of the course of the Vistula by the creation of a new mouth at Schievenhorst has had no favourable effect on navigation: ships are still obliged to pass through the Dead Vistula to Danzig or through the Elbing distributary. Passage through the main mouth is not possible, as Poland's experience in 1926 and 1927 demonstrated. The medium-water channel over the last four miles (7 km) of its course has been broadened from 656 feet (200 metres) to 1,312 feet, whilst the distance between the dikes has been reduced from 3,281 feet (1000 metres) to 2,461 feet (750 metres). This facilitates the current carrying the sand out to the sea, but simultaneously is the cause of sand-bars arising immediately before the mouth and farther off-shore. This state of affairs even before the World War forced the German Waterways Board to undertake very expensive dredging operations with a view to obviating dangerous accumulations of ice-packs which might again dam up the river.

CHAPTER 3

THE LOWER VISTULA UNDER POLISH ADMINISTRATION

POLAND TAKES OVER THE LOWER VISTULA AND ORGANIZES ITS ADMINISTRATION

When during the peace negotiations, the Germans finally convinced themselves that not only Pomerania with Danzig but also a part of East Prussia would have to be returned to Poland, the German Administration of the Lower Vistula immediately commenced to evacuate all the records, archives, charts and maps referring to the Vistula and to other waterways in that district. Equipment for maintaining the regulation of the river was taken away (dredgers, etc.) from Plehnendorf, near Danzig, to Malborg in East Prussia. Simultaneously, however, the German employees of the Administration, even including the directing personnel, filed applications with the Polish authorities in which they expressed their willingness to remain at their posts. It was only when it became certain that Danzig would be proclaimed a Free City and that, following the Convention of Paris, the waterways of the Vistula

delta would be placed under the administration of the Port of Danzig Authority, did the German government order those of its employees who had been instructed to remain in Poland, to leave the country and as far as possible to evacuate the remainder of the Vistula records, charts and equipment to Danzig. During the subsequent negotiations for the division of former German government property, Poland had always two sides against her — not only Germany, but also Danzig, whilst any binding resolutions were always sabotaged and had finally, in many cases, to be decided upon by the League of Nations (1925). The purpose of these manoeuvres was obvious: to hamper and obstruct the Polish Administration of the Vistula in order to enable German propaganda later to allege with more apparent justice that Poland was incapable of maintaining this important waterway in a state fit for navigation.

When the Polish authorities took over Pomerania, they had to create a waterways administration there virtually out of thin air — without the necessary equipment and special vessels, without records, archives, charts, etc., and, most important, without a properly trained personnel having a particular knowledge of the river sectors in question. In addition, conservation and construction works, which had been seriously neglected by the Germans during the War and

during the transitory period following it, had to be undertaken on a large scale and without delay.

A waterways directorate for the administration of the Lower Vistula was formed at Toruń and manned by Polish officials recruited from the existing personnel stationed at Chełmno, Toruń, Grudziądz and Tczew. A special delegate was appointed by the Polish government to maintain contact with the Port of Danzig Authority and to arrange the division of the equipment, etc. The administration of the dikes remained under the care of the Dike Unions, whilst that of the dikes in the Kwidzyn (Marienwerder) valley was entrusted to a newly-formed mixed Polish-German commission.

The left bank of the Vistula as far as Czatków (for a distance of 118 miles) and the right bank as far as the Nogat distributary (a distance of 100 miles) were placed under the Polish administration of the Lower Vistula. The further part of the main distributary, the Danzig and Elbing branches of the Vistula and the Weichsel-Haff Canal were entrusted to the Port of Danzig Authority; care over the Nogat had still earlier been given to the Germans by the Danzigers on the grounds that its administrative centre was at Malborg and that the distributary in question irrigated the pasture- and meadow-lands on its banks in East Prussia.

WORKS CONDUCTED BY THE POLISH ADMINISTRATION

During the years 1920 and 1921, nearly all the damage done to the regulation works was repaired by the Polish authorities, whilst it is noteworthy that navigation was fully maintained throughout the whole period. The only repairs left undone were those on the right-bank jetties along the German frontier over a distance of some twenty miles: it proved impossible to bring them up to the required state owing to the chicanery of the local population of East Prussia there and to the armed attacks of the German Border Guard (*Grenzschutz*) on the functionaries of the Polish Waterways Board. Shore-signals on the right-bank were destroyed time after time, or continually shifted in order to misdirect vessels using the river; building material, purchased from the East Prussians and destined for the conservation of the jetties was pilfered and stolen wholesale; it even became unsafe to approach the right bank by boat as Poles were shot at on sight: the killing of a Polish fisherman, Schwartz, was but the climax of a whole series of such attacks. All this had as its object the hindering of Polish efforts to administer the Vistula efficiently and properly: it was expected that the lacks and hindrances which would arise in such circumstances would weaken Polish sentiment in East Prussia during the plebiscite period and would, in addition, afford apparent proof

to other countries of Poland's incapability to administer the Vistula.

It was only towards the end of 1921, probably under the potent threat of floods in the Kwidzyn valley, that the German authorities decided to assure peaceful and more normal conditions of work on the right bank of the river for the employees of the Polish Vistula Administration. Repairs were commenced there and especially on the menaced Kwidzyn sector in 1922 and completed in 1923: as a result, the floods of 1924 did very little damage in East Prussia. For that matter, the most conclusive evidence of the efficient administration of the river by the Poles is furnished by the minutes of the Polish-German Dike Commission at Kwidzyn (*Marienwerder*) which uniformly testify that all resolutions passed in respect of the security of the dikes have been duly executed.

But not only have the integrity and maintenance of the banks been kept at a proper standard by conservation works. The state of the river bed, thus, of navigation conditions, has been maintained at least at the same level as in Prussian times. This is borne out by periodical soundings made every few years. Out of over 200 sand-banks and shoals in the Lower Vistula, about 160 are to be found in Polish territory. According to pre-War records (1901-1910), the number of main-current inflexion points where the

depth was less than that originally planned, oscillated between 91 and 167 during the various years, their mean actual depth being 1.9 ft less than that called for. After the completion of the most urgent conservation works after the War, soundings showed that there were only 130 such points and that the difference between actual and planned depths there was then 1.44 ft on the average. By the autumn of 1924, after the serious floods of that year and when all the conservation works had been completed, there were only 45 over-shallow inflexion points having a depth of only 1.08 ft less than that required. These data prove that the state of the Vistula under Polish administration compares favourably with that noted in German times.

As will have been learned from the foregoing, the state of the Lower Vistula when it was taken over by the Polish authorities from the German Administration was far from satisfactory. There can be no doubt that this kind of river could, if properly regulated, bear vessels of at least 1,000-ton stowage capacity and, compared to other rivers in Poland, it is at least at medium levels of water, i. e., during four months in the year, a good waterway. The directions taken by goods traffic before the War were mostly east-west: at present they are in greater and greater measure assuming a north-south direction. Whilst vessels entered the Vistula in former times from waterways

having a permanent depth of at least 6.56 ft, they now in increasing numbers pass from the unregulated parts of the Vistula, i. e., from conditions of navigation which are in any case not better than those of the Lower Vistula. As long as navigation conditions above Toruń do not improve considerably, Poland can rightly consider the state of the Lower Vistula as satisfactory for the time being and need not undertake further improvement works with a view to regulation for low-water levels. It suffices that she is preparing the field in this respect by conducting researches and studies on the spot with that end in view.

Budgetary data afford additional proof that Poland is not neglecting the Lower Vistula. The German budget estimates for the last pre-War year foresaw an expenditure of 4,300,000 marks for works on the Lower Vistula and 821,700 marks for the disbursements of the Conservation Board. The expenditure of the Polish government and of the Danzig Vistula Administration for the same objects during the years 1928-1931 yielded an average of 6,644,000 zlotys per annum for works and about 500,000 zlotys for administration. Taking the buying power of the two countries into consideration at the different epochs, as also the fact that the sum estimated by Germany included expense items for repairing damage caused by the exceptionally destructive floods of 1913, it can

be deduced that the sums disbursed by Poland on the maintenance and improvement of the Lower Vistula are in no wise lower than those formerly expended by Germany. Comparing the expenditure of the Polish government on the Lower Vistula with that expended on the Middle Vistula, we find that 39,000 zlotys per km (25,000 zł per mile) of river are spent in the first case and only 27,000 zlotys per km (17,000 zł per mile) in the second, and that in spite of the fact that the works on the Middle Vistula include not only conservation but also the construction of new works, deepening of the main channel, the building of ports and wintering-berths, etc. The Lower Vistula is not neglected by the Polish authorities: if anything it is being favoured.

NAVIGABILITY OF THE VISTULA MAINTAINED BY THE POLISH AUTHORITIES

Certain propaganda publications in Germany⁷ often affirm that the Polish government does not undertake regulation works on the Middle Vistula in order not to facilitate communication with Danzig and so indirectly to aid the new port of Gdynia. It would probably suffice to point out that the foregoing of a cheaper mode of transport for Polish export would obviously by no means be in the interests of the

⁷ Cf. Dr. P. H. Seraphim: *Die Wirtschaftsbedeutung der Weichsel für Polen. Jahrbücher f. Nationalökonomie u. Statistik.* Jena 1932.

Polish Republic, as also that water transport to Poland's ports plays a very small role indeed (2.2 per cent. in 1930, 1.9 per cent. in 1931, 2.2 per cent. in 1932 and 3.5 per cent. in 1933). But it would not be amiss to examine the value of this assertion in the light of facts and figures.

One of the first acts of the first Polish Ministry of Public Works (founded in the spring of 1919) was to entrust the conduct of the studies on the Middle Vistula to an eminent hydraulic engineer, Mr. Roman Ingarden, the leading expert in the domain of Poland's hydrological system. After completing plans for the regulation of this portion of the Vistula, studies were undertaken on its chief tributaries, the Bug, Narew, Pilica and Wieprz, a draft-plan was made for the regulation of the Upper Vistula, the rivers of Polesia were studied, the preliminary research-work on several navigation canals was done as were also surveys and plans of retention reservoirs for feeding the rivers and canals in time of drought. Construction operations were commenced simultaneously. The Upper Vistula, above Cracow, was regulated for low-water levels, the former frontier stretch of the river up to Sandomierz is being completed, whilst connected with that sector are further works on the Middle Vistula below Zawichost. Within the zone of the Warsaw Directorate of the Waterways Board, where the river is urgently in need of reconstruction works and joins

up with the Lower Vistula, the following works were carried out over a length of 225 miles during the past ten or twelve years: 1,406,000 cub. ft. of longitudinal embankings on the river-banks, 262,800 cub. ft. of spur jetties, 358 spurs of an aggregate volume of 1,526,200 cub. ft., making a total of 3,195,000 cub. ft. of new regulation works.

During the last few years before the world-wide economic crisis, the budgetary estimates contained an item of 41,000,000 zlotys for hydraulic works. Of this sum, 28,000,000 zlotys were to be expended on waterways of which, again, 21,000,000 zlotys were destined solely for the regulation of the Vistula, excluding, be it marked, those sums disbursed by the Port of Danzig Authority. These figures and the foregoing facts demonstrate that the Polish authorities are doing even more than can reasonably be expected from them.

Improvement of the waterways by means of regulation works must of necessity be a long operation. In order, therefore, to make the Middle Vistula suitable for navigation by boats of larger carrying capacity, the Vistula Conservation and Administration Board has been conducting systematic dredging operations on the most difficult sector — that between Warsaw and the confluence of the Bug and Vistula. In this work dredgers and excavators have been used on a much larger scale than before the War, with the

result that great progress has already been achieved. In spite of opinions expressed in certain periodicals abroad that vessels from the Lower Vistula would be able to reach Warsaw only during three months in the year, and that the lowest main current depth would fall to 60 cm. (1.97 ft), soundings of the worst section of the Vistula (Warsaw — Bug river) have during the period 1930—1932 yielded the following readings:

Year	No. of days in the year when inflexion-point soundings were (in feet):							
	1.97	2.13	2.29	2.45	2.62	2.79	2.95	3.12
1930	1	2	10	11	11	8	17	25
1931	—	—	2	18	21	13	5	3
1932	—	—	—	—	3	12	32	17

Let us compare these results with data on transit depths on the Oder⁸, a river regulated over its whole length. Below Breslau on that river, in 1930 there were depths of less than 2.45 ft on 57 days in the year and of under 3.3 ft on 64 days. On the Vistula between Warsaw and Modlin there were, it is true, 85 days in the same year when the depth at the points in question fell to less than 3.3 ft, but there were only 13 days when it was less than 2.45 ft. There are no data available for 1931 in the case of the Oder. In 1932 the depth fell to less than 3.3 ft on 130 days and to less than 2.62 ft on 61 days. This

⁸ *Zeitschrift f. Binnenschiffahrt*, 1930 and 1932.

means that during two months in the year, navigation was at a standstill. During the same year, on the Vistula below Warsaw there were only 64 days when the depth was less than 3.3 ft, whilst depths under 2.62 ft were conspicuous by their absence. For this reason, vessels plying between Danzig and Warsaw could sail during the whole season without interruption, merely decreasing their cargo-loadings during the period of low-water. The smallest cargoes carried by vessels entering the river-port of Warsaw were in July (170 tons) and in August and September (180 tons) but in other months this lower limit was always over 200 tons with the maximum limit of 400-ton cargoes approached by loadings of 390 tons.

During the period of low-water, the sand-shoals of the Lower Vistula often cause transit depths to be smaller than those reported for the middle stretches of the river: the Polish authorities have therefore succeeded despite the lack of regulation, in bringing about uninterrupted and uniform navigation conditions over the whole course of the river from at least Warsaw to Danzig.

A good waterway is not the only essential for the sound development of the traffic using it: it must also have ports, quays, wintering-berths, warehouses, transloading equipment, etc. Faced by the total lack of such essentials on the Middle Vistula, the Polish authorities commenced to build a port on the right

bank of the river at Warsaw in 1919: it can at present handle over 200,000 tons per annum (although in 1933 the actual turnover was only 71,024 tons). A wintering-berth port has been constructed at Płock. The construction of quays on the banks at Cracow has been completed and another wintering port is being built at Płaszów: studies are being conducted with a view to the future building of additional quays, wintering-berths and ports as also for effecting the more urgent railway connections necessary for serving traffic on the Vistula.

The Lower Vistula is equipped with a large number of quays and has several wintering ports for the use of the State-owned river fleet. The only larger river port on the Vistula which has proper railway connections and which is equipped with transloading equipment is at Toruń, on the right bank of the river: it also has a special basin for timber rafts. The State wintering ports at Toruń, Fordon and Korzeniowo, at Grudziądz and Tczew are also used by privately-owned merchant vessels although backwaters closed by sluice-gates are likewise used for that purpose. The Polish administration has installed transloading equipment and built up railway connections on the left bank at the port of Tczew; subsequently much extended in 1926, they are to this day used for the transloading of goods on to smaller ocean-going vessels and those proceeding to Gdynia.

Finally, with an eye to the future requirements of river traffic on the Lower Vistula, the Polish authorities have undertaken detailed studies with a view to transforming this sector into a great waterway able to serve vessels of up to at least 1,000-ton stowage capacity. Soundings and investigations on the movement of sand-banks commenced before the War are being continued: in this connexion, Mr. Born, Chief of the Vistula Waterways Board at Toruń, has inaugurated studies on dragged and suspended detritus which have aroused the interest of the professional literature on the subject in many other countries. The researches conducted to date afford the basis for a plan prepared by the above-mentioned division of the Vistula Administration for regulating the stream at low-water conditions in accordance with Girardon's principles. The plan is to be tried out in the near future upon a trial sector of the river.

It is true that, as in other countries in the whole world, the economic crisis has led to a curtailment of budgetary expenditure on waterways in Poland during the past few years: but the difference has been more than made up by sums disbursed by the Employment Fund. Budgetary credits, supplemented by sums from that fund and the Investment Works Fund will not only cover all the disbursements necessary for the normal maintenance of the works and of the channel, but will also in addition suffice for

certain more important supplementary capital works. In the very near future, preliminary works will be commenced on the Lower Vistula for low-water regulation and the river port at Toruń will be further extended. Other works which will not fail to benefit traffic on the Lower Vistula are such as the construction of the river-ports at Warsaw and Płock, the building of retention reservoirs in the Carpathians, regulation works on the Middle Vistula and work on maintaining the requisite depths of the main channel. The normal budget of the Employment Fund foresees the expenditure of about 10,000,000 zlotys on waterways and this sum is gradually to be increased to double that amount per annum; the monies in question will almost exclusively be used for works on the Vistula.

CHAPTER 4

NAVIGATION ON THE LOWER VISTULA

STATISTICS OF INLAND WATERWAY TRAFFIC AT THE PORT OF DANZIG

The first navigation season on the Lower Vistula after the War, in 1919, found that part of the river still in German hands. The Vistula river-fleet, militarized during the Great War by the requisition of vessels and boats in Pomerania and in Central Poland, continued to operate on the conclusion of peace. Thus, when the Allies demanded that the Germans transport shipments of American food stocks to Central Poland through Pomerania, a part of these were sent by the water route. During 1919, 152,764 tons of food destined for Warsaw were unloaded at Danzig (and partly at Tczew). The remainder of the cargoes registered by the records of the Einlage Locks (about 69,000 tons) represented local traffic or goods sent to East Prussia. Excluding the shipments to Central Poland, the goods traffic on the Vistula came to only 10 per cent. of the pre-War figure.

Upon the re-incorporation of Pomerania within the Polish Republic, the river fleet seized by the German

authorities and later left to the Polish government was organized in 1919 as a State enterprise under the title of the Polish State Navigation Corporation, the very few vessels left in Pomerania being then added to the existing fleet. When the Polish-Bolshevik War was finally ended by the Treaty of Riga (1921), the ships which had been requisitioned by military authorities were returned to their owners: a considerable portion of the vessels thus freed, and registered at German home-ports, then left Poland and in that manner still further reduced the already insufficient number of keels available for river navigation. This had very adverse repercussions on the development of Poland's inland waterways traffic, the more so as the complications of the War and the ruin of the shipowners made the repair or modernization of the existing vessels or the building of new ones impossible.

Almost the whole of 1920 was a year of war, and for that reason the Vistula goods traffic continued to decline in volume, the only restraining factor still being American relief supplies which accounted for 87,816 tons in that year. In 1921 these shipments ceased altogether and Lower Vistula goods-traffic reached the lowest level returned of 97,148 tons, or 115,866 tons if timber rafts drifted downstream be included.

In subsequent years, a slow but steady rise in goods traffic on the Vistula was noted, with shipments of

Polish export goods to Danzig predominating. Goods sent down the river accounted for 60–70 per cent. of the total traffic and in 1926 this ratio exceptionally rose to 86 per cent. as a result of the coal shipments being partly routed by water.

The following table affords data on goods traffic passing through Einlage Locks (including timber rafts) during the period 1922–'33 inclusive (in metric tons):

Year	To Danzig			From Danzig			Grand total
	Cargoes	Timber rafts	Total	Cargoes	Timber rafts	Total	
1922	87 325	132 539	219 864	46 282	984	47 266	267 130
1923	91 085	125 603	216 688	44 489	7 986	41 475	258 163
1924	101 986	94 894	196 880	56 298	5 889	62 187	259 067
1925	131 291	42 270	166 561	86 616	4 277	90 895	257 456
1926	530 702	18 153	548 855	87 836	5 243	93 079	641 934
1927	154 747	27 952	182 699	169 410	2 565	171 975	354 674
1928	164 254	30 308	194 562	189 650	582	190 232	384 294
1929	201 512	16 568	218 080	116 821	551	117 372	335 452
1930	278 685	10 168	288 853	155 644	384	155 028	444 881
1931	272 899	13 664	286 563	142 600	—	142 600	429 163
1932	202 239	8 995	211 234	135 523	—	135 523	346 757
1933	308 844	32 075	340 919	167 722	—	167 722	508 641

A certain lack of regularity in the growth of goods traffic is explained by the oscillations in the volume of timber floated downstream. The decreased volumes returned for 1931 and 1932 were almost entirely caused by a slackening of internal traffic on the

waterways of Danzig and in that of the East Prussian carrying trade. Nevertheless, the growth of Polish export was fully maintained in spite of the depression caused by the world-wide economic crisis.

GOODS TRAFFIC ON THE LOWER VISTULA

Statistics of foreign trade traffic passing along the Vistula were conducted by the Waterways Board at Tczew; they yielded the following data for the years 1928–'33:

Year	Exports from Poland		Imports to Poland		Total (in tons)
	Volume (In tons)	Per cent. of down-stream traffic	Volume (In tons)	Per cent. of up-stream traffic	
1928	144 762	75	81 400	43	226 162
1929	207 531	95	30 571	26	238 102
1930	215 554	75	36 102	23	251 656
1931	250 523	89	36 359	25	286 882
1932	146 381	70	61 543	46	207 924
1933	317 221	93	91 712	55	408 933

As will be remarked, Polish-Danzig goods turnovers have been steadily growing in spite of the current difficulties encountered in commodity exchange. In relation to the total Polish export, the volume of goods sent to the port by water is considerable, and amounts to only about 3 per cent. of the aggregate figure, a like figure being reported for

Danzig itself; e. g., the peak figure of exports through Danzig was in 1931 and came to 7,653,000 tons: of this volume, 3.03 per cent., or 229,627 tons (timber rafts excluded) reached Danzig by the Vistula. If we, however, compare figures of export routed along the Vistula to Danzig in 1933 with those of the total export traffic of Danzig before the War (1,311,757 tons in 1912), we receive the ratio of approximately 24 per cent. which is reasonably close to the pre-War percentage, excluding timber rafts.

Imports shipped through Danzig via the Vistula have maintained their level of about 10 per cent. of all imports through Danzig. In 1932, incoming goods using this route rose in volume to 61,543 tons and in 1933 to 91,712 tons. This volume is 25 per cent. of the total import figure for Danzig but only 8 per cent. of the pre-War standard; it should be borne in mind, however, that the greater part of the imports were, as before the War, destined for East Prussia or for the use of the Free City itself (120,000 tons in 1930).

The above figures indicate that traffic on the inland waterways is growing parallelly with the increase in total goods turnover at the port and therefore that the rise is not being inhibited or stopped by the slight setback in port traffic returns during the last two years. This is much if it be noted that the turnovers of the Port of Danzig, which in 1925

for the first time exceeded the pre-War figures, subsequently enormously increased, reaching the peak figure of 8,358,000 tons in 1928 and maintaining this level with slight oscillations until 1931.

These concrete figures and facts can be denied by no one but they can be passed over in silence: special pleading in the shape of propaganda does this as does also Mr. Dawson⁹ when he devotes a whole chapter in his book to the "Tragedy of Danzig" by resort to this simple process. Yet, Danzig has regained her erstwhile position of the busiest port on the Baltic and was only surpassed towards the end of 1933 by Gdynia whose turnovers reached 5,687,000 tons as against Danzig's 4,953,000 tons in that year. It was only Gdynia's spectacular rise and the drop in their own turnovers which reminded the Danzigers how vital and important a factor the Polish hinterland is to them.

The routing of certain export and import commodities via Gdynia caused Vistula shipments partly to pass Danzig and to proceed to the former by sea. In 1932, 43,104 tons of goods were so transported and in 1933 there were 89,432 tons of which 61,728 represented export goods. The percentage ratio of Vistula export and import traffic during the past few years should therefore be compared with the appro-

⁹ Dawson W. H.: *Germany under the Treaty*, London 1933

appropriate figures for Danzig and Gdynia combined if we wish to receive more exact data, given in the following table:

Year	Export through Danzig and Gdynia (tons)	Export via Vistula (tons)	Per cent.	Import through Danzig and Gdynia (tons)	Import via Vistula (tons)	Per cent.
1931	12 226 000	250 523	2.1	955 000	36 359	3.8
1932	9 669 000	146 381	1.5	692 000	61 543	8.9
1933	9 579 000	317 221	3.3	1 061 000	91 712	8.7

The percentage figures, especially those for export, are not high: the chief component of this traffic has been coal, only part of which is transported by river and which before the War was an import article at Danzig. If then, coal be deducted from the export figures for Danzig and Gdynia, the following data are yielded:

Year	Export by sea (coal excluded) (in tons)	Export via Vistula (in tons)	Per cent.	Per cent. of 1912 returns
1931	1 847 000	250 523	13.5	19.0
1932	1 274 000	146 381	11.5	11.1
1933	1 742 000	317 221	18.2	24.2

These figures indicate that, eliminating coal, the percentage of goods exported through Poland's ports and brought there by the water route from inland is nearing the pre-War ratio reported for Danzig, i. e.,

about 30 per cent. That this ratio is lower than for other river-maritime ports is due to the fact that the whole hinterland of the Polish littoral does not use water transport, Warsaw representing the southern limit of such carrying trade. But the steadily rising relation affords promise of a further improvement in this respect, especially as the regulation works on the Middle Vistula make progress. It should be remarked, however, that as with other river-maritime ports, transports to the ports are increasingly tending to use the railways instead of the waterways available. Thus, at Hamburg, 40 per cent. of the goods were brought by the railways and 60 per cent. by waterways before the War, whilst at present the relation has shifted to 55 per cent. and 45 per cent. respectively.

The river-port traffic of Danzig includes, apart from commodity exchange with Poland, considerable turnovers of goods and passengers with localities within the area of the Free City and that of East Prussia, besides some export trade to Lithuania. According to the returns of the Einlage Locks, which quote the destination of or port of clearance of vessels passing that point, 55 per cent. of those registered as passing through the locks were bound for points in Poland or came from that area, the great majority being cargo boats; for other directions, the returns yielded the ratio of 45 per cent., mostly cargo-passenger vessels. In 1932, 61 per cent. of the ships using the

locks were bound for or from Poland, the remainder being vessels bound for East Prussia (15 per cent.), for Lithuania (3 per cent.) or were internal traffic between points within the area of the Free City (12 per cent.). In the turnover with Poland, the port of Warsaw accounted for 22 per cent. of the total: this will serve once more to demonstrate the steady and permanent growth of traffic between Danzig and Poland.

Export and import traffic via Danzig does not account for all the carrying trade done on the Lower Vistula. On that part of the river under Polish administration, a slow but steady rise in goods traffic is to be noted between the river ports of Toruń, Grudziądz, Bydgoszcz, etc. and those on the Middle Vistula. Thus, in 1931, out of 70,900 tons loaded on board at Lower Vistula ports, 60,500 tons were to be trans-shipped at Danzig, 3,200 tons were transloaded at other ports of the Lower Vistula and over 7,200 tons went to Middle Vistula ports. Out of 140,000 tons loaded at the Bydgoszcz and Upper Noteć Canals, 28,000 tons were destined for points within Poland (3,000 tons for Middle Vistula ports). Of the 94,000 tons loaded on board at Middle Vistula ports, 41,600 tons were destined for Danzig and 2,400 for Lower Vistula ports. These figures, taken individually, do not represent any larger volume but in their entirety they serve to enhance the goods traffic of the Lower Vistula by 40,700 tons, i. e., by 10 per cent. The

aggregate goods traffic of all the Pomeranian river-ports exceeds 100,000 tons, the greatest development having been shown by Toruń.

For the time being, the vessels using the Lower Vistula include very few from ports above Warsaw, and in some years none at all come from thence to Danzig. On the Middle Vistula, the most important port is, naturally, Warsaw, with import predominant in its river traffic. Beginning with the first few post-War years, when relief food-supplies came up the river, import from Danzig has never ceased and it attained peak figures in 1928 when the total goods turnover of the river-port at Warsaw amounted to 151,708 tons. In later years, as a result of the economic crisis, this figure diminished somewhat (to 129,866 tons in 1932) but in 1933 it rose to 154,205 tons.

River transport service between Danzig and the Lower Vistula is also maintained by the ports of Płock, Włocławek, Wyszogród and, to some extent, of Puławy, the total goods turnover being about 100,000 tons per annum (109,250 tons in 1933).

River passenger-traffic between Warsaw and points as far distant as Tczew is quite large, as is evidenced by the peak figure of 604,391 persons transported in 1926.

The drifting of timber-rafts down the river has much decreased in volume since pre-War times. In the period 1925-'29, an annual average of 279,000

tons of timber passed Toruń (with a peak figure of 413,000 tons in one year), this being about a quarter of the pre-War figure. About one-fifth (a mean of approximately 58,000 tons) of this volume proceeded to the sea via Tczew, whilst the remainder was worked up at Pomeranian sawmills, except for about 209,000 tons floated on to Germany via the Bydgoszcz Canal in 1928 and 1929 in accordance with the Polish-German Timber Convention.

This general review of navigation and transport conditions on the Lower Vistula would be incomplete without data on German transit to and from East Prussia. This traffic was commenced in 1928 and yields the following total annual figures for such waterway traffic in both directions:

Year	Transit across Pomerania via waterways (in tons)
1928	2 890
1929	8 108
1930	7 090
1931	14 210
1932	12 546
1933	11 579

The highest figure attained, in 1931, comes to less than 6 per cent. of Poland's total turnover with Danzig and to only 25 per cent. of the turnover between Danzig and the river-port of Warsaw alone.

In relation to the aggregate volume of goods traffic on the Lower Vistula, German transit on the river came to only 2 per cent. in 1933.

MERCANTILE RIVER-FLEET ON THE LOWER VISTULA

The relatively slow development in the growth of goods traffic on inland waterways in Poland generally and on the Lower Vistula especially, remarkable above all in times of prosperity and business recovery, is explained not only by the lacks in auxilliary equipment (warehouses, storehouses, cranes, etc.) but also by the insufficient tonnage of the mercantile river-fleet in Poland. Since the War, no new units have been added whilst the existing vessels are highly antiquated types and many of the lighters are quite unsuitable for navigation on the Vistula, this applying especially to certain of the boats on the Bydgoszcz Canal. Some years ago, a few new vessels of 1,000-ton stowage capacity were built but these rarely carry more than 600 tons of cargo: the average cargo capacity of the freighters on the Vistula is about 280 tons and their number is only slightly above the pre-War figure.

The total number of vessels and the cargo capacity of the river-fleet on the Vistula is quite inadequate: as on January 1st, 1933 the latter aggregated 76,646 tons, including the ships on the Bydgoszcz Canal and

90,104 tons including lighters and barges. This fact is brought out into strong relief when it is realized that according to data for 1932 the mean actual use made of cargo space amounted to 30 per cent.; as the loadings on the Vistula and on the Bydgoszcz Canal came to 268,681 tons in that year and unloadings to 159,074 tons (a total of 427,755 tons), the vessels had to make an average of sixteen one-way trips per annum. Compared to pre-War times, the number of vessels has shrunk very considerably as all those which had a German port of registry returned to the Reich after being freed from military requisition, whilst the division of the Oder river-fleet, envisaged by the Treaty of Versailles was realized by the Germans only in a very small measure.

The vessels on the Vistula can be divided into three categories: 26 per cent. are those of under 200-ton stowage capacity (18 per cent. of the total cargo capacity), 50 per cent. between 200 and 300-ton capacity (40 per cent. of the total figure) and 24 per cent. are vessels of over 300-ton stowage capacity (42 per cent. of the total figure). Hence the low average stowage capacity of 280 tons per vessel.

Matters in regard to tug-boats, passenger and passenger-freight vessels are in no better shape: there are ninety-seven such vessels with an installed total engine power of 11,177 H. P.

From the foregoing data, it is clear that traffic on the Lower Vistula is by no means diminishing in volume: on the contrary, it is steadily growing in that respect and its importance to the national economy is enhanced year by year; in spite of the greater competition of railway and road transport, it is rapidly nearing the pre-War level having overcome the very adverse effects of the War. This growth in river transports is proceeding even in the face of the world-wide economic crisis, although a proper development is inhibited by the lack of suitable vessels and boats, insufficient port and harbour equipment, etc. The increase in traffic since the end of the War has been primarily evoked by the enhanced volume of Polish export, in the transport of which the Middle Vistula is taking a larger and larger share. Transit traffic between the Reich and East Prussia plays and has always played a very minor role on the waters of the Vistula.

ECONOMIC IMPORTANCE OF THE LOWER VISTULA TO POLAND

THE HINTERLAND OF THE LOWER VISTULA

The present status of river traffic on the Lower Vistula and on the waterways directly connected with it cannot be accepted as an accurate depiction of the future role of the Vistula in the economic life of Poland. For over a century the network of waterways in Central Poland was plannedly neglected by the Russian authorities of occupation, and regular navigation on the Vistula really stopped at Warsaw. Traffic as far as Sandomierz was mostly of the passenger-freight type; between that point and Nowy Korczyn the only vessels using the river were those of the Waterways Regulation Board; between Nowy Korczyn and Cracow regular passenger-freight communication was maintained; above Cracow, goods traffic was of quite large volume. Over the whole stretch of river above Sandomierz, the volume of goods traffic rose from 60,000 tons in 1924 to 172,000 tons in 1929 (including construction materials for regulation and improvement works).

The highest figure reported for this stretch before the War was 50,000 tons. But vessels and boats from the Upper Vistula only sail as far as Sandomierz; although a short-lived connection was established in 1919 with Lower Vistula vessels, this no longer exists.

Those of the tributaries of the Vistula which have no river traffic likewise have no transport communication with the Lower Vistula. In this wise the entire system of waterways in the eastern voivodships, with its growing local waterways traffic is isolated from the Lower Vistula. The only commodity which reaches the Lower Vistula from the whole hinterland is timber floated down in rafts, passing through the Królewski, Ogiński and Augustowski canals which afford drift connections with the most distant parts of East Poland. A very few of the tributaries of the Upper Vistula are likewise used by timber rafts which drift down to Pomerania. All this represents no mean area. The basin of the Vistula, in Poland alone, comes to 68,940 sq. miles, this being 92 per cent. of the total drainage area (74,600 sq. miles) and 46 per cent. of the total area of the country. The Królewski and Augustowski canals connect up the Vistula with the drainage area of the Niemen and Prypeć rivers, thus increasing the hinterland of the Lower Vistula to 104,914 sq. miles, i. e., to 70 per cent. of the total area of the Polish Republic. The Upper Noteć river and the Bydgoszcz Canal join up the Noteć drainage

basin, so bringing up the total hinterland in question to 109,450 sq. miles or 73 per cent. of the area of Poland.

On the whole area of Poland, navigable waterways total 3,075 miles in length, canals 115 miles and drift rivers 5,735 miles. These figures, however, look imposing only on paper: as a matter of fact, only 446 miles of the river system are navigable for vessels of over 250-ton stowage capacity, and an additional 497 miles for vessels of under 200-ton capacity. On the other hand, the drifting of timber can be conducted on 4,350 miles of rivers and canals. If we deduct from the length of waterways actually used for navigation, those rivers and canals directly joining the Lower Vistula, it will then appear that 359 miles (80 per cent.) of the first-class waterways, 270 miles (55 per cent.) of the second-class waterways and 71 per cent. of the drift rivers have this connection. The same applies to the volume of goods transported. The largest figures for river traffic were those returned for 1926; in that year, 1,086,297 tons of goods were transported on the waterways in lighters and other vessels, yielding a total of 152,300,000 ton-kilometres. Of this volume 818,000 tons (75 per cent.) used the Vistula, accounting for 123,000,000 ton-kilometres, i. e. 80 per cent. of the total. A similar relation is yielded at present as in 1931: of the total volume of goods transported (496,000 tons), 378,500 tons (or

77 per cent.) used the Vistula, excluding the area of the Free City of Danzig. In 1932, out of 478,600 tons loaded in Poland, 359,600 tons (or 75 per cent.) used the Lower Vistula. The share taken by the Vistula in the total waterways traffic of Poland remains therefore unchanged independent of the volume of goods transported. Comparing the tonnage of the river fleet using the Lower Vistula with that of vessels in all Poland, we receive almost the same ratio, viz., 80 per cent.

PROSPECTS FOR INLAND WATERWAY TRAFFIC AND EXPORT TRADE

In the foregoing it will have been made clear that although only a part of Poland uses the Lower Vistula for the transport of its commodity trade, that stretch of the river far and away outstrips all the other water routes in Poland in point of volume of traffic, number of available vessels, etc. This fact is all the more striking when it is considered that rich and fertile regions in the upper reaches of the Middle Vistula (Lublin, Sandomierz and Cracow districts) do not participate in Lower Vistula traffic, the same holding good with regard to the eastern provinces of Volhynia and Podolia situated on the Prypeć and Vistula basins. A lack of direct water communication with the rich voivodship of Poznań is also keenly felt, the districts adjacent to the Bydgoszcz Canal being

the only exceptions. Last but not least, the most important industrial regions of Poland, in the south-west, do not use water communication for the transport of their raw materials or products.

The mining and industrial centres of Poland are not favourably located as regards the natural waterways of Poland. Coal, the chief commodity shipped by the inland water-route in the whole world, is extracted near the upper reaches of the Vistula on the watershed between that river and the Oder. For obvious reasons, the heavy metallurgical industries are to be found there also. Even the textile industries are situated far from any waterways, being in the vicinity of the Vistula — Warta watershed. The oil-fields of the East sub-Carpathian region are quite cut off from the Vistula basin, whilst the timber industry has to cover such extreme distances that the advantages of the water route become problematical in view of the much closer vicinity of other Baltic ports or of the western frontier.

In spite of this, the regulation of the Vistula and of its navigable tributaries as also the reconstruction of the Królewski Canal afford such wide vistas of future development of water transport, both for domestic and for foreign trade, that it can be safely stated that the present traffic could be enhanced over tenfold and up to twentyfold. Such an enterprise, too, would by no means exceed the economic possibilities

of Poland. The rivers must be regulated, apart from any considerations of navigability, in view of the enormous losses suffered nearly every year by the population living in the vicinity of the larger streams and rivers. In many localities, improvement works are proceeding parallelly with the satisfaction of the needs of communication, as, for example, in Polesia, where every larger drainage canal is simultaneously a navigable water route: conversely, too, every artificial waterway built must necessarily also serve for the drainage of the adjacent marshes and swamps. For that matter, the demands of navigation for local needs are not overgreat. The best existing waterways in Poland, such as the Bydgoszcz Canal, the Warta below Poznań and the Lower Vistula are utilized by vessels of up to 400-ton cargo capacity. Passing upstream or to the tributaries which have to be regulated, the size of the vessels used would remain the same or even in case of need be decreased. Thus the normal type of river-traffic cargo-boat on the waterways of Poland would be of 300 — 400-ton stowage capacity, and less only in exceptional cases. With such a type of vessel, a very intensive river-traffic could arise as in France, where the lower maximum limit given above is the rule.

With such a system of waterways planned to embrace 73 per cent. of the whole of Poland, the chief export commodity which would pass along the

Lower Vistula would be farm and forest products as also those goods manufactured by the industries working up forest and agricultural raw materials. In that case, the erstwhile role of the Vistula would in a great measure be restored. The import trade would consist of raw materials necessary for the industries set up on the areas served by the waterways in question (Lodz, the cotton centre of Poland, already receives part of its supplies of the fibre via the Vistula) and of any other commodities suitable for water transport. Coal, carried by water, would primarily cover the needs of the domestic market, but that part of the outgoing trade shipped through Danzig could to some extent also proceed thence by river and canal. In order to handle greater volumes of coal on the water route, it would be necessary to construct a special waterway which would diminish the effective distance between the sea and the coal-fields.

Preliminary studies for the coal-canal scheme were started by the Polish authorities as long ago as during the first few post-War years: the waterway was designed to connect up the coal-fields with the Vistula below the confluence of the Bug river (probably near Bydgoszcz). In connexion with this, the Lower Vistula would have to be regulated for low-water conditions so that 1000-ton vessels could sail direct to Danzig. Calculations have shown that the water transport of coal to the sea-ports would be much cheaper

than the actual cost of carrying it by railway. The construction of such a waterway, however, has not been realized to date for two reasons: that difficulties were encountered in financing the scheme, and that it proved to be quicker and to require less capital to build a new railway line joining up Silesia with Gdynia.

INTERNATIONAL IMPORTANCE OF POLAND'S FUTURE WATERWAYS SYSTEM

Poland's system of waterways is of economic importance not only to her as it can be quite easily connected up with the network of large river routes in the rest of Europe. The lowest point of the watershed between the Baltic and the Black Sea is in Poland, its average height there being only about 475 ft. Concurrently, no difficulties need arise for connecting up the Polish system with those of neighbouring countries. The Bydgoszcz Canal connects up the former to the German system in the Oder basin, and, in the future, when the German inland canal will have been completed, will join up with the Elbe, the Weser and Rhine, from thence with the French, Belgian and Dutch network of waterways. The reconstruction of the Królewski Canal and the regulation of the Bug and Prypeć rivers will create connections with the Russian waterways, at present being developed on a very extensive scale (Second

Five-Year Plan). Moreover, should the Czechoslovak waterways be built up properly, the possibility would arise of very inexpensively joining up the Upper Vistula lateral canal (now being excavated), through the former Austrian canal with the Oder and thence through the Czechoslovak system to the Danube and Elbe. In this event, too, the Polish coal-canal scheme would become of very current interest. More expensive, but cheaper than the Czechoslovak waterway being planned, would be to connect up with the Dniester, thence along the Prut river to Rumania and to the Danube at a point below the rapids.

Should this great possible development of the Polish system of rivers and canals take place, nearly the whole of Poland would become the hinterland of the Lower Vistula, the same applying to all the neighbouring countries.

But in that case, the reconstruction of natural waterways would have to be so planned as to permit the navigation of as large vessels as possible, at least on those sections of the waterways which would play some part in the all-Europe network of water routes. Taking as our basis in east-west lines of communication, vessels of 1,000-ton stowage capacity, and of 600-700-ton capacity for certain other waterways, a network of an aggregate length of about 3,448 miles would appear if only a half of the canals possible of construction would be realized. In this

eventuality, navigation could be conducted over the following distances:

Length of waterways (in miles)	Per cent.	Stowage capacity of vessels (in metric tons)
18.6	0.6	(ocean-going ships)
932	27.0	1,000
932	27.0	600-750
261	7.6	400-600
1 305	37.8	up to 300

Nine-tenths of this network of waterways would be connected up directly with the Lower Vistula.

It is obviously difficult even to estimate what volume of goods traffic would in this eventuality use the Lower Vistula. Before the crisis, Danzig was nearing the nine million ton mark in its goods turnovers; allowing for an increase of only 50 per cent. in the growth of shipments routed by water to Danzig, this would yield a goods turnover of about 5,000,000 tons on that part of the river. Should, however, the greater part of the coal shipments be floated downstream, then this figure would be greatly surpassed.

POMERANIA ESSENTIAL TO THE ECONOMIC DEVELOPMENT OF POLAND

It should be always borne in mind, however, that the transport of goods via the Vistula represents only a portion of Poland's overseas trade directed through

her ports. The remainder also passes to the sea along the Vistula valley, whilst Poland's two ports account for an increasingly greater share of her total foreign trade (68 per cent. in 1933).

Since, then, the Lower Vistula is a natural and essential outlet for the whole system of waterways in Poland — one on which depends any and all development in that domain — it is obvious that the further economic development of Poland is impossible of realization or even of comprehension without the participation of Pomerania, whose role in Poland to-day is even more vital than it ever was in the past.

The economic history of the Vistula has shown how close has been the dependence between Poland's status as a power and her own, free access to the sea; the statistical data which has been cited herein serve to prove that relations in this respect have not undergone change: in fact, the situation today has developed still further in the direction of political independence being still more straitly tied up with economic development than was the case in olden times when international relations were less all-embracing and ramified.

In the light of the foregoing facts and figures, it must be accepted as a hard and fast rule that Pomerania with the Lower Vistula must continue to remain a part of Poland. The supremely vital economic and political necessity of Poland having free access to the

sea is as evident and unassailable an axiom as England's need for a strong navy to maintain her political and economic standing — her very national existence. These are matters which permit of no discussion: any concessions or even compromises are simply out of the question.

APPENDIX

GERMAN PROPAGANDA AND THE TRUTH

German propaganda before the Hitler regime assumed power and inaugurated a more reasonable attitude in foreign policies devoted much time and effort to Polish Pomerania: it teemed with allegations that the Lower Vistula was badly administered and maintained by the Poles, that it was insufficiently utilized by Poland and that obstacles were placed in the way of Germans wishing to use the river. Many such statements have been, we believe, conclusively disposed of in the present work and therefore only require some slight mention, if any, in this appendix; but there are other points, not touched on so far, which call for elucidation.

1. The present state of the Vistula. — Many German periodicals and pamphlets make the claim that the river is badly maintained and that its value under present conditions for navigation is greatly impaired. The constant repetition of these statements has resulted in their finding some credence in the English literature on the subject. Mr. Dawson's book, already mentioned herein, is a case in point where Germany's extravagant allegations have been blindly and uncritically repeated. This writer obviously knows nothing of hydraulic engineering or of river regulation but he goes so far as to state it is Poland's fault that there are sand-banks on the Lower Vistula, that as a result the main channel meanders and that navigation is sometimes held up. But he does not inform his readers that these unsolved problems of regulating a low-gradient river with a sandy bed have formed the subjects of discussions in the

engineering publications of Germany since the middle of the 19th century. Chapters 2 and 3 of the present work effectively dispose of these very haphazard statements but the following opinion, guaranteed in its objectivity and impartiality as uttered by a German authority, will serve as a useful supplement. Thus, wishing to encourage German inland navigation to make use of the transit service afforded by the Polish waterways but avoided for many years under the influence of German propaganda, Dr. Bloch, President of the East Prussian Manufacturers' Association, stated the following at a meeting of German delegates representing inland navigation interests at Königsberg in 1928: "The opinion is very current in business circles that the waterway transit route to East Prussia is impassible owing to many years of neglect in its maintenance. Recent researches by the Germans, however, have indicated that this view is not correct, at least not to the extent generally supposed. Navigation in both directions can be conducted." Probably as a result of this statement, waterway transit was resumed in 1929, albeit only on a small scale.⁹

2. Utilization of the Vistula by Poland. — The allegation that Poland makes insufficient use of the Vistula is one which was likewise repeated by Mr. Dawson and has been disposed of in Chapter 4. The handing over of Pomerania to Poland, however, has made it necessary for the inhabitants of East Prussia to be granted navigation facilities on the Vistula. Before the War, this communication took place either direct from localities on the Vistula or its distributaries (the Nogat, Elbing-Vistula and the Weichsel-Haff Canal) or through canals in the interior of East Prussia. The same modes of contact still exist and the Danzig river fleet profits by them on a large scale, but only in a very

⁹ *Zeitschrift f. Binnenschifffahrt* 1928.

small measure it is used for transit between East Prussia and the Reich.

On the sector of the river bordering with the dikes of the Vistula, there was in East Prussia before the War only one place of access to the Vistula in the shape of the quays at Kurzebrack (Korzeniowo). This landing place has been given over to the Germans; it is connected with Marienwerder by road and by narrow-gauge railway, although Mr. Dawson mistakenly states that it is in the open fields and has no communication with the interior of East Prussia. It is true, that, owing to the paucity of commodity exchange, the railway service functions barely once a week, but this can hardly be blamed on the Poles.

3. East Prussian access to the Vistula. — The inhabitants of East Prussia have access to the river for economic purposes in the same measure as before the War. The space between the dikes and the river is of such a nature that access to it cannot for evident reasons be quite unrestricted but must take place at certain fixed points. These points have been designated in accordance with Treaty requirements and later agreements, whilst their number was considerably increased some years ago. During the whole period of Polish administration, the central authorities have received no complaints either through diplomatic channels or through the League of Nations and this best indicates that no obstacles are placed in the way of navigation by the Polish authorities.

4. Menace of floods in the Marienwerder Valley. — This is another mis-statement often repeated, and included in Mr. Dawson's book. The dikes in that district protect not only German but also Polish territory. It would therefore appear to be obvious that Poland in the interests of her own people will never permit the condition of the

dikes to deteriorate. The safeguarding and security of the dikes has been entrusted to a mixed Polish-German Dike Union, presided over in turn by a German and a Polish citizen. The Union works in the greatest harmony, the minutes of the annual meetings regularly affirm that all the resolutions passed for the security of the dikes are strictly and fully carried out by the Polish authorities to whom the care of the river banks has been entrusted. There can be no doubt that if there were any neglect on the part of the Poles, the Germans would very quickly produce concrete evidence and cases and not resort, as Mr. Dawson does, to vague generalities. To date not a single complaint has been received either through the usual diplomatic channels or through the League of Nations.

5. The Opalenie (Münsterwalde) Bridge. — This bridge has been one of the favourite subjects of German, pre-Hitler, propaganda. The dismantlement of the structure has been presented as an act of vandalism, of Hunnish destruction, on the part of the Poles. But the real facts are never given and in this respect Mr. Dawson has not swerved from his invariable rule of giving only one side of the question even when his knowledge is conspicuous by its inspired insufficiency. The Opalenie Bridge was constructed for military strategic reasons and in time of peace was only of local service. When the War ended it lost both these aspects of any significance which it may have had before. The structure simply became unnecessary. For example, in 1927 it was used by an average of nineteen pedestrians daily and by only 203 automobiles during the whole year: yet the annual cost of upkeep of the bridge was very high, — about 1,600 zlotys per vehicle crossing the structure, i. e., about £55 sterling or 300 dollars per annum per vehicle.

The steam ferry installed instead of the bridge lies idle virtually all the time and will probably, under an understanding with the German authorities, be transferred to Kurzebrack.

The bridge itself, as it happens, was not destroyed. It has remained in Pomerania and is today serving a much more useful economic purpose than it ever did before. In connexion with the growth of German transit traffic, it proved necessary to construct an additional bridge at Toruń as the one existing there could not cope with the enhanced movement of freight and passengers. The building of new pillars and bridge-heads from the material gained from the old bridge together with the transport of the iron-construction work of the Opalenie spans came to about 40 per cent. of the cost of erecting an entirely new structure. This solution of the problem was the happiest possible under the circumstances in view of Poland's financial condition at the time. The bridge in question obviously remains a bridge whether at Opalenie or where it is, at another point in Pomerania, and also crossing the Vistula.

CONCISE INFORMATION ABOUT THE BALTIC INSTITUTE

I. Its Purpose and Activities

The Baltic Institute is a social institution whose purpose, as stated in article 2 of its statute, is "the investigation of economic, political, national and other conditions on the Baltic coast from the point of view of Poland's interests". The Institute was founded in 1926. In spite of its youth it has already achieved much both in the organization of research work and in the editing of a number of treatises, discourses and popular scientific works.

Its research work and editorial activities are based on the contributions of its corresponding members, who as a general rule are professors or instructors in Polish higher educational institutions. The first five years of the Institute's research work were devoted to study of the essential historical and cultural connection of Pomerania with the rest of Poland. The Institute has also investigated problems of overseas trade, harbour organization and the influence of access to the sea on the economic, cultural and political life of a country.

As the work of the Institute progressed it widened its studies to embrace Baltic problems in general, paying special attention to Poland's relations with other Baltic States and particularly with East Prussia.

II. Its Methods of Action

All action towards the accomplishment of the above tasks is conducted in accordance with article 2 of the Institute's statute, viz.

1. collecting and filing research material relative to the Baltic coast
2. employment of this material for the publication of studies, treatises and general literature serving to defend Poland's rights and interests on the Baltic



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3. placing the results of these investigations at the disposition of the authorities, commercial organizations and Polish citizens engaged in trade or industry in Baltic States

4. maintenance of libraries, reading rooms and museums to be employed for study relative to Poland's connection with the Baltic

5. organizing debates and discussions.

III. Its Organization

The relation between the Board, who represents the Institute in social action, and the body of students working in the various research committees and in the Management is regulated by the Institute's statute in the following manner:

A. ultimate control of the Baltic Institute rests with the general meeting of its members, which, in accordance with article 25 of its statute, acts as a supreme authority and elects a Board of Trustees, a Board of Managers and a Committee of Auditors

B. the Board of Trustees consists of 5 members and, in accordance with article 19 of the statute, appoints a director who is an ex-officio member of the Board of Managers

C. the Board of Managers consists of 7 members and executes all administrative and financial business

D. the Director, appointed by the Board of Trustees and an ex-officio member of the Board of Managers, supervises, in accordance with article 35 of the statute, all the scientific and research work of the Institute

E. the special committees in which all the research and social work is centered are appointed by the Director, in accordance with article 32 of the statute.

IV. Its Publications

The "Records", the official organ of the Baltic Institute, appear in four series.

1. *Dominium Maris* consisting of publications dealing with the problem of an outlet to the sea, as being the principal economic problem of restored Poland

2. *Balticum* consisting of papers on physiographical, ethnographical and historical problems of the Baltic coast, with especial reference to Polish Pomerania and East Prussia

3. *Assemblies of the Students of Pomerania* series consisting of the lectures and papers given at these assemblies, the minutes of the assemblies and reviews of research material collected by the members

4. *Pomeranian bibliographical series*.

To date the following volumes of the "Records" have appeared:

In the *Dominium Maris* Series:

Wojciech Stopczyk: "International Trade on the Baltic". Toruń, 1928, pp. 192 + VIII, 71 tables and 6 graphs. 6 zł.

"Defence of Pomerania". Collective work edited by J. Borowik containing treatises by H. Bagiński, S. Celichowski, K. Esden-Tempski, F. Hilchen, C. Klarner, E. Kwiatkowski, T. Nosowicz, J. Rummel, A. Siebeneichen, M. Siedlecki, M. Turski, S. Wartalski. Toruń, 1930, pp. 237 + XV, 42 tables, 14 maps, charts and graphs. 10 zł.

A. Siebeneichen & H. Strasburger: "The Question of Gdynia". Toruń, 1931, pp. 180 + VIII, 43 tables. 7,50 zł.

Casimir Świątecki: "The Development of the Port of Danzig". Toruń, 1932, pp. 309 + XIV, 148 tables, 5 maps and 8 graphs. 20 zł.

"Sea Consciousness". Collective work containing treatises by: F. Bujak, R. Dyboski, C. Klarner, W. Konopczyński, J. Nowak, W. Olszewicz, B. Stelmachowska, K. Stolyhwo, K. Tymieniecki, J. Widajewicz, Z. Wojciechowski, B. Zaborski.

In the *Balticum* Series:

"Polish Pomerania". Vol. I. Land and People. Collective work edited by J. Borowik containing treatises by: A. Fischer, J. Kostrzewski, J. Mikołajski, M. Orłowicz, M. Rudnicki, K. Stolyhwo, J. Wąsowicz, A. Wodziczko. Toruń, 1929, pp. 326 + X, 118 illustrations, 17 maps and graphs. 12,50 zł.

"Polish Pomerania". Vol. II. History and Culture. Collective work edited by J. Borowik containing treatises by: T. Glemma, W. Konopczyński, A. Mańkowski, Z. Mocarski, B. Stelmachowska, K. Tymieniecki, F. Znaniecki. Toruń, 1931, pp. 224 + X, 55 illustrations. 7,50 zł.

"Reply to German Corridor Propaganda". Collective work edited by J. Borowik containing treatises by: T. Bierowski, A. Fischer, J. Kostrzewski, T. Marski, M. Rudnicki, E. Ruecker, K. Smogorzewski, H. Strasburger. Toruń, 1930, pp. 163 + VIII. 5 zł.

Bolesław Makowski: "Pomeranian Art". Toruń, 1932, pp. 250 + XIV, 78 illustrations and 20 tables. 20 zł, bound 24 zł.

Wacław Sobieski: "The Struggle for the Baltic". Leipzig, 1933, pp. 269 + VI. 10 zł.

Bożena Stelmachowska: "Pomeranian Traditions and Festivals". Toruń, 1933, pp. 271 + XI. 10 zł.

Władysław Łęga: "The district of Mallborg". Toruń, 1933, pp. 254 + XVIII, 180 illustrations. 12 zł.

In the *Students of Pomerania Assemblies Series*:

"The National Problem in Pomerania". Toruń, 1931, pp. 130, 1 map and 1 graph. 5 zł.

"The State of Land Ownership in Pomerania". Historical and Legal Problems. Toruń, 1933, pp. 242. 10 zł.

All these works, with the exception of the book by Sobieski, which was published in German, were published in Polish. Certain future volumes of the "Records" will also be published in English and German. The Baltic Institute also publishes a series of popular instructional pamphlets in English and French under the title of the "Baltic Pocket Library".

All information regarding the work of the Baltic Institute and its publications, together with catalogues and price lists can be had by addressing:

The Baltic Institute, Toruń, Żeglarska 1, tel. 878.

CONCISE INFORMATION ABOUT THE BALTIC INSTITUTE

The Baltic Institute is a scientific institution, called into being in Toruń in 1926, whose purpose, as stated in article 2 of its Statute is "the investigation of Pomeranian and Baltic matters". The research work covers both economic and cultural conditions in the Baltic countries.

I. Scope of Activities

The Institute's prime aim has been to direct its investigations to Polish Pomerania and the neighbouring countries, but it has also observed with interest all Baltic problems and it now aims at including all the Baltic countries within the scope of its activities, as also to organize co-operation among those studying these countries. The Baltic Institute does not possess its own research staff, but invites specialists from universities and other centres of research as corresponding-members and members-colaborators of its research committees.

II. Subjects of Investigation

The subjects covered by the researches of the Baltic Institute can be divided into two main fields. The first is economic and is closely connected with maritime and oversea trade, navigation and harbour matters. The second covers all other conditions in the Baltic states, more particularly the mutual cultural relations of the countries in question and their peoples. Economic, historical and geographical problems of various Baltic countries and of the Baltic region as a whole are investigated.

III. Methods of Action

The lines of action of the Institute are the following:

1. collecting and preserving research material bearing on the Baltic region;
2. publishing the results of research work in the form both of scientific and of popular books;
3. informing such governmental, economic and private bodies as may be interested in the outcome of researches;
4. organizing and maintaining reading-rooms, libraries and archives for further research;
5. organizing lectures and discussional gatherings.

IV. Organization

The Baltic Institute, being an autonomous organization, is governed under its own Statute and By-laws.

Apart from honorary and ordinary members, who express their interest in Pomeranian and Baltic matters by belonging to the Institute and by paying a small annual contribution, there are two distinct groups of members:

a) supporting members, who assure the funds needed by the Institute;

b) corresponding-members (members-collaborators of Research Committees) who carry out the research work of the Institute.

The General Meeting of its members has the ultimate control of the Baltic Institute and elects the Board of Trustees and the Executive Board.

The Board of Trustees checks the purposefulness of the Institute's activities and establishes the general trend of its work.

The Executive Board has the administrative and financial control of the Institute.

The Executive Officer of the Board is the Director who is appointed by the Committee; he has the general control of the organization of the research work besides directing the general activities of the Institute.

Special Research Committees, appointed by the Director, consist of selected specialists and they are centres of all the research and public work of the Institute.

V. Publications of the Baltic Institute

The principal publication of the Institute is the "Records of the Baltic Institute", collections of monographs on particular problems investigated. These monographs appear in four series arranged according to subject.

1. *Dominium Maris* comprising works on maritime trade, navigation and ports.

2. *Balticum* comprising geographical and cultural studies of various territories on the Baltic.

3. *Proceedings of Research Workers on Pomerania* comprising the lectures and papers read at the meetings and the minutes of the same.

4. *Pomeranian Bibliographical Series*.

Sixteen volumes of the "Records of the Baltic Institute" have already appeared, six more are at present in press and another eight are in process of preparation for printing.

To date the following volumes of the "Records" have appeared:

Dominium Maris Series:

"International Trade on the Baltic", by W. Stopczyk. Toruń 1928, pp. 192 + VIII, 71 statistical tables and 6 graphs. Price: 6 zł.

"Defence of Pomerania", collective work edited by J. Borowik, Toruń 1930, pp. 273 + XV, 42 statistical tables, 14 maps, charts and graphs. Price: 10 zł.

"The Case of Gdynia", by A. Siebeneichen and H. Strasburger. Toruń 1931, pp. 180 + VIII, 43 statistical tables. Price: 7,50 zł.

"The Development of the Port of Danzig", by K. Świątecki. Toruń 1932, pp. 369 + XIV, 148 statistical tables, 5 maps and 8 graphs. Price: 20 zł.

"German Transit through Pomerania", by G. Piasecki (in print).

"Sea Consciousness", collective work edited by J. Borowik. Toruń 1934, pp. 390 + XVI, 35 statistical tables, 13 maps, 11 graphs, 6 illustrations. Price: 10 zł.

"Technical and Commercial Equipment of a Sea-Port", collective work edited by J. Borowik and B. Nagórski (in print).

"The Sea — an Anthology", (in preparation).

"The Port of Copenhagen", by B. Leitgeber (in print).

"The Port of Riga", (in preparation).

Balticum Series:

"Polish Pomerania". Vol. I. "Land and People", collective work edited by J. Borowik. Toruń 1929, pp. 326 + X, 118 illustrations, 17 maps and graphs. Price: 12,50 zł.

"Polish Pomerania". Vol. II. "History and Culture", collective work edited by J. Borowik. Toruń 1931, pp. 224 + X, 55 illustrations. Price: 7,50 zł.

"Reply to German Corridor Propaganda", collective work edited by J. Borowik. Toruń 1930, pp. 163 + VII. Price: 5 zł.

"Pomeranian Art", by B. Makowski. Toruń 1932, pp. 250 + XIV, 78 illustrations, 20 tables. Price 10 zł., bound: 12 zł.

"The Struggle for the Baltic", by W. Sobieski. Leipzig 1933, p. 269 + VI. Price: 10 zł.

"The District of Malborg", by W. Łęga. Toruń 1933, pp. 256 + XVII, 180 illustrations, 10 maps. Price: 12 zł.

"Pomeranian Traditions and Festivals", by B. Stelmachowska. Toruń 1933, pp. 271 + XI. Price: 10 zł.

"The Cashubs—their Civilization and Language", by F. Lorentz, A. Fischer and T. Lehr-Splawiński (also in English, in print).

"Cashub Songs", by Ł. Kamiński (in print).

"Polish Pomerania". Vol. III. "Economic Life" collective work edited by J. Borowik (in print).

"Economic Conditions in East Prussia", by A. Münnich and J. A. Wilder (in preparations).

"History of East Prussia", collective work edited by R. Lutman (in preparation).

Proceedings of Research Workers on Pomerania Series:

- "National Problems in Pomerania". Toruń 1931, pp. 130, 1 map, 1 graph. Price: 5 zł.
"State of Landownership in Pomerania. Historical and Juridical Problems". Toruń 1933, pp. 244. Price: 10 zł.
"Polish and German Settlement of the Land", (in print).

Pomeranian Bibliographical Series:

- "Bibliography of Pomerania and East Prussia (1918—1932)", by S. Wierczyński (in preparation).

Reports:

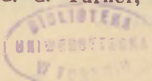
- "Five Years of the Baltic Institute's Work (1927—1932)", by J. Borowik. Toruń 1932, pp. 67. Price: 2,50 zł.
"Reports of the Director of the Baltic Institute (Jan. 1, 1932 — July 1, 1933)", pp. 36. Price: 50 gr.

All these works in Polish, with the exception of the book by Sobieski, which was published in German, and "The Cashubs", which also appear in English. Certain future volumes of the "Records" will also be published in English and German. The Baltic Institute likewise publishes a series of popular instructional pamphlets in English and French under the title of the "Baltic Pocket Library", which embrace 21 booklets in four series: Geographical Series (Land and People), Historical Series (History and Civilization), Economic Series (Trade and Communication), Political Series (Poland and the Baltic). To date six booklets have appeared in English, five in French and six in Polish.

All information regarding the work of the Baltic Institute and its publications, together with catalogues and price lists can be secured by addressing: The Baltic Institute, 1 Żeglarska, Toruń, (Poland). Telephone: 878.

The main depositories of the publications of the Baltic Institute are:

- in Poland: Mianowski Fund Institute, 72, Nowy Świat, Warsaw,
in England: J. S. Bergson, 4, Vernon Place, Southampton Row,
London W. C. 1,
in Estonia: J. G. Krüger, Tartu,
in Finland: Akateeminen Kirjakauppa, Helsinki,
in France: Messrs. Gebethner et Wolff, Bd St Germain, Paris, VI-e,
in Germany: Markert & Petters, 14, Querstr. Leipzig,
in the United States: C. C. Turner, 419 West 119 Street,
New York City, N. Y.



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Western Slavs on the Baltic — by Dr Józef Widajewicz.

The Territorial Development of Prussia — by Dr Zygmunt Wojciechowski, Professor of Poznań University. Toruń 1934.

The Teutonic Knights of the Cross — by Dr Stanisław Zajączkowski, Professor of Wilno University.

German-Polish Antagonism in History — by Dr Józef Feldman, Assist. Professor of Cracow University. Toruń 1934.

German Designs on Pomerania — by Dr Henryk Strasburger, Former Commissioner General of Poland in Danzig. Toruń 1933, pp. 40. Price: 6d. or 10c.

Landownership and Population in Pomerania — by Arthur Osborne. Toruń 1933, pp. 48, 2 maps. Price: 6d. or 10c.

An Outline of Artistic Movements in Pomerania (Guide to Pomeranian Treasures of Art). Toruń 1934.

Economic Series (Trade and Communication)

Poland — a Baltic Country — by Witold Kamieniecki, Senator, Professor of Lwów University.

Gdynia — Poland's Gateway to the Sea — by Józef Borowik, Director of the Baltic Institute. Toruń 1934. 5th edition, pp. 98, 26 illustr., 2 maps, 6 statistical tables. Price: 1s. or 25c.

Silesia and Pomerania — Basic Elements of Poland's Economic Independence — by Czesław Klarner, Former Polish Minister of Finance, and Former Minister of Trade and Commerce. Toruń 1934, pp. 77, 1 map, 9 statistical tables. Price: 1s. or 25c.

The Pomeranian Vistula — by Mieczysław Rybczyński, Professor of Warsaw Polytechnic Institute. Toruń 1934, pp. 79, 1 map. Price: 6d. or 10c.

Copenhagen — the Key to the Baltic — by Bolesław Leiberger. Toruń 1934, pp. 87, 13 illustr., 5 maps. Price: 2 zł (in Polish).

Marine Dictionary — with Preface by Dr Alexander Brückner, Professor of Berlin University. Toruń 1934 (in Polish).

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Price: 6 d. or 10 c.

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