

*HANDBOOKS PREPARED UNDER THE DIRECTION OF THE
HISTORICAL SECTION OF THE FOREIGN OFFICE.—No. 38*

D 6

.G7

no. 38

Copy 2

RHENISH PRUSSIA

LONDON :

PUBLISHED BY H. M. STATIONERY OFFICE,

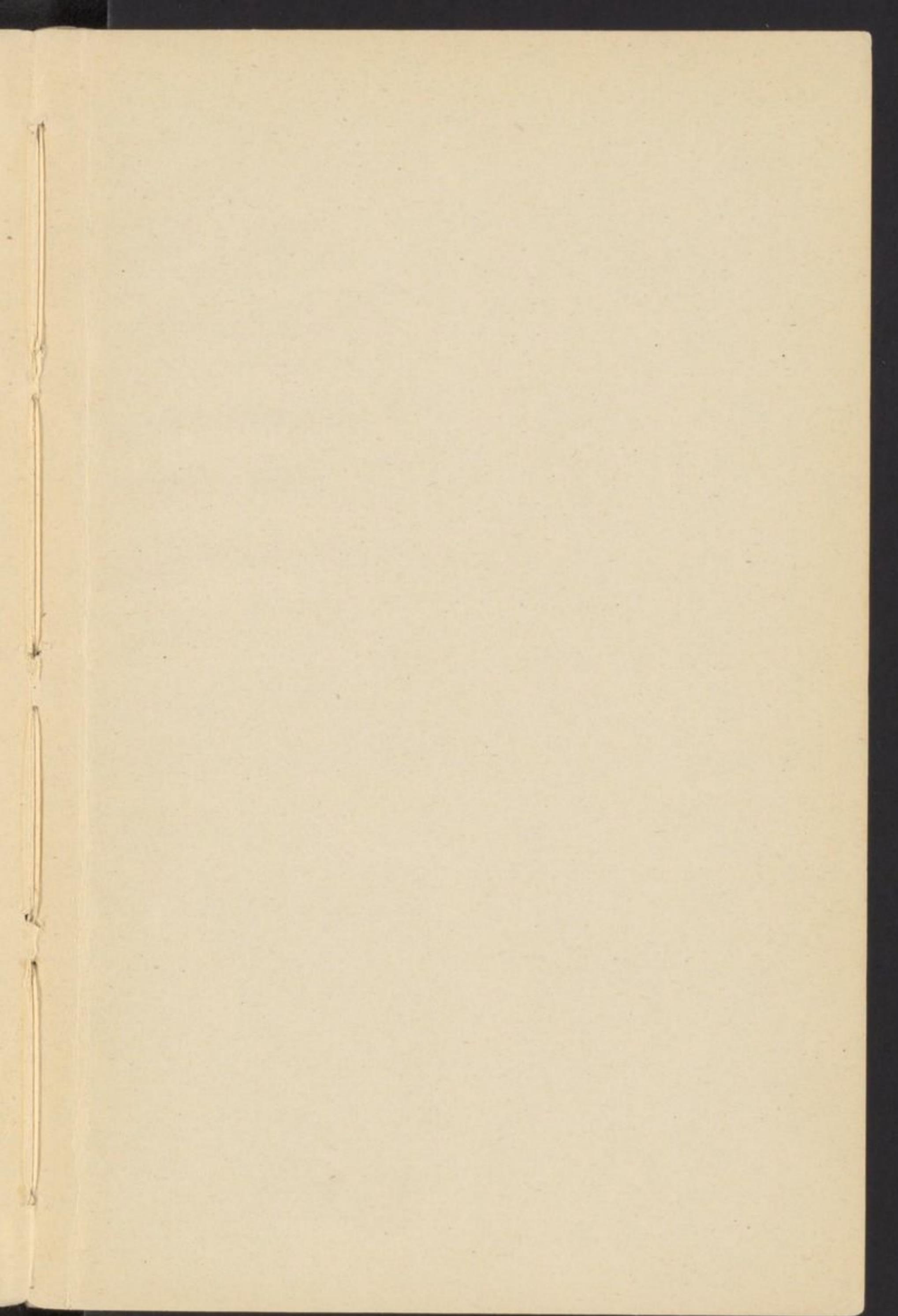


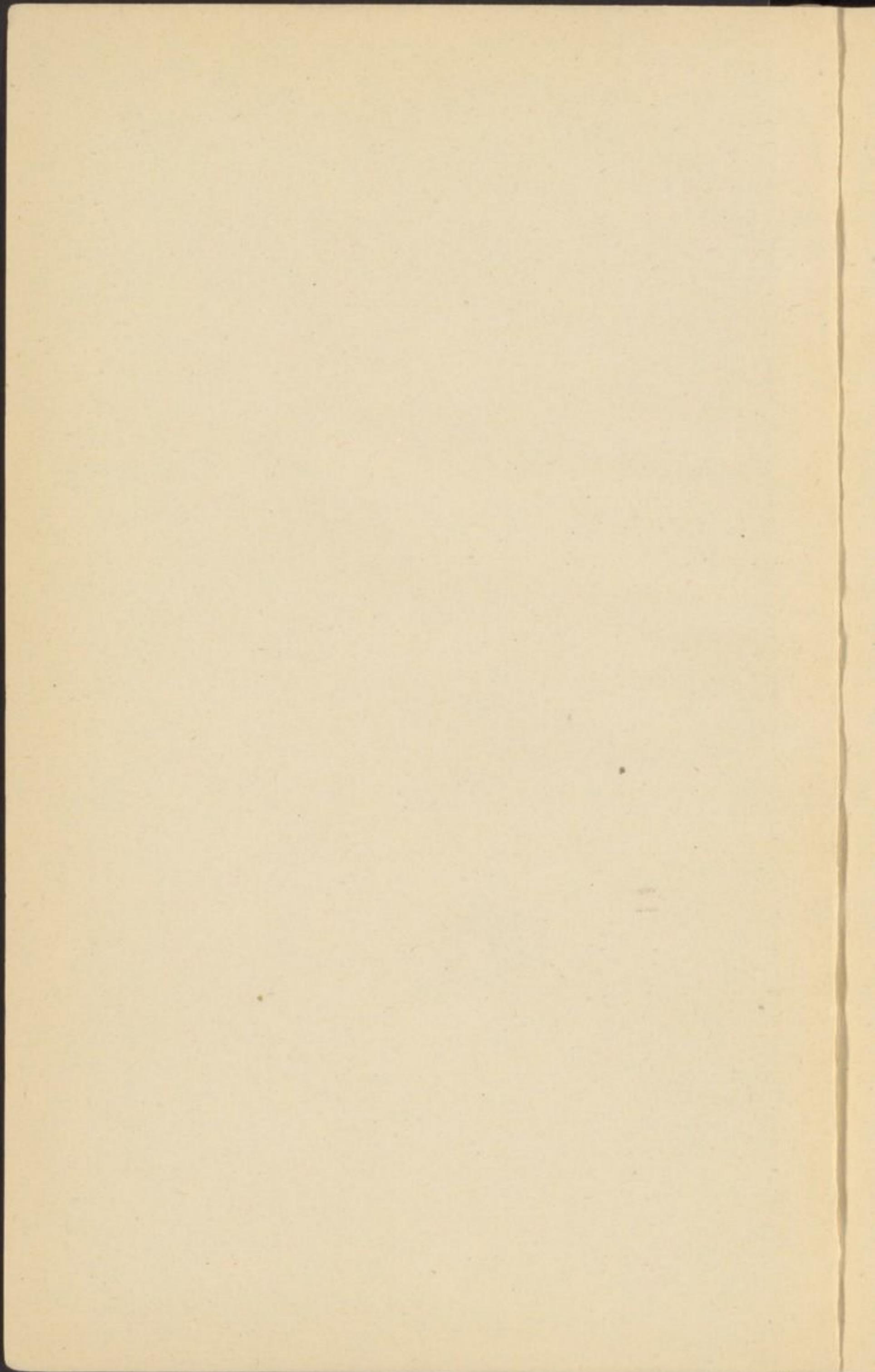
1920

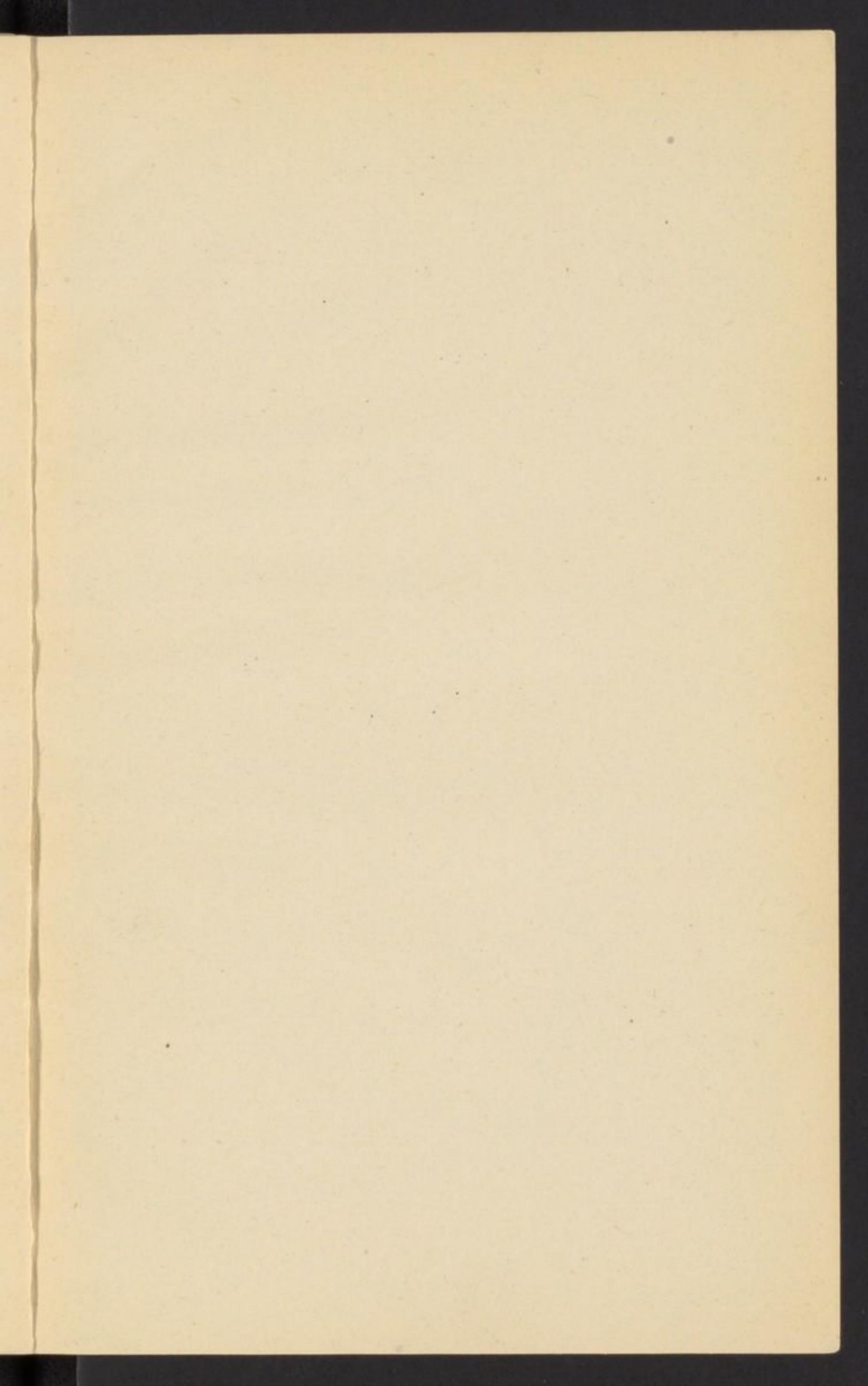


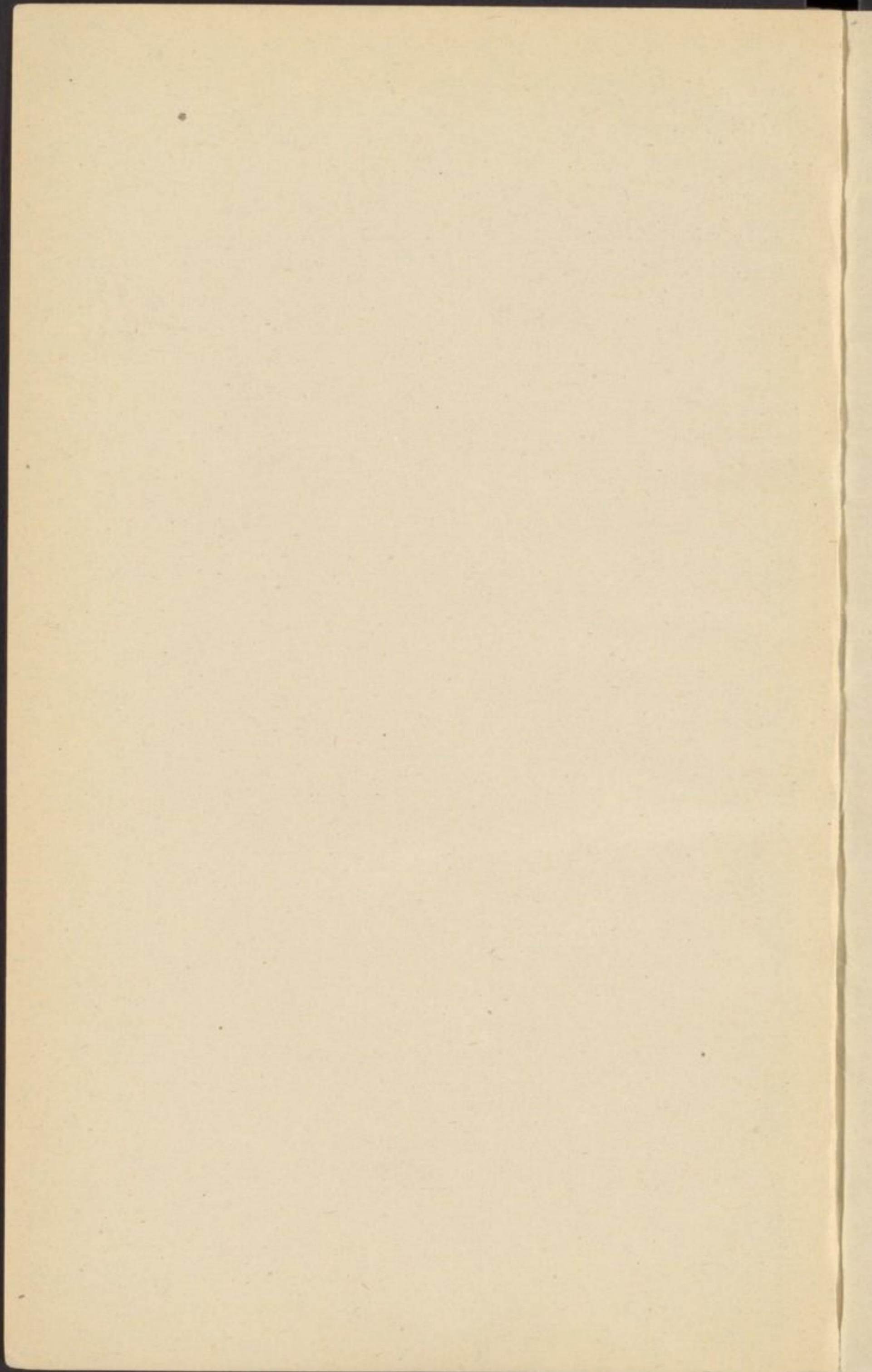
Class II 6

Book G 7









153

HANDBOOKS PREPARED UNDER THE DIRECTION OF THE
HISTORICAL SECTION OF THE ^{Gr. Brit.} FOREIGN OFFICE.—No. 38

207

1407

RHENISH PRUSSIA

153

LONDON :
PUBLISHED BY H. M. STATIONERY OFFICE.

1920

pd set

II 6
.G 7

Copy 2

D. of D.
MAY 27 1920

3

Feb 7 Mar 1, 1921

maps March 1920

EDITORIAL NOTE

IN the spring of 1917 the Foreign Office, in connexion with the preparation which they were making for the work of the Peace Conference, established a special section whose duty it should be to provide the British Delegates to the Peace Conference with information in the most convenient form—geographical, economic, historical, social, religious, and political—respecting the different countries, districts, islands, &c., with which they might have to deal. In addition, volumes were prepared on certain general subjects, mostly of an historical nature, concerning which it appeared that a special study would be useful.

The historical information was compiled by trained writers on historical subjects, who (in most cases) gave their services without any remuneration. For the geographical sections valuable assistance was given by the Intelligence Division (Naval Staff) of the Admiralty; and for the economic sections, by the War Trade Intelligence Department, which had been established by the Foreign Office. Of the maps accompanying the series, some were prepared by the above-mentioned department of the Admiralty, but the bulk of them were the work of the Geographical Section of the General Staff (Military Intelligence Division) of the War Office.

Now that the Conference has nearly completed its task, the Foreign Office, in response to numerous inquiries and requests, has decided to issue the books for public use, believing that they will be useful to students of history, politics, economics, and foreign affairs, to publicists generally and to business men and travellers. It is hardly necessary to say that some of the subjects dealt with in the series have not in fact come under discussion at the Peace Conference; but, as the books treating of them contain valuable information, it has been thought advisable to include them.

It must be understood that, although the series of volumes was prepared under the authority, and is now issued with the sanction, of the Foreign Office, that Office is not to be regarded as guaranteeing the accuracy of every statement which they contain or as identifying itself with all the opinions expressed in the several volumes ; the books were not prepared in the Foreign Office itself, but are in the nature of information provided for the Foreign Office and the British Delegation.

The books are now published, with a few exceptions, substantially as they were issued for the use of the Delegates. No attempt has been made to bring them up to date, for, in the first place, such a process would have entailed a great loss of time and a prohibitive expense ; and, in the second, the political and other conditions of a great part of Europe and of the Nearer and Middle East are still unsettled and in such a state of flux that any attempt to describe them would have been incorrect or misleading. The books are therefore to be taken as describing, in general, *ante-bellum* conditions, though in a few cases, where it seemed specially desirable, the account has been brought down to a later date.

G. W. PROTHERO,

*General Editor and formerly
Director of the Historical Section.*

January 1920.

TABLE OF CONTENTS

	PAGE
I. GEOGRAPHY PHYSICAL AND POLITICAL	
(1) Position and Frontiers	1
(2) Surface and River System	
Surface	2
River System	3
(3) Climate	5
(4) Race and Language	6
(5) Population	
Distribution	8
Towns and Villages	8
Movement	9
II. POLITICAL HISTORY	
Chronological Summary	11
(A) EARLY HISTORY	
(1) General	12
(2) Cleves, Jülich, and Berg	13
(3) Duchy of Gelderland	17
(4) Cologne	19
(5) Trier	21
(6) Aachen	22
(7) Birkenfeld	23
(B) RHENISH PRUSSIA SINCE 1815	23
III. SOCIAL AND POLITICAL CONDITIONS	
(1) Political	27
(2) Religious	27
(3) Educational	28
IV. ECONOMIC CONDITIONS	
(A) MEANS OF COMMUNICATION	
(a) Roads	29
(b) Rivers and Canals	
Rivers	30
River Traffic	31
River Ports	33
Canals	34

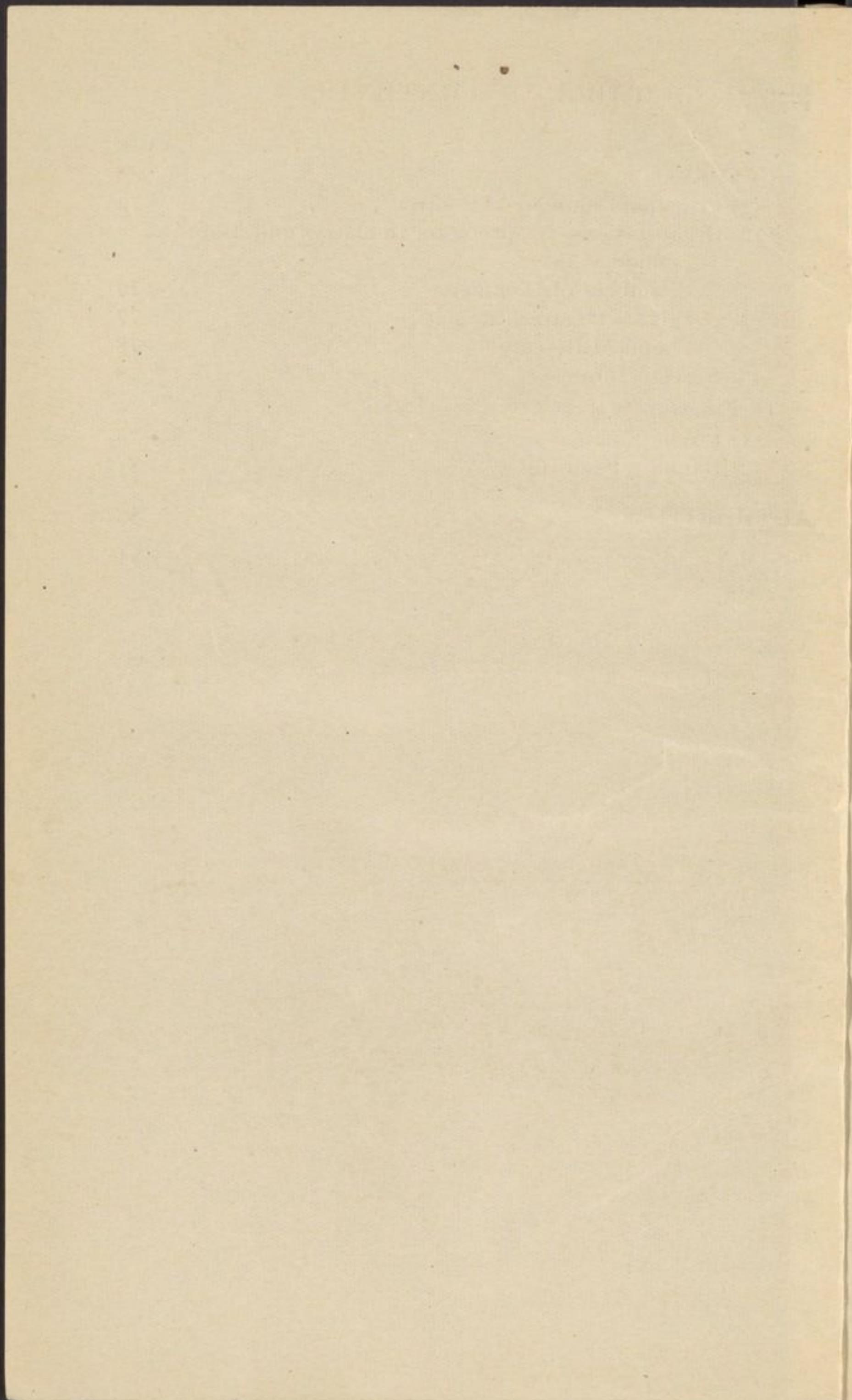
TABLE OF CONTENTS

[No. 38

	PAGE
(c) Railways	
Railway System in General	37
Relations to Government	39
Finance	40
Tariffs	40
(B) INDUSTRY	
(1) Labour	
(a) Supply and Conditions	42
(b) Immigration and Emigration	43
(2) Agriculture	44
(a) Products of Commercial Value	45
(b) State Aid and Encouragement	46
(c) Agricultural Co-operation	47
(d) Works of Amelioration	48
(e) Reclamation of Waste Land	50
(f) Forestry	51
(g) Land Tenure	52
(3) Fisheries	52
(4) Minerals	
(a) Coal and Lignite	
(i) Coal	53
Principal Reserves	53
Total Reserves	54
Classification of Coal	55
Output	55
Rhine-Westphalian Coal Syndicate	56
(ii) Lignite	57
(b) Iron Ore	58
(c) Other Metals	60
(d) Miscellaneous Minerals	62
(e) Building Materials	63
(5) Manufacture	
(a) Iron and Steel Industries	
Iron and Steel	63
Locomotives, Machinery, &c.	64
Unions and Syndicates	65
(b) Textile Industry	66
(c) Chemical Industry	68
(d) Miscellaneous Industries	71
(6) Power	
Water-power	71
Electric Power	72

TABLE OF CONTENTS

	PAGE
(C) COMMERCE	
(1) Principal Commercial Centres	73
(2) Organizations to promote Industry and Com- merce	
Chambers of Commerce	76
Private Organizations	77
Chemical Research	78
(3) Foreign Interests	78
(D) FINANCE	
(1) Public Finance	79
(2) Banking Facilities	81
AUTHORITIES	83
Maps	84



I. GEOGRAPHY PHYSICAL AND POLITICAL

(1) POSITION AND FRONTIERS

RHENISH PRUSSIA, the Rhineland or Rhine province of Prussia, lies on the western frontier of Germany between $49^{\circ} 7'$ and $51^{\circ} 55'$ north latitude and $5^{\circ} 52'$ and $8^{\circ} 3'$ east longitude, and has an area of 10,420 square miles. It is about 185 miles in length from north to south, and for the most part about 90 miles in width from east to west.

Rhenish Prussia marches in the north and along the northern part of its western frontier with Holland, as far as the small neutral territory of Moresnet, south-west of Aachen (Aix-la-Chapelle). Farther south it marches successively with Belgium and the Grand Duchy of Luxemburg. On its short south-western frontier it borders Lorraine (Lothringen), and on the south-east the Bavarian Palatinate (Pfalz). On the eastern frontier it marches in the south with the Grand Duchy of Hesse (Rhein-Hessen), farther north with the Prussian provinces of Hesse-Nassau and Westphalia.

Enclosed within the province, a few miles from its south-eastern border, is the principality of Birkenfeld, attached to the Grand Duchy of Oldenburg, with an area of 194 square miles. To the east, on the upper Lahn, between the Prussian province of Hesse-Nassau and Oberhessen, lies the detached *Kreis* Wetzlar (205 square miles).

(2) SURFACE AND RIVER SYSTEM

Surface

The northern section of the Rhine province (about one-third of its area) is part of the lower Rhine plain, which extends over Holland and northern Westphalia, and runs up the Rhine as far as Bonn in a triangular wedge, known to geologists as the 'Gulf of Cologne'. The rest of the province is a hilly district mainly made up of the central portion of the Schiefergebirge ('Slate Mountains'), but includes the 'Gulf of Trier' (Triassic formations), astride the middle Moselle, and in the extreme south the coal district round Saarbrücken.

The Plain.—The northern plain consists for the larger part of fertile agricultural land on the left bank of the Rhine, and roughly forms a triangle with the angles at Cleves (Kleve), Aachen, and Bonn; it includes, however, the district on the right bank north of the Emscher, viz. *Kreise* Rees and Dinslaken. This area is broken only by a low ridge, the *Ville* or *Vorgebirge*, parallel to the Rhine between Cologne and Bonn, about 10 miles to the west.

The rest of the plain, on the right bank of the Rhine southwards from Hamborn to Cologne, is an undulating lowland intersected by narrow valleys, forming the western half of the Rhenish-Westphalian coal and industrial district.

A strip of country, from 5 to 10 miles wide, which fringes the edge of the Schiefergebirge, varies in height between 300 and 600 ft. In this belt of foot-hills lies Aachen in the west, and in the east the Wupper, with Elberfeld, Barmen, Remscheid, and Solingen. The remainder of the plain has an almost uniform height between 100 and 300 ft.

The Hills.—The hill district is a single plateau cut into three sections by the Moselle and Rhine valleys,

The *southern* section consists of a series of ridges running north-east and south-west, viz. the Hochwald, Idarwald, and Hunsrück, with the Soonwald to the south-east. The *eastern* section, between the Rhine and the borders of Westphalia and Nassau, consists of the western portion of the Sauerland and Westerwald, and comprises the basins of the Wupper, Sieg, and Wied, breaking up in the north into the low hills of the Wupper area, the southern part of the manufacturing district. The *western* section (known as the Eifel) is the largest. In the north-west it joins on to the Hohe Venn. In the centre is a series of mountain groups, comprising in the west the Schneifel with the Losheimer Wald (or Zitterwald) to the north of it ; in the south the Salmwald ; and to the east the Hohe Eifel, with the Ahrgebirge to the north and the lower levels of the Maifeld and Voreifel to the south-east.

South of the Salmwald is the Wittlich depression, with a strip of fertile soil on the north bank of the Moselle. West of this and south of the western Eifel is the ' Gulf of Trier ', also with a fairly fertile soil.

River System

The rivers of the Rhineland belong almost entirely to the Rhine system, and that river itself forms the eastern boundary of the province for 230 miles. The principal right-bank tributaries within the province are the Lahn, the Sieg, the Wupper, the Ruhr, and the Lippe, but the last two flow for only a short distance through Rhenish Prussia. The chief tributary (left-bank), which flows right across the south-west of the district, is the Moselle, with its important right-bank affluent, the Saar.

The Moselle enters the province at the town of Sierck, and pursues an extremely tortuous course for 186 miles across the province, joining the Rhine at Coblenz.

The chief town which it passes is Trier, on the right bank. The average depth of the river from Trier to Coblenz is 6 ft., the average at low water being 3 ft.

The Saar crosses the borders of the Rhine province at Saargemünd and joins the Moselle at Konz. It is canalized from Saarbrücken to Ensdorf, and from Ensdorf to its junction with the Moselle it is only navigable for small boats. The average depth of the Saar below Ensdorf is $3\frac{1}{2}$ ft., at low water $1\frac{1}{2}$ ft.

The western part of the Rhine province is drained by the Roer or Rur (less correctly Ruhr), a right-bank tributary of the Maas (Meuse), which rises in the central hills of the Rhineland and flows in a northerly direction, crossing the Dutch frontier to join the main stream at Roermond.

The Rhine enters the province at Bingen and leaves it at the Dutch frontier, 101 miles from the sea. It emerges from the hills at Königswinter, below which it traverses the lower Rhine plain to the sea. Its average depth from Bingen to St. Goar is 9 ft. (low water, 6 ft.), from St. Goar to Cologne, 11 ft. (low water, $7\frac{1}{2}$ ft.), from Cologne to the Dutch frontier, 13 ft. (low water, 9 ft.). Moderate rapids occur just below Bingen and at four other places between Bingen and Neuwied, but do not hinder steam navigation. Interruptions to traffic from all causes (ice, drought, flood, and fog) occur on from 25 to 75 days in the year. The extreme variation in depth is from 15 ft. at Bingen to 21 ft. at Wesel. The current on the section Bingen-Königswinter requires powerful tugs for up-stream traffic, which move at from $2\frac{1}{2}$ to $3\frac{1}{2}$ miles per hour.

The usual width of the navigable channel of the Rhine is from 200 to 300 ft. The breadth of the river is an obstacle to the building of bridges. Railway bridges exist at Coblenz (two, one of which carries a road), Engers (near Neuwied, with a road), Erpel

(north of Linz, with road), Cologne (two, one with road), Düsseldorf, Duisburg (two), and Wesel. Fixed road bridges (in addition to those which carry railways) exist at Bonn, Düsseldorf, Duisburg, and Wesel. Bridges of boats also exist at Coblenz, Cologne, Mülheim, and Wesel, and a rail ferry at Bonn.

(3) CLIMATE

The climate is oceanic, with an even rainfall and no extremes of heat or cold, thus differing from the semi-continental climate of eastern Germany.

Temperature.—The valleys of the Rhine and its chief tributaries are, on the average, the warmest places in Germany, the winter especially being milder than in the central and eastern provinces. The lower Rhine plain and the Rhine and Moselle valleys have an average temperature of 48° F. (9° C.), which is exceeded in Germany only by those of the middle Moselle (as far down as Trier) and the upper Rhine plain. Hence the remarkable fact that vineyards extend down the Rhine valley as far north as the latitude of Plymouth (e. g. in the Ahr valley). The climate of the hill plateau presents a striking contrast; the name Eifel has always stood for a bleak, inhospitable, wind-swept country, and it is only where the land has recently been reafforested that this description no longer holds good.

Rainfall.—The rainfall is high and fairly evenly distributed; July is the wettest month, one-third of the total rainfall occurring in the summer. January and February are the driest months. The highest hills (i. e. the Hohe Venn and Schnee-Eifel, and just over the Westphalian border the Ebbegebirge), with the districts to the north-west of them, receive most rain. The districts immediately to the south-east of the

higher hills have the least rain, e. g. the middle Rhine, lower Moselle, and lower Nahe valleys, and also Daun (south-east of the Schnee-Eifel).

(4) RACE AND LANGUAGE

The Celtic population found in the Rhineland by Caesar seems to have survived to much the same extent under the Germanic conquerors of the fifth century as did that of central England—not enough to preserve its language, but in sufficient numbers to hand on a great number of place-names. The German invaders overran the country from three directions, north, east, and south. Saxons settled in the north, Franks round Coblenz, and Alemans in the south-west. The dialects of the province are, however, Franconian, and show that the Frankish element must have become predominant in fact as well as (politically) in name. The only exceptions are that the dialect in the north-west of the Rhineland is Low German ('Saxon' or 'Platt'), and that the dialect of the Luxemburg and Trier districts in the south-west contains a few Alemannic (South German) elements. Politically, however, the dialects are of no importance in modern times, as even Low German, which is virtually a separate language, has long since lost the independent position which it held in the Middle Ages, and the division into states has not in any way corresponded to the boundaries of dialects.

The province has, however, a considerable non-German population. The district of Malmédy is ethnically part of southern Belgium, and includes, according to German census figures, some 9,400 Walloons, whose numbers are slightly increasing, though not in proportion to the total population of the province. The *Kreise* of Rees and Cleves, bordering on Holland, have a proportion of between 5 and 10 per cent. of Dutch-

speaking inhabitants, according to the German census of 1900. A third area is in the Ruhr district, where there are a large number of Poles (of German nationality), who have been attracted by the coal and iron industries from the eastern provinces of Poznania and East and West Prussia. In 1890 they numbered 5,635, in 1900, 25,455, and in 1910, 77,235. The figures include only those persons given in the German census as speaking Polish as their native language; and the actual number of Poles is probably somewhat greater. Their presence is of some political importance. There is a high degree of solidarity among them, helped by the compactness of the area in which they have settled, and expressed in numerous associations for social, religious, and political purposes. A considerable number are unmarried men, who intend to return home with their savings. Among the families who have settled there the birth-rate is high. Incidentally their presence has checked the fall in the proportion of Catholics in the province consequent on the influx of Protestant labourers from other parts of northern Germany.

It should be observed that the present frontier, besides giving to Prussia the Walloon district of Malmédy, gives to Belgium two border areas with a considerable proportion of German-speaking inhabitants, namely (1) the commune of Beho (immediately north of the Luxemburg frontier) with 30 per cent. speaking only German, 45 per cent. German and French; (2) eight communes south-west of Aachen; in those of Henri-Chapelle, Welkenraedt, Baelen, and Membach 29 per cent. speak only German, 53 per cent. speak German and French (i. e. the Walloon dialect); in those of Gemmenich, Homburg, Belgian Moresnet, and Montzen 50 per cent. speak only German, 38 per cent. speak German and French.

(5) POPULATION

Distribution

In area the province is seventh in the list of Prussian provinces; in population it is first. In 1905 the population numbered 6,436,337; in 1910 it was 7,121,140; it is now (1919) presumably over eight millions.

The Eifel and Hohe Venn have a population of from 101 (*Kreis Prüm*) to 155 (*Kreis Bitburg*) per square mile. The Moselle valley has from 160 to 250 per square mile. The main agricultural districts (viz. the non-industrial parts of the plain, the Ahr-Neuwied-Maifeld district, and the Saar valley) have from 300 to 400, and the industrial districts have from 1,000 upwards. The Ruhr district is said to be the most thickly populated district in Germany.

In the whole province the purely rural population (living in parishes with less than 2,000 inhabitants) amounted in 1910 to only 22 per cent. of the whole. In the *Regierungsbezirke* of Düsseldorf and Cologne the proportion is as low as 5 and 12 per cent. respectively, in that of Aachen 33 per cent., and in those of Trier and Coblenz 45 and 58 per cent. respectively.

Towns and Villages

One-third of the population of the province in 1910 was living in the eleven cities of over 100,000 inhabitants, of which the largest were Cologne (Köln) with 516,527, Düsseldorf with 358,728, Essen with 294,653 (463,481 in 1916), and Duisburg with 229,483; the others being Elberfeld, Barmen, Aachen, Mülheim an der Ruhr, Krefeld, Saarbrücken, and Hamborn. Seven other towns have over 50,000 inhabitants. The present tendency is to restrict the formation of new municipalities; but incorporation being easily effected under the

Prussian law, the great towns are constantly adding to their areas.

Almost all the larger towns of the province have grown up on their actual sites as a consequence of some special geographical conditions. These consist in some cases of main lines of communication, in others of the presence of great natural resources. The chief feature of the nineteenth century, however, has been the growth of the great industrial centres in the coal districts, namely Essen, Duisburg, Oberhausen, Hamborn, Mülheim an der Ruhr, Aachen, and Saarbrücken. The selection of certain already considerable towns as educational (e. g. Bonn) or administrative centres (e. g. Cologne, Düsseldorf, Trier, and Coblenz) has merely accentuated the geographical causes which had already brought these towns into prominence.

The villages do not differ essentially from those of other districts. In the northernmost part of the province, however, they are less numerous than elsewhere, and the country there shows the Saxon custom of settling in smaller settlements consisting of single farms.

Movement

The population of the Rhineland increased from 2,010,000 in 1816 to 7,121,140 in 1910, i. e. by 273 per cent., the increase for the Empire as a whole being 161 per cent. During the nineteenth century (1815-1900) the average annual increase was 1.32 per cent., or more than in any other German state or province, except Saxony (kingdom) and the three towns of Berlin, Hamburg, and Bremen. Recent figures show that the rate of increase has itself risen. Between 1880 and 1890 it averaged 1.45 per annum; between 1890 and 1900, 2.03 per annum; and between 1900 and 1910, 2.2 per annum. Since 1871 the rate of increase has

been surpassed by that of Westphalia; on the other hand since 1890 it has exceeded that of Saxony.

The birth-rate per thousand from 1850 to 1900 averaged 38, 38.6 being the figure for the years 1891-1900. In 1913 it had fallen to 29. It is high compared with that of Berlin (21), but low compared with those of the Polish provinces (34 to 38).

The death-rate per thousand from 1856 to 1900 averaged 25. In 1913 it had fallen to 14, largely owing to a great decline in infant mortality. It is low compared with the average for Prussia (16), and especially so relatively to that of the Polish provinces (19).

II. POLITICAL HISTORY

CHRONOLOGICAL SUMMARY

1288. Battle of Woeringen. Cologne becomes a free city of the Empire.
- 1343-79. Civil war in Gelderland.
1356. Jülich becomes a duchy.
1380. Berg becomes a duchy.
1393. Union of Jülich and Gelderland.
1417. Cleves becomes a duchy.
1423. Failure of male line of Jülich. Accession of Adolph, Duke of Berg.
1471. Charles the Bold purchases reversion of Gelderland.
- 1492-3. Charles of Egmont conquers Gelderland.
- 1521-1609. Union of Cleves, Jülich and Berg.
1528. Agreement between Charles of Egmont and Emperor Charles V as to Gelderland.
1543. Gelderland ceded to Charles V.
1614. Treaty of Xanten. Cleves passes to Brandenburg, Jülich and Berg to the Count Palatine of Neuburg.
1631. Elector of Trier seeks French protection. Spaniards invade Trier.
1645. French restore Elector of Trier.
1650. Maximilian Henry of Bavaria becomes Archbishop of Cologne.
1666. Treaty of mutual succession between the Great Elector and the Count Palatine of Neuburg.
1674. French occupy Trier.
1688. Disputed claims to Archbishopric of Cologne. Louis XIV seizes territory of Trier on left bank of Rhine.
1702. War of Spanish Succession.
1703. Marlborough takes Bonn.
1713. Peace of Utrecht. Gelderland divided between Prussia and Netherlands.
1742. Berg and Jülich pass to Count Palatine of Sulzbach.
- 1757-62. French occupation of Cleves.
1776. Birkenfeld passes to Grand Duke of Baden.

1794. French enter Cologne.

1794–1814. Cologne under French control.

1795. Treaty of Basel. Gelderland seized by France.

1802. Abdication of Elector of Trier.

1814–15. Cologne, Trier, Jülich, and Cleves, with parts of Berg and Gelderland pass to Prussia; Birkenfeld to Oldenburg.

1821. Archbishopric of Cologne and Bishopric of Trier revived.

(A) EARLY HISTORY

(1) *General*

RHENISH PRUSSIA is an aggregation of many territories which have formed a single administrative unit only since 1815, and whose history before the nineteenth century is of a very diversified character. The province includes the old duchies of Cleves, Jülich, and Berg, or parts of them, a small fragment of the ancient Duchy of Gelderland, the ecclesiastical States of Cologne and Trier, and the towns of Aachen (Aix-la-Chapelle) and Cologne, which were free cities of the Empire.

In addition to the main blocks of territory and outlying portions of Cologne and Trier, the modern province includes nearly a hundred suppressed lordships and abbeys. The region abounds in religious houses, ruined or restored, but, in either case, deprived of their possessions, e. g. Cornelimünster, Malmédy, Gladbach, Herzogenrath. The history of the lands belonging to these ancient abbeys or lordships is intricate and obscure, and its importance is diminished by the circumstance that none of the great industrial towns of the Rhineland, with the exception of Essen, is situated outside the territory of the old duchies and archbishoprics. The whole district formed part of the ancient kingdom of Lotharingia, which, in the tenth century, was divided into Upper and Lower Lorraine, lying on the Moselle and the Meuse respectively.

Traces still exist of the intimate connexion of the north-eastern Rhineland with the Low Countries. The connexion with Brandenburg-Prussia did not originate until the first years of the seventeenth century. In the neighbourhood of Malmédy (annexed in 1815) Walloon is still spoken.

Of the great towns in Rhenish Prussia (besides Aachen and Cologne) the capital, Düsseldorf, and Mülheim, Elberfeld, and Barmen were in the Duchy of Berg; Düren and Gladbach in the Duchy of Jülich; Krefeld, Cleves, and Emmerich in the Duchy of Cleves; Bonn in the Electorate of Cologne; Trier and Coblenz in the Electorate of Trier. Essen was an ancient abbey, dissolved in 1803.

(2) *Cleves, Jülich, and Berg*

The three duchies of Cleves, Jülich, and Berg are closely associated historically. Cleves was a county so early as the middle of the thirteenth century, and became a duchy in 1417. In 1368 it came into the possession of Adolph, Count of La Marck, through his mother, the heiress of Cleves. The county of Jülich dates from the ninth century. In the eleventh century, Gerhard, Count of Jülich, founded a family of hereditary Counts of the Empire, and the county was raised to the dignity of a duchy in 1356. In the middle of the fourteenth century, Gebhard, a cadet of the Jülich family, married the heiress of Berg, which had been a county since 1108, and was created a duchy in 1380 for the son of this marriage. In 1423 the elder line of Jülich came to an end, and Adolph, Duke of Berg, succeeded to the dukedom. A century later the heiress of Berg and Jülich married the heir of the Duchy of Cleves, and the three duchies were united from 1521 to 1609, under a succession of dukes who also possessed La Marck and Ravensberg.

The last of these dukes, John William, died childless in 1609, and the question of the succession nearly precipitated the outbreak of what was to be the Thirty Years' War. The four sisters of the last duke had married, respectively, Albert Frederick, Duke of Prussia, Philip Louis, Count Palatine of Neuburg, John, Count Palatine of Zweibrücken, and Charles of Habsburg, Margrave of Burgau. The Elector of Brandenburg claimed the succession through his wife, who was the daughter of Albert Frederick and the eldest sister of the late duke, and agreed with Wolfgang William, Count Palatine of Neuburg, the son of Duke William's second sister, to enter on a joint possession of the duchy. In addition to these family claimants, the Elector of Saxony asserted a promise of the succession made to him by the Emperor in 1585 and repeated in 1595. The Elector of Brandenburg and the Count Palatine seized the duchies, and in consequence of this action were known as 'the Possessors'; both were Protestants. Religious opinion was somewhat evenly divided both in the duchies themselves and in the neighbouring archbishopric of Cologne; and the Emperor Rudolf II therefore deemed it necessary to send troops to vindicate his right to administer the territories while the succession was undecided. The outbreak of a religious war was prevented by the death of Henry IV of France, who had supported the Elector and the Count Palatine when they combined to resist an imperial decision in favour of the Elector of Saxony. The Dutch, alarmed at the prospect of a conflict so near their borders, seized the fortress of Jülich. The alliance of the two family claimants was destroyed by the conversion to Roman Catholicism of the heir of the Count Palatine of Neuburg and his marriage to a daughter of Maximilian of Bavaria. There was imminent danger of a conflict between the Brandenburg party, aided by

the Dutch, and the Neuburg party, supported by Spain, but the mediation of England and France brought about the Treaty of Xanten in 1614. By this agreement Cleves fell to the Elector of Brandenburg, and Berg and Jülich to the Count Palatine of Neuburg.

For two hundred years the duchies had again a separate history. Cleves was incorporated with Brandenburg by the Great Elector; and in 1732, by agreement with William IV, Prince of Orange, the small Duchy of Mörs, lying between the Rhine and Spanish Gelderland, was added to it. Except for a French occupation between 1757 and 1762, Cleves shared the fortunes of Prussia until 1794. The Neuburg family obtained permanent possession of Berg and Jülich after the Treaty of Westphalia; and the duchies passed, with the rest of the Neuburg possessions, in 1742, to the Count Palatine of Sulzbach, who had married the heiress of the last count of the Neuburg line. Another disputed succession endangered the peace of the duchies, for the Emperor Charles VI had promised the inheritance both to the Count Palatine of Sulzbach and to Frederick William I of Prussia, whose grandfather, the Great Elector, had made with the Count Palatine of Neuburg a treaty (1666) of mutual succession in default of male heirs; but Frederick II relinquished his claim after his seizure of Silesia. From the Sulzbach family, the duchies passed to the Electors Palatine of the Rhine and thence to Bavaria.

The revolutionary and Napoleonic wars had a profound influence upon the three duchies. The French invaded the countries on the left bank of the Rhine in 1792; and after 1794 they were in continuous French occupation, although they continued to be a theatre of war. Their annexation to France was accomplished step by step by the Treaties of Basel (1795), Campo Formio (1797), and Lunéville (1801).

By the first of these treaties it was agreed that French troops should remain in occupation of those parts of Prussia which were situated on the left bank of the Rhine, but that definitive arrangements as to their disposal should be postponed until the general pacification between France and the Empire (Art. V). By the Treaty of Campo Formio (in a secret article never acknowledged by Austria), the Emperor pledged himself to use his good offices in order that the Empire should surrender to France a part of the lands situated on the left bank of the Rhine, and including Jülich. By the Treaty of Lunéville it was agreed that the imperial possessions on the left bank of the Rhine should be ceded to France, and that the Empire should provide compensation for the dispossessed princes (Arts. VI and VII).

The population of Prussian Gelderland and Cleves had at first shown considerable sympathy with French ideals, but misgovernment and the ravages of war soon tended to alienate them. The district was under military rule until 1797, when commissioners were appointed who divided it into four Departments—Roer, Rhin et Moselle, Sarre, and Mont Tonnerre, with Aachen, Coblenz, Trier, and Mainz as the chief towns, respectively. Cis-Rhenane Cleves, Jülich, Prussian Gelderland, and part of the Electorate of Cologne were in the Department of the Roer; and the Departments of the Rhin et Moselle and of the Sarre were largely composed of the electoral dominions of Trier and Cologne. The French Government continued to be 'corrupt, extortionate, and tyrannical'; and Napoleon, as First Consul, was invited to annex the Departments to France. The Treaty of Lunéville gave the French an acknowledged authority over their conquests; a consular proclamation announced the union of the Departments with the French Republic; and in 1802 their government was

assimilated to that of the Departments in the interior of France. The introduction of the French legal codes swept away the chaos which arose from the existence of different legal institutions in the different States; and the condition of the Rhineland peasant was vastly improved. The government under the Empire was strict and efficient, and French rule from 1801 to 1814 was popular. In 1815 almost the whole of Cleves and Jülich were given to Prussia.

The alliance of Bavaria with France preserved the Duchy of Berg in the possession of the Elector until, in 1806, he exchanged it for Ansbach, of which Napoleon had deprived the King of Prussia by the Treaty of Schönbrunn. The duchy, with the portion of Cleves on the right bank of the Rhine, formed the nucleus of the Grand Duchy of Berg, which in March 1806 was conferred by Napoleon upon Joachim Murat, and, in defiance of the terms of the treaty, was made a fief of the French Empire. The territory of the Grand Duchy was subsequently largely increased; and among the additions were the territories of the three abbeys of Essen, Werden, and Elten, which had been secularized and given to Prussia in 1803; but the fortress of Wesel, on the right bank of the Rhine, was not included in the duchy and was annexed to France. Murat ceased to be Grand Duke in 1808; and though, in 1809, the title was conferred upon the infant son of Louis Bonaparte, the King of Holland, the duchy was thenceforward governed as a French province administered under the *Code Napoléon*. In 1815 the old Duchy of Berg, with Essen, Werden, Elten, and Wesel, was granted to Prussia and included in the Rhine province.

(3) *Duchy of Gelderland*

Only a fragment of the ancient Duchy of Gelderland is included in Rhenish Prussia; and its earlier and very

complicated history belongs, therefore, rather to the history of the Netherlands. The old division was into the four quarters of Nymegen, Arnhem, Zutphen, and Roermond, of which only the last-named district, excluding the town of Roermonde, is now Prussian. The history of the Duchy of Gelderland is a long series of wars of succession. After the death of the first Duke Reinold II in 1343 a civil war went on until 1377, when William of Jülich succeeded in right of his mother. In 1393 William became Duke of Jülich, and the two duchies of Gelderland and Jülich were united until the failure of the elder male line of Jülich in 1423. Adolph of Berg, who succeeded to Jülich, put forward a claim to Gelderland, and was supported by the Emperor Sigismund; but Arnold of Egmont, a great-nephew of the late Duke of Gelderland, retained possession of the duchy. After a long reign civil war broke out between Arnold and his son Adolph. Charles the Bold, Duke of Burgundy, intervened in 1471; and Arnold sold to him the reversion to the duchy. On Arnold's death in 1473 Charles was recognized as sovereign, and ruled the country with a heavy hand. Charles was killed at Nancy in 1477; and Gelderland passed to his daughter, Mary of Burgundy, and on her death (1482) to her son Philip the Fair, under the guardianship of his father, Maximilian of Austria. Charles of Egmont, son of the above-named Adolph, raised the standard of revolt, and until 1538 with varying success maintained himself with French aid in Gelderland against the Habsburgs. His successor was William, Duke of Jülich and Cleves. After a short reign William was compelled in 1543 by the Treaty of Venloo to surrender the duchy to Charles V, who united it to the Burgundian dominions that he had inherited from his grandmother, Mary. Until the formation of the Union of Utrecht in 1579, Gelderland

was one of the seventeen provinces of the Burgundian (later Spanish) Netherlands. In 1579 three of the four 'quarters' of Gelderland adhered to the rebel cause and became one of the seven provinces of the Dutch Republic. The 'quarter' of Roermond retained its allegiance to its Habsburg sovereign, and was known as Spanish Gelderland. At the Peace of Utrecht, 1713, Prussia acquired the bulk of this territory ; but Venloo was given to the United Provinces and the town of Roermond to the new ruler of the Belgic Netherlands, Charles VI of Austria. This portion of Gelderland was seized by the French in 1795, and with other Cis-Rhenane territory was annexed by France in 1801, and formed part of the Department of the Roer.

In 1814-15 the Prussian portion was restored and was incorporated in the Rhineland ; but the frontier was drawn at least two and a half miles (1,000 Rhenish yards) from the Meuse, in order to protect the Netherlands from possible aggression on the part of the Prussians.

(4) *Cologne*

The history of the Electorate of Cologne is, except for conflicts with the city and an internal struggle during the Reformation, merely a record of the part taken by successive archbishops in the long series of European wars. The ancient feud between the city and the archbishops culminated in the battle of Woeringen in 1288, when the citizens, with the help of the Brabanters under John the Victorious, defeated the archbishop and the Duke of Gelderland. From this date, Cologne was a free city of the Empire ; it was already a very rich and prosperous mercantile town, and since 1201 had been a prominent and influential member of the Hanseatic League. After the Reformation, its commerce was adversely affected

by the development of new trade routes and by the expulsion, in 1608, of a large number of Protestant citizens, who formed industrial communities in Krefeld, Elberfeld, Düsseldorf, and Mülheim. The government of the city was in the hands of the crafts, who, after a long struggle with the patrician families, established in 1396 a democratic constitution. This constitution, with some modifications, lasted throughout the whole subsequent career of Cologne as a free city; but it gradually ceased to be democratic, and at the end of the eighteenth century only about a seventh of the population enjoyed civic rights.

The chief interest of the political history of the Electorate lies in its close relations with France in the seventeenth and eighteenth centuries. Maximilian Henry of Bavaria, who became archbishop in 1650, made a treaty with Louis XIV which involved his dominions in the wars that ended with the Peace of Nymegen. Louis succeeded in obtaining the appointment as coadjutor of William of Fürstenberg; but, on the occurrence of the vacancy in 1688, the Pope, Innocent XI, quashed the election of Fürstenberg and confirmed the election of Joseph Clement of Bavaria. The Chapter admitted French troops into the territory of the Electorate, and Louis took it under his protection. The city of Cologne, on the other hand, opened its gates to the Brandenburgers. The incident was closely connected with the attitude of Louis XIV at the moment of the invasion of England by William of Orange. Louis withdrew his troops; and, in the end, the Pope confirmed the election of Fürstenberg with Joseph Clement as coadjutor. In 1702, on the outbreak of the War of the Spanish Succession, Joseph Clement and his brother, the Elector of Bavaria, supported the French, while the Chapter and the city adhered to the Emperor. In 1703 Bonn, the only town in the

Electorate which was left to the archbishop, was taken by Marlborough ; but the Treaty of Utrecht restored the archbishop to his dominions. Again, in the Seven Years' War, the Archbishop-Elector, Clement August, also a Bavarian prince, received a subsidy from France and sent a contingent of 12,000 men into the field against Prussia. At the outbreak of the wars of the French Revolution, the Archbishop-Elector was the Archduke Maximilian Francis of Austria, the founder of the University of Bonn. His territories were seized by the French, who in October 1794 entered Cologne, where they were welcomed by the population. The city at that date numbered some 40,000 inhabitants, about a third of its population in the Middle Ages. Some 12,000 of them are said to have been professional beggars who lived on the charity of the numerous religious houses, the suppression of which by the French led to a great decrease in mendicity. From 1794 to 1814 the Electorate and the city were under French control. After the Peace of Lunéville the city of Cologne was the chief town of an *arrondissement* ; the archbishopric was secularized ; the territory on the left bank of the Rhine was included in a French Department, and that on the right bank in the Grand Duchy of Berg.

In 1814-15 the Electorate and the city were given to Prussia, and the status of a free city was not restored. The archbishopric was revived in 1821, but only as an ecclesiastical office. The modern history of Cologne is a record of economic development under Prussian rule.

(5) *Trier*

The history of the Archiepiscopal Electorate of Trier (Trèves) is not so closely connected with France as is that of Cologne. In the Thirty Years' War the Elector, Philip Christopher of Sötern, placed himself under

French protection in 1631; and the invasion of his territory by the Spaniards was the occasion of the open participation of France in the war. The Spaniards in 1635 again obtained possession of the Electorate and held the Elector prisoner for ten years, until he was restored by the French in 1645. But in the wars of Louis XIV the Electorate was either neutral or in opposition to the French claims. In 1674 it was occupied by a French army; and at the outbreak of war in 1688 Louis XIV seized the territory on the left bank of the Rhine, with the exception of Coblenz, which was unsuccessfully besieged by the French armies. In the wars of the eighteenth century the Electorate played no important part. The electoral territory on the left bank of the Rhine was seized by the French in 1794; and the Elector abdicated in 1802 after the Treaty of Lunéville, which incorporated the district in the French Department of the Saar, of which Trier became the capital. The portion of the Electorate on the right bank was annexed to Nassau-Weilburg in 1803. Almost the whole of the Electorate was given to Prussia in 1815, the most important exceptions being St. Wendel and Meisenheim. Of these, St. Wendel passed from Coburg to Prussia in 1834, and Meisenheim from Hesse-Homburg to Prussia in 1866. The see of Trier was restored in 1821 for spiritual purposes, and was placed under that of Cologne. The chief towns were Trier, Coblenz (which during the French occupation was the capital of the Department of Rhin et Moselle), Kochem, Beilstein, Oberwesel, and Sayn.

(6) *Aachen*

The ancient importance of Aachen (Aix-la-Chapelle) had considerably decreased by the eighteenth century, but during the French occupation it was made the chief town of the Department of the Roer. When the

French took possession, the population was only 23,699, and the history of the town since its cession to Prussia in 1815 is one of economic progress. The population in 1910 was 156,143. As in the case of Cologne, the Congress of Vienna did not restore the status of a free city, which had been lost by the French occupation.

(7) *Birkenfeld*

The small principality of Birkenfeld, formed out of some ancient lordships, belonged in the seventeenth and eighteenth centuries to the House of Zweibrücken, and passed, in 1776, into the possession of the Grand Duke of Baden. It was seized by France with the remainder of the left bank of the Rhine and in 1815 was given to the Duchy of Oldenburg. It is an enclave in Prussian territory, and is represented in the Oldenburg Diet.

(B) RHENISH PRUSSIA SINCE 1815

The territory on the left bank of the Rhine was ceded to Prussia in compensation for disappointed ambitions elsewhere. The representatives of France in the Congress of Vienna were strongly opposed to the extension of Prussian dominion beyond the Rhine ; and the Prussians themselves looked upon the arrangement as unsatisfactory and as an obligation undertaken by Prussia in the general interest of Germany. The population of the province was divided in sympathy. On the right bank of the Rhine there was no hostility to Prussia, but on the left bank Prussian officials were embarrassed by what German historians describe as ' a thin Gallic varnish which had been superficially imposed upon essentially German stocks '. Anti-Prussian sentiment was specially strong in Jülich and in the old ecclesiastical territories ; in the latter the

Protestantism of Prussia was strongly resented, and everywhere the invasion of Prussian officials was regarded as a grievance. In the north the inhabitants of Saarbrücken regarded the House of Nassau as their natural lords. Prussian taxation pressed heavily upon the Rhinelanders, and they believed that the Rhineland was being exploited in the interests of Prussia. French and Belgian newspapers were widely read and the Rhenish students' clubs sported French colours. A Prussian official, writing from Coblenz in 1816, reported that 'there is not a man here but would give thanks to God on his knees were the country to pass once more under French rule'. The old Rhenish nobility—or such of them as had survived the revolutionary wars—expected from their new Prussian rulers a restoration of ancient feudal privileges which had been suppressed on the introduction of the French revolutionary reforms. The Government did not satisfy their demands, but the populace, none the less, believed that the nobles received undue favour. It was only by degrees that these impressions were removed, and it was the growth of material prosperity that reconciled the Rhineland to Prussian government.

Religious questions from time to time retarded the process of reconciliation. Prussian official celebrations of the tercentenary of the Reformation caused trouble on the Rhine; but the general aim of the Government was to consult Roman Catholic wishes, so far as was compatible with religious toleration, and they encouraged the revival of religious processions in the streets. In 1837 a dispute about mixed marriages led to the imprisonment of the Archbishop of Cologne, Baron von Droste-Vischering. This ecclesiastic, as Vicar-General of the see, had been engaged in disputes first with Napoleon and then with the Prussian Government, and had twice (1813 and 1820) been compelled

to resign his office. In 1835 he was appointed archbishop of the restored see, and after his arrest in 1837 he was forced to accept a coadjutor. Again in 1874, in the course of the *Kulturkampf*, both the Archbishop of Cologne and the Bishop of Trier suffered imprisonment.

The growth of commerce, which, as we have said, reconciled the province to Prussian rule, was greatly assisted by the steps taken immediately after annexation to improve the navigation of the Rhine and to construct roads, and somewhat later the coal-fields were exploited and the wine-making industry was greatly developed. Compulsory education was established; and, under the influence of the German Universities, High German superseded both French and a local patois as the language of the educated classes in towns like Cologne. The process of reconciliation was slow, and it was retarded not only by the religious disputes to which we have referred, but also by an agitation, led by Johannes Joseph von Görres, for the grant of a Constitution. A promise to grant a Constitution was not fulfilled; and in 1818 and 1819 the territories of Jülich, Cleves, Berg, and Mark, the city of Coblenz, and other districts sent to Hardenberg a memorial demanding a Constitution, with proposals to enfranchise the entire bourgeois and agricultural classes. Hardenberg, who had given some encouragement to constitutional claims, had to make an evasive reply. The *Rheinische Merkur* and other publications of Görres were suppressed, and he himself made his escape to Strassburg. A few years later, attempts to revise the legal system caused further discontent. In 1824 the King of Prussia ordered the abolition of the Rhenish *Code Napoléon*, without waiting for the completion of the Prussian civil code. Addresses of expostulation were sent by sixteen towns, and there was great excitement

throughout the province. In the end the Government gave way, and the *Code Napoléon* was only gradually superseded—not in any large measure until the establishment of the Empire, and not entirely until the year 1900.

The first Rhenish Diet was summoned in 1826, and it took a considerable share in the deliberations of the joint meeting of Prussian Diets in 1847 and in the discussions about the Prussian Constitution of 1850. Traces of the activities of the Rhenish Diet between 1826 and 1850 are to be found in the existence of municipal governments, consisting of the Mayor and Town Council without the interference of the intermediate body known as the *Magistrat*, which is characteristic of German urban constitutions east of the Rhine.

III. SOCIAL AND POLITICAL CONDITIONS

(1) POLITICAL

RHENISH PRUSSIA is divided, for administrative purposes, into the districts of Coblenz, Düsseldorf, Köln, Aachen, and Trier.

Since 1850 the marked feature of political life in the Rhineland has been the importance of the Centre party, the power of which was increased both by the earlier conflicts between Church and State and by the struggle with Bismarck after his attempt in 1874 to obtain State control over clerical appointments and over the exercise of ecclesiastical discipline. The struggle ended with concessions made by Bismarck to secure the support of the Centre, and it established the dominance of the Centre party in the Rhineland. Rhenish Prussia sends 63 members to the Prussian Abgeordnetenhaus and 36 members to the Reichstag; the Centre party returns 46 of the 63 and 27 of the 36. In the Reichstag elections of 1912 the Centre party polled nearly half of the votes recorded in the Rhineland, which returns three-tenths of the whole party. The political complexion of the Rhineland is thus closely connected with its religious sentiments.

(2) RELIGIOUS

The 1910 census gives the number of Catholics in the province as 4,918,551, or 69 per cent. of the population, the Protestants numbering 2,113,679, or 29 per cent. The Jews numbered 57,287, persons

of other religions 31,464. The proportion of Catholics has been slowly declining in recent years, and would have declined further, had it not been for the influx of Poles in the Ruhr district.

(3) EDUCATIONAL

The large Catholic element in the population is the only feature that differentiates educational conditions in the Rhineland from those which prevail elsewhere in Germany.

IV. ECONOMIC CONDITIONS

(A) MEANS OF COMMUNICATION

(a) Roads

THE natural means of communication are the river valleys which split up the Schiefergebirge ('Slate Mountains') into sections, namely the valleys of the Rhine, Moselle, and Lahn; transport by road and rail and river has followed these routes from time immemorial. The Rhine valley greatly exceeds the others in importance; it is wide enough and straight enough to make transport easy, and offers a direct route through the mountains from the south and centre of Europe to the Netherlands and the ocean. Moreover, there are no easy alternative routes round the outer edge of the mountain *massif*.

On the other hand, the transverse route along the Lahn and Moselle valleys, in which runs the strategic railway between Metz and Berlin, has never attracted any considerable volume of traffic, being rivalled by the route that skirts the northern slopes and runs through Liège, Aachen, and Cologne to Hanover and beyond. The point where this route crosses the Rhine has from pre-Roman times been the centre of communications in the Rhineland, and is occupied by its largest city, Cologne. The country south of the mountains, beyond the provincial boundary, also offers little serious obstacle to communications. Moreover, for road and river traffic the Moselle-Lahn route is so lengthened by the windings of the rivers as to lose any advantage it might have had. Thus its only importance has been military; and its chief towns are the fortresses of Metz, Trier, and Coblenz.

The total length of roads in the province at the end of 1912 was 20,016 km., of which 41 km. were imperial and military, 382 km. State, 6,844 km. provincial, 814 km. district (*Kreis*), 11,461 km. communal, 397 km. Road Board, and 77 km. miscellaneous roads. Only 37 km. were not public roads.

(b) *Rivers and Canals*

Rivers.—The province contains the most important section of the *Rhine*, which receives several of its largest tributaries as it passes through the province. The Rhine traverses the province from the south-east to the north-west, the length from Bingen to the Dutch border being 200 miles. The Rhine waterway system is of special importance in the province on account of the great extent of the industries of this area.

The total length of the Rhine is just over 800 miles, of which about 410 miles lie within German territory. Of the main stream some 550 miles (from Basel to the Dutch coast) are navigable, though this figure alone gives no adequate idea of the value of the Rhine as a commercial waterway. The area drained by its tributaries has to be taken into consideration; and every tributary of importance has been turned to account in German territory and utilized so far as possible for commercial purposes. Apart from numerous little streams, seven important rivers flowing into the Rhine on its way through the Rhineland are worthy of attention. The following join the Rhine on its right bank:

The *Lahn*, 135 miles long, flowing through Hesse and Hesse-Nassau and entering the Rhine near Coblenz.

The *Sieg*, 80 miles long, flowing through Westphalia and the Rhine province and joining the Rhine near Bonn.

The *Wupper*, 65 miles long, flowing into the Rhine near Cologne.

The *Ruhr*, 150 miles long, rising in Westphalia and joining the Rhine at Duisburg-Ruhrort.

The *Lippe*, 150 miles long, rising in the principality of Lippe, and joining the Rhine at Wesel.

On the left bank the chief tributary of the Rhine in the province is the *Moselle*, which brings with it the waters of the *Saar*. The *Moselle* is 320 miles long and is navigable from its confluence with the Meurthe near Frouard, a distance of about 215 miles. Another tributary on the left bank is the *Erft*, 72 miles long, which flows into the Rhine near Neuss.

The area drained by the Rhine waterway system is over 80,000 square miles. The Rhine and its 'natural streams' are navigable for 1,053 miles, to which must be added the channelled streams (278 miles), the navigable canals (239 miles), and the lakes (68 miles).

River Traffic.—The total goods traffic carried by the Rhine and its tributaries and canals was officially returned in 1913 as 83,000,000 tons. The tonnage figures for the chief ports in the Rhine province in 1912 were 18,752,469 tons received, and 22,763,365 tons sent, a total of 41,515,834 tons. The goods carried consisted of practically every class of heavy goods and raw materials, the transport of which was not so urgent as to demand railway facilities. They included iron ore, pig-iron, bar iron, wood and logs, wheat, cement, sugar, coffee, oils, asphalt, drugs and chemicals, paper, wood pulp, and many head of live stock. This traffic was dealt with in the Rhine province by 465 river steamers and motor-driven vessels, with a combined capacity of 42,139 tons, and by 1,650 barges and other craft not self-propelled, with a capacity of 1,316,287 tons. Much of the traffic is carried in large barges of 1,000 to 2,000 tons burden,

four or five of which can be towed up-stream from Rotterdam to Mannheim by a single powerful steamer.

Great importance is attached to water-transport in Germany; and the whole Empire is covered with a regular network of canals and channelled streams, linked up with one another as far as practicable. The official view is that natural waterways which can be channelled or otherwise improved are preferable to artificial canals, being, of course, much cheaper. The section of the Rhine which flows through the Rhine province is for the most part naturally navigable; and no large amount of capital has had to be expended to make it suitable for modern traffic. On the other hand, the Dortmund-Ems canal cost £22,400 a mile, and the canalizing of the Moselle £20,000 a mile, while the cost of the canal from Bevergern to Hanover is estimated at £38,300 a mile. From this it will be seen that the Rhine waterway system in the Rhine province is in a particularly fortunate position with regard to the cost of upkeep.

The question of prime cost in relation to canal traffic has always been carefully worked out in Germany. As might be expected, the initial cost of equipment is much cheaper for water transport than for transport by rail. In 1912 an iron Rhine vessel, with a carrying capacity of 1,500 tons, cost £4,500, whereas 100 open railway wagons, each with a carrying capacity of 15 tons, would cost about £13,700. Again, the cost of a tug-boat for four ships of 1,500 tons each is much less than the cost of the 8 locomotives which would be necessary to draw 8 trains of 50 wagons each holding 15 tons.

Another advantage urged in favour of water transport is that a Rhine steamer requires only a small crew in proportion to its capacity. Moreover, the dead weight of such a steamer is only about one-fifth of the

freight it can carry, whereas the tare of an open railway wagon is about half of its load, and the weight of a closed one as much as two-thirds. The friction of motion to be overcome is likewise less, especially at a low speed; one horse can draw 15 tons on rails and 500 tons on water. In addition, river steamers can be worked economically because they have plenty of space for condensing apparatus.

River Ports.—A number of important ports have grown up at the nearest points on the river to the districts rich in mineral resources. The chief port on the Rhine is Duisburg (including Hochfeld, Meiderich, and Ruhrort); geographically the adjoining harbours of Alsum and Walsum, Homberg and Rheinhausen may be considered as one with those of Duisburg. These are the ports of the Rhenish-Westphalian and North Krefeld coal-fields and of the iron-works and centres of population adjacent to the mines, some of which are situated actually at the edge of the harbours. Their importance is three times as great as that of all the other ports of the province taken together.

The other chief ports in order of importance are :

(1) Düsseldorf, with Reisholz (at the nearest point on the river to Elberfeld, Barmen, Solingen, and Remscheid).

(2) Cologne (with Deutz and Mülheim am Rhein), the great commercial centre, and nearest point on the river to the mining districts of Bensberg and Aachen.

(3) Neuss (opposite Düsseldorf).

(4) Wesel.

(5) Wesseling (the port of the lignite mines of the Vorgebirge).

(6) Leverkusen (the site of the chemical works of Fr. Bayer & Co.).

(7) Ober-Lahnstein (the port of the Lahn and Dill iron-mines).

(8) Krefeld.

(9) Beuel (opposite Bonn).

Canals.—The canals within the Rhine province are not very extensive, but owing to the canal systems connected with the Rhine, water communication is established with remote parts of Germany as well as with various parts of France. The local canals are : (1) the Erft canal, 5 km. long, linking Neuss with the Rhine and fed by the Erft ; (2) the Duisburg-Ruhrort canal, which formerly connected Duisburg with the Ruhr and the Rhine, but later was made into a harbour, the largest on the Rhine ; (3) the Spoy canal, 9 km. long, linking Cleves with the Rhine ; and (4) the newly constructed Rhine-Herne canal with a total length of 38 km. (of which, however, only a small part is in the Rhine province), running from the Rhine, between Ruhrort and Duisburg, to Oberhausen, and forming part of the Rhine-Weser canal.

By means of the Rhine-Rhône and Rhine-Marne canals the great river of the province is connected with a large part of central and southern France ; it is also connected with the basin of the Danube by the Main and the Ludwig canal, and with the Weser by a canal which is now being extended to Hanover and thence to the Elbe. By means of its connexions with the Danube, the Rhine can now serve as a water route for the transport of goods from the North Sea, or from parts of France, as far as the Black Sea.

It is evident that canals have been very extensively used by Germany during the war. The use of the railways appears to have been confined as far as possible to military transport and absolutely essential traffic, such as the conveyance of coal and food-stuffs to large towns not easily accessible by water. The benefits

derived from canal traffic have at the same time brought into strong relief their shortcomings; and great impetus has been given to wide schemes for the linking up of internal traffic by waterways, so as (a) to render Germany so far as possible independent of sea traffic, and (b) to enable her to extract the fullest military benefit from her railways by relieving them of ordinary traffic in war. The principal schemes now under discussion are the following:

(1) The completion of the Midland (Mittelland) canal. In 1899 the Prussian Government proposed a large scheme for a Midland canal to unite the Rhine with the Elbe, thus giving direct water communication with Berlin and by the Oder with Breslau. The scheme, however, was wrecked by the opposition of the agrarian party, who feared that it would favour the importation of cheap corn to the prejudice of Prussian agriculture. Six years later a greatly curtailed project was approved in the form of a canal from the Rhine to the Weser. It comprised the construction of a ship canal from Ruhrort to the Dortmund-Ems canal at Herne, with a branch canal from Datteln to Hamm; a ship canal from the Dortmund-Ems canal at Bevergern to the Weser near Bückeberg, with branch canals to Osnabrück and Minden; a canal from the Weser at Bückeberg to Hanover, with a branch canal to Linden; the enlargement of the Dortmund-Ems canal; the canalization of the River Lippe from the Weser to Datteln, and from Hamm to Lippstadt, together with improvements to certain existing waterways and a large amount of land reclamation. The cost of these works was estimated at twelve and a half million pounds. Two notable features of the Rhine-Weser scheme were the reservation of the towing service as a Government monopoly and the large powers assumed for the acquisition of land

adjacent to the canal, with a view to preventing private speculation in public improvements. The canal has been carried as far as Hanover, but there is now a strong feeling in favour of the completion of the Midland scheme in its original extent.

(2) A second project is the linking up of the North Sea and the Black Sea by water. None of the three lines proposed, viz. Oder-Danube, Elbe-Danube, and Rhine-Danube, would involve the construction of any new canals in Rhineland, but either of the alternative schemes for the Rhine-Danube connexion would greatly extend the scope of the existing Rhine waterways. The alternatives are: (a) the Main-Danube, *via* Aschaffenburg, Bamberg, and Steppberg, and (b) the Neckar-Danube, the former being supported by Bavaria, the latter by Württemberg.

(3) The whole Rhineland waterway traffic would be considerably augmented by a scheme advocated in 1917 for the development of the upper Rhine from Strassburg to the Lake of Constance, in conjunction with the utilization of water-power on the Basel-Strassburg section. A Rhine navigation congress, held at Basel in July 1918, representing Swiss federal and cantonal authorities and river navigation associations, pronounced in favour of free navigation between Switzerland and the North Sea, and petitioned the Government to protest against the German project for the construction of power stations between Strassburg and Basel, although it agreed that the Basel-Lake Constance stretch of the river should be canalized.

(4) A scheme for a canal 714 km. long from Fürstenberg-an-der-Oder to Ruhrort has been discussed, but hardly as yet in a practical spirit. Its execution would require the construction of 25 locks.

(5) Much nearer realization is the scheme for the Saar-Moselle canal. The project is an old one, aban-

done on account of opposition from the railway authorities. Even now it is objected in some quarters that the improvement of the Moselle and Eifel railways during the war has rendered it unnecessary, and that it is inadvisable to drive the German raw iron production farther to the west than need be.

(6) The linking up of the Ruhr coal district with Bremen, Hamburg, and Lübeck by means of canals has been advocated, in view of the unlikelihood of these ports being supplied with English coal after the war. In the opinion of Bremen experts a canal could be constructed from Bramsche, on the Ems-Weser canal, *via* Bremen, to the Elbe above Hamburg, where there would be connexion with Kiel by the Kiel canal, with Hamburg by the Elbe, and with Lübeck by the Elbe-Trave canal.

(7) A scheme for a Mülheim-Rhine canal, from Mülheim to Duisburg, has been approved by the Prussian Diet. The canal is to be 13 ft. deep and 147 ft. wide, and is to take 1,700-ton barges, the estimated cost being about £400,000.

(c) *Railways*

Railway System in General.—The Rhine province is extremely well provided with railways, especially as a number of lines for which there was no evident economic need have been built for strategic reasons. There are 4,749 kilometres of standard-gauge line, nearly all owned by the State, besides the numerous light railways and tramways. The lines of the Rhine province are, of course, a part of the railway system of Prussia, and are administered and worked according to regulations and methods common to the whole of that system. The head office of the Administrative Board for the province is at Cologne, and there are subsidiary boards at Elberfeld, Essen, and Saarbrücken.

German railways are officially divided into three classes: *Hauptbahnen* ('principal railways'), *Nebenbahnen* ('auxiliary railways'), and *Kleinbahnen* ('light railways'). These classes are subdivided in accordance with their gauge; and the third class (*Kleinbahnen*) is subdivided into *Strassenbahnen* (i.e. tramways) and *nebenbahnähnliche Kleinbahnen* (i.e. light railways serving as auxiliary railways). The principal railways comprise, generally speaking, all the main trunk lines of the country, whether on standard or narrow-gauge tracks. The auxiliary railways, which may also be of standard or narrow gauge, include important local lines, 'feeders', connecting lines, and the like. The main trunk lines are both constructed and worked under exceptionally stringent conditions, which are relaxed in the case of the auxiliary lines.

The greater number of the main trunk lines are built to conform with the ordinary gauge of 4 ft. 8½ in., and many of the auxiliary lines are also built to this gauge, but of lighter material. The standard measure for the narrow-gauge lines of these classes is 2 ft. 6 in. The two classes of light railways are normally of either 1 metre (3 ft. 3.37 in.) or 4 ft. 8½ in. gauge, but a few are built to the 2 ft. 6 in. gauge.

The following figures show the extent and ownership of the railway system of the Rhine province in 1914:

	State-owned.	Private.	Total.	Per 1,000 sq. km.	Per 10,000 inhabitants.
	Km.	Km.	Km.	Km.	Km.
<i>Standard-gauge Railways:</i>					
Main trunk lines . . .	2,696.6	63.6	4,749.3	17.87	6.66
Auxiliary lines . . .	1,903.9	85.2			
<i>Narrow-gauge Railways</i> . . .	50	85	135	—	—
<i>Light Railways:</i>					
Tramways	—	—	1,342	—	—
Light railways serving as auxiliary lines	—	—	920	—	—

In the case of all the trunk lines and the more important auxiliary and light railways the motive power

is steam, but most of the tramways and local light railways are electrified.

Relations to Government.—As a rule the trunk lines and important connecting lines are owned by the State, while the light railways and tramways are owned by municipalities or other local authorities, though in some cases also by private companies.

The Prussian Railway Law of 1838 provides that every company seeking powers for railway construction must apply to the Minister of Public Works, setting forth the financial and engineering details of its proposal. The Minister's advisers then consider the plans submitted; and, if construction is authorized, a time is fixed within which proofs must be furnished to the authorities that the share capital has been subscribed and the company formed. In recent years, as a matter of State policy, no concessions whatever have been granted for main trunk and very few for auxiliary lines; the assumption being that, if private capitalists can see a prospect of profitable results from such enterprise, it must be equally to the advantage of the State to construct the lines itself. When concessions are granted for auxiliary lines and these prove prosperous and are found to serve a real public want, the State frequently makes use of its powers for taking over such lines compulsorily.

In general, the form of concession adopted by the Prussian Government has served as a model for the other German States, though in Bavaria the conditions of State supervision are somewhat more stringent. The States are as a rule prepared to assist the smaller railway companies to which they have granted concessions. In 1895 the Prussian Government passed a special law authorizing the establishment of a fund of 5,000,000 marks (£250,000) for aiding the construction of such railways; and by subsequent Acts further sums have

been added. Certain general conditions are imposed ; e. g. the railway must serve general public interests ; its cost must be in proper proportion to the economic benefits to be derived from it ; the local authorities must likewise assist by the gratuitous granting of land ; and it must be shown that without State assistance it would not be possible to build the line. The State does not guarantee interest, and limits its commitments to the purchase of preference shares.

Finance.—As the Rhineland railways are included in the Prussian railway system, no separate financial returns are issued for the province. The official figures show, however, that in 1912, 1913, and 1914 respectively, the receipts of the Prussian railway system from passenger and goods traffic, sleeping cars, refreshments, &c., amounted to 3,483,500,000 marks, 3,563,200,000 marks, and 3,140,200,000 marks in the case of the standard-gauge trunk and auxiliary lines, giving an average return of 56,611 marks, 57,284 marks, and 49,898 marks per kilometre for these years. It may safely be assumed that in the Rhine province the traffic receipts per kilometre of track of the three classes named would at least reach the average for the whole country.

It should be noted that the State railways pay local taxes only, which work out to an average of about £50 per mile. This would mean a total of £145,300 for the State-owned railways in the Rhine province.

Tariffs.—The German tariff system is based on a scheme of kilometric rates for fast and slow services. Though these rates differ slightly in the different states of the Empire, the principle remains the same. The Rhine province rates are those generally adopted throughout Prussia. In considering the general question of railway goods traffic it is important to remember that the system of delivering certain classes of goods

by parcel post is older and very much more developed in Germany than in Great Britain. More latitude is allowed in the weight of parcels, and it is also possible to make use of the post office in its capacity as agent, the postman being paid on delivery of the goods. Parcels of goods intended for transmission by parcel post may be of any weight not exceeding 110 lb., whereas the limit in Great Britain is 11 lb.

The chief difficulty in calculating freight rates in Germany arises from the principle of special (*Ausnahme*) tariffs, the object of which is officially declared to be :

‘ To advance home industrial and agricultural production by granting facilities for the supply of raw materials.

‘ To assist the home products to obtain markets in competition with foreign rivals by granting facilities for export.

‘ To support the trade of German commercial centres, especially seaports, against foreign competition.

‘ To support the inland means of communication, principally the railways, against foreign competition.’

The special tariffs in force on the Prussian railways vary considerably as regards not only the kilometric rate but also the terminal charges. The most comprehensive special tariff, i.e. the raw material tariff, is based on a kilometric rate of 2·2 pf. per ton up to a distance of 350 kilometres and 1·4 pf. per ton beyond, plus terminal charges of 70 pf. per ton. These special tariffs are admittedly based on politico-economic considerations, and are drawn up, as a rule, chiefly with the object of helping German manufacturers to compete in foreign markets. For example, special rates have been granted by the Prussian State Railways for the conveyance of grain from Russia to over-sea countries

(Sweden, Norway, England, &c.), and the rate per ton per kilometre from the frontier to the German ports, Königsberg, Danzig, &c., is lower than the charge for German grain between the same points. A special tariff is also granted for the grain traffic from Hungary to England; for grain intended for export *via* Hamburg, a special rate is in operation from the frontier to Hamburg, and this is less by 115 marks for wagon loads of ten tons than the local rate between the same points (353 marks as against 468 marks). Here the competition of other routes (Fiume-Gibraltar, Tetschen-Lauben, and the Elbe) was the determining factor in the concession of preferential rates.

For minerals, petroleum, and naphtha from the North Sea ports and Lübeck, Stettin, and Swinemünde to South-West Germany, Bavaria, Switzerland, Austria-Hungary, and *vice versa*, direct preferential tariffs have been introduced, by which the rate per ton per kilometre for the Prussian State Railways proportion varies from 4 pf. to 2.2 pf. as against 6 pf. for the local traffic between the same points. These reduced rates have been instituted owing to the competition of the Belgian, Dutch, and French harbours with the Rhine shipping trade, and of the Adriatic harbours with the Elbe shipping trade as regards Austria-Hungary. For iron and steel from Westphalia to the German shipbuilding yards reduced rates operate for reasons of national interest.

(B) INDUSTRY

(1) LABOUR

(a) *Supply and Conditions*

Saxony excepted, no large territory of Germany is so industrial in character as the Rhine province and the contiguous province of Westphalia. The Rhineland

has a higher density of population than any other Prussian province, and in this respect is excelled only by Saxony. The ratio of population to area for the whole Empire in 1910 was 310·4 per square mile, the ratio for Prussia was 224, while that for Saxony was 829·5, and that for the Rhine province 683·4, Westphalia following with 528·6.

The industries of the province employ an exceptionally large proportion of skilled and well-paid labour. The engineering and electrical industries in particular are conspicuous in this respect, while the wages paid in the coal-mining industry, though falling below those ruling in Westphalia, are higher than in the other coal-fields of the country. In the larger towns, where there has been much rebuilding, the housing conditions of the working classes are in general tolerable and often excellent, though the rents are high.

(b) *Immigration and Emigration*

The industrial population of the Rhine province, as of Westphalia, has been augmented by large contingents from all parts of Prussia, and in a minor degree by migration from other German states. The Prussian State Statistical Bureau defines the Rhenish-Westphalian industrial area as comprising all those administrative *Kreise* of the two provinces in which more than half of the occupied inhabitants are employed in industry, including mining. The occupation census of 1907 showed the aggregate population of this area to be 6,873,931, of which number 1,176,051 were born in other provinces of Prussia and 220,924 in other German states, while 190,911 were born in other countries or did not know their place of birth. Thus 1,587,886 persons, or nearly 23 per cent. of the population, were born outside the industrial area, while only

one-half of the inhabitants were born in the communes in which they were resident. The population of the Rhine province comprised in the industrial area so defined numbered 4,089,895, of whom 562,236 or 13.8 per cent. were born in other Prussian provinces, 145,237 or 3.6 per cent. in other German states, and 132,680 or 3.2 per cent. in other countries; the total percentage of immigrants was thus 20.6.

The immigration to the Rhine province from Hanover and eastern Prussia in particular has been very considerable during the past twenty-five years. The Rhineland attracts a greater number of foreigners than any other Prussian province, 205,000 (nearly 3 per cent. of the population) being comprised in the census of 1910. They included 94,000 Dutch, 58,000 Austrians, 21,000 Italians, and nearly 9,000 Belgians, but not more than 1,255 French. Over 75 per cent. of the foreigners were in the Düsseldorf Government district, a predominantly industrial area. A considerable number of Italians were employed in the Saarbrücken district.

There has not been much emigration since about 1895, the average annual number of over-sea emigrants from the province having been 1,370.

(2) AGRICULTURE

The mineral resources of the Rhine province are of such value that agriculture is overshadowed in importance by the mining and manufacturing industries. It would be a mistake, however, to dismiss it as of little consequence, for parts of the Rhine province and the adjacent Westphalia are still regarded as amongst the principal seats of the German peasantry. In western Germany as a whole the prevailing form of land tenure is peasant proprietorship. The great majority of the farms in these two provinces are less

than 50 acres in extent ; and a considerable proportion are small holdings of from 5 to 15 acres.

As the soil of the Rhine province does not differ materially from that of Great Britain, the methods of cultivation and irrigation adopted are, on the whole, similar. More attention, however, is paid by the German farmer to the scientific use of fertilizers ; and, when the blockade stopped the consignments of nitrates from Chile, the loss was felt acutely. The use of machinery on the land is also more usual in Germany as a whole than in Great Britain ; but writers on the subject have complained that the small-holding system has tended to make the farmers in the Rhine province (as in Westphalia) a highly conservative class which it is difficult to convert to new methods.

(a) *Products of Commercial Value*

Principal Crops.—The principal crops of the province (winter census, 1913) were as follows :

	<i>Hectares.</i>	<i>Yield in metric tons (1,000 kg.).</i>
Barley	28,521	63,254
Hay	215,547	1,058,836
Oats	257,569	596,287
Potatoes	174,968	2,807,495
Rye	265,930	565,577
Spelt (German Wheat)	5,820	8,795
Wheat	99,690	245,942

Fruit.—In 1913 the fruit crop of the Rhineland included the produce of 7,123,620 apple-trees, 2,757,571 pear-trees, 3,628,520 plum-trees, 1,052,636 cherry-trees, 351,382 peach-trees, 84,560 apricot-trees, and 184,605 walnut-trees.

Live Stock.—The following particulars summarize

the live stock returns (census of December 1912) relating to the province :

	<i>Number.</i>	<i>Value in Marks.</i>
Horses	211,348	185,967,000
Donkeys and Mules	1,500	284,000
Cattle	1,173,686	424,025,000
Sheep	94,024	3,009,000
Pigs	1,034,297	85,211,000
Goats	303,840	9,312,000
Feathered Stock	5,657,099	6,000,000
Beehives	94,809	2,000,000

Wine.—Four wine districts are included, either wholly or for the greater part, in the Rhine province, viz. (1) the Rhine district, excluding the Rheingau, which is in the south of Hesse-Nassau ; (2) the Nahe district, (3) the Moselle–Saar–Ruwer district, and (4) the Ahr district. The 1913 returns for these areas were as follows :

<i>District.</i>	<i>Area under cultivation (acres).</i>	<i>Wine produced (imperial gallons).</i>	<i>Value (£ sterling).</i>
Rhine	7,154	184,884	25,000
Nahe	7,761	492,473	45,000
Moselle–Saar–Ruwer	18,040	3,638,891	645,000
Ahr	1,635	56,015	5,000
Total	34,590	4,372,263	720,000
Total for German Empire	261,513	22,108,834	2,420,000

(b) State Aid and Encouragement

The Government and the provincial authorities do much for the encouragement of agriculture. In 1913 the former made grants to the value of 1,603,000 marks in support of organizations and experiments in connexion with stock-breeding, viticulture, and fruit-growing in general, afforestation, inland fisheries, &c. The Chambers of Agriculture and some of the co-operative societies also receive financial assistance from the State. The agriculturists of the province

have at command a large system of technical schools of various grades, to the support of which the State liberally contributes. At the head of these institutions is the Agricultural Academy of Bonn, subsidized to the extent of £10,000 a year, while the miscellaneous schools include two higher agricultural schools, with 19 teachers and 507 scholars in 1911; 46 winter schools with 262 teachers and 1,336 scholars in the same year; 42 peripatetic rural schools for domestic training, with 98 teachers and 2,755 scholars; 393 rural continuation schools with 520 teachers and 8,211 scholars; together with a seminary at Cleves for the training of teachers for the latter schools. There are also special schools and courses of instruction for horticulture, viticulture, dairy-farming, &c.

(c) *Agricultural Co-operation*

It is noteworthy that the Rhine province was the home of the two best-known pioneers of co-operation in Germany, Hermann Schulze-Delitzsch and F. W. Raiffeisen, whose work on behalf of the co-operative movement survives to-day in the form of powerful national federations of co-operative societies of different types. The Raiffeisen societies have always given prominence to agricultural co-operation, and particularly to co-operative banks and credit societies for the assistance of small farmers and owners. Their headquarters are still at Neuwied on the Rhine.

Akin to such agricultural co-operation, though representing a bolder form of enterprise, are the *Landschaften*, which flourish here as in other provinces of Prussia. The *Landschaften* are associations of borrowers, supervised by the State and treated by it as public corporations. The following is a brief description of their system of working. A number of landholders, generally living near together, form a *Landschaft*.

Any member, if in need of capital, may mortgage his land to the association, which in return will give him a bond for an amount which may vary from one-half to two-thirds of the value of the land concerned. The mortgagor then sells the bond in the open market and uses the proceeds for his own purposes. So long as he pays the interest and amortization on his bond, the *Landschaft* has no further part to play: if, however, he fails to do so, it takes possession of the land, sells it to the highest bidder, and returns to the borrower any balance left over above the amount of his bond and the costs. The *Landschaft* can do this in Prussia without recourse to a lawsuit. Substantially the *Landschaft* has in this respect the power of final decision usually vested in a high court. There are stringent legal safeguards against dishonesty or incompetence on the part of the directors of the *Landschaft*. In Prussia one of the members of the board of directors must be appointed for life by the King; and the other directors are usually, in practice, State or other public officials. This method of controlling the *Landschaften* has resulted in their bonds being regarded as an unusually sound investment; and they have hitherto been able, in consequence, to issue them at a low rate of interest.

(d) *Works of Amelioration*

Much is done in this direction with Government assistance and advice. For the purposes of conservancy the rivers and canals are grouped in three classes in order of importance. Those of the first class are controlled by the State, those of the second class by the Water Boards, while those of the third class are left to the owners and occupiers of the adjacent land. Inspection of all water-courses is compulsory.

The dikes of the Rhine are of the first importance,

especially the winter dikes, which are built to prevent flooding, whereas the purpose of summer dikes is to aid cultivation. Below Cologne liability to flood greatly increases, the total area between that city and the frontier subject to inundation being 90,800 hectares. Isolated embankments occur between Cologne and Neuss, but on the right bank below Wesel there is a continuous line. Above Wesel their height is considerable, but below that point they are well under high-water level.

Among other improvement schemes which have been undertaken in the Rhine province are the following :

(1) The drainage of the Norf and Stommeler Brücher, near Neuss. This was undertaken in the middle of the nineteenth century; and 1,808 hectares were reclaimed.

(2) The drainage and irrigation of the Nier valley, near Düsseldorf. Plans have recently been prepared for the artificial increase of the fall of the river (estimated cost 1,200,000 marks) and for the chemical cleansing of the inflowing water (estimated cost nearly 8,000,000 marks).

(3) Between 1860 and 1866 the lower course of the Erft was drained, the summer high floods controlled, and irrigation effected at a cost of 1,500,000 marks; between 1892 and 1912 the wooden buildings were replaced by stone and improvements were made over an area of 4,465 hectares.

(4) The Nahe between Kreuznach and Bingen was regulated in 1910-12, at a cost of 436,000 marks. An area of 876 hectares was affected.

(5) The Ahr was regulated between 1889 and 1899, the river bed deepened, and the bank strengthened, the State and the province bearing three-quarters of the cost. In 1910 damage was done by high water to the

extent of 2,500,000 marks, of which the State and the province paid two-thirds.

(6) The lower course of the Sieg was regulated between 1899 and 1903 and the remainder in 1903-7. In 1909 damage was done by high water to the extent of 1,000,000 marks, of which two-thirds were borne by the State and the province. In 1914-15 the Sieg dikes were repaired and strengthened.

(7) The Wupper was regulated in 1909-11, an embankment being added near Rheindorf.

(8) The Kalflack was regulated in 1911-12.

(9) The Längst lowlands were embanked in 1907-9.

Since 1900 State and provincial grants to the amount of 1,047,500 marks have been made in aid of the Sieg regulation, Neffel regulation, Längst embankment, lower Wupper regulation and the Rheindorf embankment, Nahe regulation, Kalflack regulation, and the repairing and strengthening of the Sieg dikes.

In 1913 there were 1,163 associations and communal authorities engaged in improvement enterprises, covering a total area of 113,764 hectares and involving an outlay of 31,830,072 marks or an average of 280 marks per hectare. The works included dikes, river regulation, drainage, and irrigation. Adding the area affected by individual enterprise, the total so improved is increased to 120,000 hectares.

(e) *Reclamation of Waste Land*

Only the small proportion of 2 per cent. of the total area of the Rhine province consists of moorland, marsh, &c. This occurs in the districts of Montjoie, Malmédy, Cleves, Berghem, Eupen, Grevenbroich, Kempe, and Gladbach. Germany makes a distinction between *Ödland*, land taken up by moors, marshes, mines, and quarries, and *Unland*, which yields no income at all and is tax-free. Of *Ödland* and *Unland*

there are 81,748 hectares in the province, of which 6,000 hectares are moorland, though of this area 4,000 hectares have already been improved.

The Eifel district has been greatly improved during the last century, chiefly by being converted into grass-land, but the initial cost was heavy and constant manuring is necessary. In the steeper parts pine and fir forests have been planted. In the Montjoie district is the Platte Venn, a plateau swept by winds which are apt to damage crops. Here hedges, drainage, and manuring have in some places converted the barren lands into meadows, whilst in others forests have been planted to improve the climate. In the Malmédy district is the Wallonische Venn, part of which has been leased to an industrial company, while part (262 hectares) is being drained, cultivated, and colonized by the provincial authorities. Wankum Heath, in the Geldern district, was barren and roadless until 1901. It has now been drained, cultivated, provided with roads, and colonized, its surface comprising 68 hectares of meadow-land, 106 of cultivated land, and 216 of pine forest. The cost was 220,000 marks, viz. 104,000 marks for roads and 116,000 marks for cultivation. The enterprise has, however, proved profitable, even where the cost has exceeded 800 marks per hectare. The lowlands of the Spanish Ley (721 hectares) have been reclaimed since 1905 at a cost of 110,000 marks. At Bleibach the desolation of the country by drifting sand was completely checked in the middle of the nineteenth century by acacia-planting.

(f) *Forestry*

The general survey of the forests of the Empire made in 1900 showed that about 30 per cent. of the surface of the Rhine province was under forests and plantations, the ratio for Prussia as a whole being 24 per

cent. Of the 835,000 hectares of forest and woodland in the province, 151,944 hectares (18.2 per cent. of the whole) were owned by the State and 361,475 hectares (43.3 per cent.) by the communes, while 321,570 hectares (38.5 per cent.) were in private hands.

The chief forest areas are the Moselle zone, the Hunsrück, and the northern Eifel; also (mostly in Westphalia) the Sauerland and Westerwald. About three-quarters of the trees are deciduous. A large part of the forest area is planted with oak, formerly grown for tanning; but this industry has recently collapsed owing to the competition of *quebracho* wood from the Argentine. The forests would naturally have covered the whole of the hill country, except for the marsh-land, and would thus have extended over about two-thirds of the province; but they were ruthlessly cut down in the eighteenth and early nineteenth centuries. While a large amount of timber is marketed every year—the receipts from this source in 1911 being 7,912,000 marks—great care is devoted to re-forestation. Cologne, Düsseldorf, Duisburg, Krefeld, Elberfeld, and Essen are all important centres of the timber trade.

(g) *Land Tenure*

For the most part the farms in the Rhine province are freehold, and indeed leasehold tenure is not in much favour in any part of agricultural Germany. In the immediate neighbourhood of the large towns, however, there is an exception to this general rule. In these centres, though hardly anywhere else, a small proportion of the land is held by leaseholders, who are engaged chiefly in market gardening combined with grazing.

(3) FISHERIES

The rivers are fairly well stocked with fish, especially salmon in the Rhine and trout in the hill streams.

(4) MINERALS

(a) *Coal and Lignite*

(i) *Coal*.—Coal-mining and iron-smelting are the two most important industries in the west of Prussia. The Belgian coal-fields pass into German territory in the neighbourhood of Aachen, and a few smaller seams connect the Belgian coal-fields with the great Rhenish-Westphalian basin in the valley of the Ruhr, which, after flowing north and west for 150 miles, joins the Rhine at Duisburg. At present, most of the coal mined in the German Empire comes from the Ruhr valley, which is situated almost entirely in the province of Westphalia. It is important to note, however, that Essen, in the left-hand corner of the coal basin, lies within the boundary of the Rhine province.

Principal Reserves.—The *Rhenish-Westphalian* coal-field is estimated to contain in the area now worked (i. e. the southern district) about 47,000,000,000 tons in reserve. The middle area (surveyed but not worked) is estimated to contain about 43,000,000,000 tons. These quantities are all above the 4,000 ft. level, which roughly marks the lowest depth at which coal is now profitably worked. About one-quarter (i. e. 22,500,000,000 tons) is within the Rhine province.

Between 4,000 ft. and 6,000 ft. the worked and surveyed areas of the whole field are believed to contain a further quantity of about 35,000,000,000 tons, of which again about one-quarter lies within the province. North of the surveyed area lies a zone at present unexplored, which is estimated to contain about 90,000,000,000 tons below the 4,000 ft. level and above 6,000 ft. Of this quantity about one-eighth lies in the province. The total estimated reserves for the province in this field are :

' Actual ' .	14,000	million tons, of which	11,500	tons are above	4,000 ft.
' Probable ' .	17,000	" "	11,000	" "	
' Possible ' .	11,000	" "	none	" "	
Total .	42,000	" "	22,500	" "	

On the left bank of the Rhine lie three smaller fields. The *North Krefeld* field is separated only by the Rhine from the Rhenish-Westphalian field, of which it is a continuation. It is estimated to contain 7,000,000,000 tons above the 4,000 ft. level in the area now worked. Assuming that the unexplored portions of the North Krefeld field bear the same proportion to the known portions as is the case in the Rhenish-Westphalian field, it may be estimated that there is a ' possible ' reserve of 30,000,000,000 tons, so that the total reserves are 37,000,000,000 tons. The *Wurm-Inde* field, east and north of Aachen, is estimated to contain 1,600,000,000 tons above the 4,000 ft. level. The *Brüggen-Erkelenz* field, between the Wurm-Inde and the North Krefeld fields, is estimated to contain 1,750,000,000 tons above the 2,500 ft. level.

The fifth field, the *Saar* field round Saarbrücken, is in the extreme south of the Rhine province, and extends slightly over the border into the Palatinate and German Lorraine. The area now worked in the province is estimated to contain about 9,750,000,000 tons above the 4,000 ft. line, and 6,750,000,000 tons between the 4,000 ft. and 6,000 ft. levels. (For further details see *Lorraine and Saar Minefields*, No. 31 of this series.)

Total Reserves.—The total reserves (' actual ', ' probable ', and ' possible ') of the province are estimated at about 80,000,000,000 tons. This is about half the estimated total of the reserves of the Westphalian portions of the Rhenish-Westphalian field. Taken together, the Rhine province and Westphalia contain rather more than half the total coal reserves of Germany, the bulk of the remainder being in Upper Silesia. Thus

the reserves of the two provinces are rather greater than those of Great Britain, and amount to between one-quarter and one-third of those of all Europe.

Classification of Coal.—The coal of the Rhenish-Westphalian and North Krefeld fields is usually divided into four classes : (1) *Long-flame* coal, the most recently formed and least plentiful. (2) *Gas* coal, found in greater quantities. These two types of coal are the nearest to the surface, where they exist, and do not extend south of Essen. (3) *Bituminous* coals. (4) *Dry* coal, the first in order of formation, and found farther south than the other varieties.

The Brüggem-erkelenz field contains only dry coal with a low gas content, and two-thirds of the coal in the Wurm-Inde field is also dry.

The coal in the Saar district is classified into groups which do not correspond to the Rhenish-Westphalian. Of an estimated reserve of about 16,500,000,000 tons above the 6,000 ft. level, the uppermost seams (900,000,000 tons) have a carbon content of only 77 per cent., though locally called *dry*, 7,000,000,000 tons are classified as *flame* coals (carbon content 80 per cent.), while 8,000,000,000 tons (the lowest seams), which are called *bituminous*, are held to correspond to the Rhenish-Westphalian gas and long-flame coals. Coke is made from the last-mentioned group only, the coke yield being 55 per cent. of the gross weight of coal.

Output.—The amount of coal drawn in 1913 from the Rhineland section of the Ruhr valley was estimated at 3,725,000 metric tons, as compared with 110,811,000 tons from the Westphalian part of the valley. The combined output represented 63 per cent. of the total production of Prussia and 59 per cent. of the production of the German Empire.

According to the official returns for 1913, the Mining Board areas of the lower Rhine (i. e. from Cologne

to the Dutch border), Westphalia, and Aachen produced 117,751,555 tons of coal, valued at 1,394,592,000 marks. Allowances having been made for the coal supplied to employees free of charge, or at a low price, and for the coal used either in the pits themselves or in works connected with the pits, it was found that the amount of coal actually sold to the public was 69,825,864 metric tons, valued at 847,319,000 marks, the average value of the coal being about 12 marks a ton. The number of coal-mining companies at work in these areas in 1913 was 230, employing throughout the year 401,399 men. The output in the Saar basin in 1913 was 13,006,000 tons.

Rhine-Westphalian Coal Syndicate.—For practical purposes the coal-mining industry of the Rhenish-Westphalian field is controlled by a powerful syndicate, whose head-quarters are at Düsseldorf. Formed in 1893 for the purpose of checking the ruinous competition which then prevailed amongst the colliery companies, the syndicate has gradually extended its hold upon the industry until it now regulates the production, sale, and price of coal for the entire coal-field. It cannot be doubted that the syndicate has succeeded in maintaining a higher level of prices than would have been possible with unrestricted competition, and in preventing an excessive fall in times of industrial depression. At the same time labour has benefited by higher wages. In 1915 there was for a time a possibility that the syndicate would be dissolved, in consequence of the growing antagonism between the 'pure' colliery companies and those combining collieries with smelting works. Recognizing that such conflict was disastrous to the national interest in time of war, the Government passed the Compulsory Syndicate Law of July 12, 1915, providing for the compulsory control by syndicate of the entire Rhenish-

Westphalian colliery industry, against the will of private interests, unless this measure were adopted voluntarily by September 15 of that year. In consequence of this threat, a transitional agreement was at once concluded, the Prussian State joining it in respect of its collieries in the Ruhr basin; and a definitive syndicate was formed by contract of October 14, 1916, with force until April 1922. The new syndicate comprises 93 colliery companies or administrations (including the fiscal mines in the Ruhr basin), of which 18 combine smelting works with coal-mines.

(ii) *Lignite*.—Apart from the deposits of ordinary coal found in the Rhine province, Western Germany generally is also rich in beds of lignite or brown coal. Lignite is found in a large area west of the Rhine between Bonn and Cologne, and in small quantities east of the Rhine opposite Bonn, in the Westerwald, and elsewhere. The small deposits include an area, in the Pleistal, of *Blätterkohlen* containing bitumen, and two areas (by Godesberg and Pützchen, opposite Bonn) of alum-bearing deposits. The only class of lignite, however, that is found in quantities at present remunerative is the ordinary brown coal. This covers a continuous area of about 56 square miles between Aussem, due west of Cologne, and Weilerswist, due west of Bonn. The lignite lies under a covering of, on an average, about 35 ft. of Quaternary or Tertiary strata, and is itself from 75 to 100 ft. thick. The area is a low ridge, the *Vorgebirge* or *Ville*, running roughly parallel to the Rhine. The brown coal and other strata probably extended farther east and west across the valleys of the Erft and the Rhine, but have been washed away by these rivers.

The available reserves are estimated at 3,800,000,000 tons, with a further 'probable' reserve of 3,500,000,000 tons, the latter figure including the supplies on the

right bank of the Rhine. Other small areas on the left bank are estimated to contain a 'probable' reserve of 3,500,000 tons. The brown coal when dug contains some 50 per cent. of water. When dried it contains 66 per cent. of carbon and a low ash-percentage of under 5 per cent. Its heating value is about one-third that of pit-coal.

The increase in cost of ordinary coal has led to a larger demand for lignite both for industrial purposes and for household use in the form of briquettes. In 1873 the entire lignite output of Germany amounted to only 9,000,000 metric tons; in 1903 it was 40,000,000 tons; and by 1913 it had risen to nearly 87,186,000 tons. The production of lignite briquettes in 1912 was 19,000,000 tons.

Of the 87,186,000 tons of lignite produced in 1913 in the German Empire, 20,256,000 tons, valued at 30,696,000 marks, came from the Rhine province (lower Rhine district). Most of this was used locally in the pits and in works connected with the pits, a surplus of 2,176,628 tons, valued at 3,415,000 marks, being sold to the public. The average value of the lignite from the Rhine province was 1.52 marks per ton. In the adjoining district of the Westerwald (Hesse-Nassau) lignite of a superior quality was sold at an average price of 6.63 marks per ton and the Upper Bavarian product had as high a value as 13.10 marks a ton.

(b) *Iron Ore*

Iron ore is found scattered over most parts of the Schiefergebirge. *Hematite* is found in two adjacent areas on the Lahn and its tributary the Dill. The former falls partly within the outlying Wetzlar *Kreis*, extending south-west to Limburg. *Hematite* exists lower as a layer between the upper and middle Devonian strata, and also in pockets, into which it

has been subsequently washed. Most of this ore district lies geographically outside the Rhine province, but economically it is closely connected with it.

Throughout the same district *limonite*, which has been formed from the hematite deposits, is found. Smaller quantities of limonite occur in three other districts, namely the Eifel, the former Duchy of Berg, and near Aachen. The Eifel deposits are no longer worked, as the remaining ore is too scattered to be profitably mined. Each of these deposits is made up of accumulations in cavities in the Devonian limestone.

A much greater deposit is that of *siderite* in the Siegerland, between Siegen and Betzdorf, on the River Sieg; about two-thirds of it lies in the province. The ore lies in fissures formed during the folding of the Devonian strata in the Carboniferous period, and weathers to limonite at the surface. It is worked at varying depths from the surface to 2,300 ft.

Small quantities of iron ore with an admixture of *manganese* occur at two points on the southern edge of the Schiefergebirge, at Waldalgesheim (near Bingerbrück) and at Rosbach (near Homburg); the latter is outside the province, but is included in the only available estimate of reserves.

The total estimated reserves at workable depths are as follows:

Nature of ore.	District.	Per cent. of iron in ore as dug.	Reserves at present available.	Reserves likely to become available in the immediate future.	Lower limit of ore included in estimate.
			Tons.	Tons.	
Hematite and limonite in beds . . .	Lahn and Dill	48 %	106 million	92 million	300-1,600 ft.
Limonite in pockets	" "		60 "	—	—
" " "	Berg		3½ "	5½ million	—
" " "	Aachen		3 "	—	—
" " "	Eifel		—	5 million	—
" " "	Westerwald		¼ million	1 "	—
Siderite in veins .	Siegerland	38-40 %	100 "	15 "	4,000 ft.
Manganese in pockets	Taunus and Soonwald		1½ "	—	500 ft.

Within the Aachen and Berg-Siegerland mining districts—the former altogether and the latter for the most part contained in the province—there were 64 iron-ore mines in actual operation in 1913, the number of workmen employed therein being 12,360 and the amount of salaries and wages paid being 17,898,000 marks. The quantity of crude iron ore mined, including moisture, was 2,733,063 metric tons, with an estimated iron content of 942,209 tons, and the value of this iron ore at the pit was 33,209,000 marks. The Berg-Siegerland ore was valued at an average rate of 12.16 marks per ton, and that mined in the Aachen area at 7.25 marks per ton.

Pyrites is found with lead and zinc in the Aachen district.

(c) *Other Metals*

Copper is found in many parts of the province, usually in association with lead. It occurs in moderate quantities in the Eifel limestone near Eupen, in the Mayen district, and in the Neuwied district. It is also found in the Trias at Wallerfangen and St. Barbara, but has there been nearly exhausted.

For the purposes of returns of copper production, the German Empire is divided into two areas: (1) the Rhine, and (2) the remainder of the Empire, chiefly the Harz, Mansfeld, Lower Silesia, and Saxony. In the former area in 1913 three firms were engaged in the mining of copper ore, employing 205 workmen and paying 224,000 marks in wages. Some 57,200 metric tons of copper ore were mined, valued at 439,000 marks, or 7.67 marks per ton, the amount of metal contained in this quantity being 1,018 metric tons. In the other districts of Germany the amount of copper ore mined was returned at 890,474 metric tons, the actual metal content of this being 25,619 metric tons. It

will be seen, therefore, that the production of copper in the Rhine province is relatively unimportant.

Lead occurs in many parts of the Schiefergebirge, generally together with zinc. It is found in considerable quantities with zinc in the Aachen district, and in the Bensberg-Bergisch-Gladbach district; also at Werlau, round Barmen, at Velbert, and at Lintorf and Selbeck (south of Mülheim-an-der-Ruhr).

The most important deposits historically, however, have been those south-west of Euskirchen on the Bleibach at Commern and Mechernich, where the ore is found in nodules of galena. It has now been nearly exhausted. As a whole, the Rhine province has probably about a quarter of the lead ore of Germany.

Manganese is found in small quantities on the Saar, in Schleiden *Kreis*, and at Münster am Stein (near Kreuznach); also in considerable quantity in the iron ore in the Lahn and Dill district (including the Wetzlar *Kreis*) and on the Sieg near Siegen.

Nickel also occurs in the Lahn and Dill iron district (including Wetzlar), and was extensively mined in the middle of the nineteenth century.

Silver is found, usually in association with lead, in many parts of the province, but nowhere in considerable quantities.

Zinc occurs in many parts of the Schiefergebirge. The most important deposits are near Aachen and at Bensberg. Near Aachen there are rich deposits of calamine at Schmalgraf and at Lontzen, which lie in the angle south of the neutral territory of Moresnet. The deposits extend into Belgium (at Bleiberg and Welkenraedt) and the neutral territory (at the Vieille Montagne or Altenberg mine). They are the cause of the international importance of the territory. To the east of Aachen there are also extensive deposits at the Diepenlinchen mine, south-east of Stolberg.

The chief remaining deposits are in the neighbourhood of Bensberg and Bergisch-Gladbach, about 12 miles east of Cologne. There are also deposits worthy of mention at Werlau (near St. Goar), at St. Johann and Virneburg (both near Mayen), and near Barmen and Velbert (south of the Ruhr).

The deposits in the Rhineland as a whole do not compare in importance with those of Upper Silesia, but are probably larger than those of all the rest of the country, apart from Silesia. The Aachen district, including the Belgian mines, is one of the most important zinc-mining areas in the world.

(d) *Miscellaneous Minerals*

Brine and mineral springs, especially the latter (with a small proportion of salt), occur in very large numbers in the Schiefergebirge, over 500 springs having been counted in one *Kreis* alone (Daun). There are three principal districts :

(1) The Ahr-Maifeld district, especially the Ahr valley, with Neuenahr and the Apollinaris spring, the Brohl valley, and Bad Bertrich on the Üss.

(2) The Central Eifel, especially *Kreis* Daun, with the watering-places of Daun and Gerolstein.

(3) The Hunsrück, which continues to the west the line of springs in the Taunus ; those of Kreuznach are noteworthy.

There are isolated groups of springs in other districts, the Schwertbadquelle near Aachen being remarkable as the warmest in Germany, with a temperature of 163° F. (73° C.).

Potash salts occur at places in the *rock-salt*, which exists in abundance above the coal-measures in the northern part of the North Krefeld and Rhenish-Westphalian fields round Wesel, and has been found to be over 900 ft. thick at Menzelen (south-west of Wesel).

Sulphur is found in small quantities in Prussia, Bavaria, and Saxony, but the Bavarian and Saxon supply is insignificant. Three firms in Prussia mine sulphurous ores in addition to others, and an unnamed proportion, probably not more than half the total quantity, is mined in the western provinces. The sulphur-containing ore produced in Prussia amounted in 1913 to 263,229 metric tons, yielding about 94,500 tons of crude sulphur, valued at 2,103,000 marks. Bavaria and Saxony produced only 875 tons of crude sulphur, valued at 70,000 marks. The amount and value of the sulphuric acid produced in western Germany in 1911 were as follow :

	<i>Works. employed.</i>	<i>Men</i>	<i>Quantity</i> <i>(Metric tons).</i>	<i>Value</i> <i>(Marks).</i>
Rhineland and Hesse-Nassau	22	1,549	461,420	15,401,000
Baden, Hesse, and Alsace-Lorraine	10	274	131,194	4,285,000
German Empire	112	6,529	1,500,230	50,434,000

(e) *Building Materials*

The district of Mayen, especially the Pellenz depression, is rich in basalt, lava, and tufa. The Siebengebirge are also largely basalt. Slate suitable for roofing exists in large quantities along the Hunsrück ridge from Saarburg to Caub, and also in the Mayen district. Clay suitable for brick-making is found, especially round Cologne. Pottery clay is found in the Pellenz, at Siegburg, and east of Neuwied (mainly outside the province, in the Westerwald). It is also usually found with brown coal (see p. 57), and in the Carboniferous strata on the Saar.

(5) MANUFACTURES

(a) *Iron and Steel Industries*

Iron and Steel.—Of the 338 blast furnaces in Germany in 1913, 76 were in the Rhine province, chiefly in the Ruhrort, Duisburg, and Essen districts. The

following list shows the situation of the works and the amount of pig-iron each produced in that year. The first seven works produced approximately 4,750,000 metric tons of pig-iron, or one-quarter of the whole German output.

<i>Place.</i>	<i>Works.</i>	<i>Number of Blast Furnaces.</i>	<i>Metric tons of Pig-iron produced in 1913.</i>
Rheinhausen . . .	Fried. Krupp . . .	9	1,000,000
Hochfeld-Duisburg . . .	Eisenwerk Kraft . . .	4	300,000
" " . . .	Duisburger Kupferhütte . . .	6	450,000
Meiderich, near Ruhrort . . .	Rheinische Stahlwerke . . .	5	700,000
Laar, near Ruhrort . . .	Phoenix Company . . .	21	1,300,000
Bruckhausen . . .	Thyssen Gewerkschaft Deutscher Kaiser . . .	6	600,000
Meiderich . . .	Hüttenbetrieb Company . . .	5	400,000
Neuwied . . .	Fried. Krupp Hermanns- hütte . . .	4	—
Oberhausen . . .	Gutehoffnungshütte . . .	11	900,000
Neunkirchen, Saar . . .	Stumm Bros. . .	5	—

The steel furnaces are chiefly in the Düsseldorf, Essen, Ruhrort, and Duisburg districts. In 1912 Krupp had 55 furnaces at Essen, and 11 at Rheinhausen, while a large works at Rothe Erde near Aachen had 13. Of the 605 steel furnaces in Germany, 187 are in the Rhine province. Electric steel is made chiefly at Remscheid and Bruckhausen. Of the 31 electric furnaces in Germany, 11 are in the Rhine province.

Puddled iron is made at Düsseldorf, Cologne, and Trier. Of the 378 furnaces in Germany 124 are in the Rhine province, 61 of them being at Düsseldorf.

Rolling mills are chiefly at Düsseldorf, Cologne, and Mülheim. Of the 46 rolling mills in Germany, 12 are in the Rhine province. Tube making is largely centred at Düsseldorf, where there are six works, including the great Mannesmann factory.

Locomotives, Machinery, &c.—Amongst the heavy construction works and industries of the province the manufacture of locomotives and railway rolling stock

in general takes a prominent place, particularly in the Düsseldorf district. Machines and machine tools of every kind are made in great quantities in the Essen, Duisburg, and Düsseldorf districts, where some of the best organized and equipped works of the kind in Germany are to be found. In 1912 Düsseldorf had at least 100 works making machines, steam boilers, tools, and steel castings; Cologne had 47 machinery and tool manufacturers; Essen (apart from Krupp's ordnance works) had 16 machinery and tool manufacturers; Remscheid had 693 machine shops specializing in cutlery, saws, screws, and files; Ohligs had 127 factories, and specialized in cutlery, razors, and scissors; Solingen had 381 factories making cutlery, corkscrews, razors, knives, and scissors; Aachen had 42 machinery manufacturers, some of whom specialized in textile machinery and needle-making machinery, and it had also 36 needle manufacturers.

Unions and Syndicates.—Most of the principal German steel-works are syndicated for the sale of their products in an organization known as the Stahlwerks-Verband, or Steel Works Union, whose head-quarters are at Düsseldorf. The collective tonnage allotted to the members of the Union in 1912 was 6,602,479 tons, of which 3,109,053 tons were allotted to firms in the Rhine province. The four largest works—the Deutscher Kaiser, Phoenix, Krupp, and Burbach-Düdelingen—had allotted to them 455,000, 460,454, 585,827, and 583,974 tons respectively.

There is also a Wire Rod Syndicate. Each constituent has one vote per 1,000 tons of ordinary wire rods and one vote per 7,000 tons of wire. The total tonnage allotted to the members up to 1912 was 1,094,435 tons, of which 497,659 tons were allotted to firms in the Rhine province, the largest allotment to a single firm in that province being 85,243 tons.

An important feature of the iron and steel industries of the Rhenish-Westphalian area is the large extent to which the principle of combination of works has been carried. All the great smelting, rolling, and tube-making companies own or have interests in subsidiary companies engaged in the same industry or in iron and coal mining. Thus the great firm of Krupp combines coal-mines, blast furnaces, steel-works, engineering and armament works, and a Rhine shipping service. The Mannesmann Tube Works Company of Düsseldorf (capital 61,000,000 marks), besides being associated with many iron and steel works in Germany, owns the Queen Elizabeth coal-mine in Essen-Ruhr, and has allied or dependent companies in Austria, England, and Italy; the Phoenix Company of Laar (Ruhrort) (capital and debentures 140,500,000 marks), in addition to its works at Düsseldorf and in Westphalia, possesses a coal-mine at Meiderich; the Gutehoffnungshütte of Oberhausen (capital 30,000,000 marks) has coal-mines in Oberhausen, iron and coal mines in Rellinghausen, and ironstone mines in Lorraine and Luxemburg.

(b) Textile Industry

The principal centres of the cotton trade in the province are München-Gladbach, Barmen, Elberfeld, and Rheydt, but a certain amount of cotton goods is also produced at Krefeld. Barmen specializes in haberdashery (braids, galloons, trimmings, ribbons, tapes, webbings, &c.). The chief centre of the woollen trade is Aachen.

For the compilation of statistics relating to the textile industry, Germany is divided into fifteen industrial districts. Of these the Rhenish-Westphalian district consists of the Rhine province and Westphalia, most of the factories being in the north-east of the former and the west of the latter. In 1912 the total

number of cotton spindles in this area was 2,000,000, as compared with 10,500,000 in the whole Empire.

The silk industry also flourishes in the Rhine province, especially at Krefeld, which before the war produced half the silk manufactures of Germany. In 1910 there were at Krefeld 103 factories engaged in the manufacture of silks and velvets. There were also several printing, dyeing, and finishing works in the neighbourhood. In the year before the war, it is estimated that Krefeld produced silk to the value of 200,000,000 marks. Elberfeld also produces silks and velvets on a small scale.

The following figures, in millions of marks, show the production of textiles in Germany in 1913 :

	<i>Raw material imported.</i>	<i>Manufactured products.</i>
Cotton	692.1	2,200
Wool	376.2	1,000
Semi-woollen fabrics	} 179.6	{ 400
Silk		{ 428
Artificial silk		{ 28
Linen	81.5	230
Jute	90.7	150
Total	1,420.1	4,436

The total output of the textile industry in the Rhenish-Westphalian area had a value of nearly 900,000,000 marks ; and of this the Rhine province probably produced about half. It is, however, known that between 1915 and 1917 it became necessary to close down many of the cotton mills in western Germany, in order that the labour which they were nominally employing might be set free for war work. Owing to the shortage of raw material, the difficulty of getting new machinery, and other obstacles, many of the mills were working half time, and some only two days a week. Under the supervision of the Government a scheme was carried into effect whereby the industry

was gradually confined to a few firms working full time. It may be assumed, however, that normal conditions could rapidly be restored.

Like so many others, the textile industry has been forced by the blockade to depend largely on substitutes. Some progress was made in extracting 'cotton' fibre from nettles, a process which was first applied in Austria; and in the latter part of 1916 many firms throughout Germany were using paper yarns instead of textiles of jute and cotton for manufacture, in the absence of the customary raw materials. Indeed, textile experts in Germany have declared that the jute industry in particular is now so well organized on a paper-yarn basis that the raw materials formerly required will be dispensed with even in times of peace. On the other hand, from such evidence as is available, it is clear that the substitutes now so freely used are not strong, and entirely lack the wearing qualities of goods made from the usual materials.

(c) *Chemical Industry*

In 1913 the number of chemical factories in the German Empire was given as being over 10,000, with a total capital of 560,000,000 marks. The employees numbered 180,000; and it was estimated that 60 per cent. of these men were employed in the Rhine basin between Essen and Ludwigshafen, where some of the largest chemical works in Germany are established. The great works of the Badische Anilin- und Soda-Fabrik are outside the scope of the present report, but at Leverkusen, near Cologne, are the factories of Friedrich Bayer's Successors, the inventor of artificial indigo. In 1913 this establishment employed the services of 8,000 workmen, 1,700 technical experts, 300 experimental chemists, 70 engineers, and 8 doctors. The firm has also works at Elberfeld, and the chemical

industry is further represented on a small scale at Duisburg, Cologne, and Düsseldorf. The great chemical firms of Germany paid an average dividend of 14.3 per cent. in 1913.

Although the actual manufacture is carried on in the Rhine basin, the raw material comes chiefly from other parts of Germany and from abroad. Potash, which is an essential element in Germany's chemical products, especially in the manufacture of synthetic dyes, is found in the neighbourhood of Stassfurt (Prussian Saxony) and in Upper Alsace¹; and it is largely her command of potash which has enabled Germany's chemical industry to become so powerful. Thanks to the experiments made in the Bayer and Badische factories, the character of the dyeing industry has been completely changed within the last twenty years. Vegetable dyes have been replaced by dyes made from coal tar; and the Bayer artificial indigo has driven the natural Indian indigo from many markets. Further, artificial musk has been made at Mülhausen for many years; natural vanilla is being supplanted by chemical vanilline; and synthetic camphor is taking the place of Japanese camphor. The effect of the manufacture of artificial indigo on the Indian trade with Great Britain is shown by the following figures:

<i>Year.</i>	<i>Acreage under indigo in India.</i>	<i>Value of indigo exported to Great Britain. £</i>
1896	1,569,869	1,533,722
1901	977,349	788,820
1906	400,552	151,297
1913	172,600	48,208

With these figures may be compared the following table, showing the value of the natural indigo imported

¹ Cf. *Alsace-Lorraine*, No. 30 in this series, pp. 96-97.

by Germany, almost exclusively from India, and the value of the artificial indigo exported :

Year.	<i>Natural indigo</i>	<i>Artificial indigo</i>
	<i>imported by Germany.</i>	<i>exported.</i>
	£	£
1896	1,055,000	320,000
1900	205,000	465,000
1904	67,000	1,083,000
1907	54,000	2,129,000
1913	19,450	2,666,150

On the other hand, those branches of the German chemical industry which needed raw materials other than potash were largely dependent upon imports. Nitrates in particular had to be imported from South America. Indeed, before the war, Germany's chemical exports were balanced by imports to the extent of about one-half. Thus in 1911 and 1913 her imports of chemical and pharmaceutical products were valued at £20,832,000 and £21,519,200, while her exports for the same years were valued at £42,132,000 and £47,820,700. The stimulus given to the chemical industry by the use of poison gas, &c., led in 1915 to the establishment of sixty-five new and apparently not very important chemical undertakings; but certain branches of this industry have suffered severely from the lack of oils, fats, and other raw materials. When the blockade put a stop to the importation of raw materials from South America, experiments were made with the object of winning nitrates from the atmosphere; and these experiments, though expensive, are asserted to have been, on the whole, successful.¹ There is reason to believe that the German chemical firms had accumulated very large stocks of nitrate before the war; but, even so, the industry could not have been continued with regularity for over three years unless alternative sources had been found.

¹ The use of atmospheric nitrogen to manufacture fertilizers was of course well established some years before the war.

(d) Miscellaneous Industries

Among the other important industries of the province are *paper-making*, which is carried on at Düren on a large scale, and to a smaller extent at Cologne, Barmen, Elberfeld, and Düsseldorf; *dyeing*, which is represented at most of the textile centres, Barmen, for instance, specializing in Turkey-red; the *clothing* manufacture at Cologne, Krefeld, Elberfeld, Duisburg, Essen, München-Gladbach, and Aachen; *pianoforte* and *furniture* manufacture at Cologne, Trier, and Coblenz; *tanning* and the production of *leather goods* at Coblenz, Kreuznach, Trier, and Jülich; *glass-blowing* at Düsseldorf and Mülheim-an-der-Ruhr; and the production of *Portland cement*, *bricks*, and *beer*.

(6) POWER

Water-power.—The streams of the province are much used for the supply of power, especially for corn mills. There are now many companies and associations of landowners which by arrangement have the right to use the local water-power for grinding on certain days, while on other days the water is used for irrigation. Water-wheels have been largely replaced by turbines, all of which, by the Water Law of 1913, are under State control. Both the Ruhr and the Wupper valleys have a large number of water-driven mills, and the Wupper is said to be Germany's busiest river. The water-power available in the province in 1914 was estimated as 1,054,624 horse-power, of which only 189,799 horse-power was used for full time, the rest being idle for nine months in the year. Great damage, such as that done in the valleys of the Ahr and of the Sieg and Wied in 1909 and 1910 respectively, may be expected to recur about every twenty years unless unified control is established over the streams by

means of barrages, which would serve both for the protection of the land and for the utilization of water for irrigation purposes.

Several towns have constructed barrages in the hill country for the purpose of domestic water-supply combined with the generation of electric current for industry.

Water-power is most used in the Hohe Venn and the Rhenish-Westphalian districts, where the rainfall is highest. In the western or Hohe Venn district the chief source of power is the Urft valley reservoir, constructed in 1900-5, and holding 10,000,000,000 gallons. It provides water for the industrial town of Düren, and an annual supply of 37,400,000,000 gallons to the great electric power-station of Schwammenauel in the Roer valley. The eastern or Rhenish-Westphalian district was said in 1909 to contain twenty reservoirs of considerable size. In 1905 there were abstracted from the upper Ruhr 50,000,000,000 gallons, hardly any of which returned to the river; and the supply of water was found to be insufficient in summer for the lower mills. Since then additional reservoirs have been constructed to store water for the dry months. The largest reservoir in the district is that in the Möhne valley, with a capacity of 26,000,000,000 gallons. Others are those in the Lister, Ennepe, and Henne valleys, with capacities of 4,400,000,000, 2,420,000,000, and 2,200,000,000 gallons respectively.

Electric Power.—The production of electric power in large central works is carried on in the Rhine province on an extensive scale. The Rheinisch-Westfälisches Elektrizitätswerk of Essen is the most important of these undertakings. Originally founded twenty years ago to meet the needs of Essen only, it was gradually developed by two of the leading colliery proprietors of the district, who succeeded in acquiring

a number of other central stations until they were able to conclude contracts for the supply of light and power to about a hundred communes, large and small. The works are carried on in connexion with collieries owned or controlled by the directors of the company, the steam used in the working of the dynamos being produced by the use of inferior coal unfit for the market and of waste gases from the coke ovens. The city of Cologne obtains much of its electric current from a lignite mining company which operates on a smaller scale on the same lines. It is noteworthy that the present tendency is for municipalities and local government authorities generally to participate as shareholders in these central power works, the promoters of which, recognizing the hostility of public opinion and the Government to private monopolies, are usually ready and even eager to gain their support in this way. Both in the Rhine province and Westphalia a beginning has been successfully made with the supply of colliery gas in bulk to municipal bodies for distribution in their administrative areas.

It is worthy of note that in some towns, such as Elberfeld, Krefeld, Solingen, and Remscheid, the municipal authorities supply electric power to home industries and small workshops.

(C) COMMERCE

(1) *Principal Commercial Centres*

The industrial enterprise of the Rhine province has been broadly surveyed in the previous section. The following is a list of the principal commercial centres with their staple trades :

Aachen (Aix-la-Chapelle).—Close to the Belgian frontier, 44 miles west-south-west of Cologne. Population in 1910, 156,143. Aachen is the chief junction of the

Belgian and Prussian State railways, and consequently a great distributing centre. It manufactures cloth, linen, gloves, leather, chemicals, paints, stoneware, and needles, and is celebrated for its mineral springs.

Barmen.—Elberfeld (q. v.) and Barmen are virtually one town. The population of Barmen in 1910 was 169,214. It is a great centre of several branches of the textile industry.

Bonn.—On the left bank of the Rhine, 15 miles above Cologne. Population, 87,978. It has few manufactures, and derives its importance principally from its university.

Coblenz.—On the left bank of the Rhine at its junction with the Moselle. Population, 56,487. It is the administrative capital of the province. Its chief product is sparkling wine, but it also manufactures pianos and paper goods, and has a large trade by water and rail.

Cologne (Köln).—On the left bank of the Rhine. Deutz, on the opposite bank, was formerly a separate town, but was incorporated with Cologne in 1888. The population was 516,527 in 1910 and has increased considerably since. The chief manufactures are eau-de-Cologne, sugar and sugar goods, chocolate and cocoa, tobacco, furniture, pianos, chemicals, and machinery.

Krefeld.—Twelve miles north-west of Düsseldorf. Population, 129,406. It manufactures silks and velvets on a very large scale.

Duisburg-Ruhrort.—Duisburg is on the left bank of the Ruhr, and Ruhrort on the right bank at its confluence with the Rhine. The towns were united in 1905. Population, 229,483. The manufactures are tobacco, chemicals, dyes, machinery, and metal wares. Ruhrort has the largest river harbour on the Continent.

Düren.—On the Roer, eighteen miles east of Aachen. Population, about 35,000. Düren is chiefly noted for

its paper-mills, but also manufactures needles, nails, and felt.

Düsseldorf.—On the right bank of the Rhine, 21 miles north-west of Cologne. Population, 358,728. There are many large establishments turning out railway material, iron goods, and machinery.

Elberfeld.—On the Wupper. With Barmen (q.v.), which it adjoins, it is one of the greatest seats of manufacturing industry in the world. Population, 170,195. The principal industries are cotton, wool, and silk weaving, dyeing, calico-printing, the manufacture of iron goods, machinery, and paper, and brewing.

Essen.—Near the Ruhr, in the midst of rich coal deposits. The population, 294,653 in 1910, recently approached half a million. It is chiefly famous for Krupp's works.

Kreuznach.—On the Nahe. Population, about 23,000. It manufactures vinegar, tobacco, leather, and chemicals, and has mineral springs of some repute.

Mülheim-an-der-Ruhr.—Population, 112,580. Mülheim is a very important manufacturing centre. Its principal industries are mining, iron-smelting, the manufacture of machinery, iron and steel goods, and leather, brewing, and distilling.

München-Gladbach.—Sixteen miles west of Düsseldorf. Population, 66,414. This is an important centre of the textile industry, especially of cotton spinning and weaving.

Neunkirchen.—In the south of the province. Population, about 35,000. It has important coal-mines and iron-works.

Neuss.—Four miles west of Düsseldorf, on a canal which joins the Rhine. Population, about 42,000. Its chief industries are iron-smelting, oil-refining, the manufacture of paper, and brewing.

Oberhausen.—Six miles north-east of Duisburg. Population, 89,900. The town has iron, steel, and

zinc works, and there are numerous coal-mines in the neighbourhood.

Remscheid.—Eighteen miles south-east of Düsseldorf. Population, 72,159. It manufactures large quantities of small iron and steel goods.

Rheydt.—Close to München-Gladbach. Population, about 46,000. The town is a centre of the cotton industry.

Saarbrücken.—On the Saar, in the extreme south of the province. Population, 105,089. It is the centre of the Saar coal district, and is chiefly interested in mining. There are iron and steel works of importance in the town, which is an important railway junction.

Solingen.—Fourteen miles south-east of Düsseldorf. Population, about 51,000. It is a most important centre of the manufacture of steel goods, especially cutlery and weapons.

Trier (Trèves).—On the right bank of the Moselle, 57 miles south-west of Coblenz. Population, about 50,000. The town has iron-foundries and tanneries, and manufactures dyes and furniture.

(2) *Organizations to promote Industry and Commerce*

Chambers of Commerce.—Commercial and industrial enterprise is assisted in many ways by the Chambers of Commerce, which are found in all towns of importance. These organizations are statutory, though independent of the Government. A Chamber of Commerce is elected by the whole of the registered trading firms in the district assigned to it as its field of operations, and its funds are as a rule derived from a small tax upon these firms, taking the form of a percentage of the local trade or occupation tax. The presidency is usually held in turn by the leading members of the industrial and mercantile community. The Chamber has an executive and committees which meet periodically, but most of its practical work is done by per-

manent officials, chosen for their special knowledge, and the service of these organizations offers to able men a by no means unattractive career. Owing to their close contact with commerce and industry the Chambers of Commerce are able to give valuable advice and assistance to the Government when occasion arises, and the Government in return attaches great importance to them.

Private Organizations.—The most important private organizations for the furtherance of the interests of industry are the Federation of Industrialists (*Bund der Industriellen*) and the Central Federation of German Industrialists (*Centralverband deutscher Industrieller*). Although these are national organizations, their principal support comes from the Rhenish-Westphalian industrial district, where they have agencies. During the war the federations formed themselves into a War Committee of German Industry (*Kriegsausschuss der deutschen Industrie*). The objects of this committee were : (a) to distribute clerks and workmen where they were required in industry and agriculture ; (b) to give assistance and employment to industries injured by the war through the agency of the industries which were particularly busy ; (c) to circulate as quickly as possible information regarding tenders asked for by the Government ; and (d) to give advice and information on all administrative and legal problems arising out of the war.

In the larger towns the leading industries and trades usually have supplementary associations for the promotion and representation of their special interests, while the colliery, iron and steel, textile, chemical, and other staple industries have in addition powerful district or national unions. Thus Düsseldorf is the seat both of the Steel Works Union and of the Westphalian Pig-iron and Coal Syndicates.

Nevertheless, the great industrial firms of Germany rely less upon their trade organizations for the extension of their foreign business than upon their own efforts. Undertakings like Krupp's, the Allgemeine Elektrizitäts-Gesellschaft, and the Badische Anilin- und Soda-Fabrik have always preferred to establish branches in important foreign cities, and to appoint their own agents in places of less note. During the war, however, new associations have been formed to develop German trade in the Near East and other parts of the world.

Chemical Research.—The fourth (and largest) section of the German professional association of chemical industries has its seat at Cologne. The administrative board is composed of a chemist, an engineer, and a business man. In 1913 at least 300 research chemists were at work there; and many important discoveries have originated in these laboratories. Many of the chemists, when they have finished their course, become commercial travellers; and their technical knowledge is of the utmost advantage to them when they are pushing Germany's chemical wares in foreign countries.

(3) *Foreign Interests*

It has been estimated that the total amount of British capital invested in Germany at the outbreak of the war was £200,000,000; and a British Consular Report for 1913 suggested that a certain amount of French capital had found its way into Germany as a result of the financial difficulties felt early in that year. The United States appears to have invested comparatively little money in Germany. Of the foreign capital in the country, little is likely to have been invested in the Rhine province. For the most part, the capital of the dominating industries of West Germany has been raised by the large German syndicated firms, aided by the banks.

(D) FINANCE

(1) *Public Finance*

The system of provincial taxation is closely connected with the State and communal systems, and in order to make it clear brief reference must be made to the Prussian organization of self-government. The units of administration are the provinces, Government districts (*Regierungsbezirke*), the *Kreise* (urban and rural), and the communes (urban and rural), including in the latter case the autonomous manors. The whole of the *Kreise* of a province and the parishes comprised in them form the Provincial Union (*Verband*), which exercises corporate rights. It is to be noted that towns with a population varying from 25,000 to 40,000, according to the province, may be constituted urban *Kreise*, with the result that they are detached for administrative purposes from the rural *Kreise* to which they would otherwise belong.

Both communes and *Kreise* are empowered to meet their expenditure by levying 'dues and contributions, indirect and direct taxes'; but taxes may be levied only when other sources of revenue, including the proceeds of communal or *Kreis* estate, undertakings, and the like, are exhausted; and direct taxes must be resorted to last. The provinces may levy dues, contributions, and direct taxes, but not indirect taxes.

The direct taxes referred to above are those on real estate (land and buildings), income, and trade or occupation; while the indirect taxes include those on amusements, dogs, the transfer and the increased value of real estate, certain consumption taxes, now very limited in range, and licences for the sale of alcoholic liquors.

The direct taxes are levied upon assessments made by the State, and form a percentage of these, which

may vary from year to year. The provinces do not collect these taxes directly from the taxpayer, but issue precepts upon the *Kreise* according to a given apportionment, appeal against which is permissible, and the *Kreise* in turn issue precepts for the taxes together with the taxes required for their own purposes upon the various communes and manors.

In 1912 the Provincial Union of the Rhine province levied for its own purposes 14 per cent. of the direct taxes as assessed by the State, yielding 13,314,524 marks, equal to 1.81 marks per head of the population. The Union had in 1913 long-term loans outstanding to the amount of 44,433,157 marks, equal to 6.03 marks per head of the population. The State grants certain subsidies to the various provincial authorities, but the aggregate amount is not large. The principal contribution is a fixed payment 'for the purposes of self-government' of 47,560,000 marks, which is for the most part distributed amongst the *Kreise*, but there are also grants in aid of roads, land reclamation, &c. It is impossible to state the amount of these State grants-in-aid made to the Rhine province.

The direct taxes paid for local purposes in the towns of the province for the year 1912-13 amounted to 34.31 marks per head of their populations, and the indirect taxes to an average of 3.93 marks per head; while the standing debts of the towns were 290.32 marks per head. The corresponding taxation for the rural communes with more than 10,000 inhabitants was 27 and 2.10 marks respectively, while the outstanding debts amounted to 90.20 marks per head. The corresponding taxation for the rural *Kreise* was 2.10 and 0.36 marks respectively, and the standing debt was 26.25 marks per head.

It may be noted that the communal income-tax is particularly high in the western provinces. In 1913

all but four of the 134 towns of the Rhine province levied a local income-tax in excess of the State levy, while 41 towns levied over 200 per cent. of the State tax.

(2) *Banking Facilities*

Apart from the great multiple banks with branches throughout the Empire, there are in Rhenish Prussia 27 incorporated banks with a share capital varying from 200,000 marks to 145,000,000 marks. Their total capital amounts to 332,205,942 marks, and their total reserves to 66,910,661 marks, making together 399,116,603 marks.

German banking has latterly shown a distinct tendency to become concentrated in Berlin; and in consequence the local banks are becoming increasingly dependent upon the Berlin banks, even when they are not altogether under their control. For example, the parent house of the Rothschild family, established in Frankfurt-am-Main in 1780, was taken over in 1904 by the Disconto-Gesellschaft, which was founded in Berlin so recently as 1870. The Disconto-Gesellschaft further controls the Barmen Bankverein in Barmen and several other banking institutions in the west. The Deutsche Bank, also founded in 1870, mainly with the aim of promoting German trade abroad, controls the Bergisch-Märkische Bank of Elberfeld and the Essener Credit-Anstalt of Essen. The Dresdner Bank, founded in 1872 at Dresden, but with its head office now transferred to Berlin, controls the Mülheimer Bank, Mülheim. Examples might be multiplied. Apart from banks which under local names are directed from Berlin, the large Berlin banks have branches in all the important towns in the western provinces. From this it follows that an account of present-day banking in the west would resolve itself into an account of banking in the capital of the Empire.

While the local banking is thus largely controlled by Berlin firms, these firms themselves are subject to the general control of the Reichsbank, which is under the direct influence of the Government. The close co-ordination already existing between the Reichsbank and the other banking institutions of Germany has become intensified during the war in consequence of the methods employed to finance the imperial loans.

Apart from the banks properly so called, which, it should be borne in mind, have a wider range of interests than English banks, the Rhine province, like the rest of the Empire, enjoys the advantage of land, land-improvement, and mortgage banks of various kinds, which are as a rule under the supervision either of the Government or the provincial authorities. The land-improvement banks, which are specially encouraged by the provincial government, are intended to facilitate the amelioration of the soil, irrigation, forest cultivation, the improvement of waterways, and the like. The agricultural credit banks have already been dealt with under agriculture (see p. 47).

In 1912 the province possessed 219 public and 45 private savings banks, together with 1,055 deposit agencies, and 2,236,585 bank books were in the hands of depositors, while the aggregate deposits at the end of the year were 2,560,640,000 marks, giving an average of 350 marks per head of the population, as compared with an average of 300 marks for the whole empire.

AUTHORITIES

HISTORICAL

Besides general histories, the following books may be referred to :

- BINTERIM, A. J., and H. MOOREN. *Die Erzdiözese Köln bis zur französischen Staatsumwälzung*. 2 Bde. Düsseldorf, 1892-3.
- CHAR, F. C. *Geschichte des Herzogtums Kleve*. Kleve und Leipzig, 1845.
- ENNEN, L., and G. CEKERTZ. *Quellen zur Geschichte der Stadt Köln*. Köln und Neuss, 1863-80.
- FISHER, H. A. L. *Napoleonic Statesmanship: Germany*. London, 1903.
- HASHAGEN, J. *Das Rheinland und die französische Herrschaft*. Bonn, 1908.
- KORTH, L. *Köln im Mittelalter*. Köln, 1890.
- PERTHES, C. T. *Politische Zustände und Personen zur Zeit der französischen Herrschaft*. Bd. i. Gotha, 1862.
- RITTER, M. *Sachsen und der Jülicher Erbfolgestreit (1483-1610)*. München, 1873.
- ROVÈRE, J. *Les Survivances françaises dans l'Allemagne napoléonienne (1815-1914)*. Paris, 1918.
- SCHOLTEN, R. *Zur Geschichte der Stadt Kleve, 1879-81*. Kleve, 1905.

ECONOMIC

- ANSCHÜTZ, DR. GERHARD, and DR. FRANZ DOCHOW. *Die Organisationsgesetze der inneren Verwaltung in Preussen*. Berlin, 1908.
- DAWSON, W. H. *Industrial Germany*. London, 1913.
- *Municipal Life and Government in Germany*. London, 1914.
- HEINRICH FERDINAND, ARCHDUKE. *Die Wasserstrassen Mitteleuropas*. Vienna, 1917.
- Kanäle der Zukunft* (Schriften des Hansa-Bundes, vol. vii). Berlin, 1917.

LINDLEY, W. H. *Report and Evidence of the Royal Commission on Canals.* Vol. xiii. London, 1909.

Meyer's Konversations-Lexikon.

SALING, A. *Handbuch der deutschen Aktien-Gesellschaften,* 1913-14.

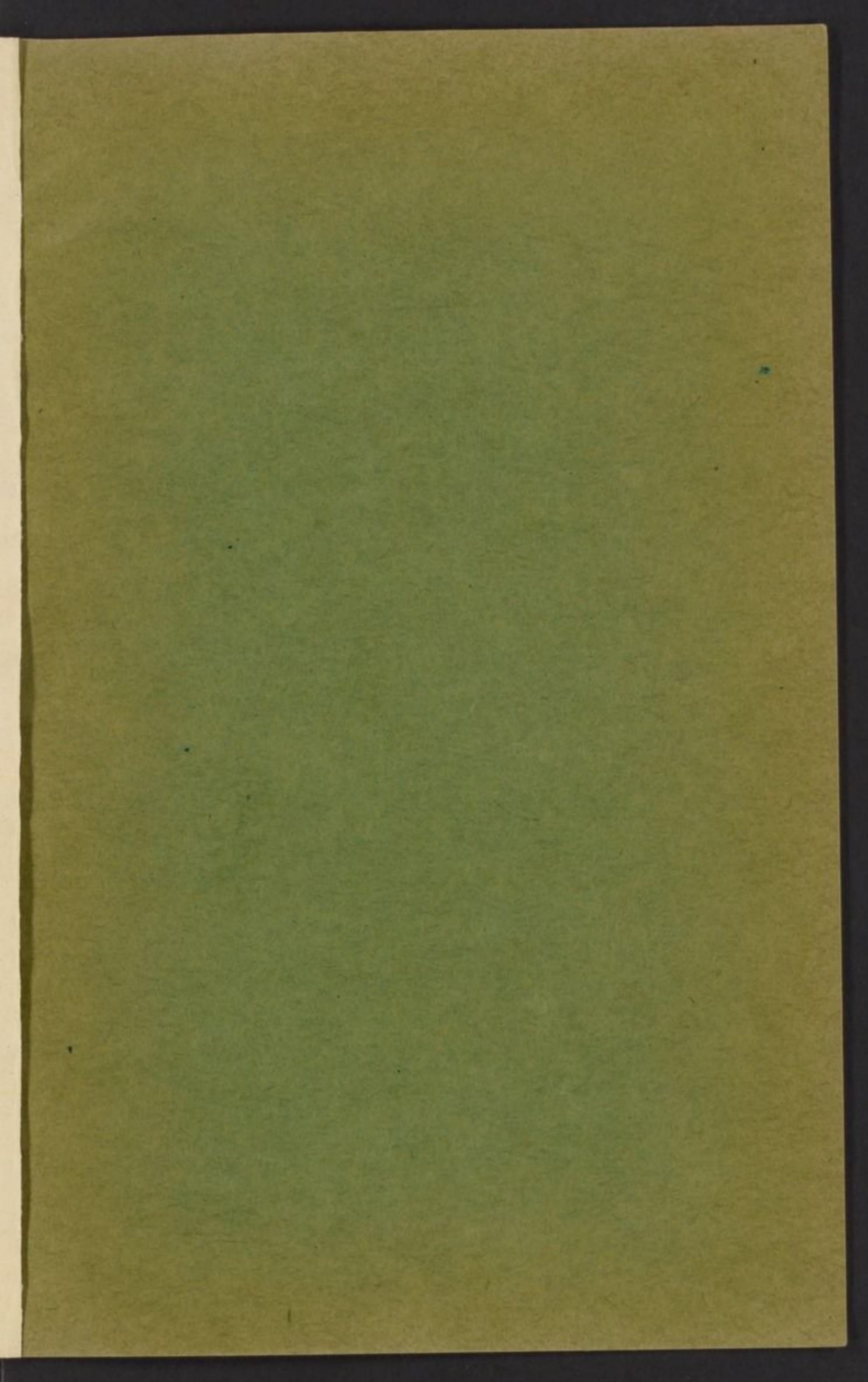
Statistisches Jahrbuch für das Deutsche Reich, 1912-14.

Statistisches Jahrbuch für den preussischen Staat, 1912-14.

TEUBERT, OSKAR. *Die Binnenschifffahrt.* Bd. i. Leipzig, 1912.

MAPS

A special sketch-map of 'Rhenish Prussia' (G.S. G.S. No. 2919) has been issued by the War Office (March 1919), on the scale of 1 : 1,000,000.



LONDON :

PUBLISHED BY H. M. STATIONERY OFFICE.

To be purchased through any Bookseller, or directly from
H. M. STATIONERY OFFICE at the following addresses :—

IMPERIAL HOUSE, KINGSWAY, LONDON, W.C. 2, and

28 ABINGDON STREET, LONDON, S.W. 1 ;

37 PETER STREET, MANCHESTER ;

1 ST. ANDREW'S CRESCENT, CARDIFF ;

23 FORTH STREET, EDINBURGH ;

or from E. PONSONBY, LTD., 116 GRAFTON STREET, DUBLIN.

1920.

Price 2/- net.