ECONOMIC, FINANCIAL AND TRANSIT DEPARTMENT

AGRICULTURAL PRODUCTION IN CONTINENTAL EUROPE

DURING THE 1914-18 WAR AND THE RECONSTRUCTION PERIOD

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TABLE OF CONTENTS

PREFACE

This volume is historical in form and practical in purpose.

After the last war it was widely believed that European agriculture would recover rapidly and that relief on any considerable scale would be required only to bridge the gap between the Armistice in November, 1918, and the summer harvest of 1919. In fact, as is shown in the following pages, cereal production was not restored to its prewar level until 1925, seven years after the Armistice. Will it take seven years after this war to restore agricultural efficiency?

No one can answer that question with assurance. But the fact that the question presents itself must affect policies of relief and reconstruction. An attempt is made here to examine the causes of the decline in production during the war and of the slowness of the recovery. Most of those causes, labour shortage, shortage of fertilizers and feeding stuffs, of implements and draught animals, and finally soil exhaustion, are at play again today. They will give rise to a problem of reconstruction and as has been shown in a companion study—*Europe's Overseas Needs, 1919-1920, and How They Were Met*—no collective effort to face the problem of reconstruction was made after the last war.

The conclusions reached in this volume (pages 52-55) are necessarily tentative and provisional. To aid others to draw their own conclusions, a series of maps are appended which show changes in area, production and yield for cereals and in livestock population in the various regions of Continental Europe.

One fact which these maps illustrate with striking clarity is that recovery was not slower in the battle areas than elsewhere. Soil exhaustion, lack of labour, and lack of capital to make good wear and tear or to finance the purchase of fertilizers, the best seed corn, etc., retarded recovery more than did the entrenchment of armies and the havoc wrought by war.

A. LOVEDAY,
Director of the Economic, Financial and Transit Department

League of Nations
September, 1943.

PART I. DATA.

Purpose of Study and Scope of Data.

1. The purposes of this study are:

(I) To bring together in convenient form the existing data on production, trade and consumption of major foodstuffs in the regions most affected by the first World War, for the War period and the early post-war period.

(II) To consider in the light of these data:

a) The causes of the decline in production in Continental Europe between 1913 and 1919.

b) The factors retarding agricultural recovery after the War.

c) The effect of the War on European imports of cereals in the early post-war period.

Figures for the whole of the inter-war period are given for purposes of comparison and to indicate the general trend.

2. Ideally it would be desirable to construct an index of agricultural production covering all the products of the land, including livestock products, fruit, and vegetables, as well as the staple cereals. Unfortunately, the statistical material is inadequate for this purpose. Figures for livestock products, fruit, and vegetables, except potatoes, are not available for all the countries of Europe. Consequently, an index which is to cover the whole of Europe must be confined to the main cereals (wheat, rye, oats, barley, maize) and potatoes. Such an index, owing chiefly to the omission of animal products, cannot claim to be representative of total food production and even less of agricultural output as a whole over long periods. During the last War, however, according to data available for seven representative countries on the European Continent, the output of milk (which is a rough index of dairy production) declined in approximately the same proportion as cereals and potato production. Though for that period, so far as Continental Europe is concerned, the cereal-potato index might therefore be assumed to reflect closely enough the decline in food production as a whole, it cannot be assumed to be equally representative during the subsequent recovery period when animal production was rapidly increasing, largely on the basis of feed imports from overseas. For, as will be shown later, the reduction in bovine population was not large and, when feeding stuffs became available, the yield of milk, meat, etc., rose automatically, while the pig population, heavily reduced during the war, could be rapidly reconstituted owing to its high natural fertility. In spite of its limitations, however, the cereal-potato index provides a useful basis from which to begin discussion.

3. In calculating the index, all of the five cereals have, for reasons of convenience, been given equal weight, the inaccuracies involved by this procedure being

comparatively small. A more refined weighting is indeed unnecessary when aggregating products as homogeneous as cereals, the more so as the crop figures are necessarily of the nature of estimates. In adding potatoes to the cereals, a rough equivalence in terms of calorie value has been adopted, potatoes being given one-fourth the weight of cereals.[1]

4. In Appendix I the production, net imports or exports and resulting net supply of the five main cereals and of potatoes are tabulated for the following regions: (1) Continental Europe; (2) Russia (pre-war boundaries, including Siberia) or the U.S.S.R. (post-war boundaries); (3) the "British Isles"[2] (United Kingdom and Ireland); (4) North America (United States and Canada); (5) the "Southern Exporters" (Australia, New Zealand, South Africa, Argentine, and Uruguay). This study is principally concerned with conditions in Continental Europe, which has been subdivided into (1a) a Western[3] and (1b) an Eastern region because, normally, the former constitutes a deficit and the latter a surplus area for cereals. The data for regions (2) and (3) are given for purposes of comparison; regions (4) and (5) are considered only as sources from which Europe could cover her import requirements.

For the period of war and reconstruction with which we are primarily concerned, annual figures are given. Subsequent trends up to the outbreak of the present war are indicated by quinquennial averages. Averages for 1909-13 are employed throughout as a basis of comparison.

5. The shifts in productive "capacity" between Western and Eastern Continental Europe and Russia involved by the territorial changes after the war may be judged, so far as cereals and potatoes are concerned, from Table I below summarizing the more detailed data shown in Tables 1 (a), 1 (b) and 2 of Appendix I. In terms of pre-war figures, Western Continental Europe lost on balance 4% of its cereal-potato production and 1½% of its population.[4] Russia's production loss amounted to 15% and her population loss to 14%.[5] On the other hand, some 30% of the pre-war production and 26% of the pre-war population of the area comprised within the post-war boundaries of Eastern Continental Europe appertained to the territories added[6] to it as a result of the war. These changes must be taken into account when comparing pre-war and post-war production data for the regions concerned. The changes in territory scarcely affect the comparability of the pre-war and the post-war trade figures of Western Continental Europe. The trade data for Eastern Europe (and, hence, those for the Continent as a whole) are more affected, although the territories ceded by the U. S. S. R. would appear to have contributed comparatively little to Russia's pre-war export surplus of cereals and did not add very substantially to the capacity of Eastern Europe to export cereals.[7]

[1] Thus, in the tables showing absolute quantities of cereals and potatoes the original figures for the latter have been divided by 4 in order to arrive at homogeneous totals.
[2] This pre-war geographical denomination has been adopted for reasons of expediency.
[3] Continent west of the eastern borders of Sweden, Germany, Switzerland and Italy.
[4] Net "loss" of territory: 1% of pre-war total area.
[5] Net "loss" of territory; 2½% of pre-war total area.
[6] 25% of post-war area.
[7] The potato trade across the borders of the regions considered is, as a rule, relatively insignificant.

TABLE I.—SUMMARY COMPARISON OF PRODUCTION, NET IMPORTS OR EXPORTS AND SUPPLY OF CEREALS AND POTATOES IN CONTINENTAL EUROPE AND U.S.S.R.

Metric quintals (000,000's)

Products and Region	1909-13		1919-23	1925-29	1934-38
	Pre-War Boundaries	Post-War Boundaries			
CEREALS					
(i) Western Cont. Europe					
Production	677.3	648.5	509.5	622.3	656.4
Trade balance	+163.8	.	+136.3	+177.2	+104.9
Supply	841.1	.	645.8	799.5	761.3
(ii) Eastern Cont. Europe					
Production	340.0	481.3	364.8	479.0	536.4
Trade balance	-26.7	.	+3.1	-6.1	-20.3
Supply	313.3	.	367.9	472.9	516.1
(iii) Russia — U.S.S.R.					
Production	745.7	633.2	[2] 355.5	671.4	878.9
Trade balance	-105.3	.	[2] -2.9	-8.4	-12.0
Supply	640.4	.	[2] 352.6	663.0	866.9
Total: (i) + (ii) + (iii)					
Production	1,763.0	1,763.0	1,229.8	1,772.7	2,071.7
Trade balance	+31.8	.	+136.5	+162.7	+72.6
Supply	1,794.8	.	1,366.3	1,935.4	2,144.3
POTATOES[1]					
(i) Western Cont. Europe					
Production	183.0	166.0	134.5	173.8	207.3
(ii) Eastern Cont. Europe					
Production	46.5	100.5	94.4	116.0	150.5
(iii) Russia—U.S.S.R.					
Production	87.5	50.5	[2] 62.4	105.5	139.8
Total: (i) + (ii) + (iii)					
Production	317.0	317.0	291.3	395.3	497.6
CEREALS AND POTATOES					
(i) Western Cont. Europe					
Production	860.3	814.5	642.0	796.1	863.7
Trade balance	+163.3	.	+136.0	+176.4	+104.4
Supply	1,023.6	.	778.0	972.5	968.1
(ii) Eastern Cont. Europe					
Production	386.5	581.8	459.2	595.0	686.9
Trade balance	-26.4	.	+1.8	-6.3	-24.1
Supply	360.1	.	461.0	588.7	662.8
Continental Europe: (i)+(ii)					
Production	1,246.8	1,396.3	1,101.2	1,391.1	1,550.6
Trade balance	+136.9	.	+137.8	+170.1	+80.3
Supply	1,383.7	.	1,239.0	1,561.2	1,630.9
(iii) Russia—U.S.S.R.					
Production	833.2	683.7	[2] 417.9	776.9	1,018.7
Trade balance	-105.8	.	[2] -2.8	-8.4	-12.0
Supply	727.4	.	[2] 415.1	768.5	1,006.7
Total: (i) + (ii) + (iii)					
Production	2,080.0	2,080.0	1,519.1	2,168.0	2,569.3
Trade balance	+31.1	.	+135.0	+161.7	+68.3
Supply	2,111.1	.	1,654.1	2,329.7	2,637.6

[1] Potatoes counted in terms of cereals at average food value ratio of ⅛. International Trade in potatoes is insignificant (see details shown in Appendix I).

[2] Average for 1920-23; data for 1919 not available for U.S.S.R.

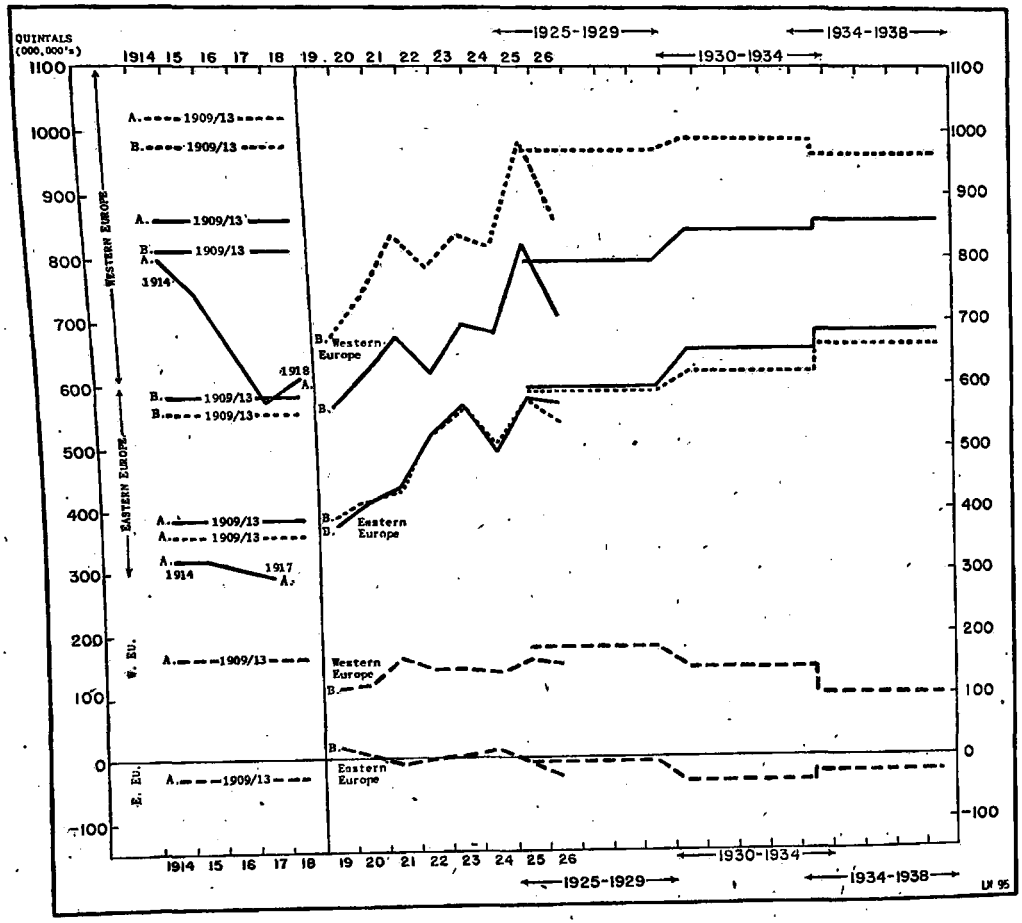
DIAGRAM 1.—PRODUCTION, NET IMPORTS OR EXPORTS, AND SUPPLY OF CEREALS AND POTATOES IN WESTERN AND IN EASTERN CONTINENTAL EUROPE.

A. Pre-war Boundaries B. Post-war Boundaries

Production ——————

Net Imports or Exports - - - - - - - - - -

Supply ....



6. The figures shown for Western and Eastern Continental Europe in Appendix I are plotted in Diagram 1. For the war-years adequate trade data are lacking for both regions, and production data for a number of the belligerent countries became increasingly scarce as the war progressed. Crop figures based in part on admittedly rough approximations are available, however, for all the war years for the Western region and up to 1917 for the Eastern region. As these estimates, apparently, did not always fully cover the invaded areas, the totals may be somewhat incomplete.

Similar reservations apply to the Russian figures for the war and early post-war years, while some statisticians maintain that the 1909-13 data would have been higher, had the same methods of estimating crops been employed then as have been employed since the middle of the 'twenties.

No such reservations need be made with reference to the data shown for the other regions covered in Appendix I. It should be recalled, however, that the changes in stocks concealed in the figures for net supply (production *minus* net exports or *plus* net imports) are proportionally larger in the case of North America and the Southern Exporters than in the case of Europe and the U. S. S. R. where the net supply figures, and especially the quinquennial averages, may be taken as roughly representative of consumption.[1]

CHANGES IN CEREAL AND POTATO PRODUCTION AND CONSUMPTION DURING THE WAR AND RECONSTRUCTION YEARS.

7. The data for *Continental Europe* suggest the following general conclusions regarding the changes in supply of the main vegetable foodstuffs during the period of war and reconstruction:

(i) By 1917, on the Continent as a whole, the production[2] of wheat, rye and maize had apparently shrunk to about 68% of the 1909-13 average. As the production of barley, oats and potatoes (the 1917 data for which are less complete) would appear to have shrunk somewhat less, the drop in the aggregate crops of cereals and potatoes was probably of the order of 30%.

(ii) The decline in crops was greater in the Western than in the Eastern part of the Continent, the intensive cultivation in Western Europe being more vulnerable to the fertilizer and man-power shortages caused by the war than was the more extensive cultivation in the East. By 1917 the output of cereals and potatoes combined had shrunk by roughly one-third in the Western region and, probably, by rather less than one-fourth in the Eastern region.[3] The 1918 cereal crop (consumed mainly after the Armistice) was better in Western Europe,[4] especially as regards wheat and rye, but the potato crop was poor.

(iii) As imports, which before the war covered nearly 20% of the cereal requirements of Western Continental Europe, were heavily reduced in the course

[1] In view of the interchangeability, in actual consumption, of food and fodder cereals and roots, no subdivision of these products according to use has been attempted in the present study.
[2] As estimated by the International Institute of Agriculture.
[3] The 1917 data for some crops in Eastern Europe are incomplete.
[4] Comprehensive data for Eastern Europe are lacking for 1918.

of the war, the decline in consumption was presumably somewhat greater in that region than the above-mentioned fall in production would seem to suggest. In Eastern Continental Europe, which before the war exported some 8%[1] of its cereal crops, consumption may have declined somewhat less than production since a smaller proportion of the crops was exported during the war.

(iv) The 1919 crops of cereals and potatoes on the Continent as a whole were 33% short of the pre-war average, even smaller, that is to say, than those of 1917. The decline was particularly marked, 37%, in the Eastern region (large tracts of which were theatres of continued warfare up to 1920), but this decline was partly offset by sizeable net imports taking the place of the previous net exports. In the Western region, on the other hand, where crops were 30% below the 1909-13 average, net imports were very considerably smaller than before the war. In both regions and, hence, in Continental Europe as a whole, the available supply of cereals and potatoes amounted to but little more than two-thirds of the pre-war average. Thus, despite relief deliveries from overseas (which are included in the import figures), there was a heavy drop in consumption.

(v) The production of the main vegetable foodstuffs considered increased progressively if jerkily from 1919, but did not regain the pre-war level until 1925, that is, until seven years after the Armistice. Indeed, even in 1925 the aggregate cereal crop was still not up to the 1909-13 level, and in 1926 it was lower than in 1925. The potato crop, on the other hand, passed the pre-war mark as early as 1922. In this connection, it must, of course, be remembered that Continental European casualties, mainly of young men killed during the war, amounted to nearly 6 millions out of an initial total population of about 237 millions.

(vi) The Continent was apparently unable, during the early post-war period, to make good the deficiency in its cereal production by increased imports. In each year up to 1926, with the single exception of 1921, the net imports of cereals into the Western region remained below the pre-war level, and were below the level which they reached in the latter part of the decade, when crops were more plentiful and industry and trade in general were expanding. As will be seen from Table I, net imports in 1919-23 (during which period the import capacity of Germany in particular was adversely affected by violent exchange depreciation) were 17% below the pre-war level and 23% short of the average for 1925-29. The predominantly agricultural Eastern region, whose economic recovery was retarded by currency inflation, remained a net importer of cereals up to the middle of the 'twenties and, although an export surplus again materialized in 1925-29, it still did not reach one-fourth of its pre-war average.

8. Between 1920 and 1926, there was, in Western Europe, a marked two-year cycle in cereal production with peaks in 1921, 1923, and 1925 and troughs in 1922, 1924 and 1926.[2] As is illustrated for the case of wheat in Diagram 2 (relating to

1 About one-sixth of the net imports of cereals into the Western region.

2 Potato production tended to vary inversely to that of cereals throughout the war and the early post-war period. In eastern Europe the two-year cycles in cereal and potato crops were scarcely perceptible.

Continental Europe as a whole), imports tended to fluctuate in an opposite direction to the crops. In this diagram the net imports of wheat and wheat flour in each commercial year (August to July) are related to the crops, the bulk of which is harvested, in Europe, during the July-September quarters of each year. As imports and production moved inversely to each other, the supply curve fluctuated slightly less than either.[1] Moreover, consumption doubtless varied still less than the supply curve in Diagram 2 suggests, as stocks expanded or contracted.

For purposes of comparison the net exports from Canada, the United States, the Argentine and Australia (exports which went mainly to the United Kingdom and Europe) have been plotted in the diagram by commercial years.[2] These figures are also given in Diagram 3 which shows aggregate wheat production, net exports and balance retained by the four principal oversea exporters. In this case, as might be expected, the volume of net exports fluctuates in the same direction as production, smoothing the year-to-year variations in consumption and stocks. The marked drop in wheat imports into Continental Europe in the commercial year August 1925-July 1926 which, incidentally, coincided with a similar drop in imports into the Unted Kingdom and Ireland, was apparently a function not only of the large European wheat crop of 1925, but also of the light wheat crop of the other principal producers in 1925.

9. As is shown in paragraphs (v) and (vi) of section 7 above, vegetable food consumption on the European continent remained for some time after the war at a low level. Some indication of the shortage of cereals in different countries about the middle of the first post-war quinquennium is furnished by Table II which shows *per capita* production, net imports and supply in 1913 and 1921. Owing to the reduction in livestock during the war, the supply of cereals for human consumption probably shrank somewhat less than the index figures in the last column suggest. On the other hand, the situation over large areas of the continent was certainly worse in the two preceding years than in 1921.

[1] This cannot be clearly distinguished in Diagram 1 or in the Appendix table showing trade by calender years.

[2] In the Southern-Hemisphere, the commercial year for wheat almost coincides with the calender year, and the latter has therefore been used for exports.

DIAGRAM 2.—WHEAT: Production, Net Imports and Supply in Continental Europe and Net Exports of Four Principal Oversea-Exporters

(Trade data by Commercial years)

Cont. Europe { Production ——— / Net Imports - - - - - / Supply ..... } Oversea Exporters, Net Exports — — —

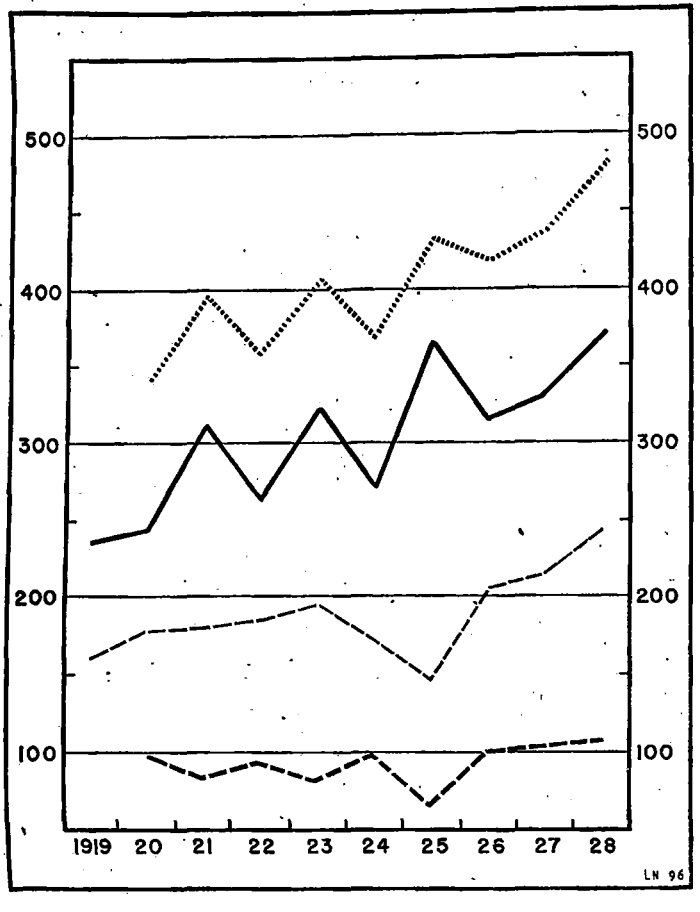


DIAGRAM 3.—WHEAT: Production, Net Exports and Balance Retained by Canada, U.S.A., Argentine and Australia

(Trade data by Commercial years)

Production ———
Net Exports - - - - -
Bal. Retained .....

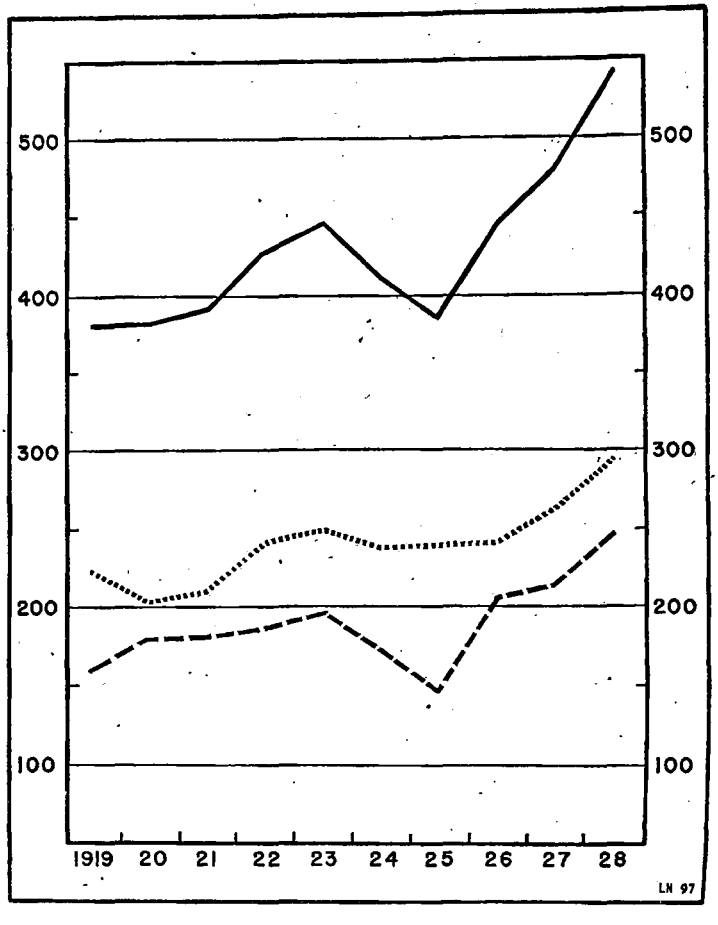


TABLE II—CEREAL PRODUCTION, NET IMPORTS AND SUPPLY, PER CAPITA
Quintals

Country	*Prewar (1913)*			*Postwar (1921)*			*Index of Per Capita Supply (1913 = 100)*
	Prod.	*Net Imp.*	*Supply*	*Prod.*	*Net Imp.*	*Supply*	
France [a]	4.3	0.7	5.0	3.8	0.4	4.2	84
Germany [a]	4.2	0.7	4.9	2.9	0.8	3.7	76
Netherlands	1.6	1.7	3.3	1.5	1.0	2.5	76
Belgium [a]	2.4	2.9	5.3	2.1	1.8	3.9	72
Switzerland	0.6	2.3	2.9	0.5	1.7	2.2	76
Poland	.	.	.	4.3	0.04	4.3	.
Czechoslovakia	3.8 [b]	.	.	3.5	0.2	3.7	.
Austria [a]	3.1	0.2	3.3	1.6	0.9	2.5	76
Hungary [a]	6.8	—0.6	6.2	5.0	—0.1	4.9	79
Roumania [a]	8.6	—3.7	4.9	4.0	—0.8	3.2	65
Bulgaria [a]	5.2	—1.1	4.1	3.4	—0.2	3.2	78

[a] Different boundaries for pre- and post-war figures.
[b] Refers to Bohemia, Moravia, and Silesia only.

10. *Russia's* agricultural production was less seriously affected than that of Continental Europe during the first two to three years of the war. Crops of wheat, rye and maize in 1917, which were recorded for an area only slightly greater than that subsequently comprised within the boundaries of the U.S.S.R., were about one-sixth below the 1909-13 average for the post-war area. This area normally exported [1] about one-sixth of its cereal crops before the war so that the reduction in its supplies for domestic needs was insignificant. On the other hand the needs of that part of the population of the invaded territories which had moved east had to be met, and the internal distribution was seriously upset by transport difficulties. Moreover progressive currency inflation discouraged the peasants from exchanging their crops for money. In consequence many towns suffered from a severe shortage in 1917. Subsequently revolution and civil war brought in their wake a catastrophic decline (some 60% in 1921) in cereal production. Many millions of the population died from starvation and epidemics, and more would have perished but for relief imports from abroad.

After 1921 there was a rapid recovery, and from 1923 on a small export surplus re-appeared, though production and net supply per capita remained for some years below the 1909-13 average. By 1925 recorded cereal crops had risen slightly above the pre-war level for the post-war area, and the potato crop had nearly doubled.

11. By contrast with the Continent, the situation in the *British Isles* was marked during the war by constancy in the aggregate supply of cereals and potatoes at a level not very much lower than before the war. Between 1916 and 1918,

[1] To areas outside the pre-war territory of Russia.

largely as a result of the intensification of the U-boat campaign early in 1917, net imports fell from 89 to 64 million quintals. A rise in production from an average of 78 million for the crops of 1915 and 1916 to an average of 99 million for 1917-18 did not fully compensate for the decline in imports. The imports remained low in 1919, presumably on account of the shortage of shipping space, while large crops were harvested in 1918 and 1919, the area under cereals having been increased during the war by nearly one-third. During the 'twenties the acreage was greatly reduced (by 1925 it was 10% smaller than the pre-war average) and, despite a rising yield per acre, there was a slight tendency for production to fall off, the decline being just outbalanced by a slow rise in net imports.

12. The smallness of cereal imports into Europe during the early 'twenties was not due to any shortage in the overseas export countries. On the contrary, these countries overflowed with abundant supplies.

In *North America* a large increase in cereal production took place during and immediately after the war. The trend is clearly brought out in the following quinquennial averages:

	1909-13	*Indices (1909-13 = 100)*				
	(absolute figures)	*1914-18*	*1919-23*	*1924-28*	*1929-33*	*1934-38*
area (hectares)	89*	111	118	114	119	109
yield (quintals)	13.6	99	98	99	87	80
prod. "	1215*	110	115	113	103	88
net exp. "	64*	207	249	204	150	85

* 000,000's omitted.

The rise in production was not due to higher yields; on the contrary, the expansion of acreage under cereals was greater than the increase in the quantity harvested.

The averages shown above conceal certain significant year to year changes (cf. Appendix I, Table 4) particularly in the exports during the war and the early post-war period:

Net Exports of Cereals
Quintals (000,000's)

1909-13	64	1919	129
1915	157	1920	136
1916	166	1921	189
1917	129	1922	193
1918	111	1923	148

The net exports rose by nearly 160% up to 1916, but fell off sharply in 1917 and 1918 presumably owing to the U-boat campaign and the demands on shipping space for the transportation of troops. The relief deliveries led to some expansion in 1919 and 1920. For some years from 1920 on a series of large crops were harvested in North America, and in 1921 and 1922 the exports reached a figure about three times as high as the pre-war average. The exports fell off subsequently, but

remained throughout the 'twenties more than twice as large as they were before the war.

13. Wartime agricultural developments in the *Southern Hemisphere*—see Appendix I, Table 5—differed from those in North America inasmuch as cereal net exports, except in 1916, were lower than before the war, although production increased, as is shown below:

	1909-13	*Indices (1909-13 = 100)*				
	(absolute figures)	*1914-18*	*1919-23*	*1924-28*	*1929-33*	*1934-38*
area (hectares)	16.5*	116	112	131	146	140
yield (quintals)	8.9	92	108	117	112	119
prod. "	147*	106	121	152	164	165
net exp. "	75*	84	129	172	200	185

* 000,000's omitted.

During the war wheat exports were better maintained than exports of maize which dropped from a pre-war average of 30 million quintals to only 9 million in 1918. This decline had a profound effect on pork production in Europe, as we shall see later.

14. The apparent contradiction between the very substantial increase which took place in cereal exports from the main sources overseas, chiefly to Europe, in the early post-war years, and the fact that nonetheless imports into Western Continental Europe and the British Isles remained considerably below their pre-war level is easily explained. It is due, of course, to the disappearance of Russia's and Eastern Europe's export surplus, which had formed an important part of the pre-war supply of cereals to Western Europe. An idea of the quantities involved is afforded by Table III.

TABLE III.—AGGREGATE NET IMPORTS (+) AND NET EXPORTS (—) OF FIVE CEREALS.

	Annual averages in metric quintals (000,000's)		
	1909-13	1919-23	Difference
Importing Regions:			
British Isles	+100	+ 82	Decr. 18
Western Continental Europe	+164	+136	" 28
Total I	+264	+218	Decr. 46
Exporting Regions:			
Eastern Continental Europe	— 27	+ 3	Decr. 30
Russia—U.S.S.R.	—105	— 3	" 102
Total II	—132	0	Decr. 132
North America	— 64	—159	Incr. 95
Southern Exporters	— 75	— 97	" 22
Total III	—139	—256	Incr. 117
Total Exp. Regions IV	—271	—256	Decr. 15
Residual export balance (Total IV *minus* Total I)	—7	—38	Incr. 31

The residual sums given at the bottom of the table represent net exports to those parts of the world which fall outside the regions shown. Of the 117 million quintals increase in North American and Southern Hemisphere exports (Total III), 31 millions went to non-European markets. The remaining 86 millions sufficed to cover only two-thirds of the decline of 132 million quintals in Russian and Eastern European exports (Total II), the difference (46 million quintals) representing the drop in the net imports of Western Europe (Total I).

INTER-WAR TRENDS IN PRODUCTION AND CONSUMPTION.

15. Before proceeding to a more detailed examination of Europe's agricultural production during the war and reconstruction years, it may be well to supplement the general survey of that period by a brief summary of the trends after the middle of the 'twenties and to compare the resulting position in the years preceding the outbreak of the present war with that of 1909-13. This may be done by means of indices showing the changes in production, net imports or exports and supply *per capita*.

Such indices for *Continental Europe* are given separately for the Western and the Eastern region in Table IV.

TABLE IV.—INDICES OF PRODUCTION, NET IMPORTS OR EXPORTS AND SUPPLY PER CAPITA

	Quinquennial Averages: 1909-13 = 100		
Western Continental Europe:	*1919-23*	*1925-29*	*1934-38*
Cereals: Production	76	89	88
Net Imports	80	100	56
Supply	77	91	82
Potatoes: Supply	73	89	101
Cereals + Potatoes: Supply	76	91	85
Eastern Continental Europe:			
Cereals: Production	76	94	96
Net *Exports*	[1]	21	67
Supply	81	98	98
Potatoes: Supply	92	109	126
Cereals + Potatoes: Supply	83	100	103

[1] Net imports.

The index figures for 1919-23 corroborate, so far as cereals are concerned, the picture of the position in the early post-war period given by Table II. The subsequent recovery both in cereal and potato production was more rapid in the Eastern than in the Western part of the Continent. During 1925-29, the most generally

prosperous quinquennium of the inter-war period, the local supply of these vegetable foodstuffs just regained the 1909-13 average *per capita* in Eastern Europe, while consumption in the Western region remained about ten percent below the pre-war level. This drop in the consumption of Western Europe reflects of course conditions quite different from those which characterize the first post-war years. In these earlier years the consumption of cereals and potatoes was down, because the population was poor. By the end of the 'twenties income per head in most parts of Western Europe was higher than it had been before the war and less cereals were being eaten because there had been a change in diet in favour of more expensive and also more nutritious foods—dairy products, fruits, green vegetables, meat, etc. This fact had obvious repercussions on the situation of cereal farming both in Europe and overseas.

During the following decade, although a policy aiming at agricultural self sufficiency was widely pursued in *Western Europe*, the increase in cereal production barely kept pace with the growth in population[1] and, as imports declined, the average annual per capita consumption of cereals was very substantially (possibly as much as 18%) smaller in 1934-38 than it had been in 1909-13.[2] The decline in imports during the 'thirties was particularly striking in the case of wheat.[3] The civil war in Spain and perhaps also the Italo-Ethiopian war may have accounted for some minor part of the decline in the aggregate consumption of cereals in Western Europe; but, in the main, that decline reflects a change in diets in favour of other foodstuffs, especially animal products[4] largely derived from imported feeds (such as oilseeds and maize). This change was chiefly due to a rising standard of living, though it may have been stimulated also by the high price of bread cereals in many countries caused by the increased duties on wheat, by milling regulations, and various other measures of indirect protection.

In the *British Isles*, where no such restrictions were applied (except in Ireland) and cereals remained cheap throughout the inter-war period, cereal consumption per head was some 11% smaller in 1934-38 than in 1909-13.

[1] There was a marked decline in the production of oats (per capita index 1925/29, 88; 1934/38, 76) reflecting mainly the substitution of motor vehicles for horses. Per capita production of wheat increased, it is true, during this decade (index 1925/29, 96; 1934/38, 104), but this increase was in substitution for and largely offset by the heavy decline in rye production (per capita index 1925/29, 74; 1934/38, 67) since 1925 (see Appendix I, Table 1a). The less important barley and maize crops, fed mainly to animals, also increased slightly (per capita indices: barley 103 and 104, maize 88 and 102 for 1925/29 and 1934/38; 1909/13 = 100).

[2] As the 1934-38 net supply of cereals included reserves set aside (particularly in 1937 and 1938) for the event of war which were larger than those in the years preceding the last war, the decline in actual consumption was still heavier.

[3] Wheat imports per head declined by some 60% between 1925/29 and 1934/38. This decline far outweighed the increase in local production (*cf.* footnote (1) above). As a result the total supply of wheat per capita was 11-12% smaller in 1934/38 than in 1909/13.

[4] In Europe as a whole the output of meat and milk (representative of dairy production) and the catch of sea fish is estimated to have increased in the aggregate by about 27%, or by some 15% per capita, between 1925 and 1938. The output of vegetable foodstuffs, other than cereals, and of agricultural non-food products also increased more rapidly than grain production and was substantially larger per head of population in the late 'thirties than before the last war (cf. *World Production and Prices* 1938/39 and previous editions).

No similar decline in cereal consumption took place in *Eastern Europe* where the pre-war level of consumption was approximately maintained from 1925-29 up to 1934-38[1]

The consumption of potatoes, which are fed largely to animals, was slightly greater *per capita* in Western Europe and over 25% greater in Eastern Europe in 1934-38 than in 1909-13.

In the *U.S.S.R.* the pre-war level of cereal and potato consumption was surpassed in the later 'twenties, and very largely surpassed by 1934-38, as production increased faster than the population, [2] while cereal exports remained small. Exactly how great the increase in consumption was may be open to doubt, since the pre-war crop estimates are believed by some experts to have been too low. According to the statistics available the 1934-38 supply of cereals and potatoes per head was about 40% larger than in the last pre-war quinquennium.[3] This figure would be reduced to slightly below 30%, if the pre-war estimates were—which is not impossible—ten percent too low compared with post-war crop estimates.

In *North America*, the trend of cereal production and exports, which was a rising one throughout the war and the early post-war period, was reversed in the latter part of the 'twenties. The decline was accentuated during the 'thirties by droughts[4] and the the deliberate restriction of cereal cultivation with a view to mitigating the protracted agricultural depression. In 1934-38, the production of cereals was 12% and net exports were 15% lower than 1909-13, and they were 24 and 66% lower respectively than in 1919-23. The sharp decline in exports was largely due to the restrictions on imports into Continental Europe referred to above.

A marked expansion of the area under cereals took place in the chief exporting countries of the *Southern Hemisphere* during the first post-war quinquennium. The expansion was accelerated in 1924-28 and reached a peak during the world depression years 1929-33 to recede only slightly in 1934-38. As the yield per acre rose substantially and continuously up to the late 'thirties, the rate of increase in production and net exports during the inter-war period was considerably higher than the rate of area expansion. In 1934-38 production was 65% and net exports were 85% larger than in 1909-13, a situation which contrasts sharply with the decline in North America.

[1] In this region, production and net supply of oats, though declining per head of the population, was practically as large in 1934-38 as in 1909-13. The same is true *grosso modo* of barley. Rye production and net supply increased in absolute quantity but declined per capita. As regards wheat there was an import surplus up to the middle of the 'thirties, instead of the prewar export surplus; a small export surplus re-appeared in 1934-38, when both production and net supply per capita was some three per cent larger than in 1909-13. The net supply of maize increased most (twenty per cent or more per capita).

[2] The rapid increase in output was mainly achieved by the application on a large scale of modern mechanized production methods. A very significant advance in plant physiology has also taken place in Russia since the 'twenties.

[3] Per capita supply of potatoes and of maize more than doubled; that of wheat doubled while consumption of rye, the leading prewar crop, was just about as large as before the war; per capita supplies of oats and barley increased by one-fourth and one-sixth respectively.

[4] The yield per acre declined by one-fifth between 1924/28 and 1934/38 but recovered to the prewar "normal" in 1939 and 1940 to reach an all-time high in 1942.

Decline and Recovery in Europe's Production by Regions and Representative Countries.

Cereals.

16. The figures for Europe discussed up to this point hide a wide diversity of changes in different parts of the continent. In Appendix II, Table 1, indices are given showing the changes in cereal area, yield and production in a number of different regions and countries as well as over the Continent as a whole.[1] Attention should be called to certain salient facts:

(i) The decline in European production, and the rather slow recovery, were not due to the devastation wrought on the battlefields of Belgium, Northern France and Northern Italy. Such devastation was confined to a relatively small area along the line of trench warfare, and made practically no difference to the total of European production. Thus in 1920 the production of cereals in Continental Europe, excluding the battlefield regions, was 71.8% of the pre-war production of the same area and the inclusion of the battlefields does not change the index for that year. In some of the following years their inclusion raises the index for the Continent by fractions of one percent, the recovery up to 1926 being on the whole more rapid in the battlefield regions than, on an average, over the rest of the Continent, and more rapid in Belgium and the invaded departments of France than in uninvaded France.[2]

(ii) As might be expected, the neutral countries show a smaller decline and a swifter recovery than most of the belligerents. For the five neutral countries of northern and central Europe—Denmark, Holland, Norway, Sweden and Switzerland—the cereal production, area and yield were all at a minimum in 1917, the respective indices being 75.8 for production, 94.2 for area, and 80.2 for yield. Production rose above the pre-war level in 1921, when climatic conditions were particularly favourable to the crops, but fell back in the following years of agricultural depression. Spain and Portugal experienced a high degree of agricultural prosperity during the war. Their cereal production shows an upward trend through the whole period 1913-25, rising by about 25% over those twelve years.

(iii) Among the main continental belligerents, Italy alone suffered a smaller decline in production than the "Northern neutrals" during the war. After the war, as can be seen from Table V below, she enjoyed a rapid recovery.

(iv) By contrast, uninvaded France and Germany suffered a very severe decline (between 40 and 50%) in their cereal production during the war[3] and

[1] Indices are also given for adjacent areas—U.S.S.R., the British Isles and Mediterranian Africa—and for North America and the group of Southern Hemisphere Exporters.

[2] See Appendix II, Table 1, Regions IV, V and VII, and Totals A and B.

[3] Some experts maintain that, owing to errors in the statistics both for Germany and France, the true decline in production in these countries was not as large as the official figures suggest. Germany's pre-war crops are believed to have been appreciably overestimated (*cf.* A. Skalweit, Die Deutsche Kriegsernaehrungswirtschaft, p. 5). The reason given is that the officials who made the returns were under constant pressure from Berlin to show an increased production each year, and also were liable to have experience only of the better farms of the neighborhood. It is possible also that the fear of requisitioning led to understatements of production during and after the war. In France, a special investigation of 1918 indicated that the official figures understated the true production (*cf.* M. Augé-Laribé, L'agriculture pendant la guerre, p. 54). The scope of the "errors" that may thus be involved in the crop returns cannot of course be accurately assessed.

did not subsequently recover the pre-war average. The course of the decline was strikingly similar in the two countries as is shown in Table V.

TABLE V.—INDICES OF CEREAL PRODUCTION

Year	*Uninvaded France*	*Germany*	*Uninvaded Italy*
1909-13	100	100	100
1914	97.9	96.8	92.8
1915	75.5	78.2	100.3
1916	78.1	79.6	91.2
1917	57.0	54.2	79.2
1918	69.6	63.4	99.7
1919	58.3	58.8	89.0
1920	77.0	60.0	79.3
1921	85.8	74.2	104.6
1922	76.1	58.2	85.2
1923	84.0	75.5	111.7
1924	86.3	71.0	95.1
1925	95.1	81.6	125.9
1926	74.2	75.4	119.9
1933-37	89.1	90.4	133.1

It will be observed that after 1919 France recovered more quickly than Germany, but did not rise ultimately to a higher level. Although the changes in production are similar in the two countries, changes in area and yield are rather different. In France the decline in production was due more to a decline in the area sown than to a decline in the yield per hectare, whereas in Germany the reverse was the case. Thus in the year 1917 France had 74% and Germany 85.4% of the pre-war area under cereals, while the French yield was 77.7% and the German yield 63.4% of the pre-war level.

(v) In those parts of Europe which had been under Russian rule before the war, the recovery was rapid. The new Baltic States, if the figures are to be trusted, were back at their pre-war production by 1921, and were 20% above it by 1925. Old Russian Poland and Bessarabia recovered to the pre-war level by 1922. These figures are surprising, in view of the fact that large areas in these regions were battlegrounds during the war. But the methods of cultivation practiced in the past had not generally been intensive. Moreover, it is not excluded that the pre-war Russian figures underestimated the true yield.

17. In view of the almost universal decline in the area under cereals, it may be asked what happened to the land that went out of cereal cultivation. Figures are not available covering the whole of Europe, but Table 4, Appendix II, gives an estimate of total land-use for France. Between 1913 and 1918, the decline in planted area in France, excluding Alsace-Lorraine, amounted to 4,363,000 hectares for cereals, and 6,009,000 hectares for all crops, excluding natural meadows. Natural meadows increased by 11,000 hectares, fallow by 3,202,000 ha., and uncultivated land by 2,805,000 ha., making a total of 6,018,000 ha. It is evident that the land

that was taken out of cultivation merely went to waste. It should be observed that the area under cereals declined proportionately more (—32.3%) than the total area under crops (—26.1%) and the area under crops and meadows (—18.1%). Between 1918 and 1920, when 1,455,000 ha. were added to the total land area of France in consequence of the reincorporation of Alsace-Lorraine, there was a large increase in the cultivated area, as is shown below:

TABLE VI.—AREA CHANGES IN FRANCE

Hectares (000's)

Area under:	*1913*	*1918* [a]	*Change 1913-18*	*1920* [b]	*Change 1918-20*	*1926* [b]	*Change 1920-26*
Cereals	13,510	9,147	—4,363	10,797	+1,650	11,031	+ 234
Other crops	9,529	7,883	—1,646	8,564	+ 681	9,205	+ 641
Meadows	10,103	10,114	+ 11	10,878	+ 764	11,197	+ 319
Total of above	33,142	27,144	—5,998	30,239	+3,095	31,433	+1,194
Fallow	3,391	6,593	+3,202	5,981	— 612	4,643	—1,338
Uncultivated land	16,410	19,215	+2,805	18,187	—1,028	18,329	+ 142
Grand Total	52,943	52,952	+ 9	54,407	+1,455	54,405	— 2

[a] Excluding Alsace-Lorraine.
[b] Including Alsace-Lorraine.

The area under crops and meadows increased by 1,640,000 ha. more than did the total land area, there being a corresponding decline in fallow and uncultivated land. These movements reflect the extensive resettlement of previously abandoned or neglected lands which took place in 1919 and 1920 with the demobilization of the armed forces. It will be observed that most of the increase in area during this period related to cereals. Nevertheless, a considerably smaller area (smaller by 2,713,000 ha.) was cultivated for cereals in the larger France of 1920 than in the smaller France of 1913. The area under other crops was also smaller, by 965,000 ha., but meadows were 775,000 ha. larger, and fallow land 2,590,000 ha. larger, than in 1913. The resettlement movement soon spent itself. The amount of uncultivated land changed very little after 1920, but by 1926 it had even slightly increased. Thus, the slowly continuing increase in cultivated area between 1920 and 1926 came entirely out of the decline in fallow, indicating that more intensive cultivation practices were gradually adopted. At the same time a substantial proportion of the tillage area which went out of use during the war appears to have been, as it were, permanently abandoned, for the 1,900,000 ha. increase in uncultivated land between 1913 and 1926 exceeded by some 450,000 ha. the total area increase resulting from the war.

Livestock Products.

18. It is impossible to obtain figures covering Europe's production of livestock products in the period under review. It is not even possible to obtain accurate year-by-year figures for the numbers of livestock for the whole continent. Table

VII gives an estimate based upon official figures but containing many approximations where figures are lacking. It excludes Iceland, the Faroes, Malta, the Portugese islands and Turkey.

TABLE VII.—APPROXIMATE NUMBERS OF LIVESTOCK

(000,000's)

Animal	*Year*	*Continental Europe ex. Russia 1914*	*Continental Europe ex. Russia 1923*	*United Kingdom and Ireland*	*Europe, Total ex. Russia 1923*
Horses, Asses and Mules	1913	22.6	26.5	2.2	28.7
	1920	20.8	24.3	2.4	26.7
	1925	23.8	27.8	2.1	29.9
Cattle	1913	82.5	91.6	11.9	103.5
	1920	76.8	85.4	11.7	97.1
	1925	80.2	90.0	12.0	102.0
Pigs	1913	63.6	68.5	3.7	72.2
	1920	47.7	53.2	3.1	56.3
	1925	55.6	62.8	3.6	66.4
Sheep	1913	98.5	106.9	30.0	136.9
	1920	83.7	91.2	23.3	114.5
	1925	106.1	112.1	26.4	138.5

The numbers of all animals declined during the war, and increased afterwards. By 1925, there were more draught animals and sheep than before the war, but fewer cattle and pigs. The pig population suffered the sharpest decline. The figures hide a wide variety of local conditions, to be discussed more fully later. Table 3 of Appendix II shows the changes in livestock numbers for the main regions of Europe. It reveals that the neutral countries suffered small losses, or even enjoyed gains in livestock population during the war. Among the belligerents, losses of horses and cattle were fairly uniform, with France showing the heaviest loss, and Germany or Austria the lightest. Italy, however, was an exception; her herds increased.

The changes in sheep were distributed very unevenly, West-Central Europe gaining numbers, while France and East-Central and South-Eastern Europe lost. The changes in the pig population were fairly uniform by regions, but it will be shown later that there were significant local deviations within the regions.

19. Illustrative figures from scattered sources may be obtained, which indicate that the decline in the *production* of livestock products was much greater than the decline in livestock *numbers*. For Germany, R. W. Balderston[1] states that in 1919 livestock efficiency was only 55% of normal. The following table[2] shows the average slaughter weight of livestock in Germany:

[1] Annals of the American Academy, Vol. LXXXIX, May 1920, p. 211.

[2] E. H. Starling, Journal of the Royal Statistical Society, March 1920, p. 235. Department of Overseas Trade (London), Reports on Economic and Commercial Conditions in Foreign Countries, Report on Germany, March 1922.

TABLE VIII.—AVERAGE SLAUGHTER WEIGHT OF CATTLE IN GERMANY

Kilogrammes

Period	*Cattle*	*Calves*	*Sheep*	*Pigs*	*Weighted General Index*
Prewar	250	40	22	85	100
Last Quarter, 1916	210	39	18	83	89
First Half, 1917	194	31	17	75	81
Second Half, 1917	161	30	18	59	66
First Half, 1918	137	27	17	52	57
Second Half, 1918	133	31	16	59	58
1919-20	155	31	17	75	70

The dead weight of cattle in Austria in 1920 was said to be half its normal figure and even in 1924 the weights of cattle and pigs were well below normal.[1] Even in the United Kingdom carcass yields and meat supplies were below normal, though the decline was not so great as on the continent. Table IX shows an estimate of British meat production.[2]

TABLE IX.—INDEX OF MEAT PRODUCTION IN THE UNITED KINGDOM

(1910-14 = 100)

Year	*Numbers of Livestock*	*Rate of Slaughter*	*Carcass Yield*	*Production of Meat*
1915	102	101	102	105
1916	101	96	102	98
1917	101	101	100	102
1918	96	95	90	83
1919	93	87	85	69

Starling[3] gives an estimate of the production of various livestock products in Germany, shown in Table X.

TABLE X.—PRODUCTION OF LIVESTOCK PRODUCTS IN GERMANY

Year	*Veal and Mutton* (000 Tons)	*Fat* (000 Tons)	*Milk* (000 Hectoliters)	*Butter* (000 Tons)
1912	2412	683	22,000	400
1917	1626	135	.	.
1918	.	.	11,000	240
1919	960	89	.	.

1 Department of Overseas Trade (London), reports on Austria, 1921 and 1924.

2 J. B. Guild, Journal of the Royal Stat. Soc., July 1920, p. 552.

3 Starling, *op. cit.*, p. 235.

Meat consumption per head, in Germany, estimated at 52 kg. in 1913, was only half that figure in 1922, and the total milk production in 1922 was still only two-thirds of the pre-war level.[1]

20. Direct estimates of milk production can be obtained for some years for the United Kingdom, France, Germany, and the five northern neutral countries, Denmark, Holland, Norway, Sweden and Switzerland. These estimates, based on the data collected in "Milk and Milk Products" (International Institute of Agriculture, Rome, 1924), are shown in Tables XI and XII.

TABLE XI.—MILK PRODUCTION

Kg. (000,000,000's)

	Prewar	*1914*	*1916*	*1918*	*1921*
United Kingdom	8.8	8.9	8.5	7.0	9.0
Germany	22.2	23.5	17.6	11.8	12.3
France	13.2	12.9	9.9	7.2	11.0
Total	44.2	45.3	36.0	26.0	32.3
Five Neutrals	.	14.3	.	10.3	13.2
Total, Eight Countries	.	59.6	.	36.3	45.5
Index	.	*100*	.	*61*	*76*

It should be observed that in the continental countries, milk production declined in approximately the same proportion as cereal production. In Germany and France, where cereal production in 1917 had fallen to between 50 and 60 percent of the pre-war figure, milk production in 1918 also fell to between 50 and 60 per cent of the prewar figure. In the neutral countries, cereal production declined to a minimum of 75% of the prewar level in 1917 while milk production in 1918 declined to 72% of the prewar level.

21. Direct estimates of the number of cows and of the yield per cow are also obtainable for the eight countries mentioned above. The results are summarized in Table XII.

TABLE XII.—NUMBER OF COWS AND MILK YIELD PER COW

Number of Cows (000,000's):	*Prewar*	*1914*	*1916*	*1918*	*1921*
Three Belligerents	22.9	22.6	20.2	19.2	20.7
Five Neutrals	.	6.0	6.1	5.6	5.9
Eight Countries	.	28.6	26.3	24.8	26.6
Index	.	*100*	*92*	*87*	*93*
Milk Yield per Cow (kg. 000's):					
Three Belligerents	1.9	2.0	1.8	1.3	1.5
Five Neutrals	.	2.4	.	1.9	2.2
Eight Countries	.	2.1	.	1.4	1.7
Index		*100*		*70*	*83*

1 Department of Overseas Trade (London), Report on Germany, April, 1924, p. 18.

It will be observed that the decline in the yield per cow was greater than the decline in the number of cows, thus tending to confirm the general proposition that the decline in livestock production was due more to a decline in the supply of feed than to a decline in numbers.[1]

INCIDENCE OF THE DECLINE IN FOOD PRODUCTION ON CONSUMPTION IN URBAN AND RURAL AREAS.

22. City populations, as a rule and especially in the Central and Eastern parts of the Continent, endured a more serious diminution in their food consumption during the war than did the residents of rural areas. From the point of view of urban consumers it is the *exchangeable surplus* (*i. e.*, the quantity of food which farmers are prepared to sell and which can be made available on the market) rather than the total national supply of food that matters in any given situation. When the total production declines the exchangeable surplus usually declines more than proportionately, since the agricultural population does not greatly restrict its consumption of foodstuffs. As regards milk, there is a good deal of evidence to show that, in Germany, the decline in consumption in the cities exceeded the decline in production. Figures for the milk supply of Munich and Augsburg are available for each year between 1912 and 1925:

Hectolitres (000,000's)

1912	11.6	1917	8.3	1922	7.8
1913	12.2	1918	7.1	1923	6.9
1914	12.0	1919	5.2	1924	9.6
1915	11.8	1920	5.3	1925	11.9
1916	10.7	1921	7.1		

There was a fall by 57% from 1913 to 1919 and a slow rise up to 1925, broken by a relapse in the year of hyperinflation 1923. The milk supply of eight cities of Bavaria declined by 55% between 1913 and 1920.[2] The falling off in the milk supply of these cities cannot have been caused by a diminution in the number of cows. For, as against the 1,852,000 milk cows which Bavaria had in December 1912, she had 1,799,000 in December 1919, and 1,848,000 in December 1920. The fall in city consumption was evidently due partly to a decline in milk yield per cow (*cf.* Table XII), but mainly no doubt to a reduction in the proportion of milk sold off the farms.[3]

[1] This proposition, of course, relates principally to dairy produce and beef which together constitute the greater part of the livestock production in Europe. The decline in the output of pork and poultry products was more closely related to the decline in the hog and poultry population which, owing to their relatively short reproduction cycle, could be more drastically reduced than could the cattle population when the feed supply got scarce.

[2] Statistisches Jahrbuch für den Freistaat (Koenigreich) Bayern. The eight cities are Munich, Nüremberg, Augsburg, Würzburg, Ludwigshafen-am-Rh., Fürth, Kaiserslautern, and Regensburg.

[3] In countries where dairy products were subject to relatively low maximum prices, milk was commonly retained on the farms for the production of butter for the black market.

The decrease in city consumption of milk in Bavaria, great as it was, seems to have been less severe than in some cities in other areas. It is estimated that, in 1919, the fall in the milk supply of Bochum [1] was 84%, of Stuttgart [2] 80%, of Klugenfurt [2] 89% and of Vienna [2] 90-95% of the pre-war average.

A decline in the production of food may lead to defects in distribution more serious in their effects on urban consumption than the decline in production itself. The starvation in Germany might have been greatly mitigated had the available food itself been better distributed. Starling [3] estimates that the German food production of 1917-18 allowed an average of about 3,000 calories per head per day for the whole population. However, the agricultural population maintained an average consumption of 4,000 calories per head thus leaving only 2,000 calories per head for the towns.[4]

In Russia it seems to have been the disappearance of the exchangeable surplus, rather than any great diminution of the total food supply during the war,[5] which caused the great deficiencies in the towns.[6] The exchangeable surplus depends not only on the amount of food produced, but also on the amount of other goods available for exchange. In Russia starvation in the towns towards the end of the war seems largely to have arisen from the gearing of practically the whole of Russia's relatively small industry to war production, and from the disappearance of imported manufactures, for in consequence of the lack of manufactured goods the towns were unable to buy food from the peasants. For a time the government was able to obtain supplies by printing money and giving it to the peasants for food, but this led to the inflation of prices and to an eventual unwillingness on the part of the peasant to give up good food for depreciating money. The breakdown of the exchange between town and country seems to have been important everywhere in Central Europe; the starvation of Vienna, for instance, was due as much to a failure in exchange and transportation as to a failure in production.

Changes in Cereal Production, Area and Yields and in Livestock Population by Small Districts; Comments on Map Diagrams.

23. Before an adequate interpretation of the changes in European agricultural production can be made, it is necessary to examine in more detail the character of European agriculture. The analysis by countries or by large regions is not suffi-

[1] Huber, Annals of the American Academy, Vol. XCII, Nov. 1920, p. 131.

[2] The Famine in Europe. (Fight the Famine Council, London, 1919), p. 71.

[3] Starling, The Food Supply of Germany During the War, Journal of the Royal Statistical Society, March 1920, p. 255.

[4] The decline in the crops of the main cereal areas of Eastern and Northern Germany, failing a proportional decline in farm consumption, must have meant an even greater decline in the surplus "exported" to the deficient areas of Western Germany and to Berlin. Suppose, for instance, that the consumption of cereals in Mecklenburg had been 5 quintals per head in 1913 and 4.5 quintals in 1921. As production per head was 14.8 and 8.4 quintals respectively, the "exportable" surplus would have been 9.8 quintals per head in 1912 and 3.9 quintals in 1921, a decline of 60% against a 43% decline in production.

[5] In the early postwar years, also the total food supply was highly deficient owing to the catastrophic decline in the crops resulting in famine over large areas.

[6] P. W. Struve *et al.*, Food Supply in Russia during the World War, p. 409.

cient, for many of the countries of Europe (for instance, France and Italy) are as heterogeneous in respect to agriculture as is the continent itself. If a clear picture of the structural changes in European agriculture is to be obtained, therefore, it is necessary to analyse the figures for small districts. To do this for the whole of Europe, however, is unnecessary, for the essential facts are revealed by the analysis of the central section of Europe, stretching from France to Poland and from Denmark to Northern Italy. This region has been divided into 150 districts, the complete list being given in Appendix III. The results obtained by the analysis of the figures for these districts have been expressed in a series of maps, showing the figures for each district. As a guide to the interpretation of the maps isomers have been inserted, bounding the regions where the figures lie within certain specific limits. The base map showing the boundaries of the districts is in Appendix III.

24. Maps 1a to 1f show the agricultural densities in various parts of Europe in 1913. They are analogous to maps of population density, and express production, livestock, etc., *per hectare* of the total area of each district. Map 1a is the cereal production density map, in which each figure represents the production of total cereals divided by the *total* area of the district in which it is placed. It must not be confused with the cereal *yield* map, 2a, which shows the production of total cereals divided by the area planted to cereals. Map 1a shows the relative importance of the various districts as cereal producers. It shows a marked "ring structure," with two, or perhaps three, centres of high density surrounded by rings of lower density. A belt of high cereal "density" (above 4 quintals per hectare) extends across Europe from Northern France to Eastern Germany. Within this belt are two centres of very high density, one in Northern France, the other in Central and Central-Northern Germany. Around the belt of high density is a semicircular ring of moderate density (2-4 quintals per hectare), running from Normandy, through Central France, Southern Germany, Bohemia and Poland. Around this again is a ring of low density running from Southern France, through Switzerland, Austria, the Balkans and Eastern Poland, interrupted by two secondary areas of high density, the North-Italian Plain and the mid-Danubian valley (principally the Hungarian plain). This "ring structure" of cereal density is due largely to a similar ring structure in the *yield per hectare,* shown in Map 2a. Apart from the mountainous regions the proportion of the total area planted to cereals is fairly uniform throughout Europe, as shown in Map 1b. Most districts of Europe north of the mountains have more than 25% and less than 35% of their area under cereals.

25. Maps 1c to 1f show the density of the livestock population. The areas of lowest cattle density (under 20 head per 100 hectares) are North-Central France, Southern France, Central and Eastern Poland, and the Balkans. There are three main areas of high density (above 40 head per 100 hectares), one in North-Western France, the second stretching in a wide belt from Belgium to Bavaria and the third in Schleswig-Holstein and Denmark. The pig density map, (1d) shows a marked ring structure, with a single region of very high density in North-West Germany. It also brings out the marked difference between France and adjoining countries, the North-Eastern quarter of France having only 5 pigs per 100 hectares against Hanover's 73. Southern and North-Central France stand out as

areas of unusually low density of the pig as of the cattle population. Map 1e shows the high sheep density of parts of France and the Balkans. The low sheep density of North-Western France should be compared with the high cattle density of the same region. Map 1f shows the density of the horse population and that the greatest density of horses is in the north.[1]

26. Maps 2a to 2f show the effects of the war on the yield per hectare sown to cereals in Europe. Map 2a shows the yield in 1913. It will be seen that there is a centre of high yield in Belgium, the Netherlands, Northern Germany and Denmark,[2] and a secondary centre of high yield in Northern Italy (crops grown under irrigation), and that as one travels in any direction from these centres the yield falls in a fairly regular manner. Through Maps 2b to 2f we see this structure distorted, but not destroyed by the war, and finally re-establishing itself in much the old form by 1936. Even in 1919, when yields were practically at their lowest, the ring structure is not destroyed, though the low yields below 12 quintals per hectare have pushed in both from South-West France and from the Balkans. In 1921 the structure is distorted by a "valley" of low yields pushing in from the South of France towards Southern Germany. In 1924 another "valley" of low yields has pushed in towards Southern Germany from the Balkans, but it is noticeable, comparing Map 2d with 2a, that there is a tendency for yields to rise on the outer edges of the "circle," in Western France and in Poland. Maps 2e and 2f depict the structure returning to normal, and again show the tendency for the "circle" of higher yields to expand.

27. Maps 3a and 3b show the production of cereals and potatoes in the years 1913 and 1921, in quintals[3] per capita of the human population. Both show a structure, which is modified, but not fundamentally changed, by the war. There are three main areas of high per capita production (above 5 quintals per ha.), one in Northern France, one in Eastern and North-Central Germany, and Denmark, and one in South-Eastern Europe. Around them lies a region of lower per capita production (from 2 to 5 quintals per head); Holland, Switzerland, Austria, the Riviera and Dalmatia have very low per capita production. This structure was not fundamentally changed by the war; indeed the boundary of the French region of high per capita production was practically unchanged. The corresponding regions in eastern Europe, however, were greatly diminished, and the regions of low per capita production correspondingly extended.

28. The study of these maps brings out several important conclusions:

(a) Europe exhibits a ring-like structure of agricultural intensity, measured either by density or yield of cereals, with two "peaks," one in North-West Germany

[1] There is a noteworthy relationship between the horse density and the July temperature. Anywhere in Western Europe where the July temperature is above 20° C. (68° F.), there are fewer than five horses per 100 hectares. Where the July temperature is between 20° and 18° C., there tend to be from five to ten horses per 100 hectares. Where the temperature is below 18° C., there tend to be more than ten horses per 100 hectares.

[2] In actual fact this high yield area also includes Sweden, which is not shown in the maps.

[3] In maps 3a and 3b relating to cereals and potatoes taken together, the weight of potatoes is reduced to correspond, in terms of food value, to that of cereals. In map 3c relating to potatoes alone, the gross weight is used.

and the Low Countries, and the other in Northern Italy. This structure was modified, but not destroyed by the disturbances of the war, and tended to re-establish itself in its original form when the disturbances had subsided (Maps 2a and 2f).

(b) The pattern of European agriculture does not in general follow the lines set by the national boundaries. All the larger countries of Europe are heterogeneous to a marked degree, with the possible exception of Germany. A line drawn from the north to the south of France, or of Italy, passes from regions of the highest intensity to regions of the lowest intensity (Maps 1a and 2a). The only national boundary which stands out clearly in the agricultural structure is that between France and Northern Italy, and this evidently for physical reasons.

(c) The intensity of agricultural production tends to be greatest in the industrial regions. If Map 1a is examined closely it will be seen that the main industrial regions of Europe (Northern France and Belgium, the Rhineland, Saxony and Silesia, and Northern Italy) have a high density of cereal production, more than six quintals per hectare of total area. With the exception of Hungary, the primarily agricultural regions (*e. g.*, Central France, Poland, the Balkans) generally have much lower densities, in the neighborhood of three quintals per hectare. The industrial regions also tend to have a higher cattle and pig density than the agricultural regions (Maps 1c and 1d). Only in sheep do the non-industrial regions predominate, and a high sheep density is usually a sign of a less intensive agriculture. The higher density of cereal production and of cattle and pig population in the industrial regions is an indication of intensive cultivation which alone is remunerative on high cost land. High yields, good communications with and proximity to densely populated markets render intensive use of labour and fertilizers profitable. In less industrialized and hence less urbanized regions where greater distances separate the agricultural producer from his markets, and where the means of transport are less developed, extensive agriculture tends to be more renumerative.

In Continental Europe, the industrial regions appear in fact to be more important agriculturally than the primarily agricultural regions. It will be seen that even when production per head of total population is considered, in maps 3a and 3c, such industrial regions as Northern France, Saxony and the Rhineland, with all their great cities, outrank or equal some of the less intensively cultivated agricultural regions. Moreover, the highest per capita production is found in those areas, such as the Baltic coast of Germany or the districts around Paris, which lie fairly close to great centres of population. Industrialisation, it should be noted, tends to raise rather than lower the agricultural output, both in bulk and per capita.

(d) A fourth conclusion is that the productivity of agriculture in Europe depends perhaps less on the native fertility of the soil than on the technical efficiency of the people and the economic factors referred to under (c) above. The belt of high yield, stretching from Northern France across to Eastern Germany, includes some of the best soil in Europe at its western end and some of the worst soil on the sandy plains of the east; yet poor and good soil alike produce more than 20 quintals per hectare. Climatic factors, though they obviously influence productivity, cannot account alone for such uniformity in yields from different soils.

(e) The final conclusion is that there is great room for improvement in yields in various parts of Europe, and for expansion of agricultural production. In the '20s and '30s there was a marked tendency for yields to improve on the outer edges of the European circle of intensity. Higher yields pushed out across Northern and Western France, across Poland and the Balkans, into Central Italy and into the Baltic States (Maps 2a-2f). There seems every reason to expect a continuance of this movement when the disturbance of the present war is over.

PART II. INTERPRETATION.

29. We may now turn to the two questions forming the main object of the present study: (i) Why did European production decline so drastically during the war? (ii) Why did it not return to its pre-war level before 1925 or even later? These questions are closely related, and may be considered together. The broad answer is similar for both; production fell during the war mainly because resources of all kinds were withdrawn from agriculture on account of the war effort. Production did not recover until 1925, or even later, because resources that had been destroyed could not quickly be replaced, or because resources that had been diverted into other occupations did not return to agricultural employments. These resources may be classified as follows: (i) land, (ii) labour, (iii) livestock, (iv) farm equipment, (v) fertilizers, (vi) transportation, (vii) enterprise and social climate.

Land:

30. The problem of the withdrawal and restoration of the resources devoted to agriculture may first be studied from the point of view of land.

As will be seen from the indices shown in Table XIII,[1] the decline between 1909-13 and 1920 in the cereal production of the continent as a whole was due about equally to a decline in area and a decline in yield. The area under cereals recovered steadily to a point some five percent below the pre-war level in 1925.

TABLE XIII.—INDICES OF CEREAL AREA, YIELD AND PRODUCTION IN CONTINENTAL EUROPE

Year	1909-13	1920	1921	1922	1923	1924	1925	1926	1933-37
Area	100	85.3	90.5	90.5	91.9	93.2	95.3	95.1	100.5
Yield	100	84.0	89.3	84.7	97.7	86.3	103.8	86.9	104.6
Production	100	71.8	80.9	77.0	90.3	80.2	98.8	92.5	105.2

The yield also showed a rising trend, though it fluctuated from year to year causing the two-year cycle in crops to which attention has been drawn in section 8; it rose above the pre-war level in 1925. The averages for 1933-37 show both these trends continuing; by that time the area under cereals had regained the pre-war figure, and the yield had risen to a point nearly five per cent above the pre-war level.

The detailed analysis by small districts of the changes in production, area and yield of cereals is shown in map diagrams 4, 5 and 6 (Appendix III).

The following conclusions may be drawn from these maps:

[1] Series "Total A" reproduced from Appendix II, Table 1.

(i). The decline in *production* during the war was fairly uniform in all districts of the continental belligerents. There was, however, some tendency for coastal districts in France to decline less than the interior districts (Maps 4a, 4b).

(ii). Recovery was not uniform (Maps 4c-4f). Some parts of France recovered very quickly—*e. g.*, the Loire Valley. Other parts in the South and West-Central regions never recovered at all. In Germany the East recovered more rapidly than the West. The Danube Valley (except northern Bulgaria) also recovered very slowly. Table 2 of Appendix II shows the recovery of that region by countries. It will be seen that production recovered in Bulgaria (apparently) by 1919-20; in Poland by 1921-22; in Czechoslovakia by 1923; in Yugoslavia by 1924; in Hungary by 1925; in Roumania by 1926. Production in some of these countries slipped back afterwards, but only in Roumania did the average for 1933-37 fall short of the pre-war figure. No country in Eastern and Central Europe restored the area under cereals to its pre-war level before 1924-25.

(iii). Over most of France and Western Germany the decline in cereal *area* during the war was fairly uniform. In Eastern Germany the decline was rather less than in France and Western Germany (Maps 5a, 5b). It is roughly true that the boundary between the regions of greater and of lesser decline in the area under cereals follows the line which divides the peasant agriculture of the west from the predominantly large-estate agriculture of Eastern Germany. It almost follows the boundary of Napoleon's empire.[1] Apparently the agriculture of large states was better able to withstand the war demand for labour than was the agriculture of one-family farms.

(iv). The recovery in the area under cereals was also fairly uniform (Maps 5c to 5f). Over most of Western and Central Europe the area returned to a figure around 90% of the pre-war figure. Certain "patches" stand out as areas of slow recovery: Normandy, Burgundy, Southern France, South Germany and Austria.

(v). The decline in *yield* was fairly uniform (Maps 6a, 6b); again, however, there is a division between large-estate and peasant agriculture. Map 6a shows that the decline in yield in Eastern Germany was greater than the decline in France and Western Germany. Evidently large-estate agriculture was more vulnerable than peasant agriculture to the lack of certain fertilizers during the war.

(vi). The recovery in yields was not uniform. According to Maps 6c and 6d Central France, the Netherlands, Poland, Czechoslovakia and Bulgaria had recovered by 1921, while North and West Germany and the Danube Valley had not recovered even by 1924. Referring again to Table 2, Appendix II, it will be seen that apparently the yield recovered in Bulgaria and Poland by 1920; Czechoslovakia by 1921; Yugoslavia by 1924; Austria and Hungary by 1925. Rou-

[1] The small-peasant agriculture of Western Germany is in large part the outcome of reforms introduced during the occupation of that area by Napoleon.

mania and Greece had not recovered the pre-war yield even in the period 1933-37. Recovery was delayed by land reforms in certain of these countries.

(vii). It is evident from the above that the marked differences in the rate of production recovery in different parts of Europe are due much more to differences in the recovery of yields than to differences in the recovery of area planted.

(viii). There is some evidence to show that the yield fell most where it was highest. Since high yields are normally achieved by the intensive use of fertilizers and labour, this was to be expected. But as there are two factors at play of varying importance in different countries, comparisons between countries are not very significant. The evidence from the national figures is much more conclusive—Germany and France may be selected by way of illustration. The individual districts of pre-war Germany (excluding Alsace-Lorraine) and pre-war France detailed in the maps are grouped below according to their cereal yield in 1913, and the average decline in yield that had taken place by 1917 is calculated for the same groups:

Germany (24 Districts)		France (87 Departments) [1]	
Yield in 1913 (quintals per ha.)	Average % drop in yield in 1917	Yield in 1913 (quintals per ha.)	Average % drop in yield in 1917
15 —17.5	25	7.5—10	13
17.5—20	35	10 —12.5	20
20 —22.5	40	12.5—15	24
22.5—25	43	15 —20	32

In Italy on the other hand, as will be seen from a comparison of maps 6a and 2a, the yield was relatively best maintained in 1917 in those fertile Northern districts where it was highest in 1913. But Italy only entered the war in 1915 and did not suffer from any serious shortage of fertilizers until the 1916-17 crop year.

(ix). Contiguity to the battle front did not have a particularly unfavourable effect on yield (Map 6a). The uninvaded sections of the French departments of Nord, Meuse and Meurthe-et-Moselle actually recorded a smaller decline in yield than the rest of France. The yield in the French battlefield area was low in 1919 (Map 6b), but had recovered to a level comparable with other parts of the country by 1921.

Labour:

31. The next question is how far the decline in production, and the slow recovery, were due to the scarcity of labour. There is no doubt that the withdrawal

[1] Excluding three departments which had a yield of about 20 quintals per ha. in 1913. Of these Seine-et-Oise had an index of 62 in 1917, thus conforming to the general tendency. For the other two departments—Seine and Nord—the 1913 and 1917 data are not directly comparable. The 1917 index of the former was nominally 84; but this department had a negligible cereal production and its index for wheat alone was 68. The 1917 index (yield of all cereals) of the latter department was 95 but related in fact to a very much smaller territory than in the base year, as is demonstrated by its area index which dropped to 25 (1913 = 100).

of labour from agriculture was the most important factor accounting for the decline in production during the war. It is no doubt the major cause of the decrease in area. The decline in horses and equipment was almost certainly less than the decline in the labour supply, as will be shown below. A certain part of the fall in yield must also be attributed to the withdrawal of labour, for the labour supply probably declined more than the cultivated area, and, therefore, the latter could not be cultivated so intensively as before. Unfortunately, it is impossible to get figures for Europe as a whole to show the exact magnitude of the withdrawal of labour on account of the war. Nevertheless, some figures are available. M. Augé-Laribé [1] estimates that out of 5.2 million male agricultural workers in France, 3.7 million were taken by the army, leaving only 1.5 million men and 3.2 million women. An inquiry conducted in 1916 revealed a reduction in total workers ranging from 65% in the North-East to 53% in the South, with a reduction in the yield of a working day ranging from 38% to 24%.[2] We shall not be far wrong if we assume that towards the end of the war the effective labour force of French agriculture was somewhat less than half its pre-war level. This in itself is enough to account for the great areas in 1917 and 1919 (Maps 4a and 4b) where the production was less than half that of 1913. In Russia also, according to M. Antsiferov, about 40-50% of agricultural labour was mobilised.[3] Dr. Skalweit estimates that in Germany, of the 5.2 million men in agriculture, about 3.3 million were mobilised,[4] while an inquiry in Bavaria in 1917 showed a 70% reduction in man power. These figures should be compared with Augé-Laribé's figures for France mentioned above. The figure of a 50% reduction in labour supply seems to be fairly representative of all the continental belligerents.

In Great Britain the story was different. Here enlistment of agricultural workers was discouraged, conscription was not introduced until 1917, and even then deferment was easily obtained for essential agricultural workers.[5] A country, which like Great Britain had a relatively small proportion of her population engaged in agriculture, did not have to draw on agricultural man-power so heavily as did the agricultural nations.

According to official British figures, the number of employees in agriculture changed as follows from July 1914 to July 1918:[6]

1 M. Augé-Laribé, L'Agriculture pendant la Guerre, p. 66.

2 *Ibid.*, p. 87.

3 Antsiferov, *et al.*, Russian Agriculture During the War, (Carnegie Foundation), Chapter 5.

4 August Skalweit, The Maintenance of the Agricultural Labor Supply in Germany During the War. The International Review of Agricultural Economics. Vol. 13 (1922), p. 836.

5 International Review of Agricultural Economics, Vol. 13, p. 85.

6 British Association, "British Labour, Replacement and Conciliation, 1914-21", London, 1921, p. 67.

(Numbers in 000's)

	Males			*Females*			*Total*		
	1914	1918	% Change	1914	1918	% Change	1914	1918	% Change
Permanent Workers	800	589	—26	80	113	+41	880	702	—20
Casual Workers	120	70	—42	50	65	+30	170	135	—21
Total	920	659	—28	130	178	+37	1050	837	—20

As the number of farmers no doubt declined relatively less than the number of workers, the total labour supply was clearly much better maintained than on the continent.

32. All the belligerents made attempts to relieve the labour shortage. Prisoners of war were used in almost all countries with varying success. By 1918 Germany had 900,000 prisoners so engaged, but their productivity is stated to have been low.[1] Most countries granted leave, especially round harvest time, to soldiers who had been agricultural workers. Wounded men and refugees from battle fronts were used. School children were organized into agricultural work-camps; women were extensively employed. Even the armies behind the lines cultivated considerable areas when the fronts were stable. An important difference between British and Continental agriculture should be noticed here. On the continent women work in agriculture even in peace time, and consequently do not form a reserve for use in time of war—they cannot do much more than they are doing already. In Britain such work is less general, and consequently women may form an important reserve of agricultural labour. A peculiarity of German agriculture is also worth mention—its reliance on seasonal foreign labour. The outbreak of war caught nearly 300,000 Russian and Polish workers in Germany. These remained for the duration of the war, and even increased in number as Polish territory, previously Russian, was brought under German control. None of these attempts to overcome the labour shortage, on the continent at least, were successful.

33. Whereas it is fairly clear that the decline in production during the war is closely related to the withdrawal of labour, the relation between the recovery of production after the war and the labour situation is more obscure.

Census figures are not available covering the whole of Europe, but there is evidence that in the principal belligerent countries the war occasioned a relative decline in the rural population. Thus in France the population in "urban" communes (with over 2,000 inhabitants) was 17.51 millions in 1911 and 17.38 millions in 1921. The "rural" population was 22.09 million in 1911 and 20.12 million in 1921 (1911 boundaries in both cases). Thus almost the whole net loss of popu-

[1] F. Aereboe, Der Einfluss des Krieges auf die Landwirtschaftliche Produktion in Deutschland, (Carnegie Foundation), p. 33.

lation took place in the rural areas. In Germany in 1925 the "war generation" of men aged 24-44 comprised 32.7% of the male population of cities with over 100,000 inhabitants, and only 26.7% of the remaining districts. This relative decline in the rural population may be due to two reasons. One is a greater proportionate loss of rural men in the war. Thus in Austria the war losses represented 2.8% of the total population, but losses of agriculturalists comprised 3.4% of the agricultural population.[1] In France, 16.1% of all men mobilized were lost, but Paris lost only 10.5% and Marseilles only 11.9%.[2] No figures are available for Germany. It is not unreasonable to suppose that in general the losses from rural areas were greater than those from urban areas; the former had fewer original rejects on health grounds and rural soldiers are less likely to obtain the safer specialized jobs behind the lines. Nevertheless, figures for losses by occupation, which are available for France, seem to contradict the above proposition. France lost 538,000 agriculturalists, representing 6.1% of the people engaged in agriculture. She lost 757,000 men from other occupations, representing 6.3% of the people engaged in non-agricultural occupations.[3] It is probable, therefore, that a second reason for the decline in rural population—the flow to the towns—is more important. War jolts men out of their accustomed pursuits, and seems to speed the movement to the towns. During the war, men and women who are not in military occupations are attracted to the towns by the expanding war industries. After the war they may not wish to return to the country. The demobilized rural soldier also is an uprooted man who may be unwilling to return to the placid life of his fathers.

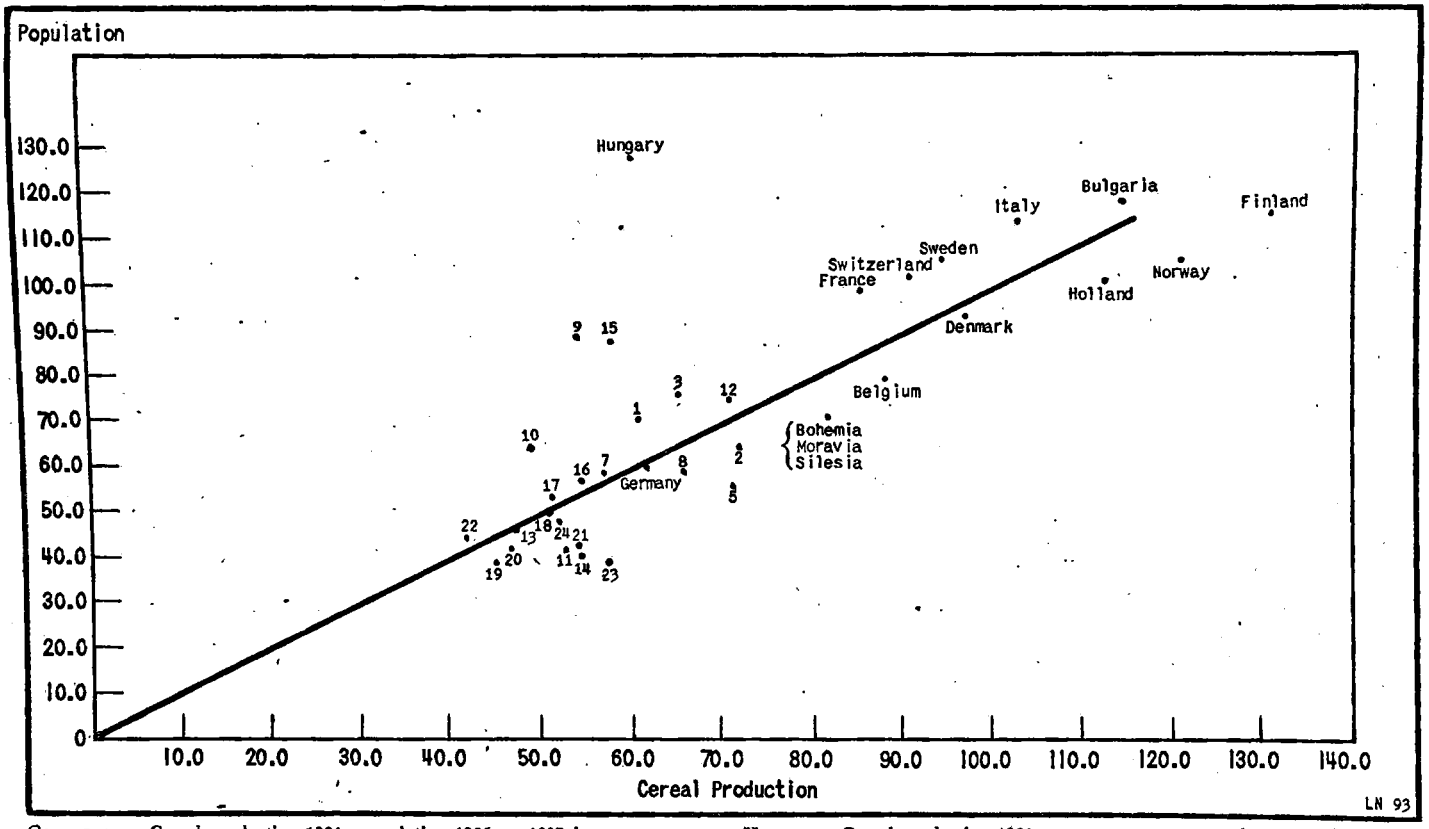
34. When the changes in agricultural production are compared with changes in agricultural population for various districts or countries, a broad connection is observed, as in Diagram 4. There are many important exceptions, however. Hungary ("Trianon" boundaries) increased her agricultural population, but recovered production very slowly. The same is almost certainly true of Roumania, although no relevant population figures are available for that country. It is probably true to say that agricultural populations have been rising, in absolute figures, in Southern and Eastern Europe, but falling in Western Europe. The long-run trend, observable in Map 4f, for production to rise in Southern and Eastern Europe and to fall in Northern and Western Europe is probably closely connected with the long-run trends in population. But the extent of recovery after the war is not closely connected with the change in the number of agriculturalists. This is shown clearly for France in Diagram 5, where the relation between the index of agricultural population (1906=100) and the index of cereal production (1913=100) is shown for 1921. There is a small negative correlation, indicating that production recovered most in those departments in which the number of agriculturalists fell most. It is evident that changes in the efficiency of labour must have been a more important factor in promoting recovery in some districts than changes in the number of labourers. It is worthy of note that it is the technically advanced countries, by and large, which suffered the greatest diminution in agricultural labour, indicating that technical progress proceeded more rapidly in countries that were already ad-

[1] Bureau International du Travail, Enquête sur la production, 1924, p. 49.

[2] Bureau International du Travail, Enquête sur la production, 1924, p. 49.

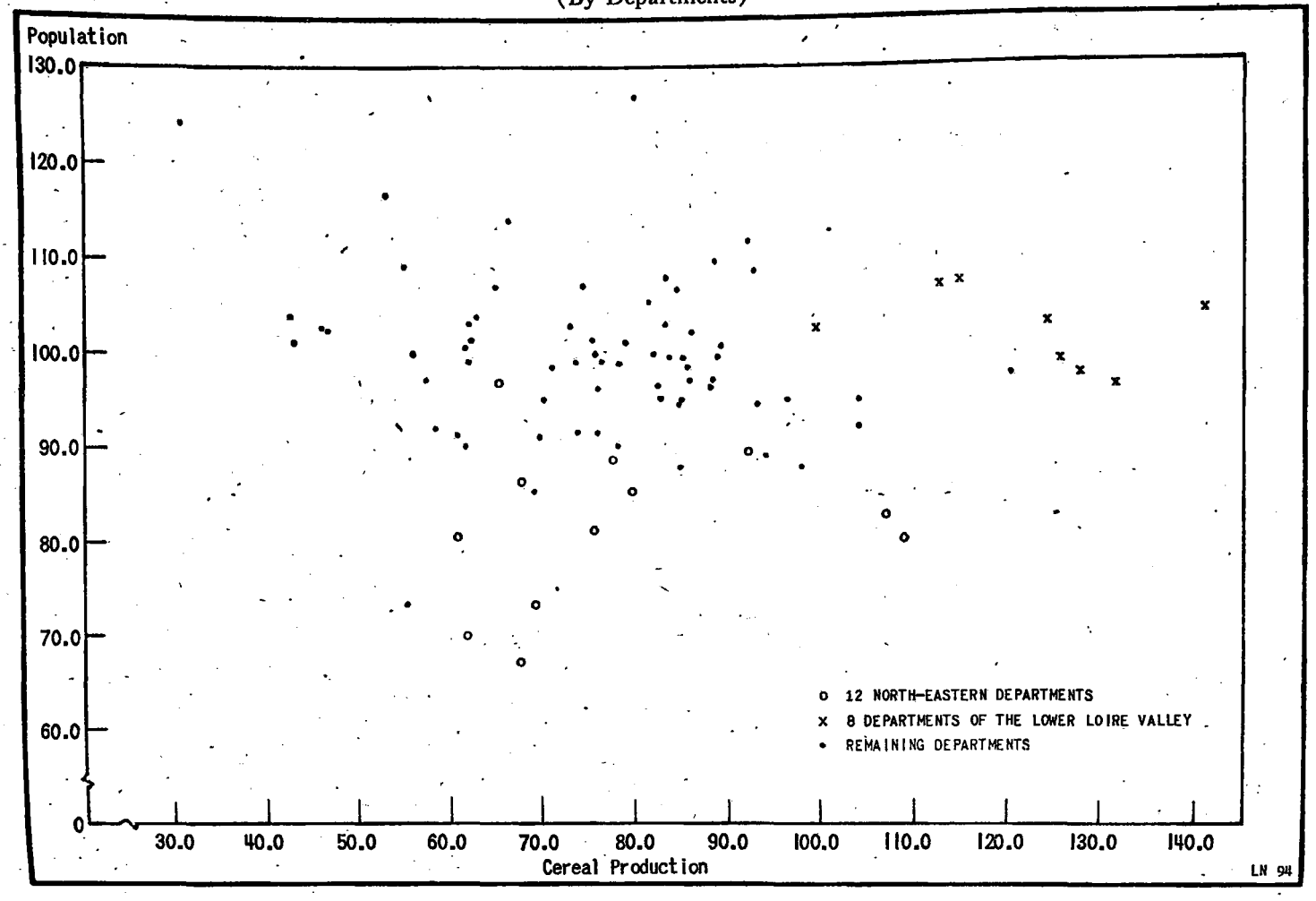
[3] M. Huber, La population de la France pendant la guerre, (Carnegie Foundation), p. 423-426.

DIAGRAM 4.—GERMANY: (by Provinces) AND OTHER COUNTRIES
INDEX OF POST-WAR LABOUR POPULATION RELATED TO INDEX OF CEREAL PRODUCTION
(Pre-war level = 100)



Germany: Cereal production 1924; population 1925 on 1907 base.
Belgium, Switzerland: Cereal production 1924; population 1920 on 1907 base.
Bulgaria: Cereal production 1924; population 1920 on 1907 base.
Holland: Cereal production 1921; population 1920 on 1909 base.
Denmark: Cereal production 1921; population 1921 on 1911 base.
Hungary: Cereal production 1921 on pre-war average as base; population 1920 on 1910 base.
Italy: (All provinces) 1921 production on 1910-14 base; 1921 population on 1911 base.
France: Cereal production 1921; population 1921 on 1906 base.

DIAGRAM 5.—FRANCE
INDEX OF FARM LABOUR POPULATION IN 1921 (1906 = 100)
RELATED TO INDEX OF CEREAL PRODUCTION IN 1921 (1913=100)
(By Departments)



vanced than in more backward countries. Even within France the industrial north suffered a greater decline in agricultural labour than the rest of the country, whereas in the south, where the number of agriculturalists increased, production diminished.

Livestock:

35. The numbers of livestock have an important effect both on the total output of agriculture and on the form in which the output appears. In order to interpret these changes it is desirable again to analyse the figures by small regions. This is done in Maps 7 and 8. The following conclusions can be drawn:

(i). The number of cattle declined fairly uniformly around an average of less than 10% in most of France, in Switzerland, and the Netherlands, and in Germany with the exception of two regions of high cattle density, Bavaria and Schleswig-Holstein, where numbers actually increased between 1913 and 1919. Only in the battlefield areas (including Belgium) and in a few other French districts, principally in Southern France, did the decline exceed 20%. Losses in the battlefield areas were made good by about 1924. Elsewhere on the Continent, recovery was on the whole relatively slow, the reconstruction of cattle herds by natural growth being necessarily a lengthy process.

(ii). The number of pigs not only declined greatly, but declined much more in some districts than in others. In 1919 there were only about 30% of the pre-war number of pigs in the region stretching along the coast from Holland to Denmark. In a belt extending from Bavaria through Switzerland to the Cevennes there were from 60-80% of the pre-war numbers. The number of pigs recovered rapidly in all districts, although it lagged slightly in France, Hungary and Transylvania by comparison with Germany. There has been a permanent shift away from the Dutch-German coastal region toward the south and east (Maps 8a-8e).

(iii). The number of sheep increased during the war in Western and Southern Germany and in Switzerland, fell elsewhere in Europe, and fell greatly in France. The situation did not change much until 1924 or 1925, when the numbers declined rapidly in Germany also. A tendency is apparent for sheep numbers to grow in southern relative to northern Germany.

(iv). The number of horses declined in practically all the belligerent countries on the Continent during the war. Over most of the area the decline by districts varied between 10 and 30%. In the Western Front area, the Garonne Valley and Bavaria, however, the decline exceeded 30%. The number increased in most districts in the years after the war, but decreased again during the '30s with the increase in motor vehicles.

36. In interpreting the causes and effects of changes in livestock numbers certain theoretical principles must be kept in mind.

(i). The number of animals that can be most economically maintained depends on the amount of feed available. With a given amount of feed there is an "optimum" number of livestock which will give the maximum amount of live-

stock products. If the number is larger than the optimum figure too much of the available feed will have to go into the "maintenance" ration, and not enough into the "production" ration. If the number is smaller than the optimum, the efficiency of feeding (product per unit of feed) will decline as animals tend to be overfed. There is reason to suppose that by the end of the war the number of cattle was above optimum. But the optimum figure was subsequently raised by the resumption of feed imports and the recovery in local feed production.

(ii). Unfortunately, it is not possible to determine exactly the quantity of feed available for various classes of livestock, since it is not generally known what proportion of the main crops that provide the "production ration" (cereals, roots, and potatoes) is fed to stock. The decline in the production of cereals and potatoes is some indication of the decline in feeding stuffs, for although it is probable that the production of grass, hay, and roots fell off rather less than that of cereals, it is also probable that a greater proportion of cereals and potatoes was diverted to human consumption. In addition there was a great decline in European imports of feeding stuffs, as is illustrated in Table XIV. The supplies of Russian barley, which were for the most part used to feed German pigs, were cut off by the war and never resumed. Imports of maize and linseed from Argentina also were drastically curtailed in the later years of the war by the British blockade and the German U-boat campaign. It is probable, therefore, that the supply of feeding stuffs in many areas of Europe at the end of the war was less than half the amount available in pre-war days. As imported barley and maize are mainly fed to pigs, a sharp reduction in pig population took place on the European Continent with the notable exception of Spain and Portugal.

(iii). There was on the whole no drastic reduction in the number of cattle. It is possible that the production of milk and beef would have been larger in the years round about the end of the war if the number of cattle had been less. It does not necessarily follow, however, that a vigorous policy of cattle slaughter should have been adopted. Cattle are infertile animals, having usually but one calf a year, and consequently it is difficult to raise their numbers rapidly. Map 7d shows, for instance, that even by 1928 there were large areas of Europe where the number of cattle had not recovered to the 1913 level. In judging the policy to be followed in a feed shortage, therefore, the present loss in production which follows from keeping too many animals must be balanced against the future loss in production which would result from too great a slaughter.

(iv). It is significant that the decline in the number of pigs was greater than that of any other animal. A temporary reduction in pig population can be allowed to take place the more readily as the pig is extremely fertile and the population, therefore, can be rapidly increased with an improvement in the feed supply, as was demonstrated by the rapid recovery following the war. The decline in imports particularly affected the pig industry of the Dutch-German-Danish coast (Map 8a). The belt in which the decline in the number of pigs was least and the recovery greatest corresponds roughly to the "potato belt" of Europe, extending from Poland and Eastern Germany in a south-westerly direction through Bavaria into South-Central France. This fact brings out the point that

TABLE XIV.—TRADE IN FEEDING STUFFS (EXPORT OR IMPORTS)
Metric quintals (000,000's)

Commodity and Country	1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1926	1928	1934-8
Exports of Maize:															
Argentina	48.1	35.4	43.3	28.7	8.9	6.6	22.3	44.1	28.3	28.3	28.4	45.3	49.1	63.7	55.3
U.S.A.	11.5	4.0	12.3	13.6	13.2	10.1	2.8	4.5	32.8	41.6	10.7	4.7	5.9	6.6	8.0
Russia[1]	5.8	2.9	.	.	.	.	.	.	.	.	[2] 0.4	[2] 2.2	2.6	0.6	0.3
Roumania[1]	9.7	11.4	4.6	8.3	.	.	.	4.4	7.7	3.0	6.8	7.5	6.9	4.7	5.4
Imports of Maize:															
United Kingdom and Ireland	25.0	19.8	24.7	17.4	12.7	7.4	8.6	17.2	18.7	18.9	17.5	22.9	19.4	20.7	35.8
Netherlands	10.0	6.5	11.0	7.0	2.1	.	2.2	3.9	9.0	8.8	7.1	8.6	10.2	12.1	9.3
Denmark[1]	4.0	2.6	6.9	4.5	2.4	.	1.9	2.5	4.6	4.4	3.3	4.2	3.9	6.3	3.3
Germany[1]	9.2	2.9	.	.	.	.	.	4.1	18.7	10.9	2.5	3.9	7.0	12.8	9.8
France[1]	5.9	4.1	4.5	7.2	1.5	1.4	1.4	4.4	3.1	5.3	5.6	5.5	5.9	6.9	6.9
Exports of Barley:															
Russia[1]	39.2	19.7	.	.	.	.	.	.	.	.	[2] 2.2	[2] 2.3	7.2	.	3.1
Imports of Barley:															
United Kingdom and Ireland	11.4	8.1	6.2	8.0	4.6	2.5	8.4	6.4	8.0	6.5	9.2	11.2	5.9	6.7	9.2
Germany[1]	32.4	16.7	.	.	.	.	.	0.7	3.1	2.7	3.1	5.9	17.4	19.3	2.9
Netherlands	8.9	4.6	1.1	1.3	0.4	.	1.4	0.5	1.4	1.4	2.8	2.8	3.1	3.3	2.5
Exports of Linseed:															
Argentina	10.2	8.1	9.8	6.4	1.4	3.9	8.5	10.1	13.6	19.4	10.4	13.6	16.7	19.4	15.4
Imports of Linseed:															
United Kingdom and Ireland	6.2	4.6	4.0	4.7	1.8	2.5	5.2	4.0	4.8	3.6	3.9	4.5	3.7	3.5	2.6
Germany[1]	5.6	3.4	.	.	.	.	.	0.5	1.5	1.0	0.6	1.3	3.2	4.4	[2] 2.2

[1] Figures prior to 1919 relate to pre-war territory.
[2] Trade across European frontiers only.

Europe has two pig industries, operating under widely diverse conditions. The "port pig" is fattened on imported feeds, and centres around the great ports of entry—*e. g.*, Hamburg. The "potato pig" is fattened on bulky, locally grown feeds, usually potatoes. The war affected these two industries in different ways.

(v). The divergent reactions of sheep breeding in France and in Germany (Table 3b of Appendix II) are to be explained mainly by the different situation in regard to imports of wool. France had access to overseas supplies, which Germany had not. Consequently, in Germany the high price of wool made it profitable to use some of the land which went out of cultivation to pasture sheep and goats. In France evidently this was not the case. It should be observed that there are two types of sheep breed in Europe: there is the "arable sheep" industry where the sheep are fattened on root crops or artificial grasses, and the "pasture sheep" industry of the hill pastures.

(vi). Information is deficient regarding the changes in farm equipment during the war, but it certainly deteriorated. We have numerical information only with respect to horses, where the decline in numbers during the war (10-30%) was generally less than the decline in labour power (about 50%). But during the war considerable numbers of horses were taken away from agriculture.

37. In interpreting the recovery in livestock numbers after the war, a further theoretical principle is of importance. The rate of growth of a population depends on the excess of births over deaths. A growth in a livestock population can only be obtained by increasing the number of births, or by withholding animals from slaughter. The number of births is not usually capable of rapid expansion except as regards pigs, consequently the growth of a livestock population is often accompanied at first by a reduction in the number of animals slaughtered. But, failing compensatory meat imports, a fall in slaughter tends to raise the price of meat, and thus increase the economic inducement to slaughter. Where imports of meat are normally small in relation to domestic production and are not capable of quick expansion, the withholding of animals from slaughter is likely to cause the price of meat to rise rapidly to the point at which it does not pay the producer to withhold any more animals. This fact limits the economic rate of growth of the livestock population. On the other hand, where meat consumption normally depends largely on imports capable of further expansion, even a small rise in price resulting from a reduced supply of home-killed meat will suffice to attract additional imports to fill the gap. The availability of meat imports therefore may have a marked effect on the rate of recovery in livestock numbers. The factors here discussed are particularly important as regards cattle, the natural fertility of which is comparatively low.

Fertilizers:

38. The supply of fertilizers was an important factor affecting agricultural production. Plants require several elements among which nitrogen, potassium, and phosphorus are the most important. Animal fertilizer — manure and bone — provides all three elements, though not always in the right proportions. Chemical fertilizers fall into three broad groups corresponding to the above elements: nitrogenous, phosphatic, and potassic. In the years following 1914, the Allies had con-

trol of practically all the natural sources of nitrates and phosphorus, and Germany of practically all the potash. Natural nitrates are found only in Chile; natura rock phosphates are found for the most part in North Africa, the United States, and Oceania. In 1914 almost the whole supply of potash came from deposits in Central Germany and in Alsace. In consequence of the war and the interruption of trade, the system of plant nutrition that rested on trade in chemical fertilizers was broken up, and the great fall in yield in Europe, and especially in the continental belligerent countries, must be attributed mainly to this factor.

39. Three factors determined the supply of nitrogenous fertilizers during and after the war (Table XV): (i) The availability of Chile nitrate. This was not available to the Central Powers from the very beginning of the war, and the shortage of shipping had cut off almost all Europe's imports by 1918, when France was the only European country to import any appreciable quantity. (ii). The development of synthetic nitrates. In Germany the development of the Haber process for the synthesis of nitrogen compounds from the air (1913) paved the way for a great expansion of production of nitrates and ammonium salts, so that in spite of the decline in imports the total supply increased. Britain before the war produced more than her requirements of ammonium sulphate as a by-product of coal-gas production. The cessation of her imports of Chile nitrates by 1918 was more than compensated by the decline in exports of ammonium sulphate, so that the total supply of nitrates actually increased. French production of nitrates was rather small, and did not expand during the war, so that the decline in imports led to a decline in the total supply. (iii). The absorption of nitrates for industrial and military purposes (*e.g.*, explosives) withdrew a large amount from agricultural use. Estimates available for Germany suggest that consumption for agricultural purposes, which absorbed most of the supply before the war, declined by over one-half. Total supply, on the other hand, despite the virtual cessation of imports, was only a little smaller in 1918 than before the war, thanks to the rapid increase in domestic synthetic production. For other countries no estimates for the agricultural use of nitrates seem to be available, but as regards France it may reasonably be assumed, from the decline in total supply in 1915 and again in 1918 and 1919, that the agricultural supply was even further curtailed. It would appear that the Italian total supply did not fall greatly until after the war, and then, as in France, it rose far beyond the pre-war level by the middle of the 'twenties.

40. The supply of phosphatic fertilizers to agriculture comes from two main sources—phosphate rock, which is usually converted into superphosphate by treating with sulphuric acid, and basic slag, a by-product of the steel industry. Table XVI shows an estimate of the supply for the main belligerents. In making this estimate the production of superphosphate has not been included, as it is almost all derived from natural phosphates. It will be observed that the amount available shrank greatly in France and Germany during the war, but increased in Great Britain. It should also be observed that the French supply recovered almost to its pre-war level by 1920, and surpassed it by 1922, whereas the German supply did not recover the 1913 level until about 1928. Britain greatly increased her production and net imports of phosphates during the war. Germany derived over half her phosphates before the war from basic slag, the production of which shrank during

TABLE XV.—PRODUCTION AND SUPPLY OF NITRATES
Metric tons of N (000's)

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1926	1928
GERMANY														
Production	123.4	114.0	118.0	157.3	180.4	210.6	110.7	152.1	230.5	293.0	.	312.2	391.8	546.6
Net Imports (+) or Exports (-)	+116.2	+101.2[a]	.	.	.	.	.	-1.1	-2.5	+3.8	-29.9	-28.3	-163.3	-225.2
Total Supply	*239.6*	*215.2*	.	.	.	.	.	*151.0*	*228.0*	*296.8*	.	*283.9*	*228.5*	*321.4*
Agricultural Use[2]	210.0	98.0	73.0	80.0	92.0	115.0	159.0	215.0	290.0	280.0	240.0	310.0		
FRANCE[1]														
Production[3]	17.9	.	9.4	7.8	11.7	12.2	14.9	13.3	13.4	19.0	25.9	30.2	43.1	59.6
Net Imports (+) or Exports (-)	+55.5	+48.2	+41.5	+87.0	+72.8	+43.0	+30.5	+48.4	+62.3	+38.3	+59.3	+69.9	+75.4	+100.2
Total Supply	*73.4*	.	*50.9*	*94.8*	*84.5*	*55.2*	*45.4*	*61.7*	*75.7*	*57.3*	*85.2*	*100.1*	*118.5*	*159.8*
UNITED KINGDOM & IRELAND														
Production	91.3	90.0	90.1	91.7	96.9	91.4	84.0	88.5	53.3	63.8	[6]80.5	86.2	62.6	118.1
Net Imports (+) or Exports (-)	-47.6	-42.0	-49.7	-51.6	-13.9	-4.0	-50.7	-7.4	-18.4	-25.2	-42.5	-46.7	-28.1	-71.0
Nitrate of Soda	+20.7	+24.2	+12.4	+3.2	-0.6	+0.1	-31.1	+15.8	+8.7	+5.3	+11.0	+12.0	+6.0	+12.0
Sulphate of Ammonia	-68.3	-66.2	-62.1	-54.8	-13.3	-4.1	-19.6	-23.2	-27.1	-30.5	-53.5	-58.7	-34.1	-83.0
Total Supply	*43.7*	*48.0*	*40.4*	*40.1*	*83.0*	*87.4*	*33.3*	*81.1*	*34.9*	*38.6*	[6]*39.2*	[6]*40.8*	[6]*36.3*	*46.8*
ITALY[1]														
Production	5.6	5.9	7.9	7.9	4.2	4.6	4.5	6.8	5.2	8.0	11.1	13.6	21.2	36.9
Net Imports[4]	+15.2	+12.0	+12.8	+14.0	+16.4	+15.6	+3.0	+8.9	+4.1	+8.4	+12.4	+17.5	+21.8	+15.5
Total Supply	*20.8*	*17.9*	*20.7*	*21.9*	*20.6*	*20.2*	*7.5*	*15.7*	*9.3*	*16.4*	*23.5*	*31.1*	*43.0*	*52.4*

[1] Figures prior to 1919 relate to pre-war territory.
[2] Estimates by F. Aereboe, op. cit. The figures refer to agricultural years.
[3] Figures for Cyanamide of Calcium refer to industrial years.
[4] Imports of synthetic nitrates assumed to be nil during the period 1914-21.
[5] Great Britain only.
[6] Including also Nitrate of Lime and Cyanamide of Calcium.
[a] Trade in the first six months.

TABLE XVI.—PRODUCTION AND SUPPLY OF PHOSPHATES
Metric Tons of P_2O_5 (000's)

	1909	1913	1916	1918	1919	1920	1921	1922	1923	1924	1926	1928
GERMANY [1,2]												
Production (Basic Slag)	244	329	285	214	111	154	127	147	*150	*170	182	213
Net Imports	174	207	—	—	.	.	164	212	61	140	224	357
Supply	418	536	285	214	.	.	291	359	*211	*310	406	570
BELGIUM—LUXEMBURG [1,2]												
Production:												
Basic Slag, Belgium	44	85	.	.	49	49	42	55	45	58	94	124
Luxemburg	.	.	.	.	.	.	24	49	37	54	69	82
Natural Phosphates	28	30	11	8	13	27	8	9	8	4	4	2
Total	(72)	(115)	.	.	(62)	76	74	113	90	116	167	208
Net Exports	(-84)	(-46)	.	.	-	-15	-16	-73	-33	-57	-86	-87
Supply	(-12)	(69)	.	.	(62)	(61)	58	40	57	59	81	121
FRANCE [2]												
Production:												
Basic Slag	60	95	..	8	26	43	51	80	76	123	159	207
Natural Phosphates	80	60	5	.	21	25	22	27	36	44	51	36
Total	140	155	.	.	47	68	73	107	112	167	210	243
Net Imports	164	269	84	70	146	267	170	303	354	311	303	249
Supply	304	424	.	.	193	335	243	410	466	478	513	492
UNITED KINGDOM and IRELAND												
Production (Basic Slag)	33	52	66	72	68	76	27	40	44	40	24[3]	29[3]
Net Imports	89	136	94	141	106	158	117	121	108	106	112	106
Supply	122	188	160	213	174	234	144	161	152	146	136	135
ITALY [2]												
Supply (Net Imports)	155	173	131	70	136	120	171	171	214	255	280	202
NETHERLANDS												
Supply (Net Imports)	23	43	—	—	21	50	41	73	74	88	98	112
DENMARK [2]												
Supply (Net Imports)	11	36	36	—	26	38	13	46	51	54	70	56
U.S.A.												
Production[4]	751	948	604	759	692	1 251	737	737	916	968	1 095	1 076
Net Exports	-307	-416	-74	-44	-115	-326	-224	-223	-259	-257	-238	-288
Supply	444	532	530	715	577	925	513	514	657	711	857	788

* Rough estimates.
1 Luxemburg is included with Germany until 1920.
2 Figures prior to 1919 relate to pre-war territory.
3 Production of Great Britain only.
4 Almost exclusively natural phosphates.

the war, when, moreover, her imports of rock phosphate were cut off by the blockade. The drastic drop in the supply of phosphates in France during the war resulted in part from reduced imports of phosphate rock, but mainly from a heavy decline in the production both of basic slag and of domestic phosphate rock.

41. The trade figures for potassic fertilizers are so incomplete that it is impossible to estimate the total supply by countries. Fortunately, however, the picture is a simple one. Before the war Germany had a virtual monopoly of potash. During the war German production was fairly constant, and in view of the decline in exports the agricultural use increased. France and Britain went short of potash, but this did not seem to affect greatly the yield of British agriculture, and the decline in French yield is more likely to be due to other causes.

TABLE XVII.—PRODUCTION OF POTASH (AS K_2O)

Metric Tons (000's)

	1913	*1916*	*1918*	*1919*	*1920*	*1921*	*1922*	*1924*	*1926*	*1928*
France	—	—	—	92	199	146	207	272	403	447
Germany[1]	1110	884	1002	812	924	921	1296	842	1260	1691
Poland	—	—	—	—	—	3	15	22	41	58
Total	1110	884	1002	904	1123	1070	1518	1146	1704	2196

In addition to the European production, the United States also began to develop sources of potash during the war, contributing 44,000 tons by 1920.

42. Summing up the fertilizer situation it may be concluded that the scarcity of nitrogen and phosphorus were important factors contributing to the decline in yields during the war. After the war the release of supplies formerly devoted to military uses made nitrogen relatively plentiful; the main factor retarding recovery in yields was lack of *phosphorus*. In this connection, it is perhaps worth observing that Germany, the only country that had a markedly deficient supply of phosphorus in the years following the war, was the only country of North-Western Europe that had not recovered her pre-war yield by 1928. In considering the total fertilizer situation the value of manure must also be taken into account. An estimate is available for Germany[2] giving the amount of fertilizing substances in 1913, shown in Table XVIII.

TABLE XVIII.—FERTILIZERS IN GERMANY—1913-14

Metric Tons (000's)

	Nitrogen (N)	*Phosphoric Oxide* (P_2O_5)	*Potash* (K_2O)
Chemicals	210	630	557
Animal Manure	600	300	600
Green Manure	29	8	23
Total	839	938	1180

It will be seen that artificials bulk much more largely in the total supply of phosphorus than in the supply of the other two elements; consequently a decline in the supply

[1] Pre- and post-war figures not strictly comparable on account of territorial changes.

[2] Honcamp, Ueber Produktion, Verbrauch, und Bedarf an Pflanzennaehrungsstoffen.

of fertilizing elements in manure depends to some extent on the degree to which animals are fed on imported fodder, for some elements of the fodder pass on to the manures. The decline in imported fodder during and after the war must have had an important effect on the supply of animal manure, especially in Germany.

Transportation and Trade Impediments:

43. The transport situation should be mentioned as a general cause underlying the decline in production during the war years and the delayed recovery in some regions afterwards. It was probably not an important factor in Northern and Western Europe: in France, for instance, the number of locomotives and wagons actually rose (14,273 locomotives, 424,340 wagons in 1914, 14,719 locomotives and 429,154 wagons in 1919). But in South-Eastern Europe the already inadequate transport system deteriorated gravely during the war. Thus Roumania (Old Kingdom) had 900 locomotives before the war [1] and 150 in 1919.[2] The transport situation was aggravated in the Danube Valley by the delay in the distribution of the rolling stock of the old Austro-Hungarian railroads among the succession states. It was further aggravated by the policy of the succession states themselves, which set up a complex network of trade and currency restrictions over the whole of what had once been a fairly unified economic area. Even the provinces of Austria imposed restrictions on movement of foodstuffs to Vienna which were not removed until August, 1922. Roumania prohibited the private export of wheat, and the price policy of her wheat monopoly contributed to the decline in exports. All the succession states in the early 'twenties had exchange controls and export and import prohibitions, which only gradually gave way first to a quota arrangement and then to a tariff system.

Land Reforms:

44. Among the general causes affecting agricultural recovery the agricultural reforms of Eastern Europe occupy an important though somewhat indefinable place. Extensive areas passed from large- to small-scale ownership after the war, and some two million new farms were created. The following table shows the percentage of total agricultural land affected in the various countries:

TABLE XIX.—EFFECT OF AGRICULTURAL REFORMS, UP TO 1930

Country	*Percentage of the total agricultural land affected*
Greece	50.0
Latvia	42.4
Roumania	29.7
Estonia	25.0
Lithuania	17.5
Czechoslovakia	14.1
Hungary	10.0
Jugoslavia	10.0
Poland	6.1
Bulgaria	little

[1] Great Britain, Department of Overseas Trade, Commerce Reports, Roumania, April, 1922.
[2] L. Pasvolsky, Economic Nationalism of the Danubian States, (Brookings Institute).

The movement was mainly a social movement to create a peasant agriculture whose basic unit is the owner-occupied family farm, but in part also a national movement to replace alien by native landowners. Historically it may be considered as a continuation of the French Revolution. The effect of the reform depended largely on the degree to which it involved the destruction of a system of enterprise as well as a system of ownership. In Roumania the reform seems to have delayed the recovery of production, in part because it involved a switch from wheat to maize, in part because a larger proportion of the peasant's time was at first occupied in building houses and byres, in sinking wells, etc. In Greece the effect of the reform was perhaps overshadowed by the dislocations consequent upon the transfer of populations. In Serbia the reform meant little more than a cessation of rent payments. In Hungary and Poland the quantitative effects were not large. In the Baltic states, although the reform was very extensive, it seems to have inaugurated an era of rapid progress, perhaps because these Northern states, in contrast with Roumania, could easily develop their livestock industry. It is reasonable to expect that the success of a reform which created millions of small farmers would be bound up with the development of livestock production, as it is in this form of enterprise that the small unit has an advantage.

Profitability of Production:

45. The profitability of agricultural production is another factor of obvious importance in the recovery. It is not necessary for the present study to enter upon the intricacies of farm cost accounting, the more so as but few and scrappy data are available for continental Europe for the period with which we are mainly concerned. It will suffice to refer briefly to the findings contained in reports on the agricultural situation in the 'twenties and early 'thirties issued by the Economic Committee of the League, the International Institute of Agriculture and the International Commission of (European) Agricultural Associations.

(i). During the war when the demand for agricultural products greatly exceeded the reduced supply, agriculture in Europe seems to have been universally profitable to the producer, and government intervention was directed mainly to the prevention of too great a rise in agricultural prices. This situation continued for some two years after the Armistice. The sharp slump in world prices which set in during 1920, however, brought widespread agricultural depression in Europe, even in countries in which there was inflation, as the prices of the goods the farmers sold, rose less than the prices of the goods they bought. "During the years 1921 to 1923, in particular, the receipts from agriculture did not, in most countries, cover the cost of production under normal working conditions," [1] a fact which was clearly unfavorable to recovery.

(ii). A marked improvement in the profitability of agriculture took place after 1924, and continued for several years, though the pre-war price relation between agricultural products, particularly cereals, and other commodities was not fully restored in many countries.

[1] Memorandum (based on the findings of the International Commission of Agricultural Associations) presented by J. Gautier, A. Hermes and H.A.F. Lindsay to the World Economic Conference, Geneva, 1927.

(iii). A new agricultural depression set in during 1928—a year of exceptionally large crops both in Europe and in exporting countries overseas—and was intensified in 1929 by the slump in industrial activity. As from the end of the 'twenties, with a view to preserving the peasantry that was threatened by ruin, Governments intervened in one European country after another by various measures (increased import duties, milling regulations, price guarantees, debt alleviations and subsidies of different kinds) designed to mitigate the depression in agriculture. As a result of such intervention (often described as aiming at agricultural self-sufficiency) and under the influence of the revival in demand following the gradual recovery (from 1933) in industrial activity, the profitability of agricultural production seems to have been largely restored, at least to the pre-depression level, during the latter part of the 'thirties in the normally cereal-importing countries of Europe.

(iv). It should be observed that the post-war crises in European agriculture related mainly to cereal cultivation. The profitability of the rapidly expanding animal production favoured by the long-term trend of consumers' demand seems on the whole to have been better maintained throughout the two decades of the inter-war period.

PART III. SUMMARY OF CONCLUSIONS, COMPARISON BETWEEN THE TWO WAR PERIODS, AND POST-WAR IMPLICATIONS

46. In Continental Europe the production and net imports of cereals and potatoes fell off sharply during the war and remained low in the early post-war years. In 1919 the aggregate consumption of these commodities was about one-third short of the pre-war average.

The fall in the output of livestock products was probably at least as great, while livestock numbers declined by rather less than one-fifth—cattle by less than one-tenth—on the average.

47. The post-war recovery in cereal production was slow. The potato crop passed the pre-war mark as early as 1922, but the aggregate cereal crop had still not returned to the 1909-13 level by the middle of the 'twenties. Even in 1925-29 this level had not been fully regained in Western Europe.

The cereal imports of this region for the same period were, however, almost large enough to raise total consumption (though not consumption per capita) to the pre-war average. In Eastern Europe, which exported a much smaller proportion of its crops in the late 'twenties than before the war, total cereal consumption rose slightly above, and consumption per capita almost equalled, the pre-war figure. In the early 'twenties, Eastern Europe was a net importer of cereals.

48. The fall in Europe's cereal production during the war was due in about equal measure to a reduction of the area under cereals and a decline in the yield per unit of area. The main cause of the area reduction was the shortage of man power, due to the calling of men to the colours. The decline in yield was due to a shortage both of labour and of important fertilizers, especially phosphates and natural manure. The shortage of draught power (as horses were taken by the armies) and the inadequate repairs and replacements of productive equipment were additional contributing factors.

49. The slow pace of recovery after the war was due to a number of factors, the relative force of which varied from one region or country to another. The main initial cause was undoubtedly the marked deterioration of the whole productive apparatus, including land, equipment, livestock and, perhaps, even man power, which had taken place, in neutral as well as belligerent countries, under the strain of war. Actual devastation through military operations was not a major factor.

Under the economic and social conditions which prevailed on the Continent during the early post-war period, a rapid restoration of normal production standards could hardly be expected. Agriculture, like industry, was suffering from the scarcity of capital and the general disorganization brought about by the inflation. War continued to be waged for some years after 1918 in Eastern Europe, and radical land reforms temporarily delayed recovery in some countries.

On the Continent as a whole the recovery in yield took place faster than the reconstitution of the area planted under cereals. The yield rose above the pre-war level for the first time in 1925 and, as the trend was upwards, it later reached a higher average than before the war. On the other hand, the cereal area was, in the middle of the 'twenties, still noticeably smaller than before the war. It was only towards the middle of the 'thirties that it climbed back to the pre-war average. And this was only as a result of the policy aiming at the preservation of the peasantry and at lessening the dependence upon imports, which was widely adopted in the course of the great depression, and which largely restored pre-depression levels of profitability in cereal production.

50. Despite the rise in yields resulting from improved agricultural technique, including the extended use of synthetic fertilizers, there was still room at the end of the inter-war period, and there will be room after the present war, for further improvement. Increased industrialization of backward agricultural areas would be a means to that end, for high yields are achieved by intensive cultivation, by livestock farming and dairy production which can be remuneratively pursued in industrialized areas. In fact, the industrial regions of Continental Europe are more important agriculturally than are the primarily agricultural regions.

51. Industrialization, where it leads to a rise in the standard of living, is generally accompanied by a change in consumers' demand in favour of animal and other non-cereal foodstuffs. Indeed, the production of these foodstuffs proved, on the whole, to be more remunerative, and therefore expanded more rapidly, than cereal production during the inter-war period. Per capita consumption of cereals barely returned to the 1909-13 average in the cereal-exporting Eastern part of the Continent. In the cereal-importing Western part it never recovered the pre-war level. In fact, it declined considerably in the wake of the agricultural self-sufficiency drive (accompanied by a marked decrease in cereal imports) in the early 'thirties and, in the last quinquennium of the inter-war period, it was apparently almost one-fifth less than in the period 1909-13. The local production of cereals was some 12% short of the pre-war volume. Nonetheless, the average consumer in Western Europe was undoubtedly less inadequately nourished before the present war than before the last war. The change in diet accompanying the rise in the standard of living in cereal-importing Western Europe would appear therefore to have been one of the underlying causes of the unwieldy surplus situation which confronted the cereal producers of the exporting areas overseas during the 'thirties. The long-term trend here referred to should not be ignored in looking ahead to the world cereal situation that will have to be faced after the present war, once the urgent needs of relief and rehabilitation have been satisfied.

52. The relief and reconstruction needs of the Continent will depend very largely on the local agricultural situation as it exists at the time the war is brought to an end in Europe. What, exactly, that situation will be cannot, of course, be accurately forecast at the present stage. If, however, we compare the general position in the third and the fourth years of this war—such as it appears from the somewhat inprecise and scrappy information available—with that of the corresponding years of the last war, the following points of similarity and dissimilarity emerge:

(i). The general course of cereal and potato production on the Continent as a whole has been fairly similar during the two wars and, climatic factors apart, for the same basic reasons, namely, a shortage of man power and draught power, the rundown condition of equipment and the lack of certain fertilizers. When complete and accurate data are made available, the relative fall in production, compared with the pre-war average in the two cases, may prove to have been not much smaller in 1942 than in 1917. The crop prospects in the summer of 1943 seem to promise an improvement. It may be recalled in this connection, that though the cereal crop (at any rate of Western Europe) was considerably larger in 1918 than in 1917, the first post-war year 1919 (under the impact of the factors referred to above) yielded a harvest that was even smaller than the poorest of the war period.

(ii). In contrast to the last war, the course of military events in the present war has led to the subjection of practically the whole of the Continent to the rigours of a tight blockade. It should also be noted that the destruction caused in Spain prior to this war, by the Spanish Civil War, was greater than that caused in South-Eastern Europe by the Balkan wars which preceded the last world war.

As a consequence of aerial warfare, the destruction of physical capital is much greater in the present than in the last war and, under the German occupation, the civilian population of Europe is also suffering greater hardship which may reduce its productive capacity for years to come. The population of the Continent as a whole has not necessarily had less (it may have had more) to eat in terms of calories, for the reduction in livestock (especially cattle) has been carried considerably farther in this war, and a considerably smaller proportion of the supply of cereals and potatoes, etc., has therefore been taken away from human consumption to be transformed into livestock products. But the distribution of the available supply of vegetable foodstuffs has been organized in a manner such as to benefit, in the first instance, the population of the ruling power, and there is little doubt that very large groups of the populations of the other nations are more undernourished than in the last war.

Further, transportation facilities are undergoing heavier and more widespread destruction and disruption than during the last war. It is also probable that fewer replacements and repairs of worn agricultural equipment are being made today, as the available industrial capacity has been concentrated in a higher degree on the production of implements of war. The heavy reduction in livestock means a loss of agricultural capital which cannot be made good rapidly and it entails, moreover, a reduction in the supply of natural manure. Especially since the conquest of North Africa by the Allies, the lack of phosphates, which are so important an element in the fertilizer diet that is necessary to keep the soil in good condition, must have become at least as serious as it was during the last war. Finally, the rural population of large sections of the Continent has been dispersed, a fact which is bound to react unfavourably on agricultural productive capacity.

(iii). When all of the above factors are considered, it is apparent that, fundamentally, the agricultural position of the European Continent is weaker at present than it was at the end of the last war and is bound to weaken further, the longer the war lasts. As nearly the whole of the Continent is now involved, the need for initial relief from overseas and for assistance in reconstruction will be the greater and the more urgent. Failing such assistance, the process of agricultural recovery may prove to be even slower and more painful than it was last time.

53. The task of alleviating the fertilizer shortage in Europe after the war may not prove very difficult, at any rate as regards synthetic fertilizers, since there will be no lack of industrial capacity nor, in most cases, of the requisite raw materials for their production. But the import requirements of natural phosphates, the only important fertilizer raw material that nature does not provide in sufficient amount on the Continent, will have to be met and time is always required before exhausted land can be got back to full fertility.

For the replacement of the agricultural equipment destroyed, worn out or rendered obsolete the engineering industries expanded during the war will, it may be assumed, prove adequate. The problem here is likely to prove to be one of purchasing power rather than of productive capacity.

A number of years will certainly be required to reconstitute the reduced cattle herds and to make good the serious deficiency of dairy produce. This livestock problem, which was perhaps the least difficult that presented itself last time, is likely to prove the most serious of those facing European agriculture after the present war and it therefore deserves particular attention in any comprehensive reconstruction programme.

APPENDICES

APPENDIX I

Production, Trade and Supply of Cereals and Potatoes

General Note. Up to 1938 the tables are based exclusively on the *International Year Book of Agricultural Statistics* published by the International Institute of Agriculture, Rome. The data shown for 1939 and 1940 are taken partly from the same sources and partly from national statistics.

In the course of the war-period, 1914-1918, most of the belligerent countries on the Continent discontinued publication of trade statistics. The figures shown for 1914 are somewhat incomplete as, in the case of Germany, Austria-Hungary, Belgium and Italy, they cover only the first six months of the year. It should be recalled, however, that oversea imports into Belgium, Germany and Austria-Hungary practically ceased with the outbreak of the war at the beginning of August. Also, the production data grew increasingly scarce, particularly in Eastern Europe and Russia, as from 1917.

The eastern borders of Sweden, Germany, Switzerland and Italy, have been chosen as the line of demarcation between Western and Eastern Continental Europe shown separately in Tables 1a and 1b, the former region being normally a net importer and the latter a net exporter of cereals.

APPENDIX I.— Production, Net Imports [1] (+), Net Exports [1] (-) and Supply [2] of Cereals and Potatoes [3].

Metric quintals (000,000's).

Table 1.—Continental Europe [4].

Commodities		Pre-War Boundaries †						Post-War Boundaries										
		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-9	1930-4	1934-8
Wheat	Production	(348.1) 332.3	274.5	284.7	269.9	221.6	.	235.3	243.5	311.1	264.9	324.1	271.9	365.6	316.7	353.4	398.4	415.7
	Trade	+62.0	+58.5	.	.	.	.	+84.3	+91.4	+102.9	+82.4	+87.3	+90.7	+94.3	+73.8	+96.4	+59.6	+32.8
	Supply	394.3	333.0	.	.	.	.	319.6	334.9	414.0	347.3	411.4	362.6	459.9	390.5	449.8	458.0	448.5
Rye	Production	(248.7) 203.6	178.9	157.0	151.7	125.3	.	154.3	139.9	196.5	181.4	209.0	165.4	240.4	193.4	222.2	230.2	224.3
	Trade	+6.6	+5.4	.	.	.	.	+10.5	+12.5	+6.7	+10.2	+17.7	+17.7	+11.0	+5.1	+8.8	+5.0	+1.7
	Supply	210.2	184.3	.	.	.	.	164.8	152.4	203.2	191.6	226.7	183.1	251.4	198.5	231.0	235.2	226.0
Barley	Production	(136.6) 117.2	106.4	95.7	102.7	.	.	91.6	108.4	113.7	120.0	132.9	113.0	133.3	134.8	143.4	152 [illegible]	144.6
	Trade	+33.3	+18.6	.	.	.	.	+6.5	-1.8	+6.0	+0.7	+3.3	+10.5	+13.1	+15.5	+15.1	+11.8	+6.9
	Supply	150.5	125.0	.	.	.	.	98.1	106.6	119.7	120.7	136.2	123.5	146.4	150.3	158.5	164.3	151.5
Oats	Production	(250.9) 227.2	215.4	170.2	188.6	.	.	162.8	187.0	192.0	195.5	235.2	206.2	217.8	234.1	236.7	224.9	223.0
	Trade	+10.7	+5.9	.	.	.	.	+8.5	+3.4	+4.3	+6.2	+4.7	+6.7	+12.0	+7.2	+6.7	+5.7	+4.6
	Supply	237.9	221.3	.	.	.	.	171.3	190.4	196.3	201.7	239.9	212.9	229.8	241.3	243.4	230.6	227.6
Maize	Production	(145.4) 137.0	137.1	129.6	113.6	114.9	.	112.2	132.6	100.6	107.9	118.8	149.7	159.1	166.0	145.6	170.7	185.2
	Trade	+24.5	+11.5	.	.	.	.	+16.2	+19.0	+42.9	+44.7	+26.6	+25.9	+25.0	+32.2	+44.1	+42.2	+38.6
	Supply	161.5	148.6	.	.	.	.	128.4	151.6	143.5	152.6	145.4	175.6	184.1	198.2	189.7	212.9	223.8
Total Cereals	*Production*	(1129.8) 1017.9	912.3	837.2	826.5	.	.	756.2	811.4	913.9	869.7	1020.0	906 2	1116.2	1045.0	1101.3	1176.7	1192.8
	Trade	+137.1	+99.9	.	.	.	.	+126.0	+124.5	+162.8	+144.2	+139.6	+151.5	+155.4	+133.8	+171.1	+124.3	+84.6
	Supply	1154.4	1012.2	.	.	.	.	882.2	935.9	1076.7	1013.9	1159.6	1057.7	1271.6	1178.8	1272.4	1301.0	1277.4
Potatoes	Production	(266.5) 229.5	212.8	232.3	148.5	.	.	181.5	215.5	195.8	304.3	247.3	271.3	286.0	237.3	289.8	328.5	357.8
	Trade	-0.2	-1.0	.	.	.	.	+1.0	-2.2	-5.5	-0.3	-1.0	-1.8	-1.2	-10.0	-1.0	-12.7	-4.3
	Supply	229.3	211.8	.	.	.	.	182.5	213.3	190.3	304.0	246.3	269.5	284.8	227.3	288.8	315.8	353.5
Total Cereals and Potatoes	*Production*	(1396.3) 1246.8	1125.1	1069.5	975.0	.	.	937.7	1026.9	1109.7	1174.0	1267.3	1177.5	1402.2	1282.3	1391.1	1505.2	1550.6
	Trade	+136.9	+98.9	.	.	.	.	+127.0	+122.3	+157.3	+143.9	+138.6	+149.7	+154.2	+123.8	+170.1	+111.6	+80.3
	Supply	1383.7	1224.0	.	.	.	.	1064.7	1149.2	1267.4	1317.9	1405.9	1327.2	1556.4	1406.1	1561.2	1616.8	1630.9

† Bracketed figures in first column indicate production within *post*-war boundaries.

For footnotes see end of Appendix I.

Appendix I (continued).
Metric quintals (000,000's).

Table 1-s—Western Continental Europe [5]

Commodities		Pre-War Boundaries †						Post-War Boundaries										
		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-29	1930-34	1934-38
Wheat	Production	(225.2) 226.7	207.0	195.5	186.6	145.2	184.8	166.1	176.6	226.0	177.2	223.4	167.6	248.2	203.6	231.1	264.3	268.2
	Trade	+74.6	+59.6	.	.	.	.	+73.0	+79.1	+92.4	+72.9	+75.4	+76.8	+84.6	+72.1	+87.8	+57.0	+38.4
	Supply	301.3	266.6	.	.	.	.	239.1	255.7	318.4	250.1	298.8	244.4	332.8	275.7	318.9	321.3	306.6
Rye	Production	(139.9) 156.3	142.8	123.3	120.4	95.4	111.7	93.9	85.7	109.5	90.4	105.4	92.5	123.0	92.5	112.0	111.7	107.2
	Trade	+4.0	+2.4	.	.	.	.	+6.7	+10.9	+5.3	+7.9	+15.6	+13.8	+7.7	+5.6	+6.9	+9.0	+5.5
	Supply	160.3	145.2	.	.	.	.	100.6	96.6	114.8	98.3	121.0	106.3	130.7	98.1	118.9	120.7	112.7
Barley	Production	(70.2) 73.9	68.7	62.8	67.4	53.6	58.2	52.6	57.0	61.2	56.4	51.2	80.1	75.1	71.8	77.6	84.0	83.6
	Trade	+39.0	+21.4	.	.	.	.	+6.6	+2.1	+9.4	+7.7	+12.4	+15.3	+16.3	+23.9	+23.6	+22.1	+12.9
	Supply	112.9	90.1	.	.	.	.	59.2	59.1	70.6	64.1	63.6	95.4	91.4	95.7	101.2	106.1	96.5
Oats	Production	(172.7) 179.9	173.0	130.7	148.2	101.2	105.2	108.2	129.1	126.4	123.0	154.5	142.5	150.7	159.3	163.3	151.1	150.2
	Trade	+12.1	+6.8	.	.	.	.	+8.4	+3.7	+5.9	+8.6	+6.4	+6.1	+10.4	+7.2	+6.6	+6.2	+5.2
	Supply	192.0	179.8	.	.	.	.	116.6	132.8	132.3	131.6	160.9	148.6	161.1	166.5	169.9	157.3	155.4
Maize	Production	(40.5) 40.5	40.1	45.4	34.9	34.9	30.6	33.5	36.7	35.4	32.5	35.5	44.3	43.9	40.7	38.3	43.5	47.2
	Trade	+34.1	+23.1	.	.	.	.	+15.6	+23.8	+50.3	+46.6	+34.7	+27.5	+38.3	+45.0	+52.3	+51.3	+42.9
	Supply	74.6	63.2	.	.	.	.	49.1	60.5	85.7	79.1	70.2	71.8	82.2	85.7	90.6	94.8	90.1
Total Cereals	*Production*	*(648.5)* 677.9	631.6	557.7	557.5	430.3	490.5	454.3	485.1	558.5	479.5	570.0	527.0	640.9	567.9	622.3	654.6	656.4
	Trade	+163.8	+113.3	.	.	.	.	+110.3	+119.6	+163.3	+143.7	+144.5	+139.5	+157.3	+159.8	+177.2	+145.6	+104.9
	Supply	841.1	744.9	.	.	.	.	564.6	604.7	721.8	623.2	714.5	666.5	798.2	721.7	799.5	800.2	761.3
Potatoes [3]	Production	(166.0) 183.0	170.0	187.5	111.0	144.3	120.5	113.0	134.3	120.0	176.3	128.8	157.8	185.0	143.3	173.8	194.0	207.3
	Trade	-0.5	-14.0	.	.	.	.	+0.8	-0.5	-0.5	-	-1.0	-1.3	-1.2	-0.8	-0.8	-0.8	-0.5
	Supply	182.5	156.0	.	.	.	.	113.8	133.8	119.5	176.3	127.8	156.5	183.8	142.5	173.0	193.2	206.8
Total Cereals and Potatoes	*Production*	*(814.5)* 860.9	801.6	745.2	668.5	574.6	611.0	567.3	619.4	678.5	645.8	698.8	684.8	825.9	711.2	796.1	848.6	863.7
	Trade	+163.3	+99.3	.	.	.	.	+111.1	+119.1	+162.8	+143.7	+143.5	+138.2	+156.1	+159.0	+176.4	+144.8	+104.4
	Supply	1023.6	900.9	.	.	.	.	678.4	738.5	841.3	789.5	842.3	823.0	982.0	864.2	972.5	993.4	968.1

† Bracketed figures in first column indicate production within *post-war* boundaries
For footnotes see end of Appendix 1

Table 1-b—Eastern Continental Europe [6]

Appendix 1 (continued).
Metric quintals (000,000's)

Commodities		Pre-War Boundaries †						Post-War Boundaries										
		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-29	1930-34	1934-38
Wheat	Production	(123.0) 105.6	67.5	89.2	83.3	76.4	.	69.2	66.9	85.1	87.7	100.7	104.3	117.4	113.1	122.3	134.1	147.5
	Trade	-12.6	-1.1	.	.	.	.	+11.3	+12.3	+10.5	+9.5	+11.9	+13.9	+9.7	+1.7	+8.6	+2.6	-5.6
	Supply	93.0	66.4	.	.	.	.	80.5	79.2	95.6	97.2	112.6	118.2	127.1	114.8	130.9	136.7	141.9
Rye	Production	(108.7) 47.3	36.1	33.7	31.3	29.9	.	60.4	54.2	87.0	91.0	103.6	72.9	117.4	100.9	110.2	118.5	117.1
	Trade	+2.6	+3.0	.	.	.	.	+3.8	+1.6	+1.4	+2.3	+2.1	+3.9	+3.3	-0.5	+1.9	-4.0	-3.8
	Supply	49.9	39.1	.	.	.	.	64.2	55.8	88.4	93.3	105.7	76.8	120.7	100.4	112.1	114.5	113.3
Barley	Production	(66.4) 43.3	37.7	32.9	35.3	.	.	39.0	51.4	52.5	63.6	81.7	32.9	58.2	63.0	65.8	68.5	61.0
	Trade	-5.7	-2.8	.	.	.	.	-0.1	-3.9	-3.4	-7.0	-9.1	-4.8	-3.2	-8.4	-8.5	-10.3	-6.0
	Supply	37.6	34.9	.	.	.	.	38.9	47.5	49.1	56.6	72.6	28.1	55.0	54.6	57.3	58.2	55.0
Oats	Production	(78.3) 47.3	42.4	39.5	40.4	.	.	54.6	57.9	65.6	72.5	80.7	63.7	67.1	74.8	73.4	73.8	72.8
	Trade	-1.4	-0.9	.	.	.	.	+0.1	-0.3	-1.6	-2.4	-1.7	+0.6	+1.6	0	+0.1	-0.5	-0.6
	Supply	45.9	41.5	.	.	.	.	54.7	57.6	64.0	70.1	79.0	64.3	68.7	74.8	73.5	73.3	72.2
Maize	Production	(104.9) 96.5	97.0	84.2	78.7	80.0	.	78.7	95.9	65.2	75.4	83.3	105.4	115.2	125.3	107.3	27.2	138.0
	Trade	-9.6	-11.6	.	.	.	.	+0.6	-4.8	-7.4	-1.9	-8.1	-1.6	-13.3	-12.8	-8.2	-9.1	-4.3
	Supply	86.9	85.4	.	.	.	.	79.3	91.1	57.8	73.5	75.2	103.8	101.9	112.5	99.1	118.1	133.7
Total Cereals	*Production*	*(481.9)* 340.0	280.7	279.5	269.0	.	.	301.9	326.3	355.4	390.2	450.0	379.2	475.9	477.1	479.0	522.1	536.4
	Trade	-26.7	-19.4	.	.	.	.	+15.7	+4.9	-0.5	+0.5	-4.9	+12.0	-7.9	-20.0	-6.1	-21.9	-20.3
	Supply	313.3	267.3	.	.	.	.	317.6	331.2	354.9	390.7	445.1	391.2	473.4	457.1	472.9	500.8	516.1
Potatoes [3]	Production	(100.5) 46.5	42.8	44.8	37.5	.	.	68.5	81.2	75.8	128.0	118.5	113.5	101.0	94.0	116.0	134.5	150.5
	Trade	+0.3	+13.0	.	.	.	.	+0.2	-1.7	-5.0	-0.3	-	-0.5	-	-9.2	-0.2	-11.9	-3.8
	Supply	46.8	55.8	.	.	.	.	68.7	79.5	70.8	127.7	118.5	113.0	101.0	84.8	115.8	122.6	146.7
Total Cereals and Potatoes	*Production*	*(581.8)* 386.5	323.5	324.3	306.5	.	.	370.4	407.5	431.2	518.2	568.5	492.7	576.9	571.1	595.0	656.6	686.9
	Trade	-26.4	-0.4	.	.	.	.	+15.9	+3.2	-5.5	+0.2	-4.9	+11.5	-1.9	-29.2	-6.3	-33.2	-24.1
	Supply	360.1	323.1	.	.	.	.	386.3	410.7	425.7	518.4	563.6	504.2	574.4	541.9	588.7	623.4	662.8

†Bracketed figures in first column indicate production within *post-war* boundaries.
For Footnotes see end of Appendix 1.

Table 2.—Russia, including Siberia.—U.S S.R.[7]

Appendix I (continued).
Metric quintals (000,000's).

Commodities		Pre-War Boundaries †						Post-War Boundaries										
		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-9	1930-4	1934-8
Wheat	Production	(206.0) 221.8	226.9	225.0	179.6	165.6	.	.	86.6	55.7	87.5	114.1	128.5	206.1	248.7	215.2	251.6	359.4
	Trade	-42.8	-24.4	.	.	.	.	.	.	+1.8	+4.7	-3.3	-2.4	+0.8	-10.5	-3.1	-13.0	-6.4
	Supply	179.0	202.5	.	.	.	.	.	.	57.3	92.2	110.8	126.1	206.9	238.2	212.1	238.6	353.0
Rye	Production	(189.1) 234.2	221.0	231.1	224.6	165.1	.	.	93.7	101.8	181.5	199.2	187.2	225.7	239.1	220.5	223.9	219.7
	Trade	-7.3	-3.8	.	.	.	.	.	.	+0.6	+1.8	-12.0	-6.5	-0.1	-2.2	-1.2	-4.9	-1.6
	Supply	226.9	217.2	.	.	.	.	.	.	102.4	183.3	187.2	180.7	225.6	236.9	219.3	219.0	218.1
Barley	Production	(90.4) 109.9	94.2	93.4	84.7	.	.	.	47.1	26.6	38.2	45.5	39.3	57.1	53.5	57.6	63.3	86.3
	Trade	-37.0	-19.6	.	.	.	.	.	.	.	+0.2	-2.2	-2.3	-4.8	-7.2	-2.8	-6.6	-3.0
	Supply	72.9	74.6	.	.	.	.	.	.	.	38.4	43.3	37.0	52.3	46.3	54.8	56.7	83.3
Oats	Production	(134.3) 158.0	132.8	130.2	139.9	.	.	.	70.2	52.2	73.8	77.6	87.6	116.9	155.4	143.4	146.3	178.8
	Trade	-10.7	-2.5	.	.	.	.	.	.	.	+0.3	-1.0	-0.6	-0.1	-0.2	-0.3	-2.0	-0.7
	Supply	147.3	130.3	.	.	.	.	.	.	.	74.1	76.6	87.0	116.8	155.2	143.1	144.3	178.1
Maize	Production	(13.4) 21.8	22.9	18.3	18.8	21.5	.	.	11.5	11.6	20.6	27.1	23.1	42.8	33.4	34.7	39.0	34.7
	Trade	-7.5	-2.7	.	.	.	.	.	.	.	+0.8	-0.4	-2.2	-1.0	-2.6	-1.0	-1.4	-0.3
	Supply	14.3	20.2	.	.	.	.	.	.	.	21.4	26.7	20.9	41.8	30.8	33.7	37.6	34.4
Total Cereals	*Production*	(684.2) 745.7	697.8	698.0	647.6	.	.	.	309.1	247.9	401.6	463.5	465.7	648.6	730.1	671.4	724.1	878.9
	Trade	-105.3	-53.0	.	.	.	.	.	.	+2.4	+7.8	-18.9	-14.0	-5.2	-22.7	-8.4	-27.9	-12.0
	Supply	640.4	644.8	.	.	.	.	.	.	250.3	409.4	444.6	451.7	643.4	707.4	663.0	696.2	866.9
Potatoes [3]	Production	(50.5) 87.5	66.5	56.8	47.8	.	.	.	52.0	53.3	57.3	86.8	90.5	96.5	109.5	105.5	118.8	139.8
	Trade	-0.5	-	.	.	.	.	.	.	+0.2	-	-	-	-	-	-	-	-
	Supply	87.0	66.5	.	.	.	.	.	.	53.5	57.3	86.8	90.5	96.5	109.5	105.5	118.8	139.8
Total Cereals and Potatoes	*Production*	(683.7) 833.2	764.3	754.8	695.4	.	.	.	361.1	301.2	458.9	550.3	556.2	745.1	839.6	776.9	842.9	1018.7
	Trade	-105.8	-53.0	.	.	.	.	.	.	+2.6	+7.8	-18.9	-14.0	-5.2	-22.7	-8.4	-27.9	-12.0
	Supply	727.4	711.3	.	.	.	.	.	.	303.8	466.7	531.4	542.2	749.9	816.9	768.5	815.0	1006.7

† Bracketed figures in first column indicate production within *post-war* boundaries.
For footnotes see end of Appendix I.

Appendix 1 (continued).
Metric quintals (000,000's).

Table 3.— British Isles (United Kingdom and Ireland).

Commodities		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-9	1930-4	1934-38	1939
Wheat	Production	16.2	17.0	20.1	16.3	17.5	25.4	18.9	15.5	20.1	18.1	16.5	14.7	14.6	14.2	14.4	14.4	19.2	19.4
	Trade	+58.5	+57.8	+50.7	+56.7	+55.6	+47.0	+48.0	+63.4	+48.7	+56.3	+55.8	+67.7	+54.4	+57.8	+60.6	+64.2	+58.9	...
	Supply	74.7	74.8	70.8	73.0	73.1	72.4	66.9	78.9	68.8	74.4	72.3	82.4	69.0	72.0	75.0	78.6	78.1	...
Rye	Production	0.5	0.5	0.4	0.5	0.5	0.8	0.8	0.6	0.5	0.6	0.6	0.4	0.3	0.3	0.2	0.2	0.1	...
	Trade	+0.5	+0.5	+0.4	+0.5	+1.3	+1.3	+0.4	+0.5	+0.3	+0.2	+0.3	+0.4	+0.3	+0.2	+0.2	+0.3	+0.4	...
	Supply	1.0	1.0	0.8	1.0	1.8	2.1	1.2	1.1	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.5	0.5	...
Barley	Production	14.2	14.6	10.6	12.0	13.0	14.1	13.1	14.9	12.3	12.1	12.4	12.9	13.1	11.9	12.3	9.4	9.1	9.8
	Trade	+10.8	+7.9	+6.1	+8.0	+4.6	+2.5	+8.4	+6.4	+7.8	+6.4	+9.2	+11.1	+8.1	+5.6	+6.9	+7.5	+9.2	...
	Supply	25.0	22.5	16.7	20.0	17.6	16.6	21.5	21.3	20.1	18.5	21.6	24.0	21.2	17.5	19.2	16.9	18.3	...
Oats	Production	30.0	29.2	31.6	30.2	36.8	44.1	36.1	32.0	29.9	28.6	28.1	30.0	30.0	32.2	31.2	28.1	25.9	23.1
	Trade	+9.0	+7.0	+7.8	+6.1	+6.4	+5.6	+2.9	+2.9	+4.1	+4.7	+4.9	+5.1	+3.7	+3.5	+3.1	+3.3	+1.2	...
	Supply	39.0	36.2	39.4	36.3	43.2	49.7	39.0	34.9	34.0	33.3	33.0	35.1	33.7	35.7	34.3	31.4	27.1	...
Maize	Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	...
	Trade	+20.8	+19.1	+23.3	+17.2	+12.7	+7.4	+8.6	+17.0	+18.4	+18.8	+16.9	+22.3	+15.6	+18.7	+19.8	+28.9	+34.8	...
	Supply	20.8	19.1	23.3	17.2	12.7	7.4	8.6	17.0	18.4	18.8	16.9	22.3	15.6	18.7	19.8	28.9	34.8	...
Total Cereals	*Production*	60.9	61.3	62.7	59.0	67.8	84.4	68.9	63.0	62.8	59.4	57.6	58.0	58.0	58.0	58.1	52.1	54.3	...
	Trade	+99.6	+92.3	+88.3	+88.5	+80.6	+63.8	+68.3	+90.2	+70.3	+86.4	+87.1	+106.6	+82.1	+85.8	+90.6	+104.2	+104.5	...
	Supply	160.5	153.6	151.0	147.5	148.4	148.2	137.2	153.2	142.1	145.8	144.7	164.6	140.1	144.4	148.7	156.3	158.8	...
Potatoes[3]	Production	17.3	19.0	19.2	13.9	21.9	23.4	16.0	16.2	16.6	21.9	15.2	14.9	19.1	16.9	19.5	18.9	14.0	18.7
	Trade	+0.3	+0.3	+0.2	+0.1	+0.2	-0.8	+0.6	+0.6	+0.2	+0.1	+0.5	+1.1	+1.1	+0.7	+0.8	+1.0	+0.3	...
	Supply	17.6	19.3	19.4	14.0	22.1	23.4	15.2	16.8	16.8	22.0	15.7	16.0	20.2	17.6	20.3	19.9	14.3	...
Total Cereals and Potatoes	*Production*	78.2	80.3	81.9	72.9	89.7	107.8	84.9	79.2	79.4	81.3	72.8	72.9	77.1	75.5	77.6	71.0	68.3	...
	Trade	+99.9	+92.6	+88.5	+88.6	+80.8	+63.8	+67.5	+90.8	79.5	+86.5	+87.6	+107.7	+84.2	+86.5	+91.4	+105.2	+104.8	...
	Supply	178.1	172.9	170.4	161.5	170.5	171.6	152.4	170.0	158.9	167.8	160.4	180.6	160.9	162.0	169.0	176.2	173.1	...

For footnotes see end of Appendix 1.

Table 4.— North America (United States and Canada).

Appendix 1 (continued).
Metric quintals (000,000's).

Commodities		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-9	1930-4	1934-8	1939	1940
Wheat	Production	241.5	286.4	386.3	244.7	236.9	302.2	309.9	298.3	303.7	344.9	346.1	306.6	291.7	337.0	341.1	294.3	266.9	346.2	372.4
	Trade	-51.0	-86.2	-121.2	-117.8	-85.9	-76.5	-100.0	-111.3	-137.4	-123.9	-119.8	-131.8	-105.6	-128.2	-124.8	-78.9	-53.1	-73.8	-54.4
	Supply	190.5	200.2	265.1	126.9	151.0	225.7	209.9	187.0	166.3	221.0	226.3	174.8	186.1	208.8	216.3	215.4	213.8	272.4	318.0
Rye	Production	9.7	11.4	14.4	13.1	17.0	25.3	21.9	18.2	21.1	34.5	21.9	20.1	14.1	13.5	13.7	10.2	12.3	13.8	13.9
	Trade	-0.2	-2.1	-3.6	-4.3	-3.9	-4.3	-10.7	-15.8	-8.6	-14.6	-9.9	-11.3	-9.2	-4.6	-6.5	-0.2	+0.3	-1.0	-0.9
	Supply	9.5	9.3	10.8	8.8	13.1	21.0	11.2	2.4	12.5	19.9	12.0	8.8	4.9	8.9	7.2	10.0	12.6	12.8	13.0
Barley	Production	50.1	50.3	61.6	49.0	58.1	72.6	38.8	55.0	46.7	55.3	59.8	58.9	66.1	62.0	75.3	64.4	62.2	82.3	90.0
	Trade	-2.7	-5.4	-6.8	-7.1	-5.4	-5.0	-10.9	-5.9	-8.3	-7.3	-5.7	-9.4	-13.6	-10.5	-13.7	-3.5	-3.7	-4.7	-0.3
	Supply	47.4	44.9	54.8	41.9	52.7	67.6	27.9	49.1	38.4	48.0	54.1	49.5	52.5	51.5	61.6	60.9	58.5	77.6	89.7
Oats	Production	220.2	213.9	296.5	245.0	293.3	289.0	214.0	299.0	222.3	252.2	276.5	280.7	278.0	240.1	237.0	197.6	188.2	195.2	238.0
	Trade	-2.4	-6.7	-17.5	-25.4	-22.8	-18.8	-9.3	-3.0	-5.1	-8.7	-3.8	-5.0	-10.4	-4.2	-4.3	-1.3	-1.0	-1.1	-2.2
	Supply	217.8	207.2	279.0	219.6	270.5	270.2	204.7	296.0	217.2	243.5	272.7	275.7	267.6	235.9	232.7	196.3	187.2	194.1	235.8
Maize	Production	693.4	682.5	764.4	653.6	780.6	639.3	600.2	818.7	783.2	741.7	779.1	589.7	743.6	685.8	680.2	583.0	534.4	663.1	623.9
	Trade	-7.6	+2.0	-7.9	-11.4	-11.0	-6.8	+1.6	-0.1	-29.6	-38.2	-8.4	-1.3	-1.1	-2.4	r1.8	+1.1	+3.4	-6.0	+0.3
	Supply	685.8	684.5	756.5	642.2	769.6	632.5	601.8	818.6	753.6	703.5	770.7	588.4	742.5	683.4	678.4	584.1	537.8	657.1	624.2
Total Cereals	*Production*	1214.9	1244.5	1523.2	1205.4	1385.9	1328.4	1184.8	1489.2	1377.0	1428.6	1489.4	1256.0	1399.5	1338.4	1347.3	1149.5	1064.0	1300.6	1338.2
	Trade	-63.9	-98.4	-157.0	-166.0	-129.0	-111.4	-129.3	-136.1	-189.0	-192.7	-147.6	-158.8	-139.9	-149.9	-151.1	-82.8	-54.1	-86.6	-57.5
	Supply	1151.0	1146.1	1366.2	1039.4	1256.9	1217.0	1055.5	1353.1	1188.0	1235.9	1335.8	1097.2	1253.6	1188.5	1196.2	1066.7	1009.9	1214.0	1280.7
Potatoes[3]	Production	29.6	33.7	28.6	23.8	35.5	35.1	28.3	36.5	31.9	37.2	34.6	35.1	26.6	29.4	28.8	30.4	30.4	28.8	31.7
	Trade	+0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.3	-0.3	-0.1	-0.2	-0.1	-
	Supply	29.8	33.5	28.3	23.6	35.3	34.8	28.0	36.3	31.6	36.9	34.3	34.7	26.2	29.1	28.5	30.3	30.2	28.7	31.7
Total Cereals and Potatoes	*Production*	1244.5	1278.2	1551.8	1229.2	1421.4	1363.5	1213.1	1525.7	1408.9	1465.8	1518.0	1291.1	1420.1	1367.8	1376.1	1179.9	1094.4	1329.4	1369.9
	Trade	-63.7	-98.6	-157.3	-166.2	-129.2	-111.7	-129.6	-136.3	-189.3	-193.0	-147.9	-159.2	-140.3	-150.2	-151.4	-82.9	-54.3	-86.7	-57.5
	Supply	1180.8	1179.6	1394.5	1064.0	1292.2	1251.8	1083.5	1389.4	1219.6	1272.8	1370.1	1131.9	1279.8	1217.6	1224.7	1097.0	1040.1	1242.7	1312.4

For footnotes see end of Appendix 1.

Table 5.— Southern Exporters[8]

Appendix 1 (concluded).
Metric quintals (000,000's).

Commodities		1909-13	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1925-9	1930-4	1934-8	*1939	*1940
Wheat	Production	70.0	57.5	100.5	67.4	99.1	73.2	75.8	88.2	95.0	88.5	107.9	102.9	89.7	113.5	110.8	125.2	118.3	98.8	105.3
	Trade	-38.2	-25.0	-23.0	-38.7	-26.8	-43.5	-63.3	-68.6	-49.0	-62.1	-53.6	-66.4	-62.3	-40.7	-68.8	-70.5	-61.5	-72.8	-59.2
	Supply	31.8	32.5	77.5	28.7	72.3	29.7	12.5	19.6	46.0	26.4	54.3	36.5	27.4	72.8	42.0	54.7	56.8	26.0	46.1
Rye	Production	0.4	*0.7	*0.7	0.4	*0.5	*0.4	0.4	0.4	0.6	1.1	1.2	0.6	1.5	1.6	1.9	2.7	2.6	5.2	2.3
	Trade	-0.1	-0.1	-	-	-	-	-0.1	-0.2	-0.2	-0.3	-0.7	-0.8	-0.1	-0.7	-1.2	-1.2	-1.2	-1.9	-1.7
	Supply	0.3	*0.6	*0.7	0.4	*0.5	*0.4	0.3	0.2	0.4	0.8	0.5	-0.2	1.4	0.9	0.7	1.5	1.4	3.3	0.6
Barley	Production	1.6	1.7	2.7	1.8	*2.0	*2.1	1.9	3.0	3.2	3.6	4.1	3.1	5.6	6.1	5.6	8.0	7.8	12.5	...
	Trade	-0.1	-0.3	-0.7	-0.7	-0.2	-0.1	-0.3	-0.9	-1.2	-0.8	-1.0	-2.2	-0.9	-2.0	-2.3	-3.8	-4.0	-3.3	-4.5
	Supply	1.5	1.4	2.0	1.1	*1.8	*2.0	1.6	2.1	2.0	2.8	3.1	0.9	4.7	4.1	3.3	4.2	3.8	9.2	...
Oats	Production	14.6	11.1	16.7	9.4	14.8	9.6	9.3	12.9	8.9	12.8	15.8	13.8	15.8	13.9	14.1	14.1	12.5	14.9	...
	Trade	-6.5	-3.8	-5.4	-8.1	-2.9	-5.5	-3.6	-4.3	-4.2	-3.0	-4.7	-7.2	-4.5	-5.0	-4.6	-5.5	-3.7	-3.6	-2.1
	Supply	8.1	7.3	11.3	1.3	11.9	4.1	5.7	8.6	4.7	9.8	11.1	6.6	11.3	8.9	9.5	8.6	8.8	11.3	...
Maize	Production	60.5	97.0	54.2	27.8	59.1	71.0	77.2	74.6	57.0	66.3	83.8	74.0	94.5	100.8	95.4	105.1	102.1	125.7	...
	Trade	-30.2	-36.2	-43.8	-29.5	-11.1	-8.9	-23.2	-44.0	-31.8	-30.7	-34.0	-46.3	-37.9	-49.7	-59.2	-66.5	-68.5	-38.4	-23.0
	Supply	30.3	60.8	10.4	-1.7	48.0	62.1	54.0	30.6	25.2	35.6	49.8	27.7	56.6	51.1	36.2	38.6	33.6	87.3	...
Total Cereals	Production	147.1	*168.0	*174.8	106.8	*175.5	*156.9	164.6	179.1	164.7	172.9	212.8	194.5	407.0	245.9	227.8	255.1	249.9	257.1	...
	Trade	-75.1	-65.4	-72.9	-77.0	-41.0	-58.0	-90.5	-118.0	-86.4	-96.9	-94.0	-122.9	-105.6	-98.1	-136.1	-147.5	-138.9	-120.0	-90.5
	Supply	72.0	*102.6	*101.9	29.8	*134.5	*98.9	74.1	61.1	78.3	75.4	118.8	71.6	301.4	137.8	91.7	107.6	104.4	137.1	...
Potatoes[9]	Production	3.8	3.5	3.5	3.5	*3.5	3.3	3.3	4.0	3.8	3.8	6.3	3.3	3.0	4.3	3.5	4.0	3.3	4.3	...
	Trade	+0.1	-	+0.1	-	-	-	-	-	-	-	-	-0.1	-	-	-	-	-0.2	+0.1	...
	Supply	3.9	3.5	3.6	3.5	*3.5	3.3	3.3	4.0	3.8	3.8	6.3	3.2	3.0	4.3	3.5	4.0	3.1	4.4	...
Total Cereals and Potatoes	Production	150.9	171.5	*178.3	110.3	*179.0	*159.6	*167.9	183.1	168.5	176.1	219.1	197.8	210.0	240.3	231.3	259.1	246.6	261.4	...
	Trade	-75.0	-65.4	-72.8	-77.0	-41.0	-58.0	-90.5	-118.0	-86.4	-96.9	-94.0	-123.0	-105.6	-98.1	-136.1	-147.5	-139.1	-119.9	-90.5
	Supply	75.9	*106.1	*105.5	33.3	*138.0	*101.6	*77.4	65.1	82.1	79.2	125.1	74.8	104.4	142.1	95.2	111.6	107.5	141.5	

For footnotes see end of Appendix 1.

FOOTNOTES TO APPENDIX I

* Partly provisional data.

1 The trade figures for wheat and rye include flour expressed in terms of grain as follows:
Wheat—1 quintal of flour = 1.3 quintals of grain.
Rye—1 quintal of flour = 1.7 quintals of grain.

2 Production plus net imports or minus net exports.

3 Potatoes counted throughout at ¼ of their original weight in accordance with the average food-value ratio of 1 quintal of cereals = 4 quintals of potatoes.

4 Excluding Turkey and Russia.

5 Continent west of the eastern borders of Sweden, Germany, Switzerland and Italy.

6 Continent east of Sweden, Germany, Switzerland and Italy. (Excluding Turkey and Russia).

7 The Russian production data for the war years are not strictly comparable to those for 1909-13 as invaded regions were omitted from year to year making the scope of the statistics for 1917 roughly equal to that of the post-war statistics. The trade statistics for the years 1920-24 are for trade across the European frontier only.

8 Principal grain exporting countries only, namely: Argentine, Uruguay, Union of South Africa, Australia and New Zealand.

APPENDIX II

Analysis by Regions and Countries

In Table 1, Europe, excluding the U.S.S.R., has been divided into twelve regions (*cf.* map attached) as follows:

Region I. The Northern Neutrals: Denmark (pre-war boundaries), the Netherlands, Norway, Sweden, and Switzerland. This region is defined so as to separate out those territories which were under neutral control during the war. The part of Schleswig ceded to Denmark by Germany is therefore not included.

Region II. Spain and Portugal. Spain is separated from the other neutrals because the war affected her differently.

Region III. The United Kingdom and Ireland.

Region IV. Uninvaded France: i. e., France, less Alsace-Lorraine, and less the ten departments occupied in whole or in part by the Germans: Nord, Pas de Calais, Somme, Aisne, Ardonnes, Oise, Marne, Meuse, Meuthe-et-Moselle and Vosges.

Region V. The Western Front. The ten occupied departments of France, together with Belgium, including Eupen and Malmedy.

Region VI. Uninvaded Italy: Italy, less the province of Venete, and less the provinces of Venezia Tridentina and Venezia Giulia ceded by Austria.

Region VII. The Italian Front. The Italian provinces of Veneto and Venezia Giulia. Before the war Venezia Giulia consisted of the Austrian provinces of Gorz and Gradisce, Istria, and Trieste.

Region VIII-a. The German Republic, with the boundaries finally established in 1923.

Region VIII-b. The districts ceded by Germany as a result of the war: Saar, Alsace-Lorraine, the Polish provinces of Poznan, Pomorse and Slask (Silesia), Hultschin (ceded to Czechoslovakia), Danzig, Memel. Eupen and Malmedy, ceded to Belgium, are not included in this region but in Region V, as they are not given separately in the post-war Belgian statistics.

Region VIII-c. The Republic of Austria, with boundaries established by 1923, including Burgenland; Bohemia, Moravia, and Silesia; Venezia Tridentina.

Region VIII is defined so as to include the more highly developed regions of the Central Powers, following the boundaries as they existed during the war.

Region IX. Hungary (Trianon boundaries), the Southern Voivodinas of Poland (Galicia), Bukovina and Transylvania.

Region X. The Old Kingdom of Roumania, Bulgaria, Jugoslavia, Greece. The purpose of this division is to trace the effects of the war, as far as possible, on the old Austro-Hungarian Empire. It is impossible to do this completely, as separate figures cannot be obtained for the parts of Jugoslavia which came from Austria and from Hungary. However, Regions VIII-c, IX, and X comprise the old Austro-Hungarian Empire, plus the Balkan countries. Regions I to X include the whole of Europe outside the boundaries of pre-war Russia. Regions XI and XII cover the territory ceded by Russia as a result of the war.

Region XI. Finland, Estonia, Latvia, Lithuania (not including Memel [Klaipeda]).

Region XII. The Central and Eastern Voivodinas of Poland, Bessarabia.

Four additional regions are inserted for purposes of comparison:

Region XIII. The U.S.S.R.

Region XIV. Mediterranean Africa; Morocco, Algeria, Tunis, Libya, Egypt.

Region XV. (North America, the United States and Canada).

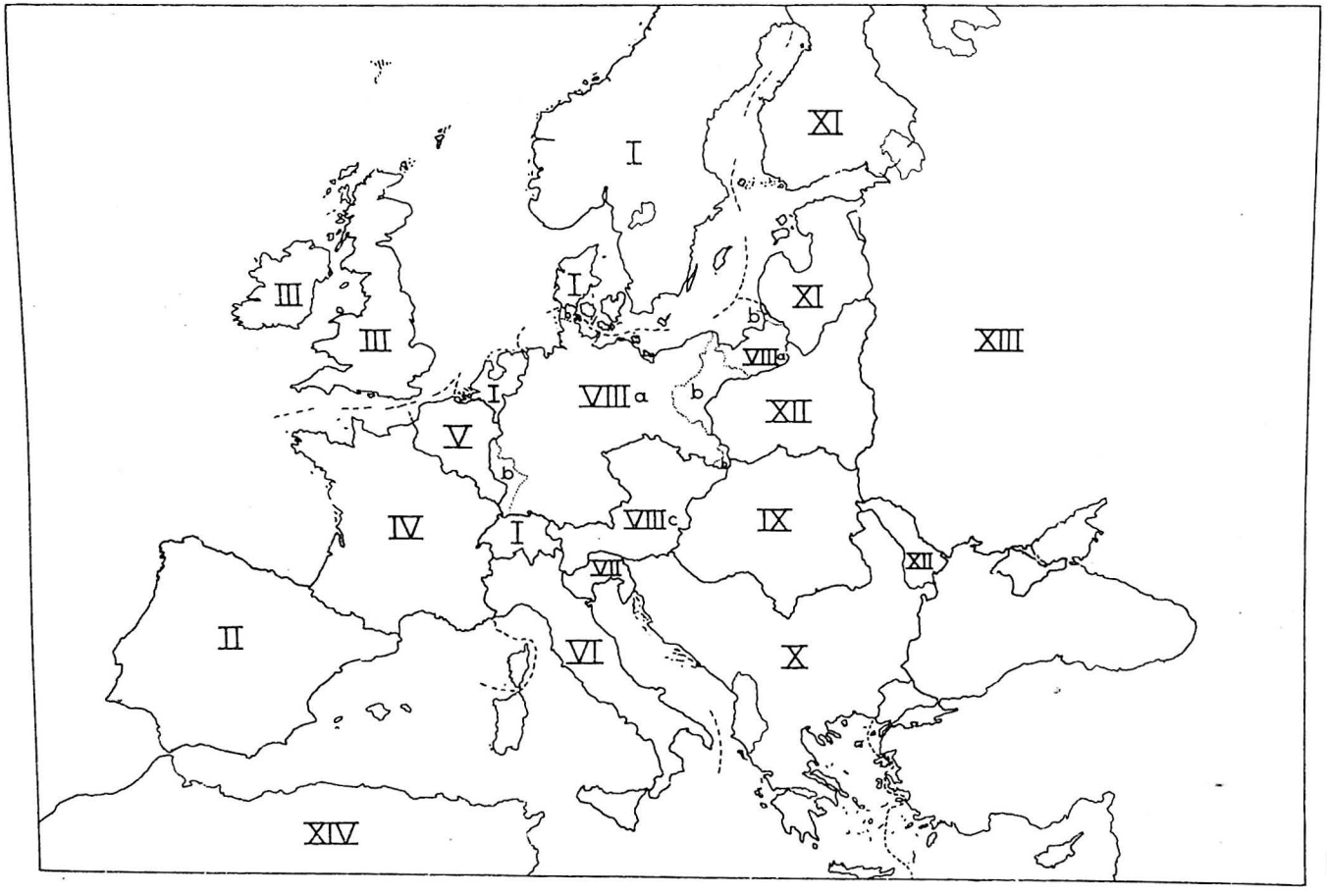
Region XVI. Five Southern Hemisphere Exporting Countries: Argentine, Uruguay, Australia, New Zealand, South Africa.

In Table 2, cereal indices are given separately for eight Central and Eastern European countries, in most of which land reforms were effected in the course of the post-war reconstruction period.

It is not possible to give livestock numbers for consecutive years, but in Table 3-a figures are given for the principal kinds of stock for 1913, and in Table 3-b indices have been computed for 1920 and 1925. The twelve European regions are the same as those given in Table 1.

The statistics appearing in Appendix II come for the most part from national official sources, except where national statistics were inadequate. In these instances data published by the International Institute of Agriculture, Rome, were used.

STATISTICAL REGIONS



APPENDIX II † *Table 1.* — Indices of Area, Yield and Production of Cereals.
1909-13 = 100

Region		1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1933-7	1938	1939
Region I:	Area	100.3	101.5	98.0	94.2	99.6	98.9	97.9	98.7	98.2	96.9	93.8	96.6	97.6	94.6	...	...
The Northern	Yield	87.4	101.1	95.6	80.2	86.3	95.6	94.5	103.3	100.0	100.0	95.1	111.0	106.1	125.3	...	...
Neutrals	Production	87.8	102.8	94.0	75.8	86.1	94.7	92.9	102.2	98.7	97.0	89.5	107.5	103.7	118.8	...	...
Region II:	Area	.	.	.	.	108.1	109.3	106.9	108.8	107.5	109.5	107.9	112.4	111.7	114.2	...	...
Spain and	Yield	.	.	.	.	97.8	93.5	105.4	103.2	95.7	114.0	94.6	112.9	100.0	105.4	...	...
Portugal	Production	.	.	.	.	106.7	102.7	113.5	113.0	103.0	125.5	102.3	127.8	111.9	121.1	...	...
Region III:	Area	98.9	103.4	101.4	111.8	132.5	121.3	112.0	106.9	105.1	97.6	94.4	89.7	88.2	76.7	79.7	...
The United Kingdom	Yield	102.1	99.5	95.3	99.5	104.7	93.2	92.2	96.4	92.7	97.2	101.0	106.2	109.4	114.6	120.3	...
and Ireland	Production	100.7	103.1	96.7	111.5	138.4	113.0	103.4	103.1	97.4	94.4	95.1	95.2	96.2	88.0	95.8	...
Region IV:	Area	96.1	88.8	83.1	74.0	73.3	74.1	78.6	80.2	78.7	81.8	81.7	82.0	79.0	77.2	...	...
Uninvaded France	Yield	100.0	85.1	94.2	77.7	95.0	79.3	98.3	107.4	96.7	103.3	105.8	116.5	94.2	115.7	...	...
	Production	97.9	75.5	78.1	57.0	69.6	58.3	77.0	85.8	76.1	84.0	86.3	95.1	74.2	89.1	...	...
Region V:	Area	.	.	.	.	.	59.4	74.4	83.1	86.6	87.8	86.9	87.9	84.7	85.5	...	...
Belgium and 10	Yield	.	.	.	.	.	77.8	91.9	98.9	88.6	104.3	97.8	108.6	117.3	118.4	...	...
French Departments	Production	.	.	.	.	.	46.1	68.2	81.7	76.5	91.3	84.7	95.2	99.2	101.0	...	...
Region VI:	Area	99.8	103.8	98.3	90.5	94.0	89.7	95.5	99.3	96.9	97.0	95.3	97.6	100.1	100.2	...	...
Italy of 1914	Yield	93.6	97.3	92.7	88.2	106.4	100.0	83.6	105.5	88.2	115.5	100.0	129.1	120.0	133.6	...	...
	Production	92.8	100.3	91.2	79.2	99.7	89.0	79.3	104.6	85.2	111.7	95.1	125.9	119.9	133.1	...	...
Region VII:	Area	.	.	.	.	.	.	89.6	87.5	87.9	89.1	84.6	88.9	93.5	89.4	...	...
Veneto, Venezia	Yield	.	.	.	.	.	.	95.0	95.0	85.7	114.9	118.0	122.4	113.0	132.9	...	...
Giulia	Production	.	.	.	.	.	.	84.9	82.9	75.2	101.8	99.6	108.7	105.6	118.2	...	...
Region VIII a:	Area	.	103.4	89.9	85.4	85.3	80.6	84.0	83.5	82.4	86.6	88.3	91.9	92.9	93.1	...	...
Germany of 1923	Yield	.	75.9	87.7	64.1	74.9	75.4	70.3	85.6	66.7	88.2	77.4	89.2	80.5	99.5	...	...
	Production	.	78.4	78.8	54.5	63.7	60.9	59.0	71.3	54.8	76.2	68.1	81.9	74.7	92.5	...	...
VIII b:	Area	.	103.7	94.0	85.5	82.8	86.0	84.4	97.3	97.4	88.5	94.4	95.0	94.1	98.6	...	...
Ceded Areas	Yield	.	74.1	88.4	60.4	74.6	54.0	76.8	92.6	79.4	79.9	90.0	83.1	83.6	78.4	...	...
	Production	.	77.5	83.9	52.0	62.2	47.0	65.6	91.0	78.0	71.6	85.5	79.	79.6	78.1	...	...
VIII a and b:	Area	100.7	103.4	90.5	85.4	84.9	81.4	84.1	85.6	84.7	86.9	89.3	92.4	93.1	93.9	...	...
Germany of 1914	Yield	95.9	75.8	87.6	63.4	74.7	72.2	71.1	86.6	68.6	86.6	79.4	28.1	80.9	96.4	...	...
	Production	96.8	78.2	79.6	54.2	63.4	58.8	60.0	74.2	58.2	75.5	71.0	81.6	75.4	90.4	...	...
VIII c:	Area	.	.	.	.	.	77.4	77.4	77.8	77.9	80.7	80.4	81.2	81.8	87.9	...	...
Aus., Burg., Boh.,	Yield	.	.	.	.	.	79.4	77.9	105.9	97.8	112.5	105.1	123.5	114.0	128.7	...	...
Mor., Sil., Ven. Tr.	Production	.	.	.	.	.	61.8	60.4	82.7	76.3	90.8	84.4	100.5	93.3	113.5	...	...

† 1937 being the last year for which detailed data by provinces were available for certain countries at the time of writing, the five-year period 1933-37 is here adhered to in place of the 1934-38 period shown in Appendix 1.

Appendix II. *Table 1* (concluded)

1909-13 = 100

Region		1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1933-7	1938	1939
Total VIII a-b-c:	Area	.	.	.	.	.	80.6	82.6	83.9	83.2	85.6	87.4	90.0	90.7	92.6	...	...
	Yield	.	.	.	.	.	74.0	72.9	90.1	73.5	91.2	84.0	94.5	86.7	101.7	...	...
	Production	.	.	.	.	.	59.3	60.1	75.6	61.1	77.9	73.1	84.6	78.2	94.1	...	...
Region IX: Hungary, Slovakia and Ruthenia, Transylvania	Area	.	.	.	.	.	.	85.7	88.6	90.0	91.8	93.1	94.1	96.4	102.5	...	...
	Yield	.	.	.	.	.	.	80.8	83.2	86.4	80.8	86.4	105.6	104.8	104.0	...	...
	Production	.	.	.	.	.	.	69.0	74.1	77.9	74.3	80.8	99.8	100.9	106.4	...	...
Region X: Yugoslavia, Bulgaria, Roumania, Greece	Area	.	.	.	.	.	.	82.6	89.2	92.3	91.5	97.0	102.4	102.1	111.2	...	...
	Yield	.	.	.	.	.	.	93.7	77.7	82.1	89.3	85.7	100.9	101.8	99.1	...	...
	Production	.	.	.	.	.	.	77.0	68.7	75.2	81.4	83.3	102.5	103.8	117.4	...	...
Region XI: Finland, Estonia, Latvia, Lithuania	Area	.	.	.	.	.	.	85.5	90.6	95.9	98.8	98.3	99.8	98.3	108.0	...	...
	Yield	.	.	.	.	.	.	88.3	113.8	117.0	97.9	101.1	121.3	105.3	126.6	...	...
	Production	.	.	.	.	.	.	75.4	103.8	113.2	97.7	99.8	121.7	104.4	137.9	...	...
Region XII: Russian Poland and Bessarabia	Area	.	.	.	.	.	.	73.4	96.2	93.8	94.7	98.4	96.0	93.7	107.8	...	...
	Yield	.	.	.	.	.	.	108.9	84.2	118.8	85.1	103.0	83.2	120.8	105.0	...	...
	Production	.	.	.	.	.	.	79.4	81.0	110.6	80.6	100.5	79.5	112.3	112.4	...	...
Total A: Continental Europe[1]*, Post-War Boundaries*	*Area*	.	.	.	.	.	.	*85.3*	*90.5*	*90.5*	*91.9*	*93.2*	*95.3*	*95.1*	*100.5*	*98.4*	*98.0*
	Yield	.	.	.	.	.	.	*84.0*	*89.3*	*84.7*	*97.7*	*86.3*	*103.8*	*96.9*	*104.6*	*117.6*	*114.5*
	Production	.	.	.	.	.	.	*71.8*	*80.9*	*77.0*	*90.3*	*80.2*	*98.8*	*92.5*	*105.2*	*115.5*	*112.3*
Total B: Continental Europe[1]*, excluding Battlefields*	*Area*	.	.	.	.	.	.	*85.7*	*90.8*	*90.7*	*92.1*	*93.5*	*95.7*	*95.5*	*101.1*	...	...
	Yield	.	.	.	.	.	.	*79.4*	*84.6*	*80.1*	*92.6*	*80.9*	*97.8*	*91.2*	*98.6*	...	...
	Production	.	.	.	.	.	.	*68.0*	*76.5*	*72.9*	*85.3*	*75.5*	*93.6*	*87.1*	*99.6*	...	...
Region XIII: U.S.S.R.	Area	.	.	.	.	.	.	68.6	62.4	52.7	73.2	85.2	89.4	101.0	107.7	...	...
	Yield	.	.	.	.	.	.	72.0	73.3	129.3	100.0	86.7	114.7	114.7	120.7	...	...
	Production	.	.	.	.	.	.	48.8	39.2	63.4	73.2	73.5	102.4	115.3	135.7	...	...
Region XIV: Mediterranean Africa	Area	.	99.7	100.4	96.4	102.6	98.8	99.8	105.1	101.0	108.7	109.2	120.7	124.4	132.9	127.9	...
	Yield	.	105.3	94.7	96.8	116.0	84.0	75.5	100.0	77.7	102.1	85.1	92.6	81.9	84.0	86.2	...
	Production	.	106.0	95.6	93.3	119.2	82.9	75.8	105.7	78.5	111.4	93.5	112.5	102.8	112.7	111.3	...
Region XV: North America	Area	103.5	112.1	108.4	113.4	118.2	113.9	115.8	122.7	119.0	117.6	112.6	112.8	114.5	108.0	116.6	107.5
	Yield	99.3	112.5	91.9	100.7	92.6	86.0	105.9	92.6	99.3	104.4	91.9	102.2	96.3	77.2	92.6	100.0
	Production	102.4	125.4	99.2	114.1	109.4	97.5	122.6	113.3	117.6	122.1	103.4	114.7	110.2	83.1	107.9	107.0
Region XVI: Southern Hemisphere Exporters	Area	112.1*	123.9*	116.9	122.7*	112.7*	108.2	108.2	108.3	116.3	115.7	115.1	123.5	131.4	137.5	...	...
	Yield	107.9*	96.6*	62.9	97.8*	94.4*	103.4	113.5	103.4	101.1	125.8	115.7	111.2	122.5	120.2	...	...
	Production	114.3*	119.0*	72.7	119.3*	106.3*	112.0	121.9	112.1	117.2	144.7	132.3	140.8	160.4	164.7	...	...

* Indices based in part on estimates.

[1] Excluding Russia and Turkey.

Table 2.——Indices of Area, Yield and Production of Cereals in Central and Eastern Europe.

1909-13 = 100

Appendix II (continued)

Country		1920	1921	1922	1923	1924	1925	1926	1933-7
AUSTRIA and BURGENLAND	Area	72.4	77.0	76.5	83.3	82.8	83.7	86.0	87.9
	Yield	72.5	84.0	79.4	90.1	87.0	108.4	100.0	122.1
	Production	52.4	64.9	60.9	75.1	72.0	90.9	85.9	107.4
BULGARIA	Area	90.3	91.5	93.3	94.0	97.8	101.0	100.6	111.3
	Yield	107.1	96.5	103.5	100.0	90.6	123.5	117.6	142.4
	Production	96.8	88.6	96.8	94.9	89.2	125.7	118.7	160.0
CZECHOSLOVAKIA	Area	82.8	81.0	81.9	82.0	81.4	81.9	82.7	91.0
	Yield	83.2	116.8	109.2	124.4	108.4	130.5	116.8	127.5
	Production	68.9	94.5	89.4	101.7	88.2	107.0	96.7	116.0
GREECE	Area	73.5	70.1	63.1	66.1	77.5	93.2	89.5	118.1
	Yield	89.4	91.5	87.2	75.5	72.3	74.5	77.7	96.8
	Production	65.6	64.5	55.0	50.3	56.3	69.5	69.9	114.1
HUNGARY	Area	84.9	87.4	98.9	96.5	98.9	99.2	101.2	103.8
	Yield	78.4	75.5	77.7	92.8	81.3	110.1	103.6	105.8
	Production	66.2	66.2	76.5	89.4	80.5	108.7	104.5	109.5
POLAND	Area	71.0	97.1	90.7	89.0	93.8	93.5	94.6	104.4
	Yield	104.4	100.0	116.8	77.9	118.6	98.2	108.8	100.9
	Production	74.4	97.2	105.8	69.4	110.8	91.6	103.3	105.6
ROUMANIA	Area	84.4	89.2	94.5	99.2	101.2	103.5	102.8	114.3
	Yield	86.7	63.3	77.5	77.5	60.0	71.7	99.2	81.7
	Production	72.9	56.1	73.6	76.7	60.6	74.6	101.6	93.1
YUGOSLOVIA	Area	89.5	93.9	95.1	89.5	96.1	98.6	96.0	120.7
	Yield	88.2	74.8	75.6	89.9	111.8	122.7	115.1	112.6
	Production	78.8	70.3	72.0	80.6	107.3	120.8	110.4	136.3

Table 3a.— Approximate Livestock Numbers, by Regions, 1913
(000,000's)

Appendix II (continued)

	Region	Horses, Asses & Mules	Cattle & Buffalo	Sheep	Pigs	
I.	Northern Neutrals	1.78	9.65	4.10	4.70	0.97
II.	Spain and Portugal	3.04	3.58	20.44	3.61	.
IV.	Uninvaded France	3.15	12.97	15.10	6.26	1.34
V.	Western Front	0.90	3.43	1.79	2.03	0.30
VI.+ VII.	Italy	2.19	6.20	11.16	2.51	2.71
VIII a.	Germany of 1923	3.82	18.48	4.99	22.53	3.16
VIII b.	Ceded German area	0.77	2.62	0.54	3.26	0.39
VIII c.	West-Central Europe	0.74	5.64	0.51	3.77	.
IX.	East-Central Europe	2.71	8.43	7.94	7.73	.
X.	Balkans	3.55	11.55	31.96	7.23	4.40
	Continental Europe[1], *Pre-War Boundaries*	22.65	32.56	98.59	63.69	.
XI.	Baltic States	1.30	3.91	4.00	2.61	.
XII.	E. Poland, Bessarabia	2.57	5.70	4.40	2.23	.
	Continental Europe[1], *Post-War Boundaries*	26.52	91.66	106.99	68.47	.
III.	United Kingdom and Ireland	2.21	11.85	30.02	3.73	.
	Total Europe[1], *Post-War Boundaries*	28.73	103.51	136.95	72.20	.

[1]Excluding Russia and Turkey.

Table 3b.— Approximate Indices of Livestock Numbers, by Regions, 1920 and 1925

1913 = 100

Region	Horses, Asses & Mules		Cattle & Buffalo		Sheep		Pigs	
	1920	1925	1920	1925	1920	1925	1920	1925
I.	112	.	99	.	93	.	79	.
II.	102	141	118	127	117	116	155	176
IV.	81	88	90	100	58	64	67	84
V.	74	90	74	89	45		67	82
VI.+ VII.	114	116	102	119	107	111	96	114
VIII a.	94	103	91	93	123	95	63	72
VIII b.	77	.	90	.	118	.	67	.
VIII c.	98	.	97	.	135	.	76	.
IX.	80	.	96	.	75	.	70	.
X a.[1]	80	98	85	76	77	95	79	78
X b.[2]	105	139	72	86	96	103	119	125
XI.	88	111	93	118	103	119	85	101
XII.	91	.	95	.	78	.	146	.
Continental Europe[3] *Post-War Boundaries*	92	105	93	98	85	105	78	94
III.	109	95	98	101	78	88	84	97
Total Europe[3]	94	104	94	99	84	101	78	92

[1]Excluding Greece.
[2]Greece.
[3]Excluding Russia and Turkey.

Table 4.——Land Use in France, 1913-26.
Hectares (000's)

Appendix II (concluded)

	Excluding Alsace-Lorraine							Including Alsace-Lorraine						
	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Cereals[1]	13510	12473	11268	10549	9410	9147	9534	10797	11173	11109	11347	11429	11476	11031
Legumes[2]	315	297	254	254	270	253	274	308	319	341	297	317	308	320
Tubercles[3]	1659	1597	1453	1388	1472	1292	1361	1556	1569	1581	1573	1591	1599	1598
Forage Crops[4]	5281	5184	4802	4629	4555	4430	4489	4819	4877	4909	5052	5182	5167	5232
Industrial Crops[5]	394	273	158	157	148	136	163	214	215	219	259	296	311	328
Table grapes and Gardens	341	340	265	240	313	270	284	304	313	359	357	367	374	373
Vines	1539	1525	1523	1509	1506	1502	1495	1363	1321	1396	1420	1458	1444	1354
Grassland[6]	10103	9821	9870	10055	10228	10114	10554	10878	10930	10887	10931	11023	11161	11197
Total (i)	*33142*	*31510*	*29609*	*28781*	*27902*	*27144*	*28154*	*30299*	*30717*	*30801*	*31236*	*31663*	*31840*	*31433*
Arable Land	23651	22185	21787	.	.	20881	21743	22591	22680	22435	22678	22598	22418	22263
Grassland	10038	8865	9859	.	.	10235	10554	10878	10930	10887	10931	11023	11161	11197
Vines	1617	1597	1590	.	.	1567	1559	1579	1592	1607	1609	1616	1615	1600
Gardens	267	258	*200	.	.	253	275	296	300	299	295	308	319	242
Diverse Cultures	960	913	873	.	.	801	834	876	858	843	831	813	781	774
Total[7] *(ii)*	*36533*	*33818*	*34309*	.	.	*33737*	*34965*	*36220*	*36360*	*36071*	*36344*	*36358*	*36294*	*36076*
Fallow[8]	3391	2308	4706	.	.	6593	6811	5981	5643	5270	5108	4695	4454	4643
Uncultivated Land	16410	18134	18844	.	.	19215	17988	18187	18045	18333	18061	18047	18112	18329
Total Uncropped	*19801*	*20442*	*23550*	.	.	*25808*	*24790*	*24168*	*24688*	*23603*	*23169*	*22742*	*22566*	*22972*

For footnotes see next page.

FOOTNOTES TO TABLE 4 (APPENDIX II)

* Estimate.

[1] Wheat, meslin, rye, barley, buckwheat, oats, maize, millet.

[2] French beans, green peas, kidney beans, lentils, peas, broad beans, dried kidney beans.

[3] Potatoes, artichokes.

[4] Beets, turnips, cabbage, clover, lucerne, sainfoin, grasses, annual fodder.

[5] Sugar beet, distillery beet, tobacco, hops, hemp, flax, colza, rape, poppy.

[6] Natural meadows, herbage, and pasturage.

[7] Total (ii) is derived from the figures in the table entitled 'Superficie des differents parties du territoire' in *Annuaire Statistique de la France*. It will be observed that the results are not always consistent with Total (i), derived from the table entitled 'Resume general, pour la France entiere, de la production agricole'.

[8] The figure for 'fallow' is not given directly, but is derived by the subtraction of Total (i) from Total (ii), which includes fallow under the heading 'arable land'. The area of fallow is somewhat exaggerated in the table, because Total (i) also does not include the area under orchards and fruits, some of which are included under 'Diverse Cultures' in Total (ii). However, even if 'Diverse Cultures' is removed from Total (ii), the changes in the figure for 'fallow' would not be substantially different.

APPENDIX III

CEREAL PRODUCTION, AREA, YIELDS AND
LIVESTOCK POPULATION BY DISTRICTS
OF CONTINENTAL EUROPE

MAP DIAGRAMS

DISTRICTS SPECIFIED IN THE BASE MAP.

A. AUSTRIA

A 1. Lower Austria
A 2. Upper Austria
A 3. Styria
A 4. Salzburg
A 5. Tyrol and Venezia Tridentina
A 6. Vorarlberg
A 7. Carinthia

B. BELGIUM

Bu. BULGARIA

C. CZECHOSLOVAKIA

C 1. Bohemia
C 2. Moravia
C 3. Silesia
C 4. Slovakia
C 5. Sub-Carpathian Ruthenia

D. DENMARK

F. FRANCE

F 1. Finistère
F 2. Côtes-du-Nord
F 3. Morbihan
F 4. Loire-Inférieure
F 5. Vendée
F Y. Charente-Inférieure
F 7. Gironde
F 8. Landes
F 9. Pyrénées (Basses-)
F 10. Ille-et-Vilaine
F 11. Maire-et-Loire
F 12. Sèvres (Deux)
F 13. Charente
F 14. Dordogne
F 15. Lot-et-Garonne
F 16. Gers
F 17. Pyrénées (Hautes)
F 18. Manche
F 19. Calvados
F 20. Orne
F 21. Mayenne
F 22. Sarthe
F 23. Indre-et-Loire
F 24. Vienne
F 25. Indre
F 26. Vienne (Haute-)
F 27. Creuse
F 28. Corrèze
F 29. Lot
F 30. Cantal
F 31. Tarn-et-Garonne
F 32. Aveyron
F 33. Garonne (Haute-)
F 34. Tarn
F 35. Ariège
F 36. Pyrénées-Orientales

F. FRANCE (continued)

F 37. Aude
F 38. Hérault
F 39. Seine-Inférieure
F 40. Eure
F 41. Eure-et-Loire
F 42. Loire-et-Cher
F 43. Loiret
F 44. Cher
F 45. Allier
F 46. Puy-de-Dôme
F 47. Loire (Haute-)
F 48. Lozère
F 49. Gard
F 50. Somme
F 51. Oise
F 52. Seine-et-Oise
F 53. Seine
F 54. Seine-et-Marne
F 55. Yonne
F 56. Nièvre
F 57. Saône-et-Loire
F 58. Ain
F 59. Rhône
F 60. Loire
F 61. Isère
F 62. Ardèche
F 63. Drôme
F 64. Vaucluse
F 65. Bouches-du-Rhône
F 66. Pas-de-Calais
F 67. Nord
F 68. Aisne
F 69. Ardennes
F 70. Marne
F 71. Meuse
F 72. Meurthe-et-Moselle
F 73. Vosges
F 74. Marne (Haute-)
F 75. Aube
F 76. Côte d Or
F 77. Saône (Haute-)
F 78. Belfort
F 79. Doubs
F 80. Jura
F 81. Savoie (Haute-)
F 82. Savoie
F 83. Alpes (Hautes-)
F 84. Alpes (Basses-)
F 85. Var
F 86. Alpes-Maritimes
F 87. Corsica
F 88. Alsace-Lorraine

G. GERMANY

G 1. East Prussia
G 2. Brandenburg and Berlin
G 3. Pomerania
G 4. Border Province
G 5. Silesia
G 6. Prussian Saxony + Anhalt
G 7. Schleswig-Holstein (post-war)
G 8. Hanover, Oldernburg, Bremen, Hamburg, and Brunswick
G 9. Westphalia, Waldeck, Lippe and Schaumburg-Lippe
G 10. Hessen-Nassau and Hesse
G 11. Rhine Province (Less Saar)
G 12. Saxony
G 13. Württemberg + Hohenzollern
G 14. Baden
G 15. Mecklenburg
G 16. Thuringia
G 17. Upper Bavaria
G 18. Lower Bavaria
G 19. Palatinate
G 20. Upper Palatinate
G 21. Upper Franconia
G 22. Middle Franconia
G 23. Lower Franconia
G 24. Swabia

H. HUNGARY

I. ITALY

I 1. Piedmont
I 2. Liguria
I 3. Lombardy
I 4. Venezia
I 5. Emilia
I 6. Tuscany
I 7. Marches
I 8. Umbria
I 9. Latium
I 10. Abruzzi and Molise

Li. LITHUANIA

L. LUXEMBOURG

N. NETHERLANDS

P. POLAND

P 1. Central Voivodinas
P 2. Eastern Voivodinas
P 3. Western Voivodinas
P 4. Southern Voivodinas

R. ROUMANIA

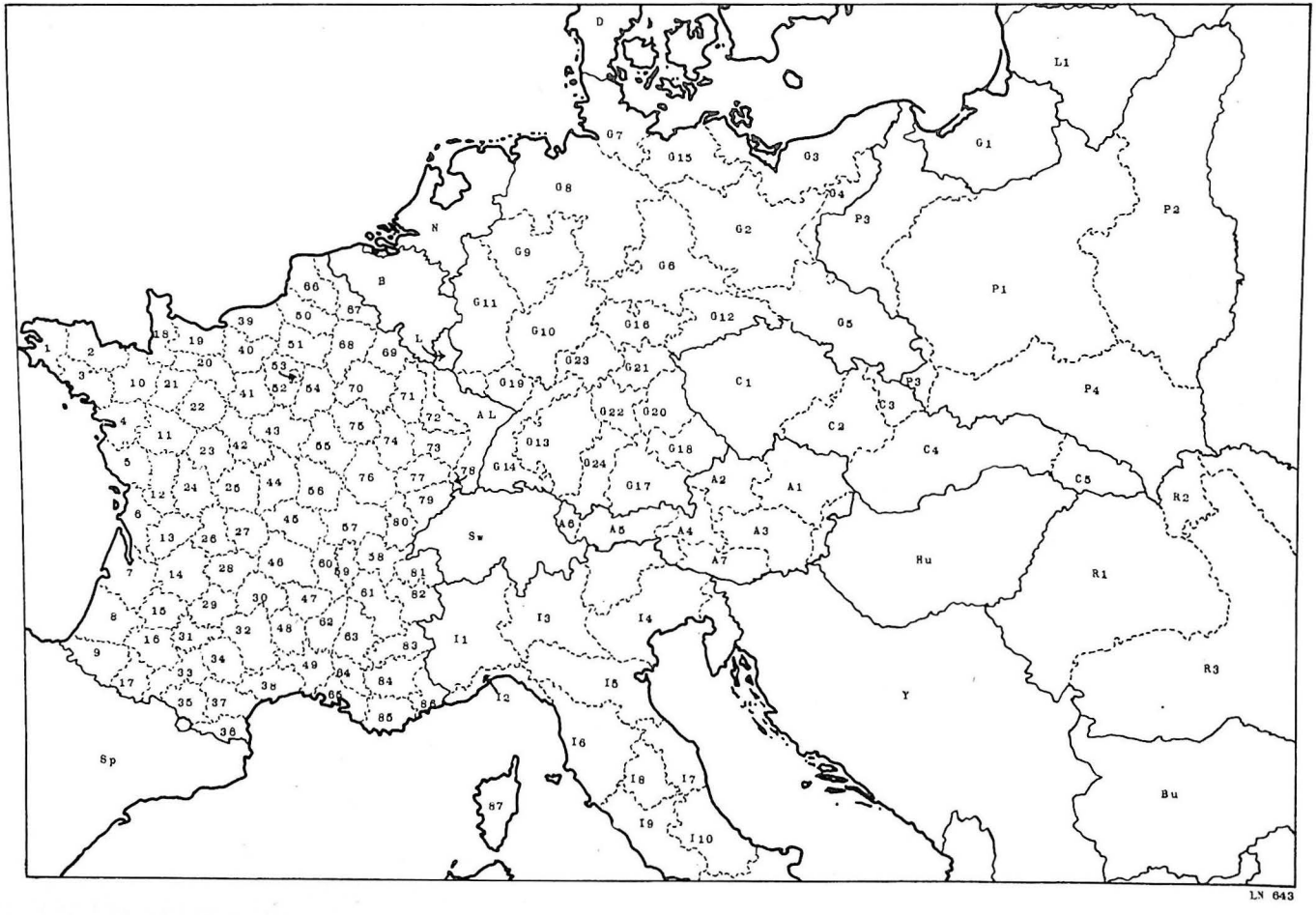
R 1. Transylvania
R 2. Bukovina
R 3. Old Kingdom

Sp. SPAIN

Sw. SWITZERLAND

Yu. YUGOSLAVIA

Base Map


D
L1
G7
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G8
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P3
P2
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G2
G9
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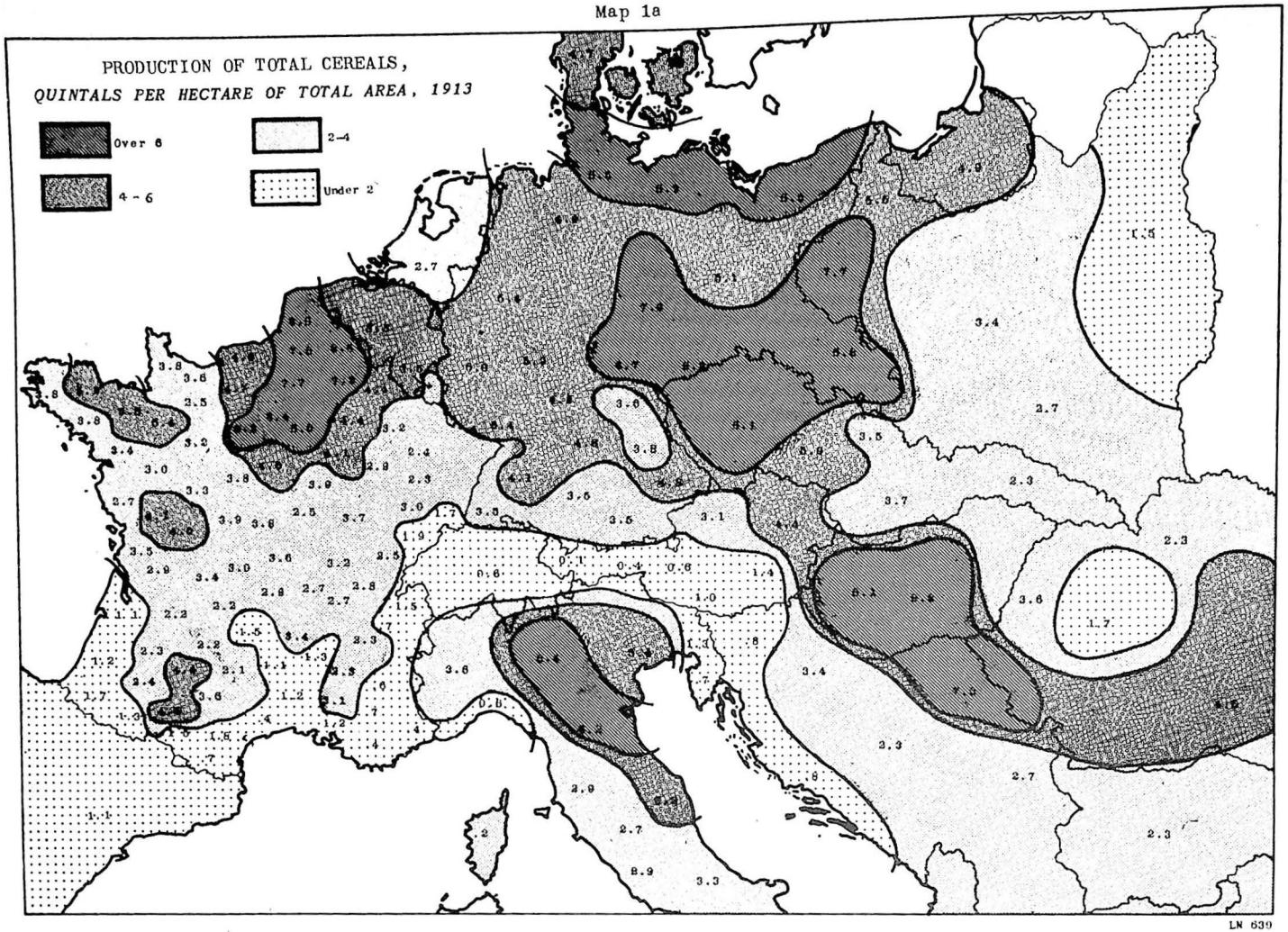
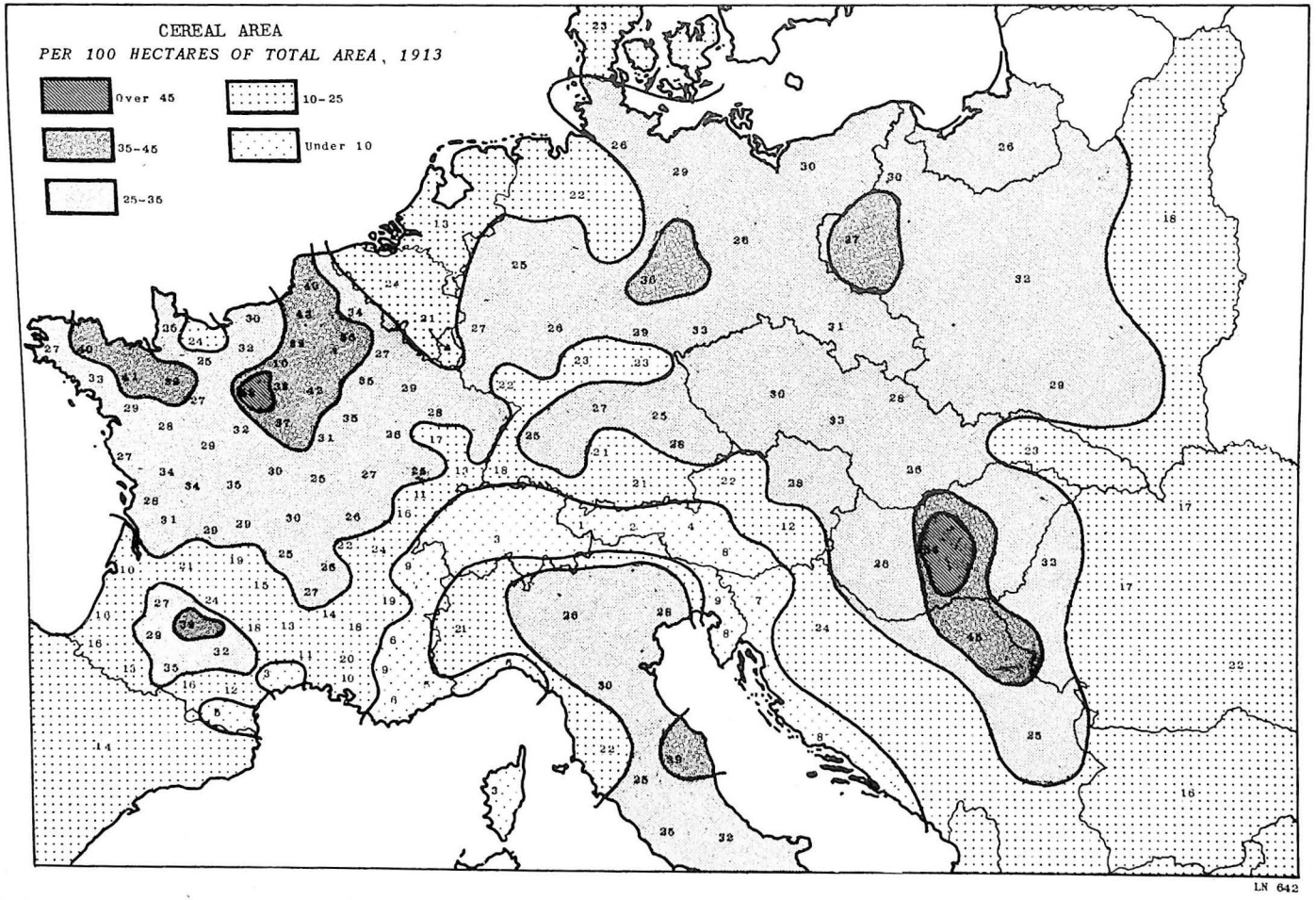
B
G11
G5
G10
G16
G12
L
G23
G21
C1
P3
P4
AL
G19
G22
G20
C3
C2
G13
G18
C4
G14
G24
G17
A2
A1
C5
R2
A6
A5
A4
A3
Sw
A7
Hu
R1
I3
I4
I1
R3
I5
I2
Y
I6
Sp
I8
I7
Bu
87
I9
I10
LN 643

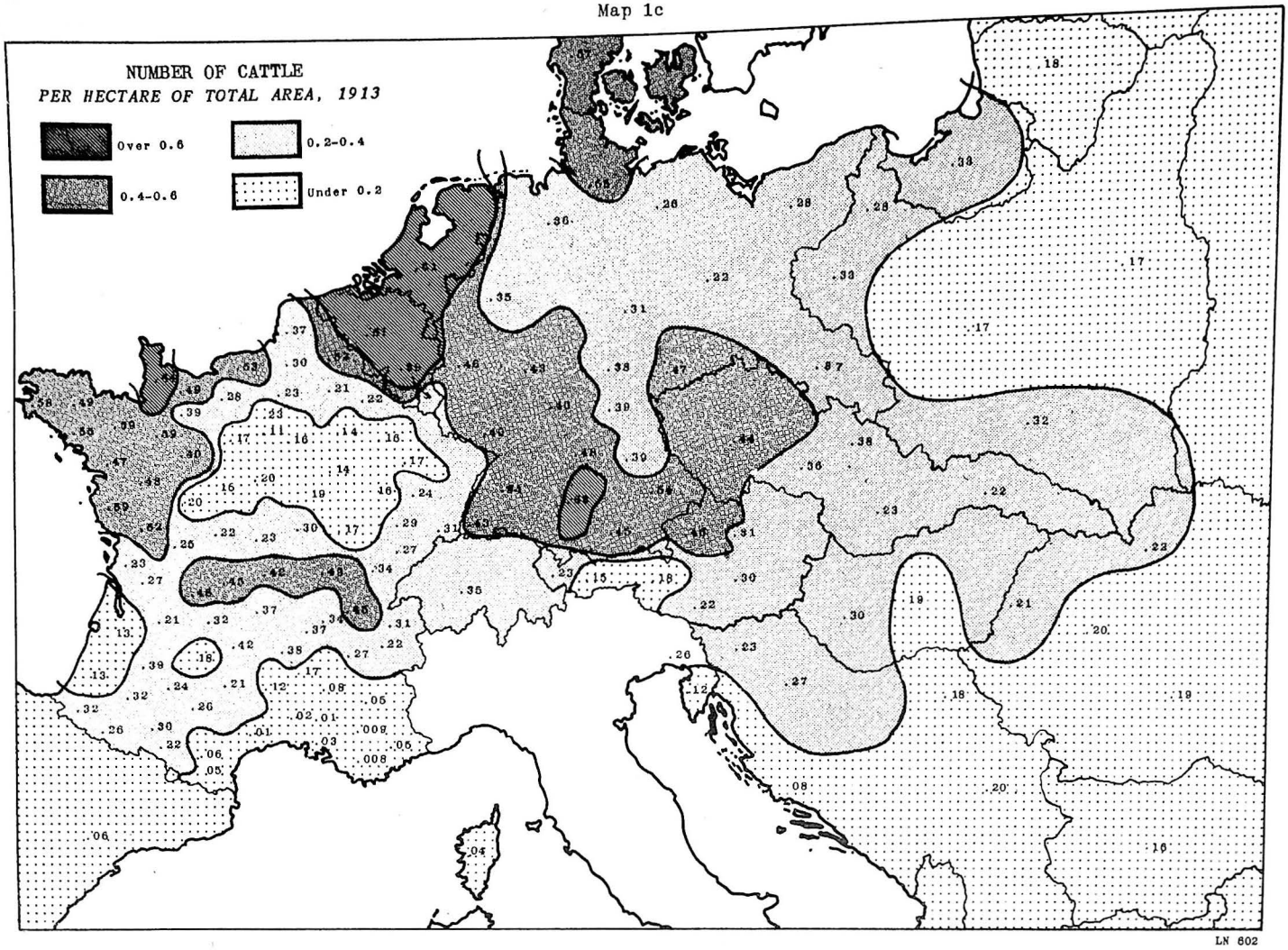
Map 1a


PRODUCTION OF TOTAL CEREALS,
QUINTALS PER HECTARE OF TOTAL AREA, 1913
Over 6
4 - 6
2-4
Under 2
LN 639

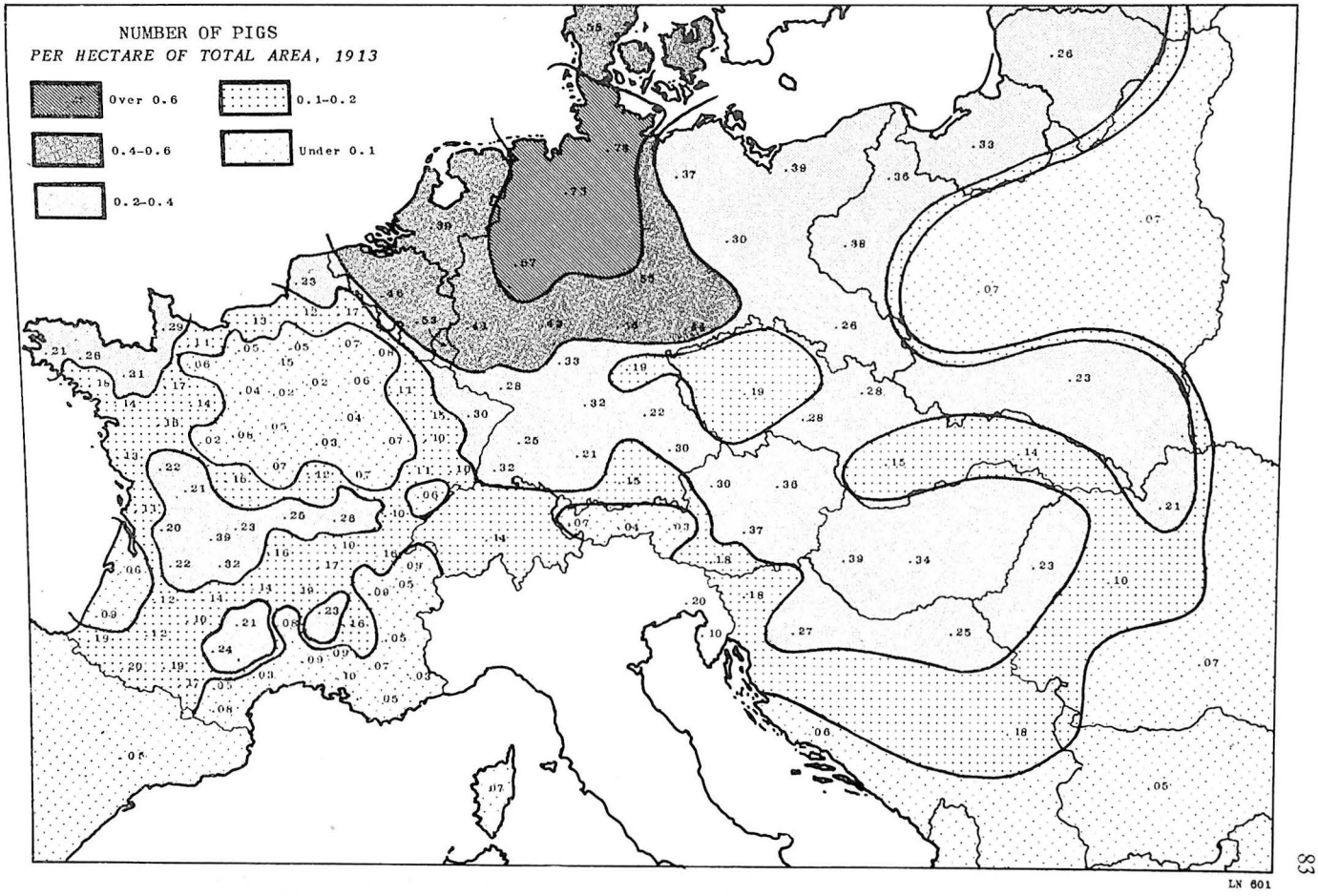
Map 1b


CEREAL AREA
PER 100 HECTARES OF TOTAL AREA, 1913
Over 45
35-45
25-35
10-25
Under 10
LN 642

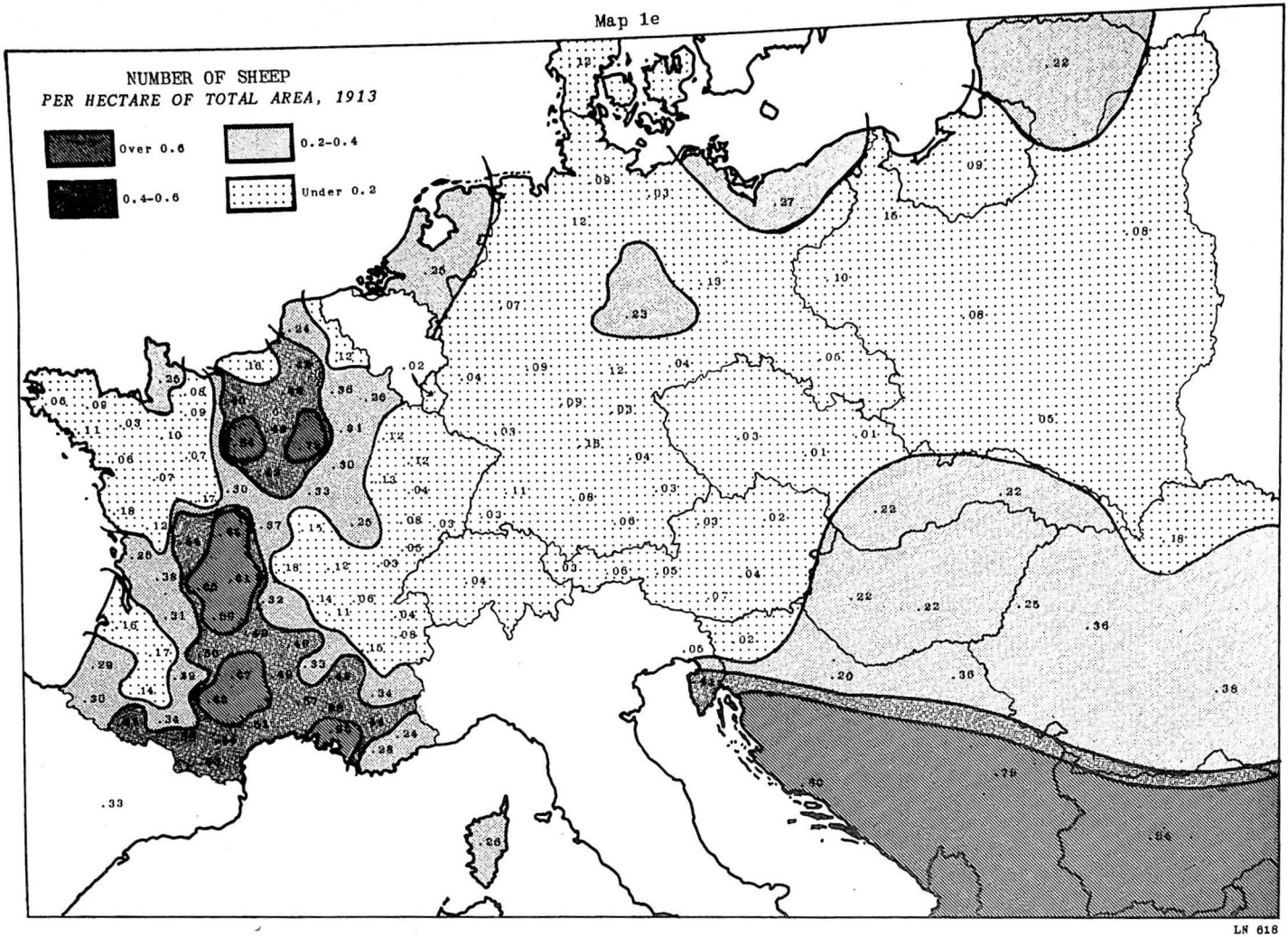
Map 1c


NUMBER OF CATTLE
PER HECTARE OF TOTAL AREA, 1913
Over 0.6
0.4-0.6
0.2-0.4
Under 0.2
LN 602

Map 1d

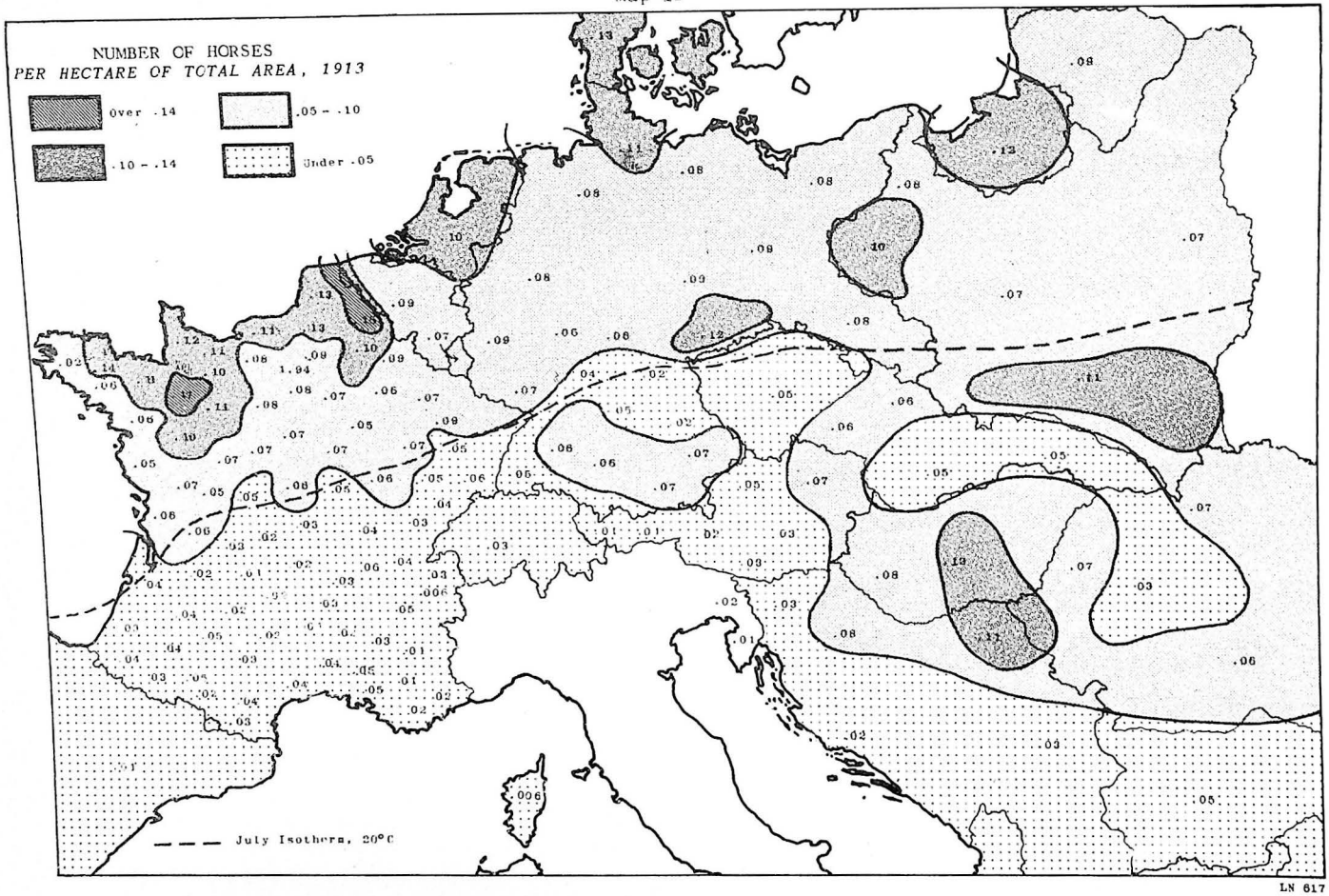

NUMBER OF PIGS
PER HECTARE OF TOTAL AREA, 1913
Over 0.6
0.4-0.6
0.2-0.4
0.1-0.2
Under 0.1
LN 601

Map 1e


NUMBER OF SHEEP
PER HECTARE OF TOTAL AREA, 1913
Over 0.6
0.4-0.6
0.2-0.4
Under 0.2

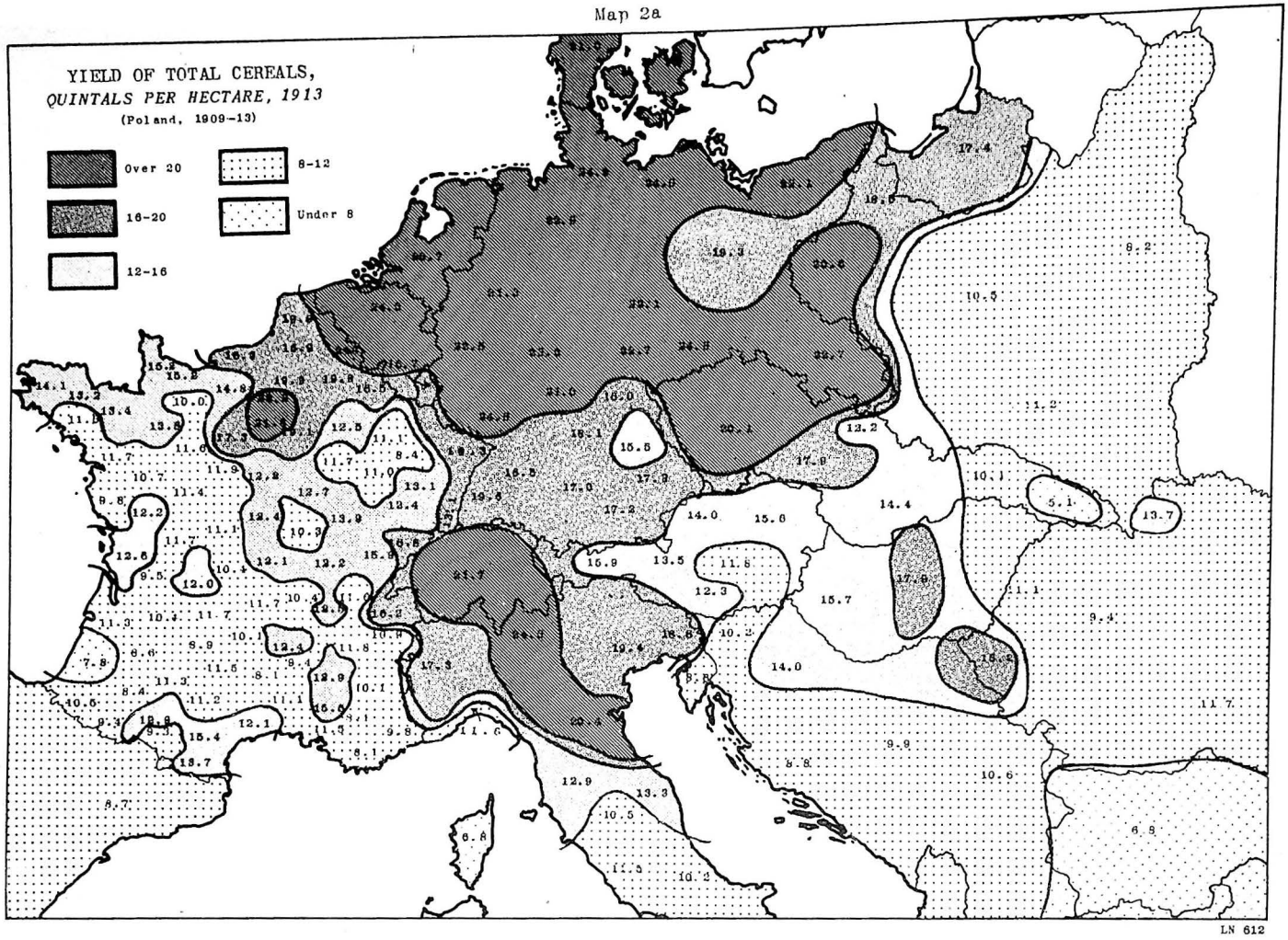
LN 618

Map 1f

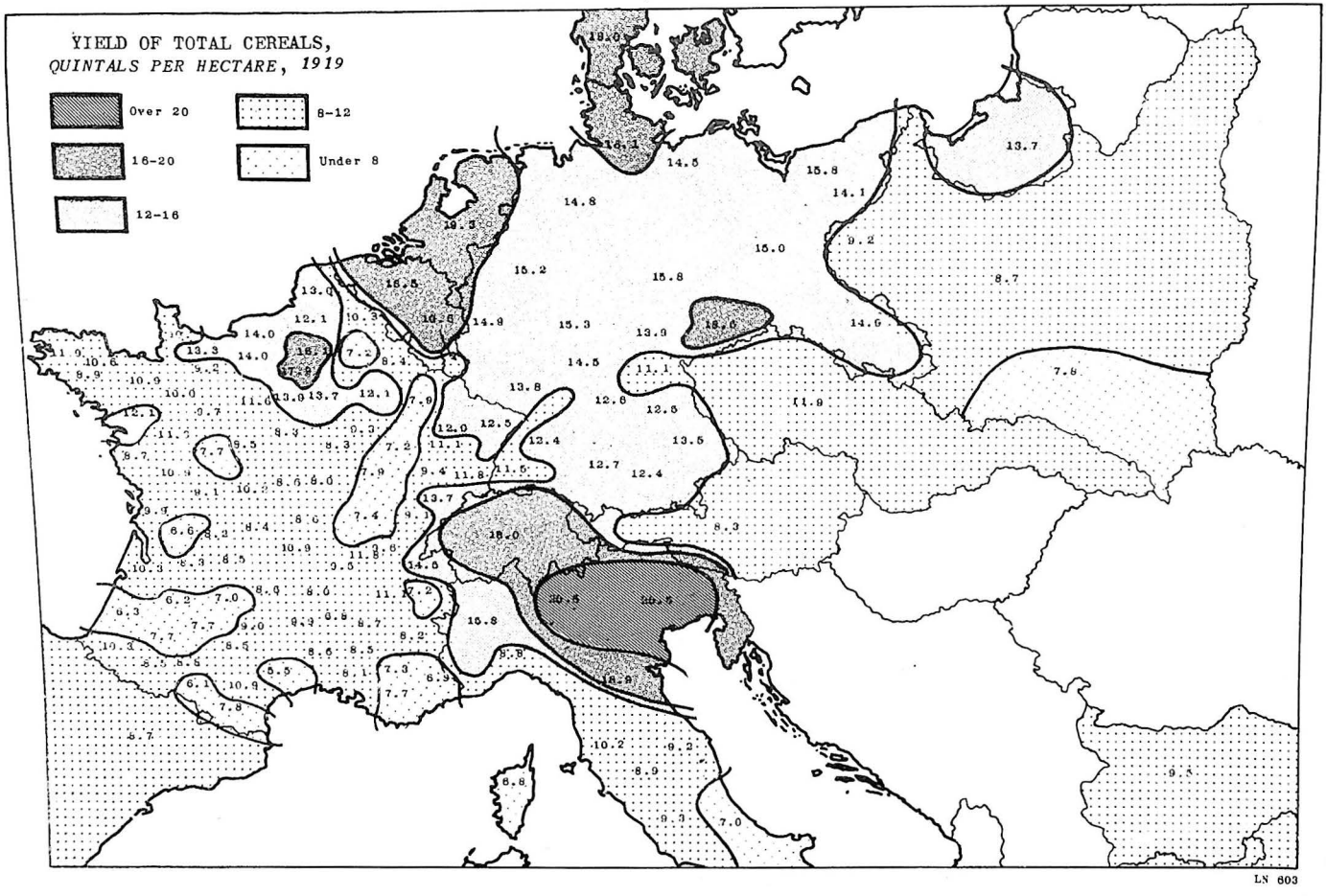

NUMBER OF HORSES
PER HECTARE OF TOTAL AREA, 1913
Over .14
.10 - .14
.05 - .10
Under .05
July Isotherm, 20°C

LN 617

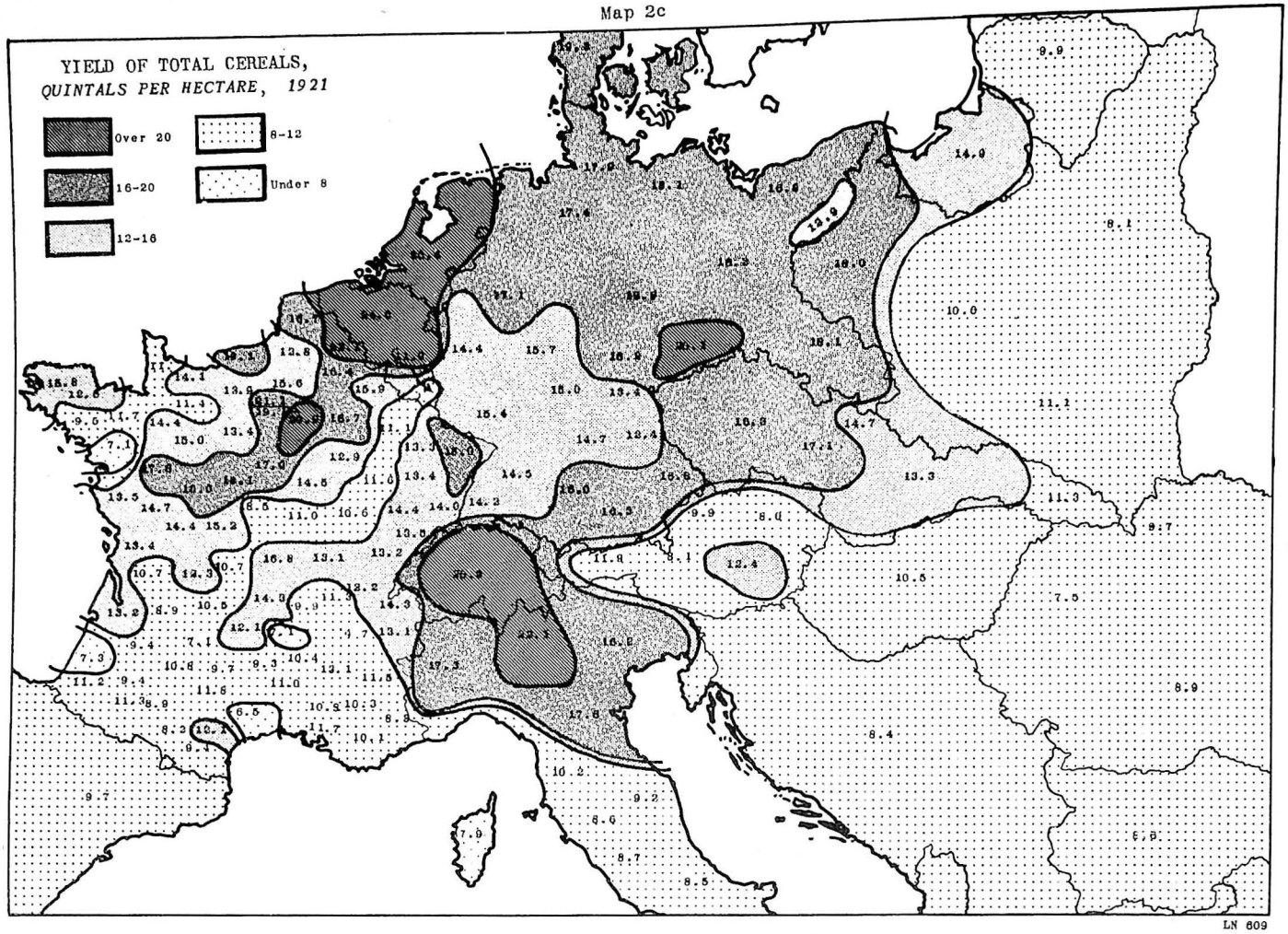
Map 2a


YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1913
(Poland, 1909-13)
Over 20
16-20
12-16
8-12
Under 8
LN 612

Map 2b

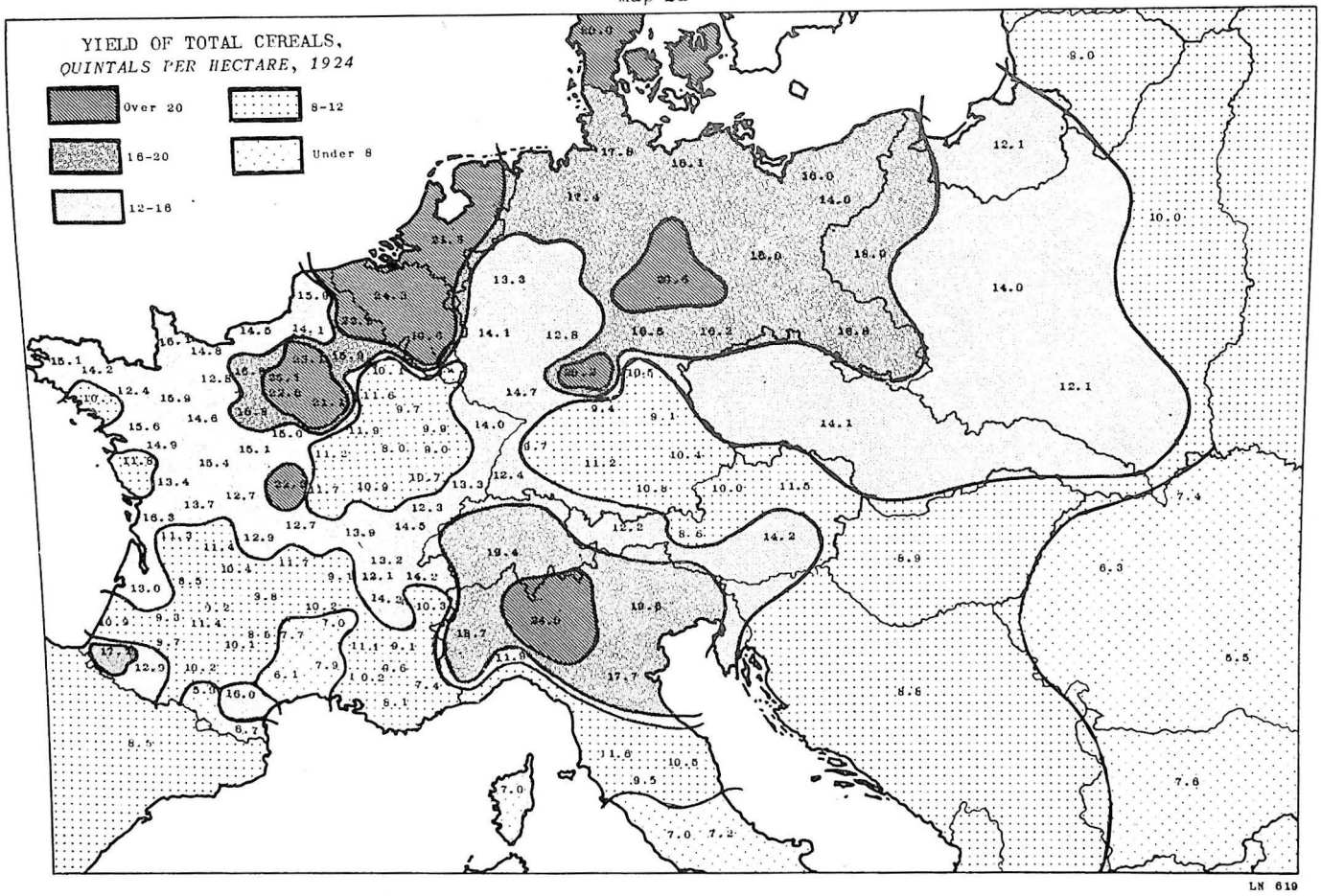

YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1919
Over 20
16-20
12-16
8-12
Under 8
LN 603

Map 2c

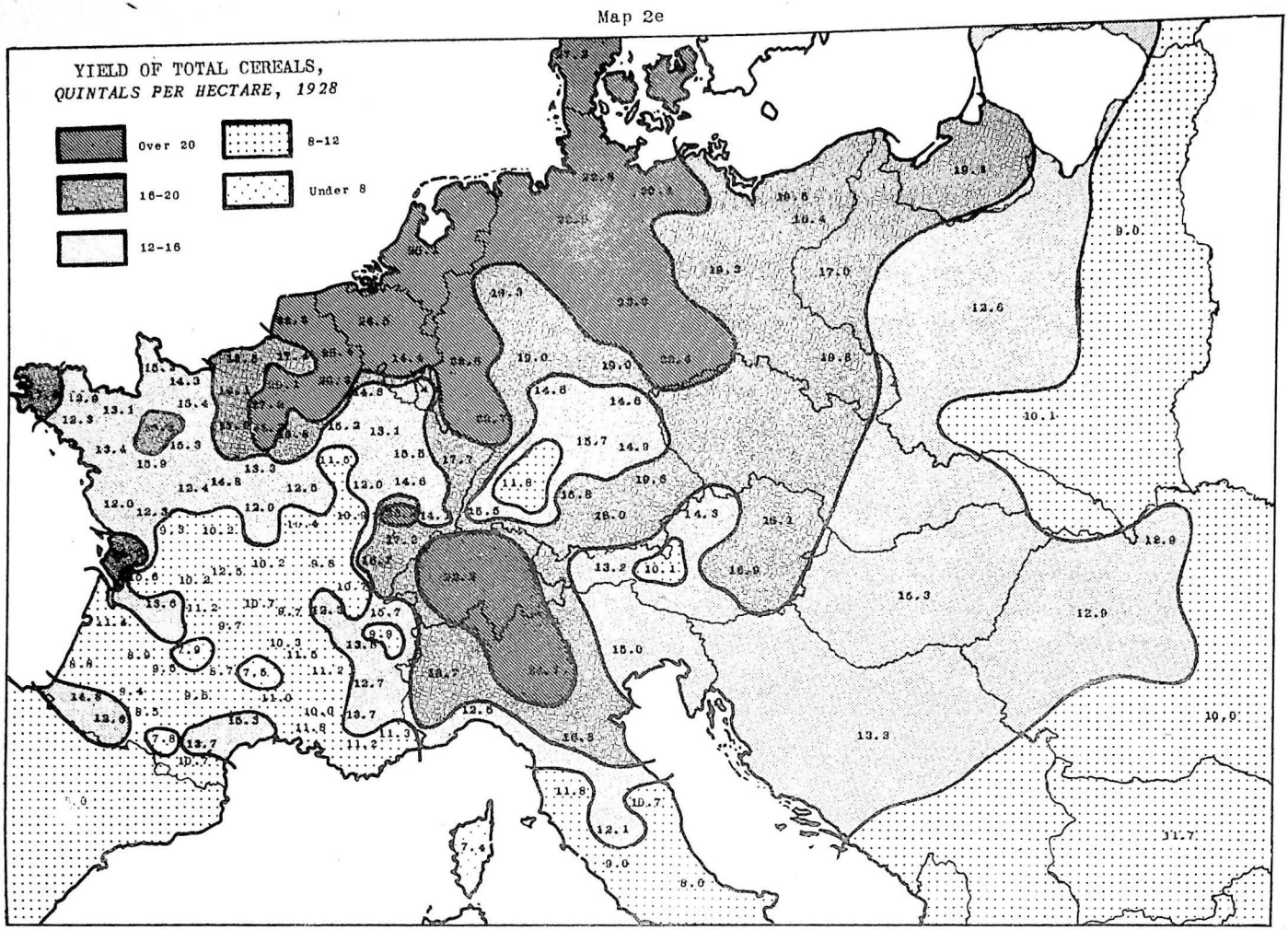

YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1921
Over 20
16-20
12-16
8-12
Under 8

LN 609

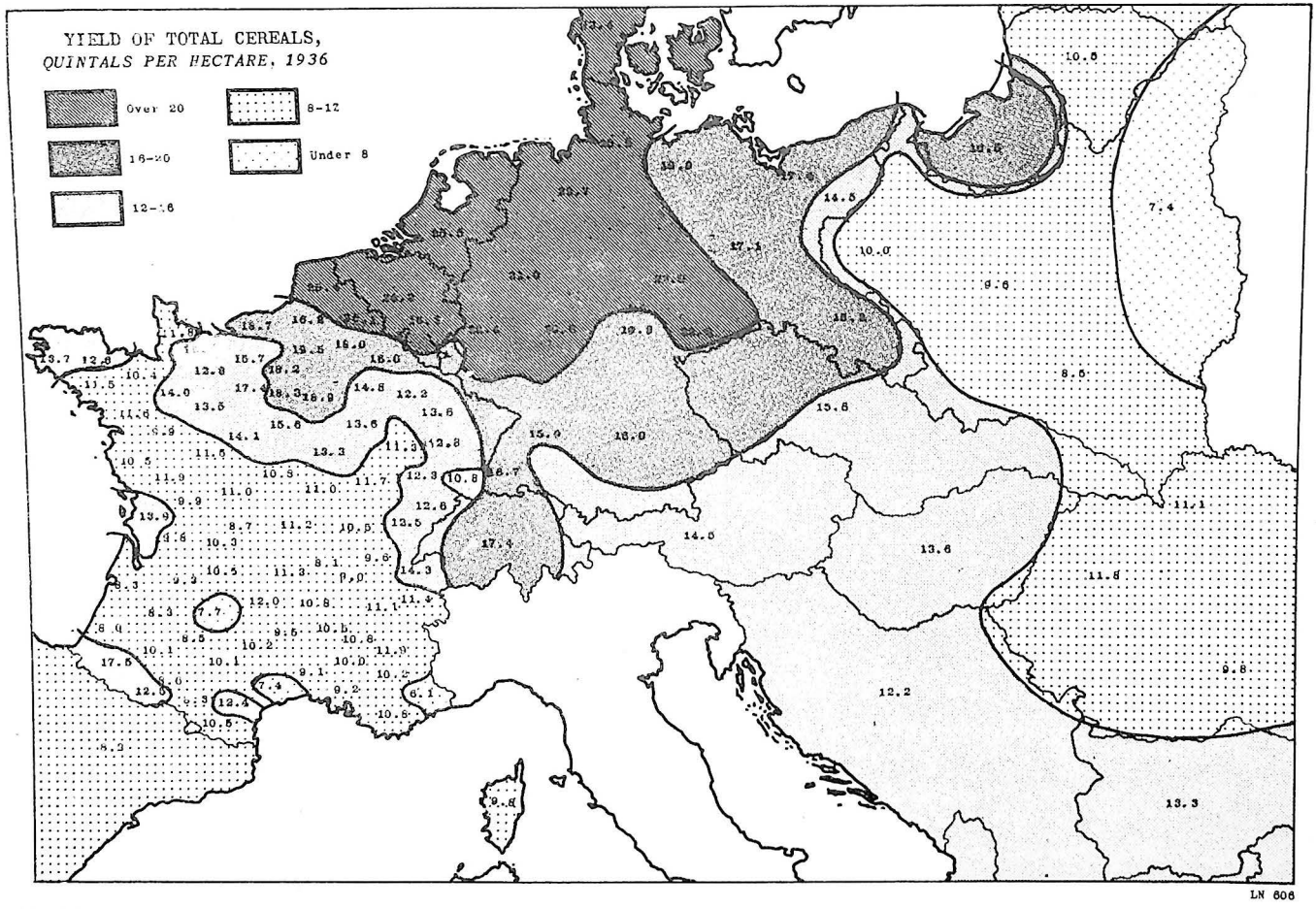
Map 2d


YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1924
Over 20
16-20
12-16
8-12
Under 8
LN 619

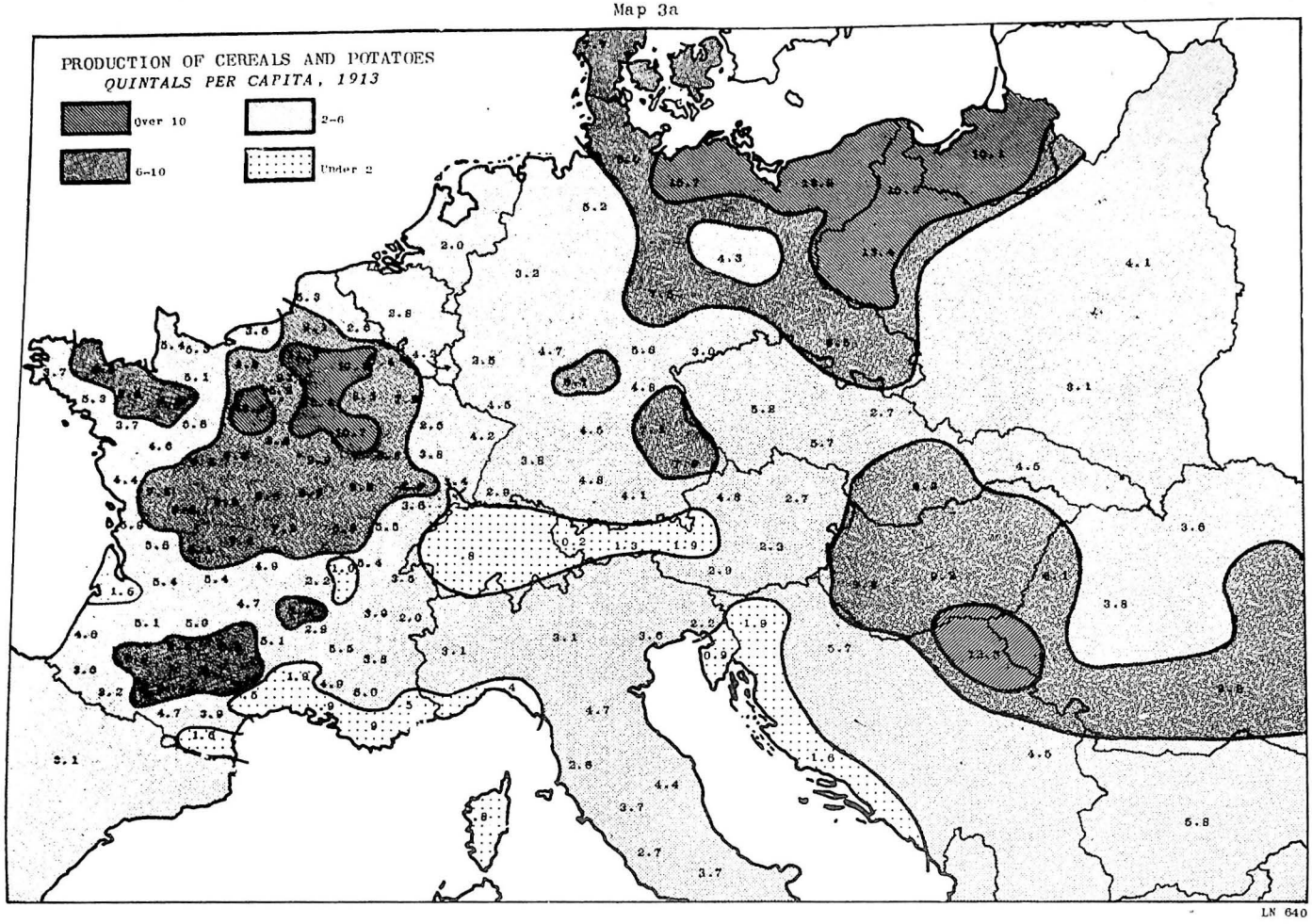
Map 2e


YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1928
Over 20
16-20
12-16
8-12
Under 8
LN 605

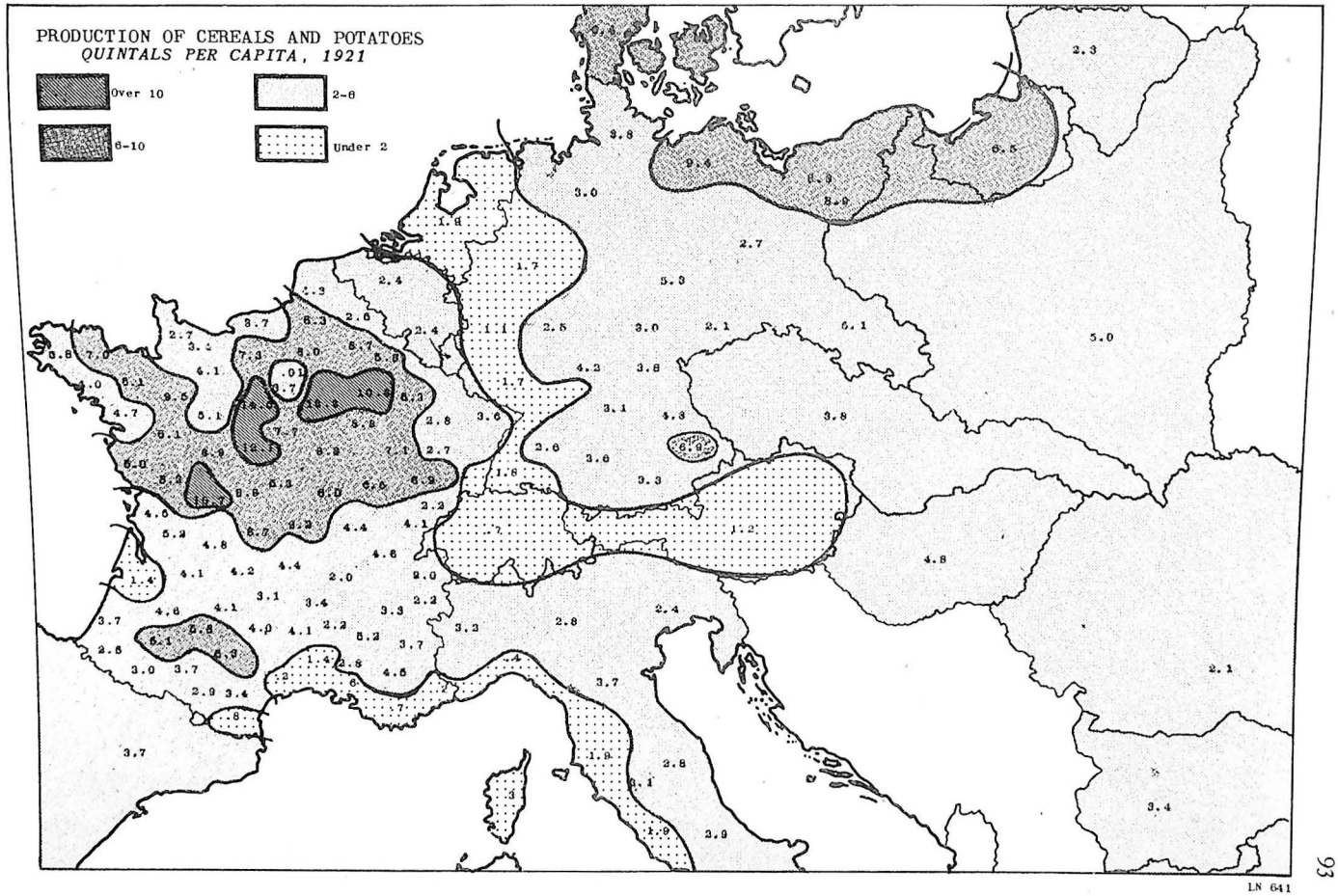
Map 2f


YIELD OF TOTAL CEREALS,
QUINTALS PER HECTARE, 1936
Over 20
16-20
12-16
8-12
Under 8
LN 606

Map 3a

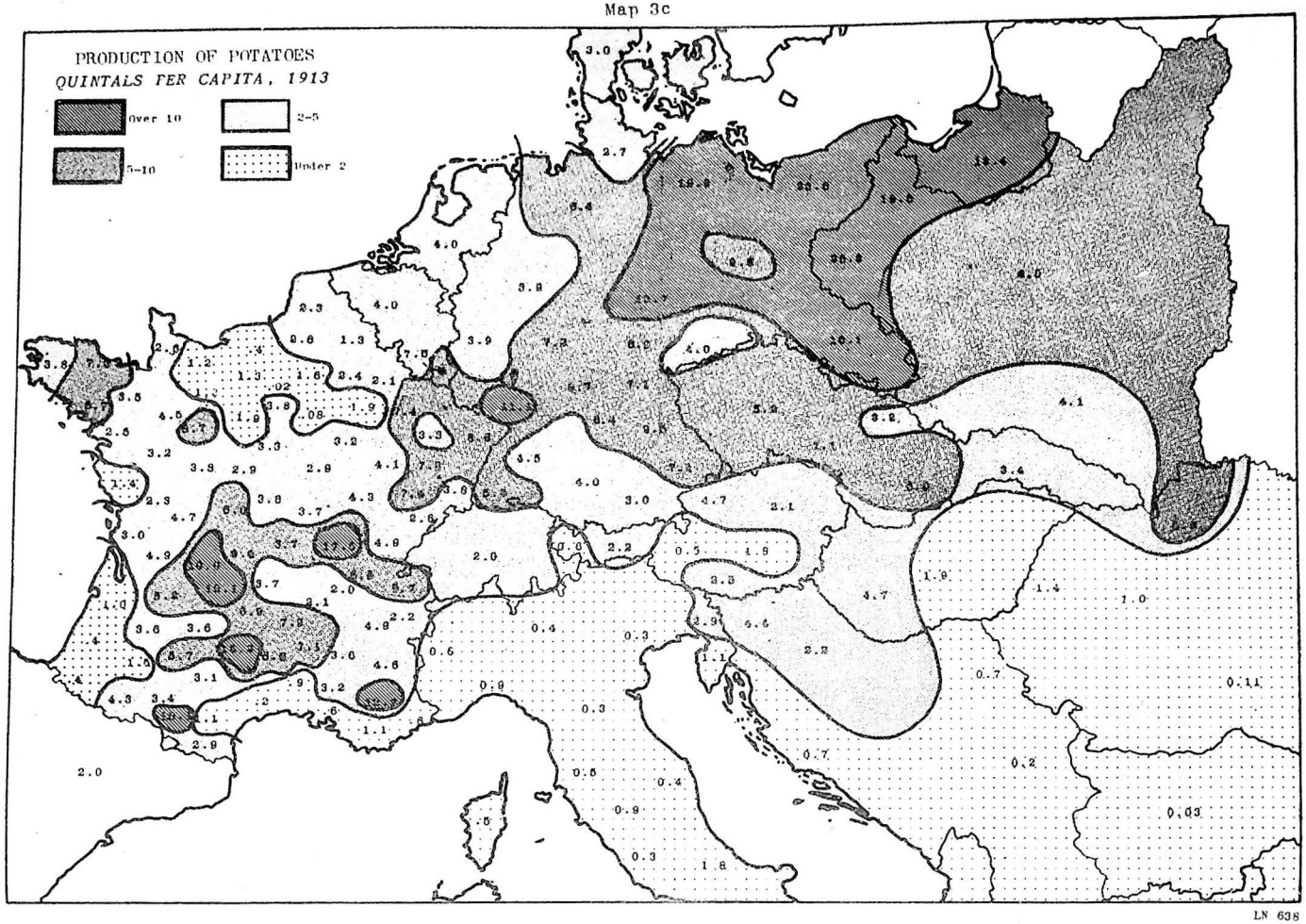

PRODUCTION OF CEREALS AND POTATOES
QUINTALS PER CAPITA, 1913
Over 10
2-6
6-10
Under 2
LN 640

Map 3b


PRODUCTION OF CEREALS AND POTATOES
QUINTALS PER CAPITA, 1921
Over 10
6-10
2-6
Under 2

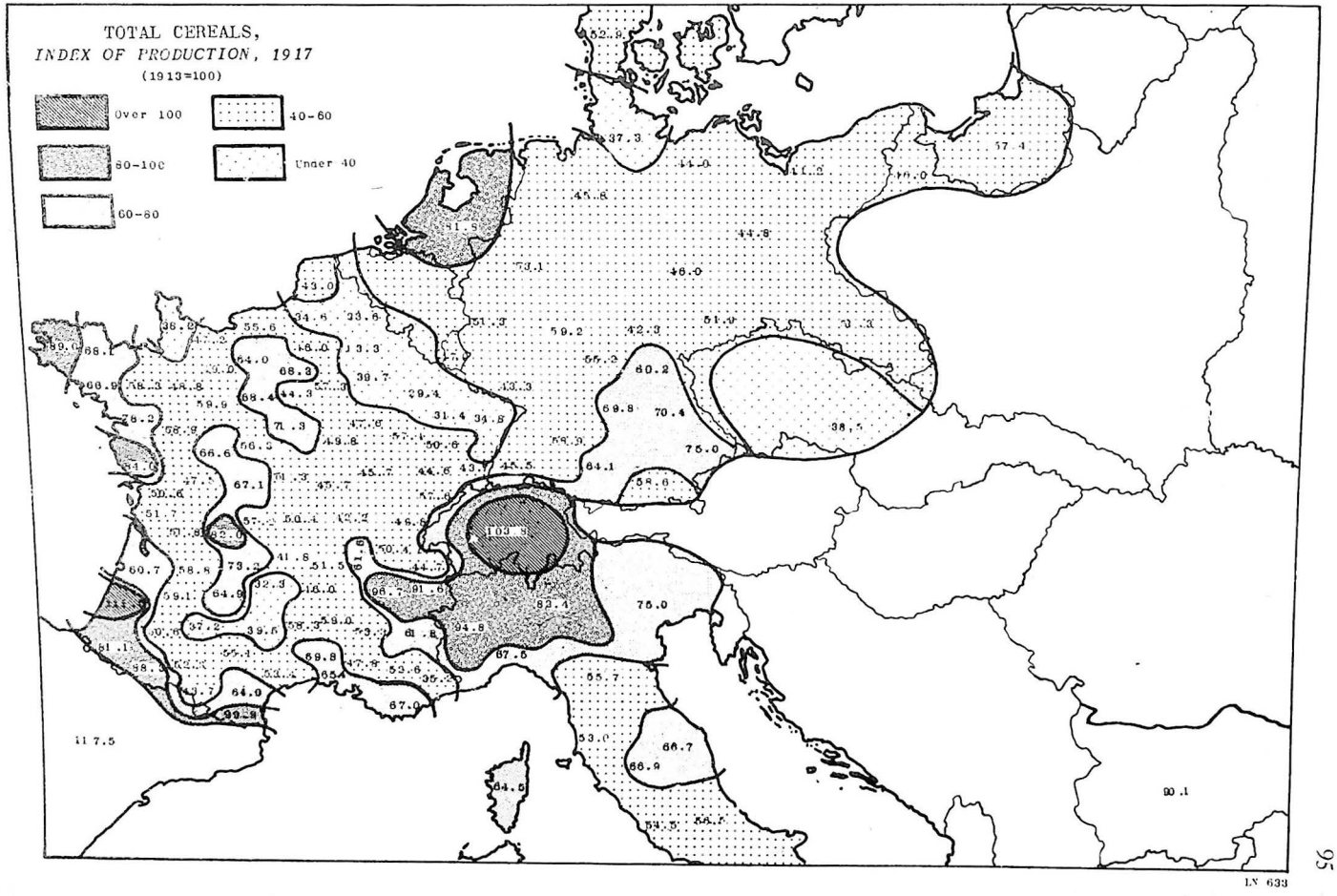
LN 641

Map 3c

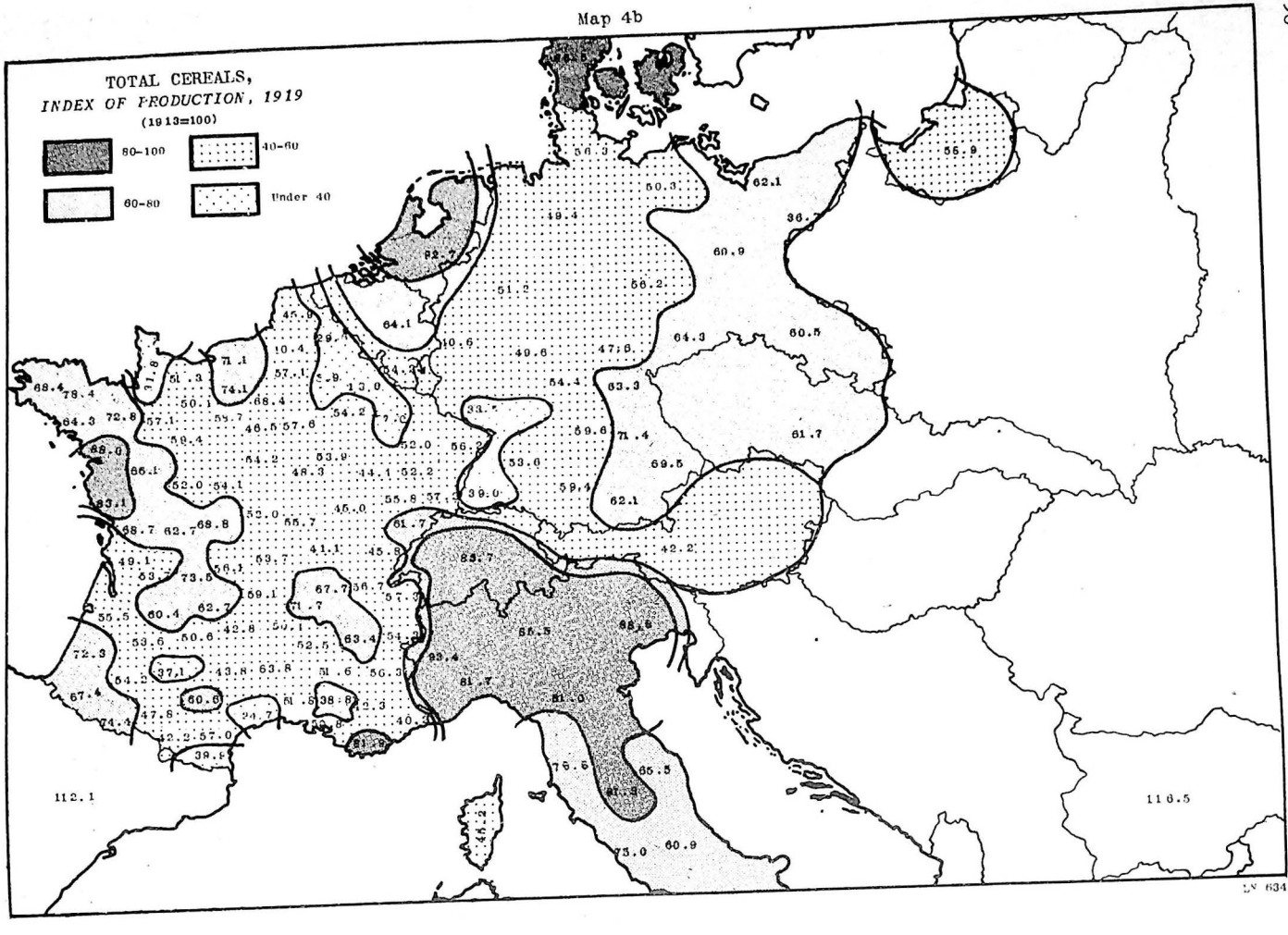

PRODUCTION OF POTATOES
QUINTALS PER CAPITA, 1913
Over 10
5-10
2-5
Under 2

LN 638

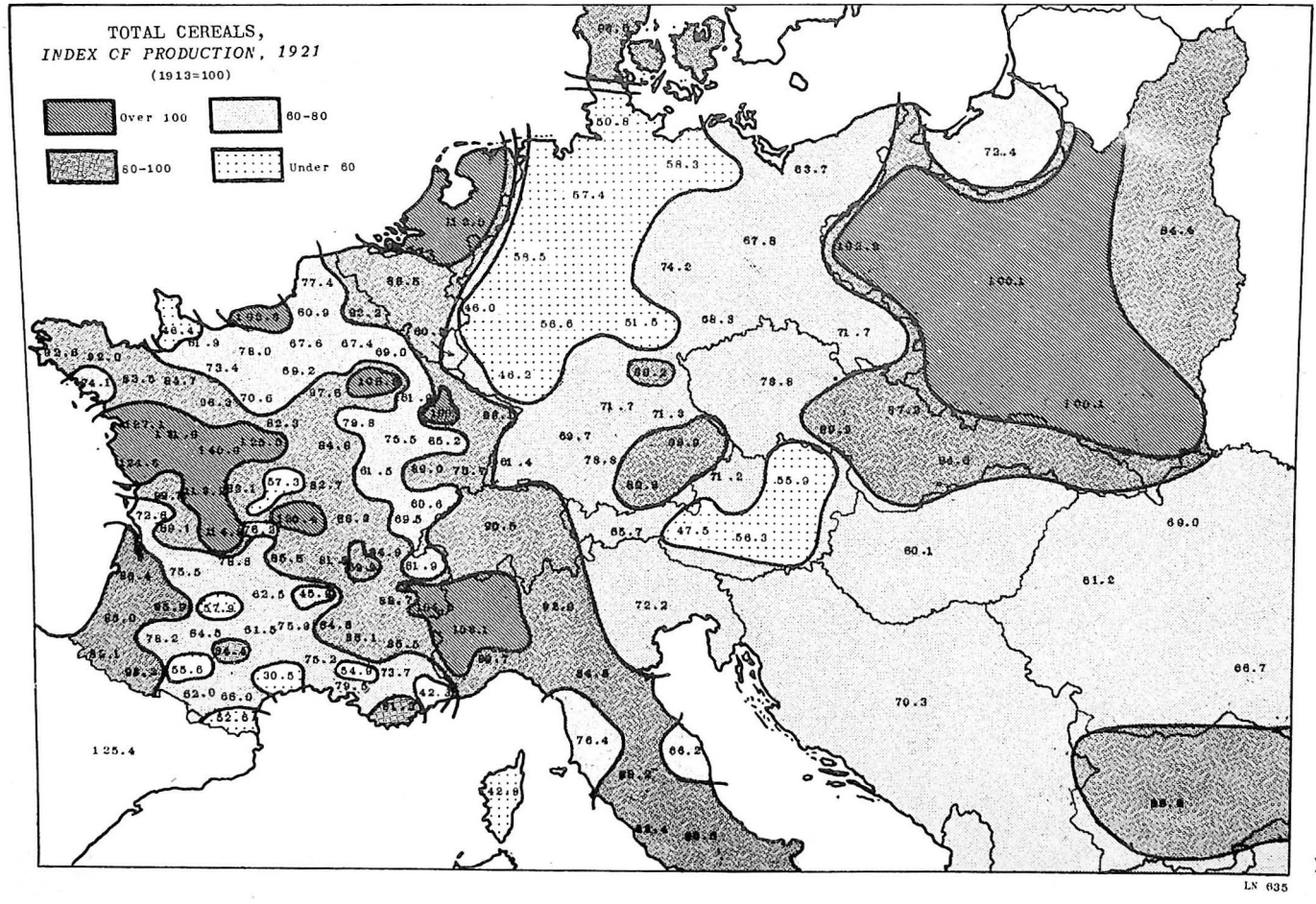
Map 4a


TOTAL CEREALS,
INDEX OF PRODUCTION, 1917
(1913=100)
Over 100
80-100
60-80
40-60
Under 40
LN 633

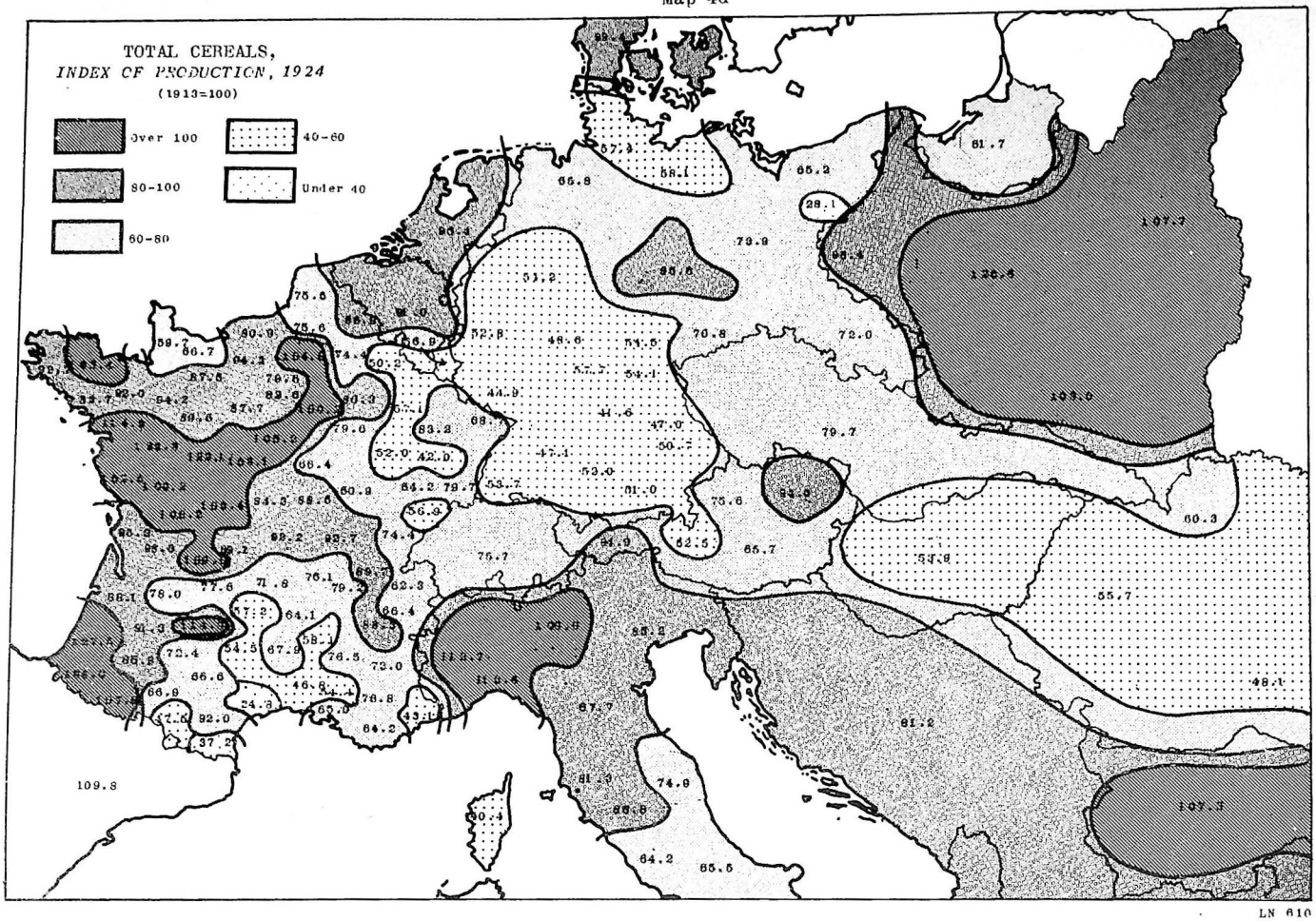
Map 4b


TOTAL CEREALS,
INDEX OF PRODUCTION, 1919
(1913=100)
80-100
60-80
40-60
Under 40
112.1
110.5
LV 634

Map 4c

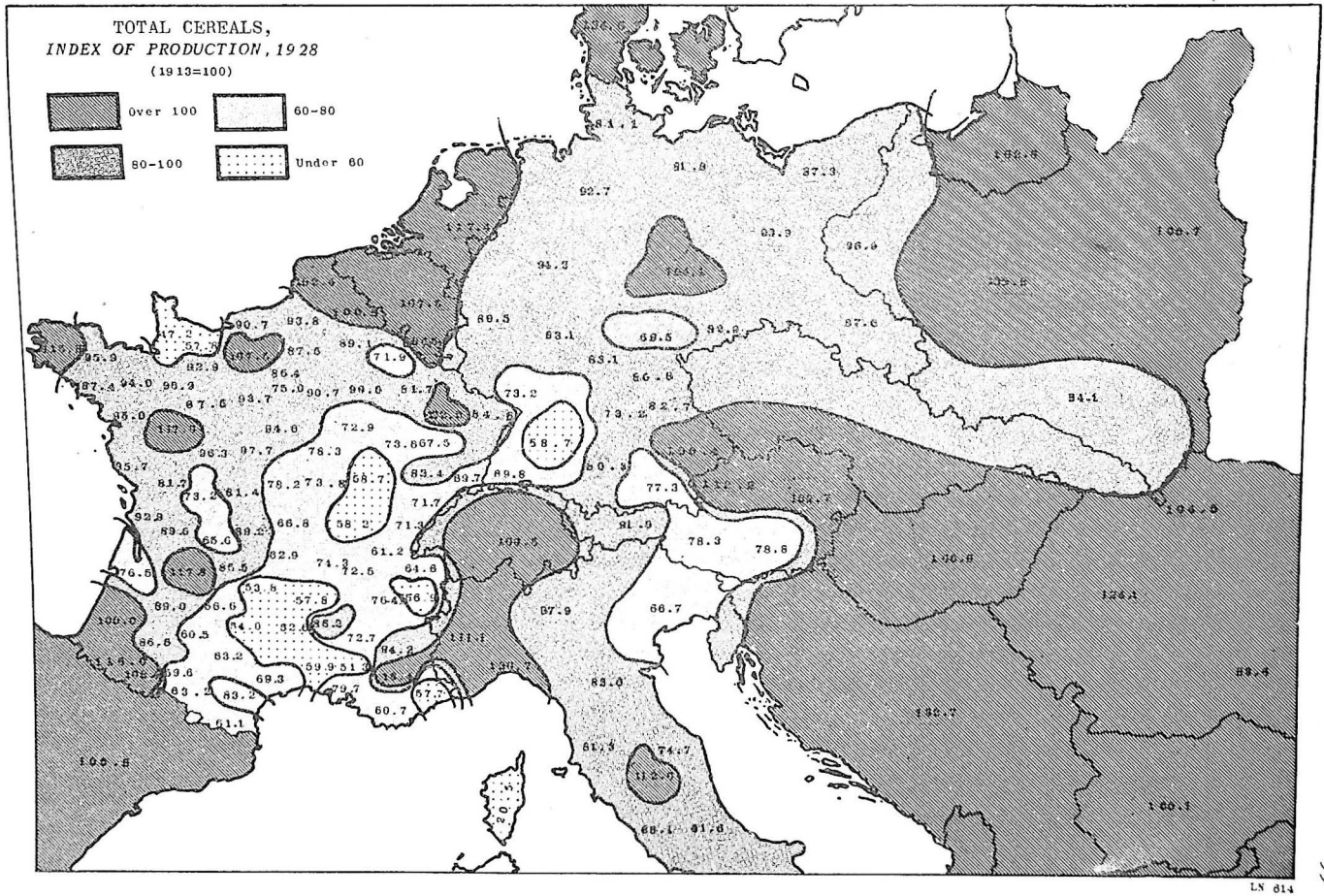

TOTAL CEREALS,
INDEX OF PRODUCTION, 1921
(1913=100)
Over 100
60-80
80-100
Under 60
LN 635

Map 4d


TOTAL CEREALS,
INDEX OF PRODUCTION, 1924
(1913=100)
Over 100
80-100
60-80
40-60
Under 40

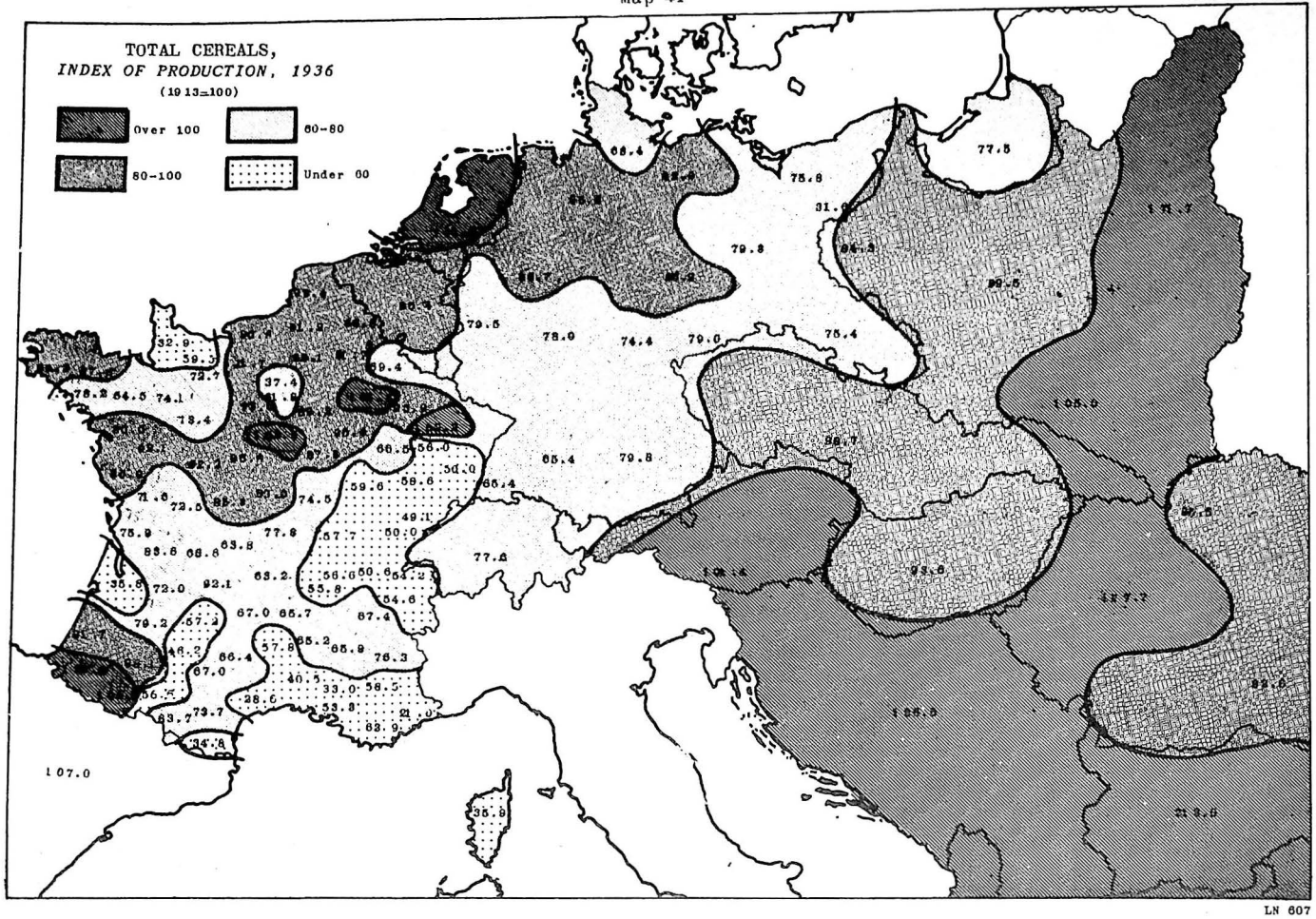
LN 610

Map 4e


TOTAL CEREALS,
INDEX OF PRODUCTION, 1928
(1913=100)
Over 100
60-80
80-100
Under 60

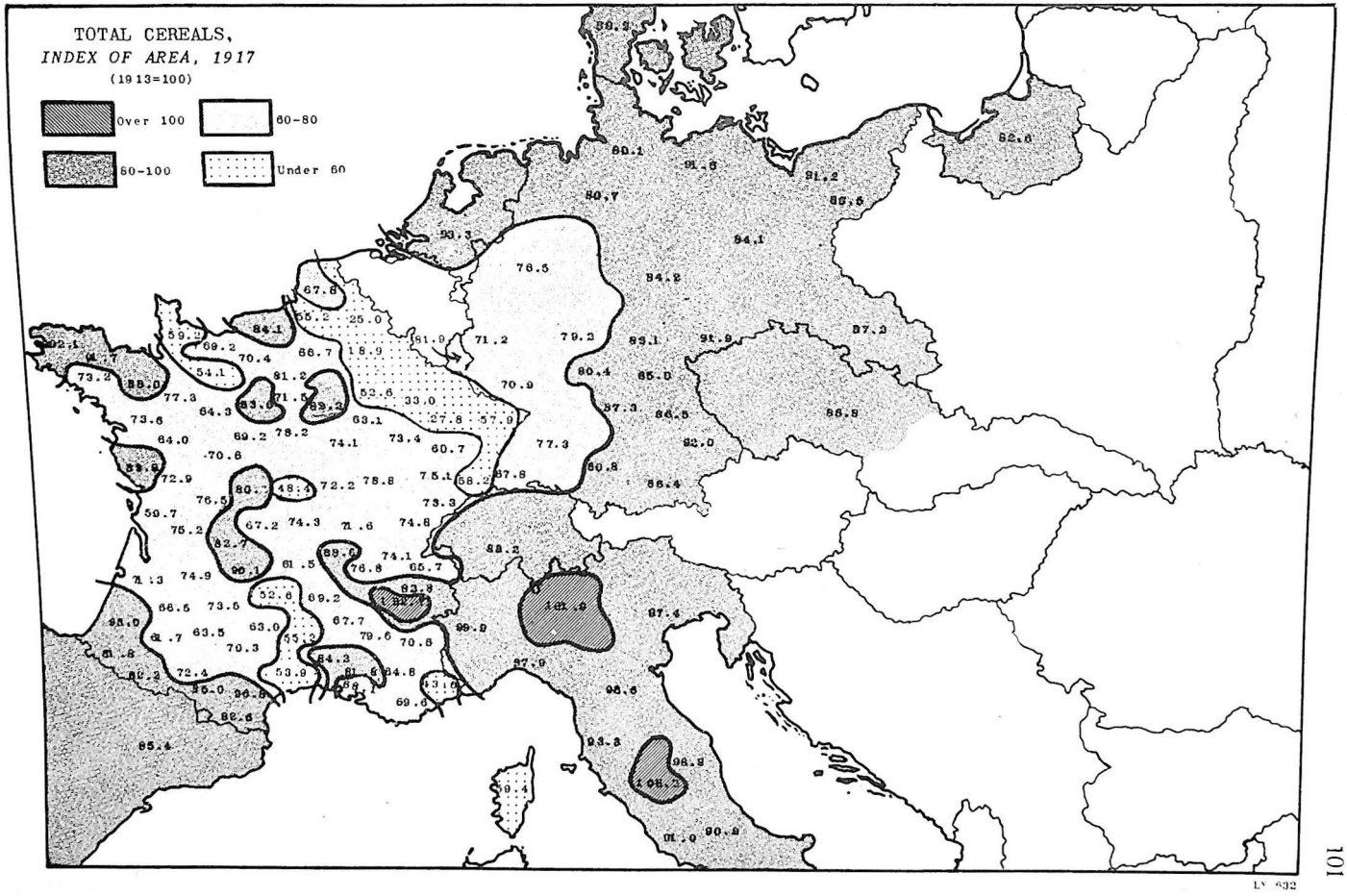
LN 814

Map 4f

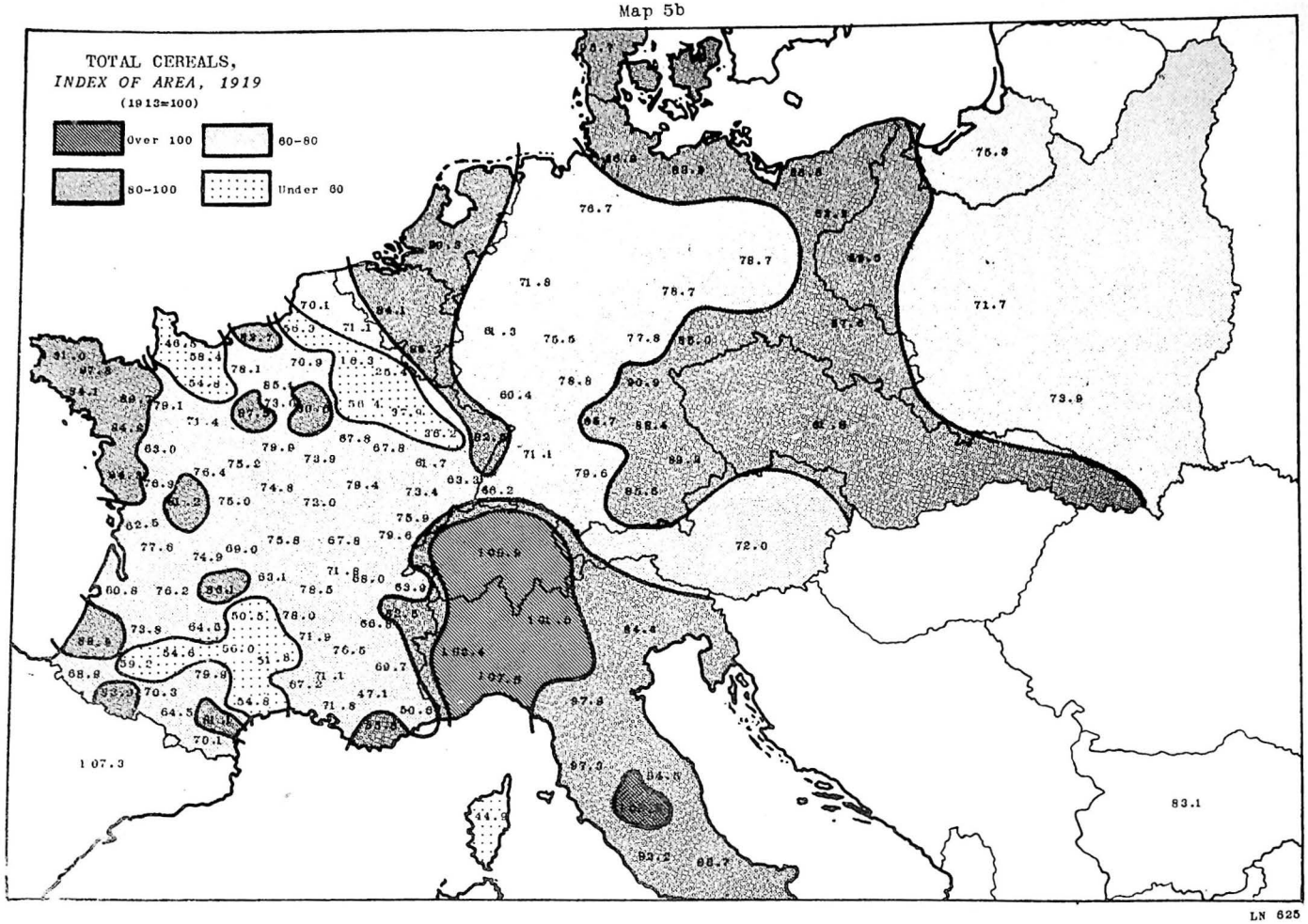

TOTAL CEREALS,
INDEX OF PRODUCTION, 1936
(1913=100)
Over 100
80-100
60-80
Under 60

LN 607

Map 5a

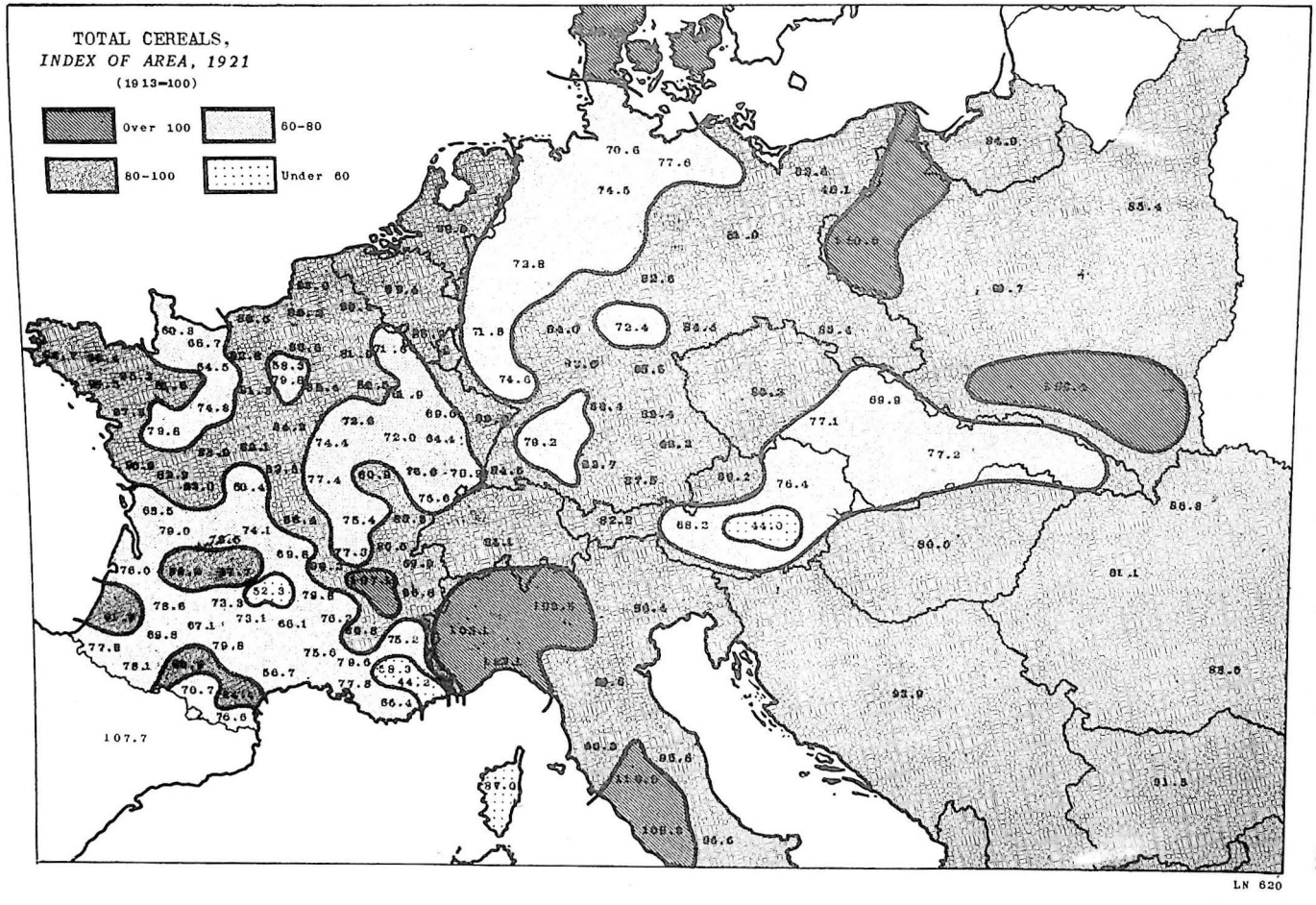

TOTAL CEREALS,
INDEX OF AREA, 1917
(1913=100)
Over 100
80-80
80-100
Under 80

Map 5b


TOTAL CEREALS,
INDEX OF AREA, 1919
(1913=100)
Over 100
80-100
60-80
Under 60
76.7
78.7
71.8
78.7
71.7
73.9
72.0
83.1
107.3

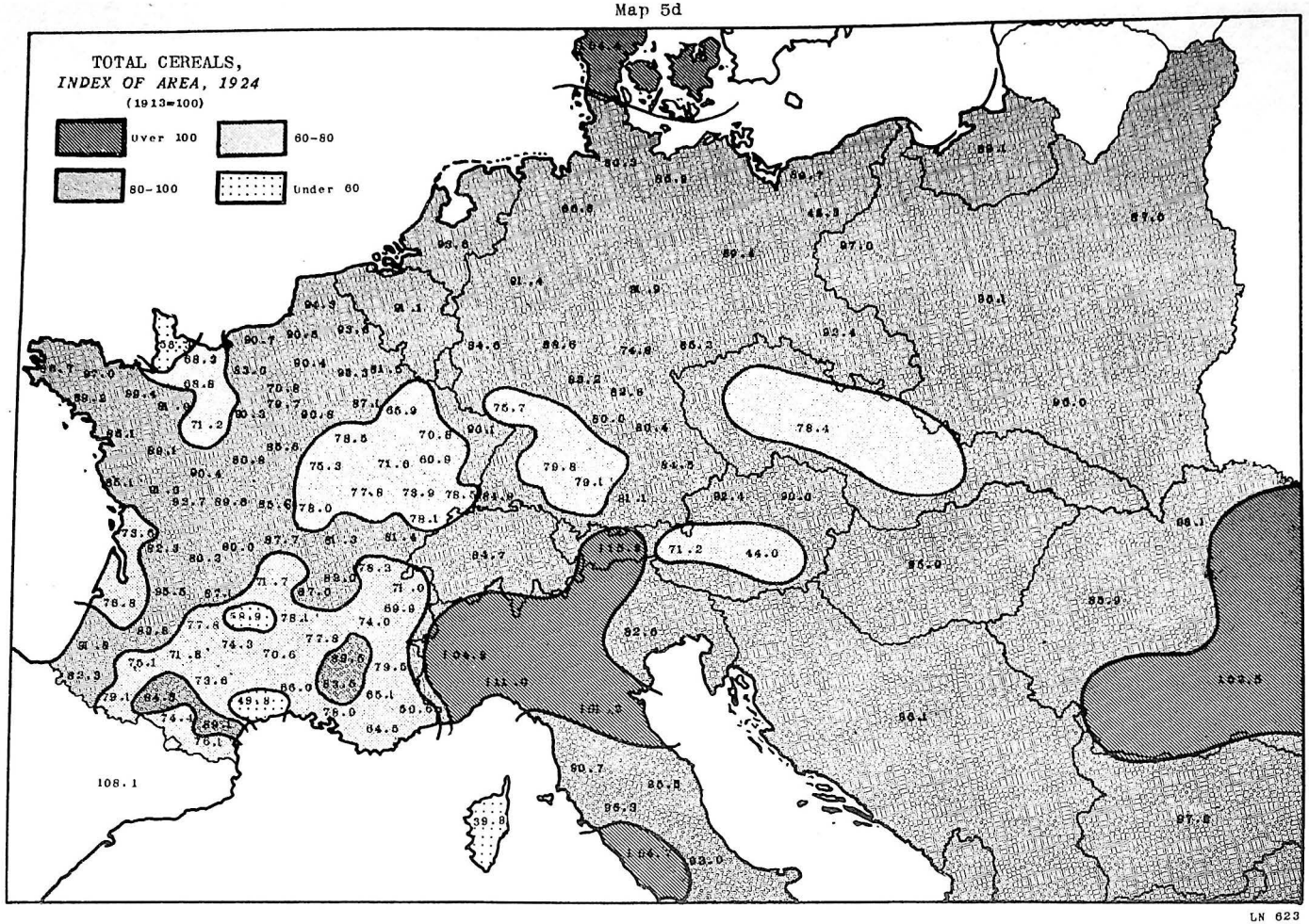
LN 625

Map 5c


TOTAL CEREALS,
INDEX OF AREA, 1921
(1913-100)
Over 100
60-80
80-100
Under 60

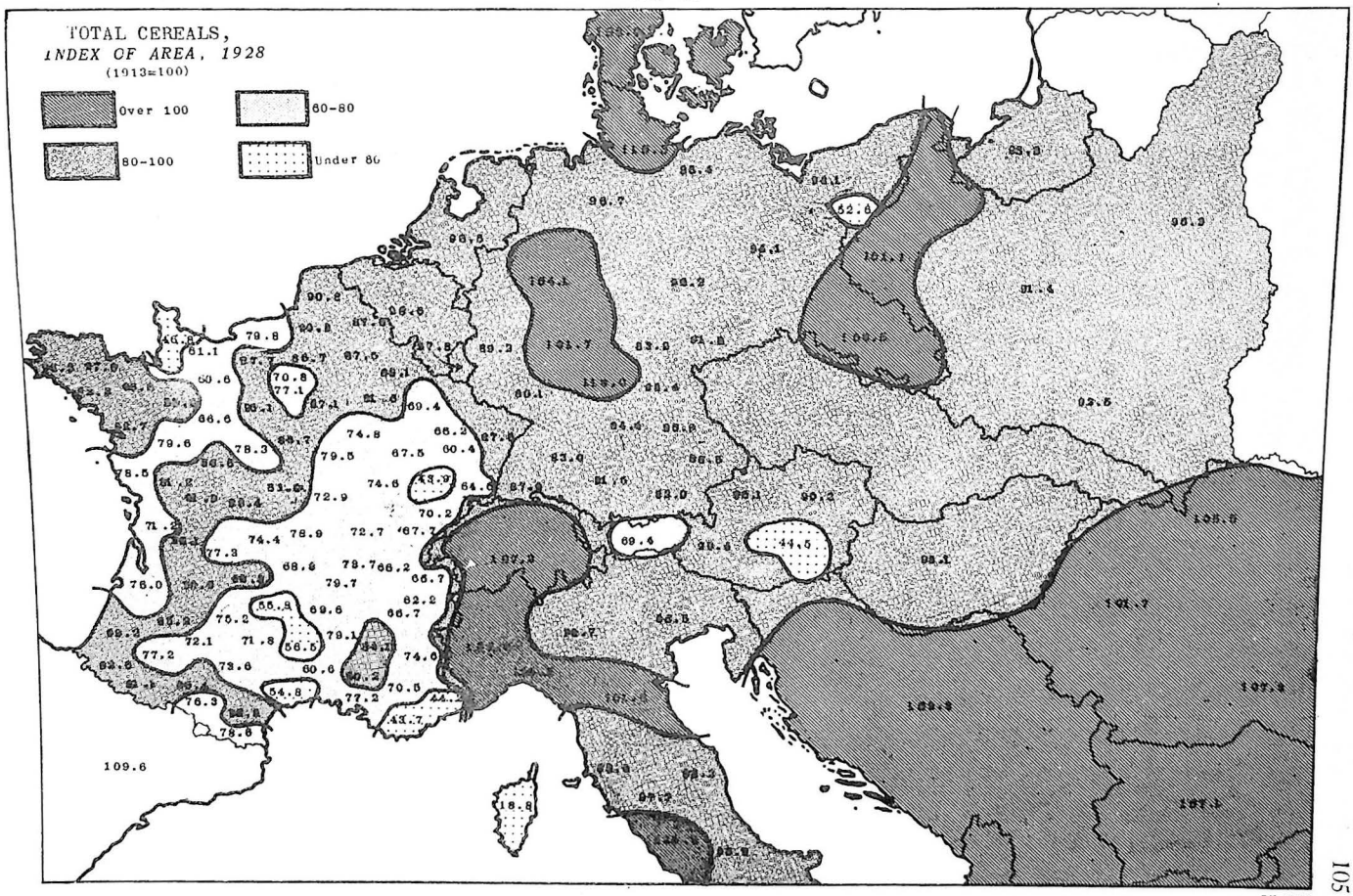
LN 620

Map 5d

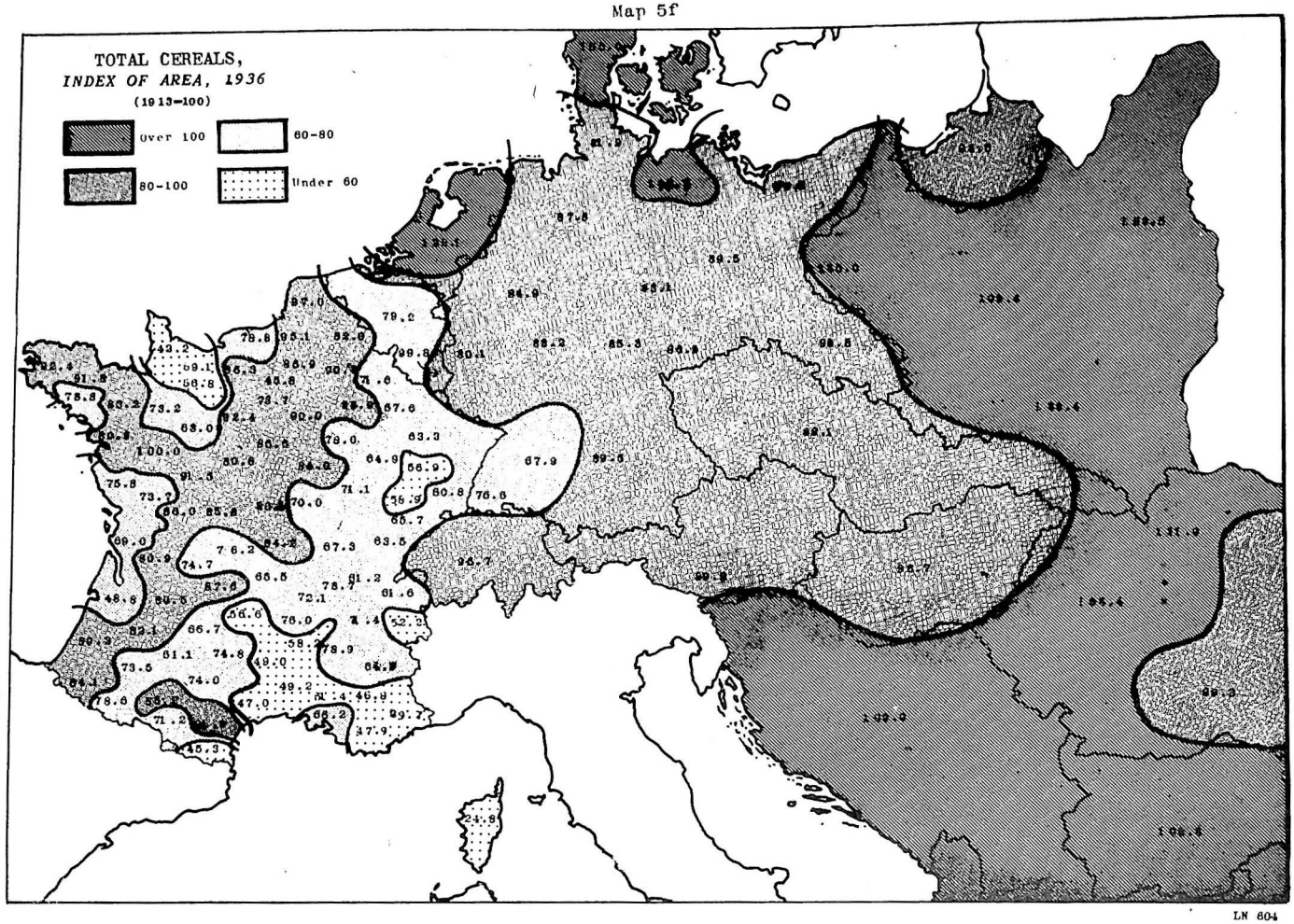

TOTAL CEREALS,
INDEX OF AREA, 1924
(1913=100)
Over 100
80-100
60-80
Under 60

LN 623

Map 5e

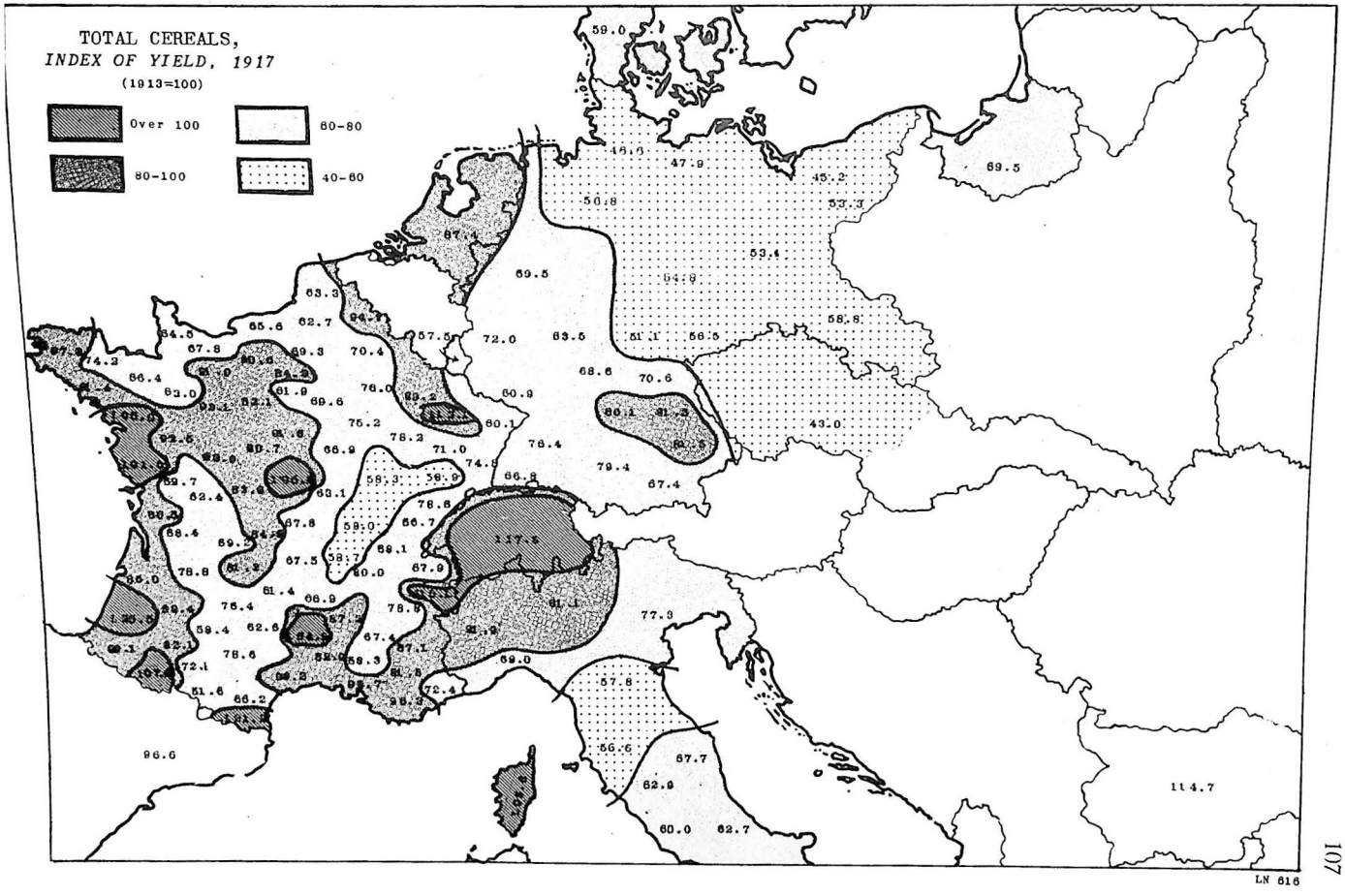

TOTAL CEREALS,
INDEX OF AREA, 1928
(1913=100)
Over 100
80-100
60-80
Under 80
LN 600

Map 5f

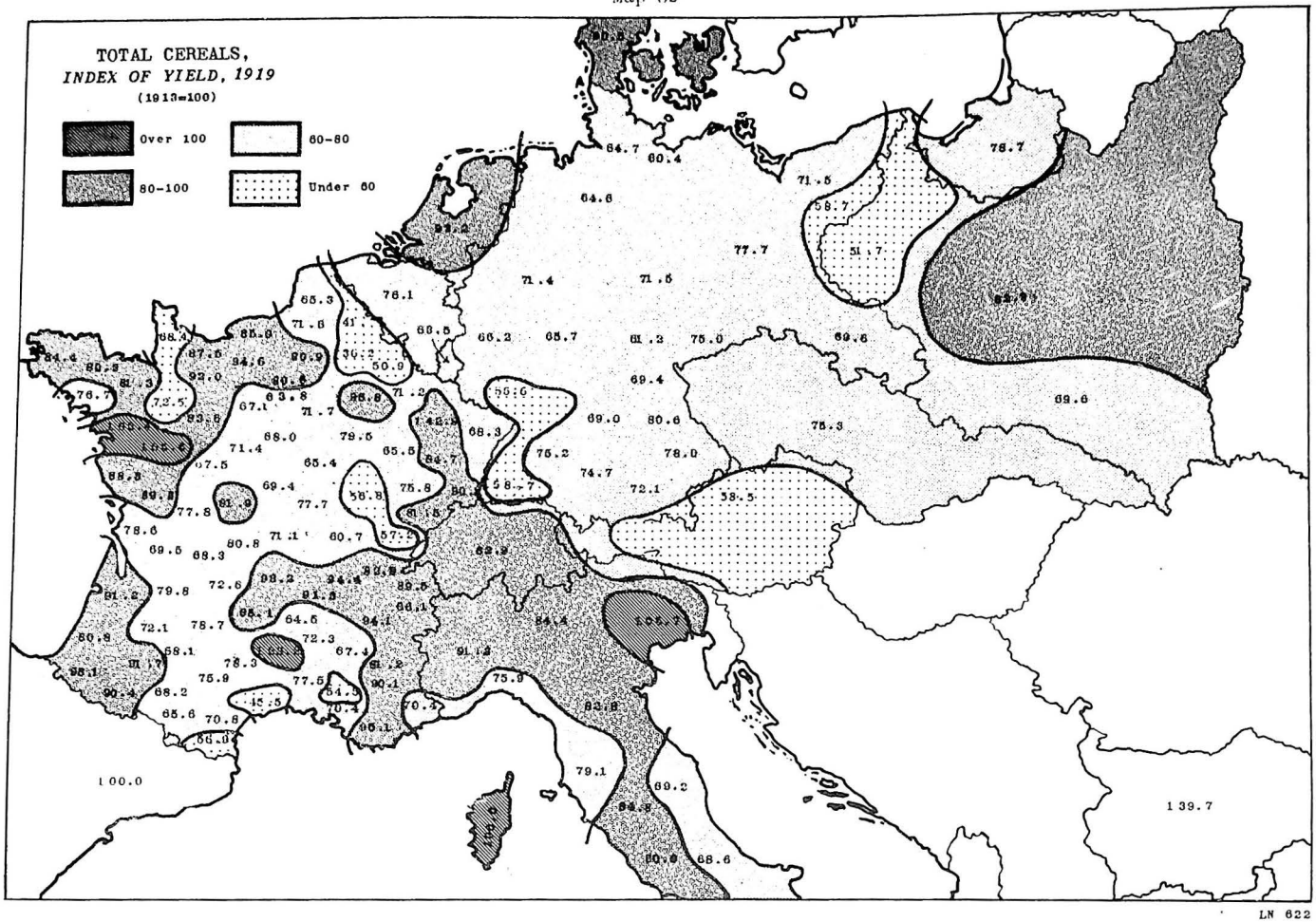

TOTAL CEREALS,
INDEX OF AREA, 1936
(1913=100)
Over 100
80-100
60-80
Under 60

LN 604

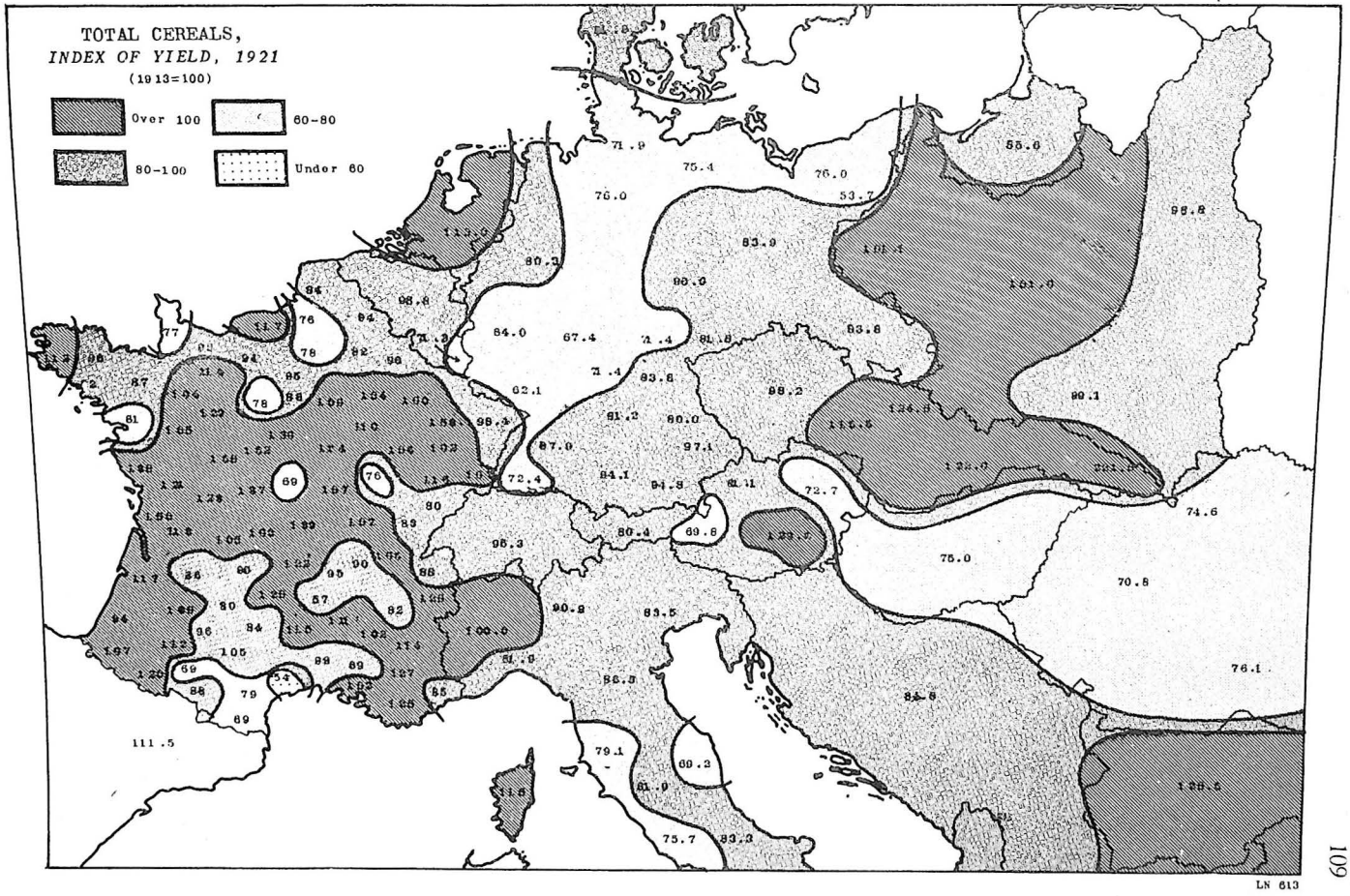
Map 6a


TOTAL CEREALS,
INDEX OF YIELD, 1917
(1913=100)
Over 100
80-100
60-80
40-60
LN 616

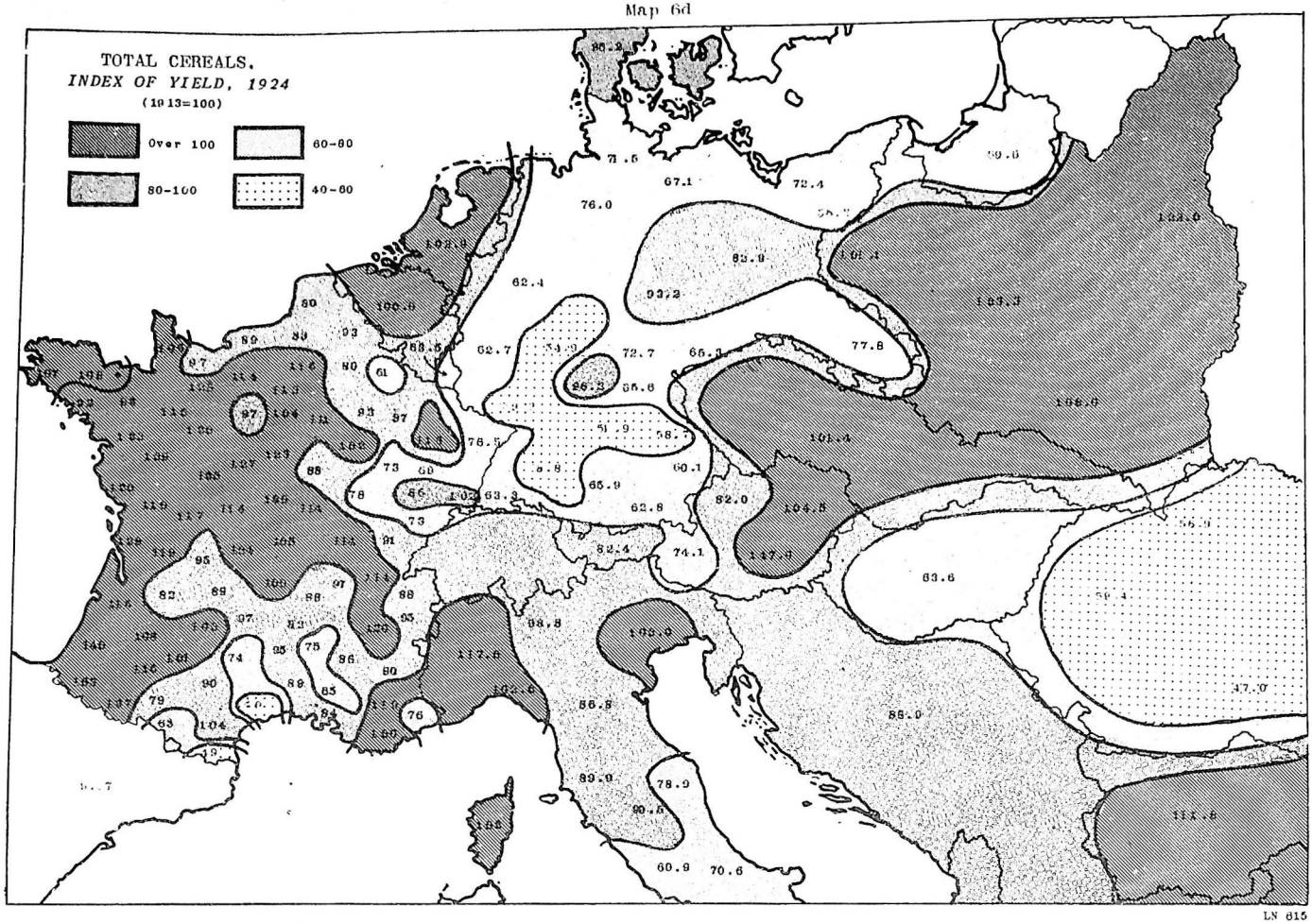
Map 6b


TOTAL CEREALS,
INDEX OF YIELD, 1919
(1913=100)
Over 100
60-80
80-100
Under 60
100.0
139.7
LN 622

Map 6c

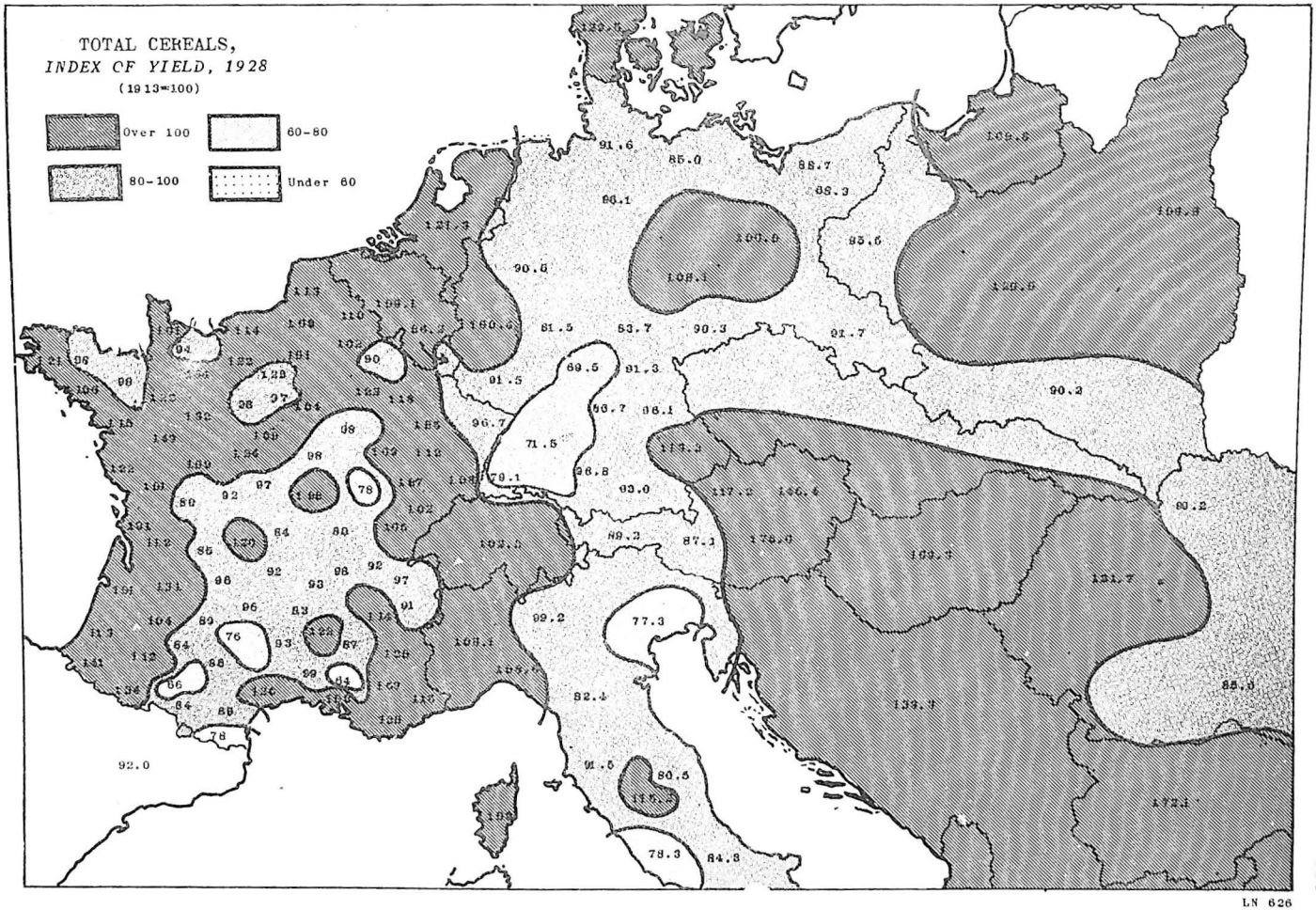

TOTAL CEREALS,
INDEX OF YIELD, 1921
(1913=100)
Over 100
60-80
80-100
Under 60
LN 613

Map 6d


TOTAL CEREALS.
INDEX OF YIELD, 1924
(1913=100)
Over 100
80-100
60-80
40-60

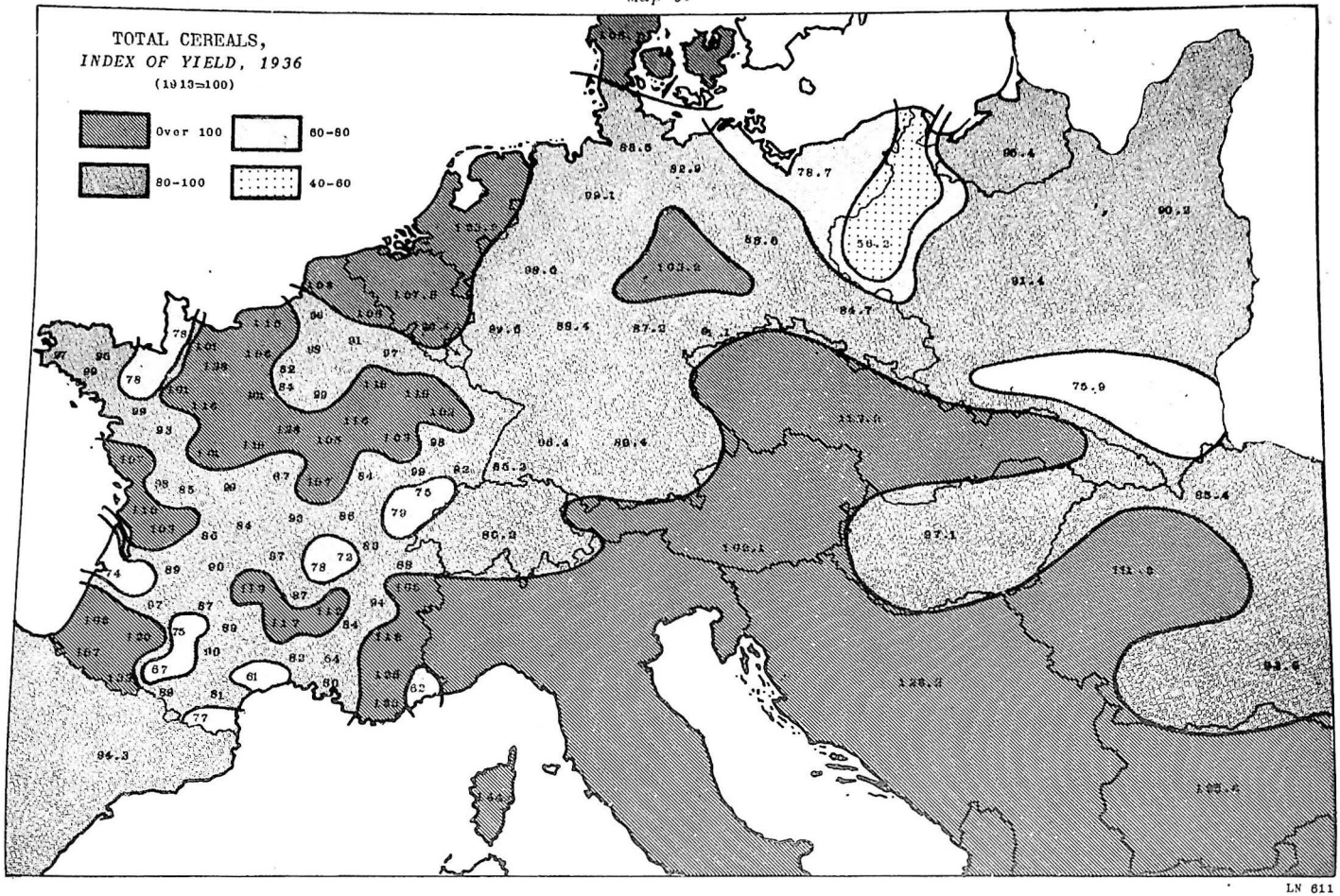
LN 815

Map 6e


TOTAL CEREALS,
INDEX OF YIELD, 1928
(1913=100)
Over 100
60-80
80-100
Under 60

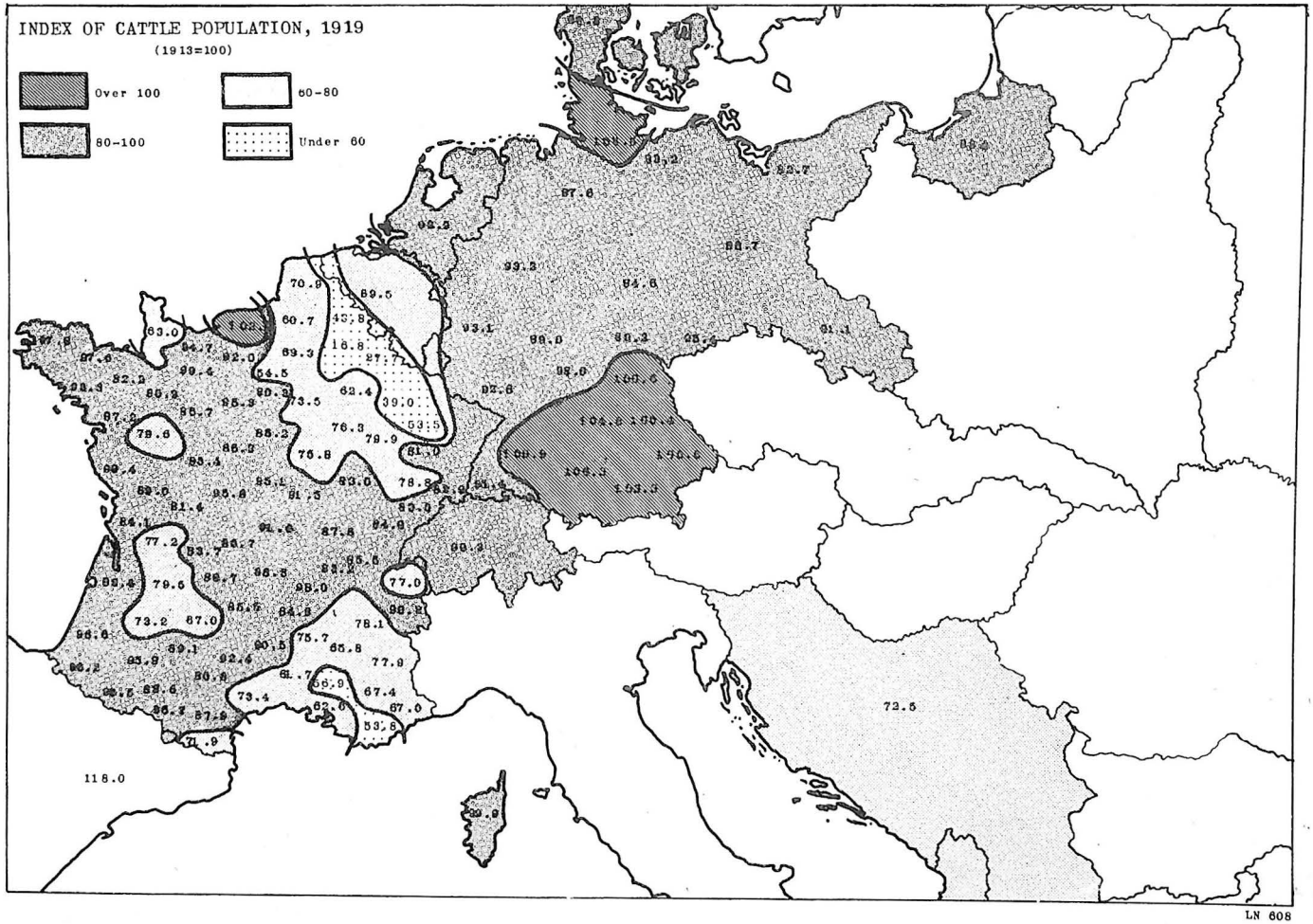
LN 626

Map 6f

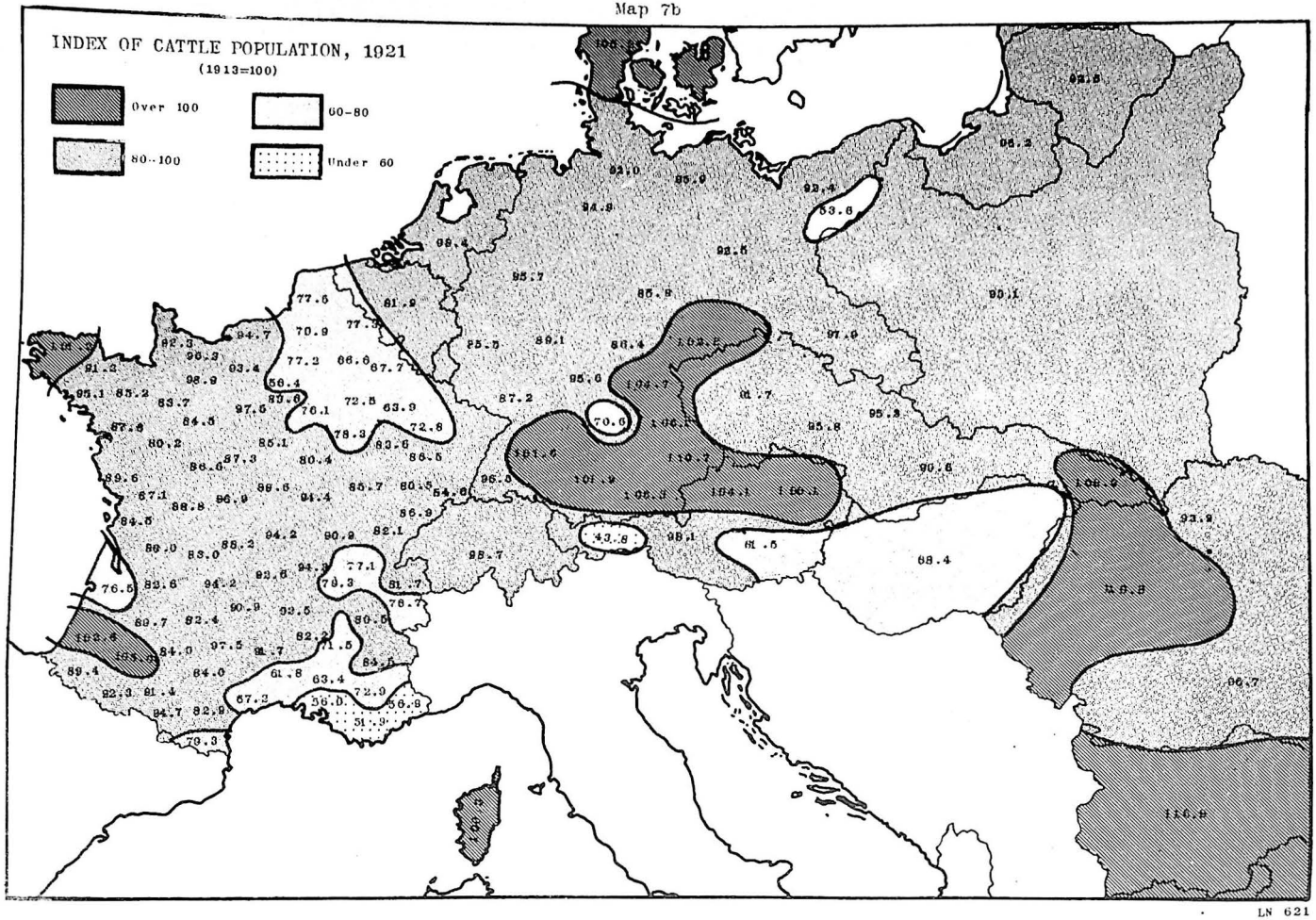

TOTAL CEREALS,
INDEX OF YIELD, 1936
(1913=100)
Over 100
80-100
60-80
40-60

LN 611

Map 7a

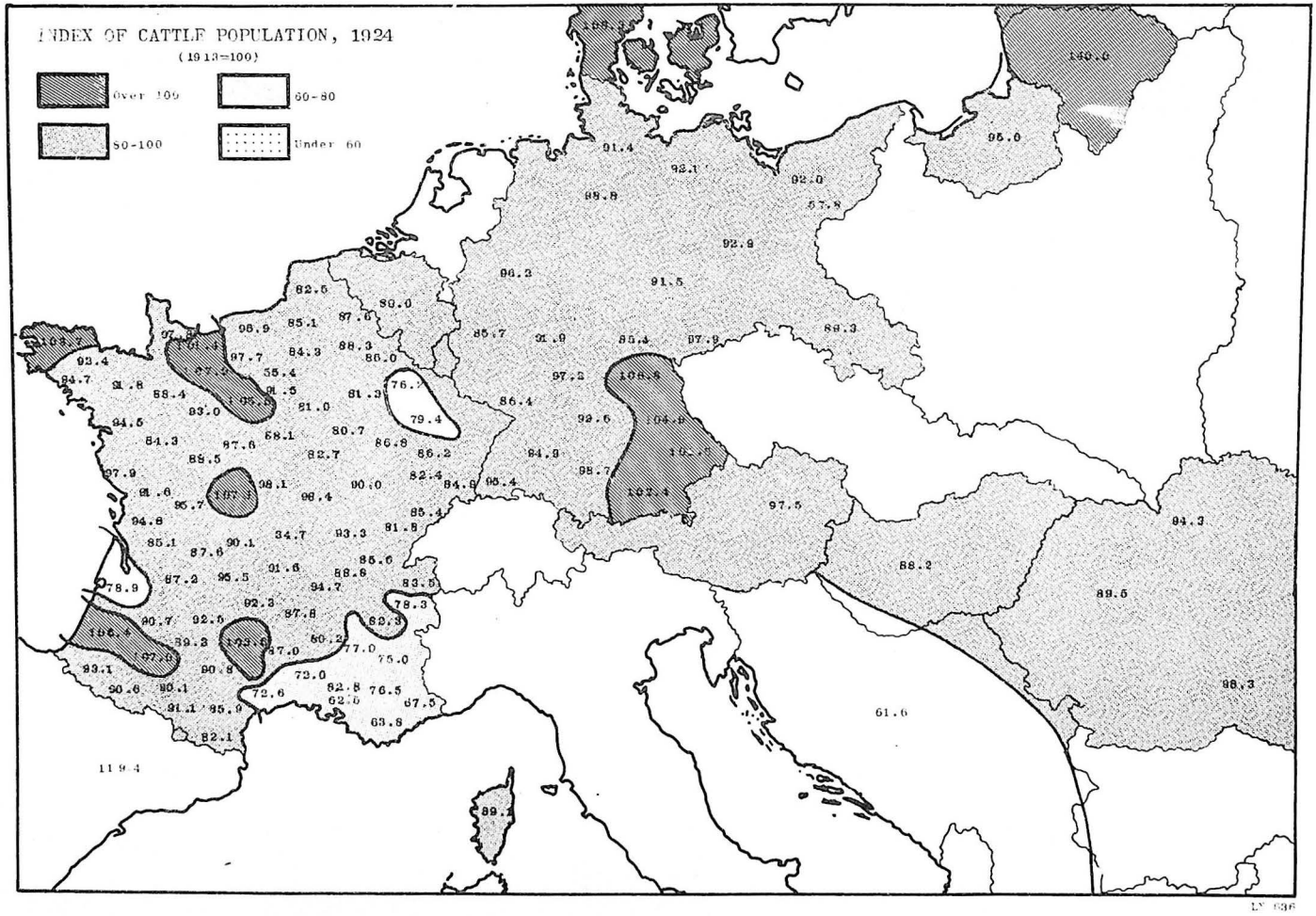

INDEX OF CATTLE POPULATION, 1919
(1913=100)
Over 100
60-80
80-100
Under 60
118.0
72.5
LN 608

Map 7b

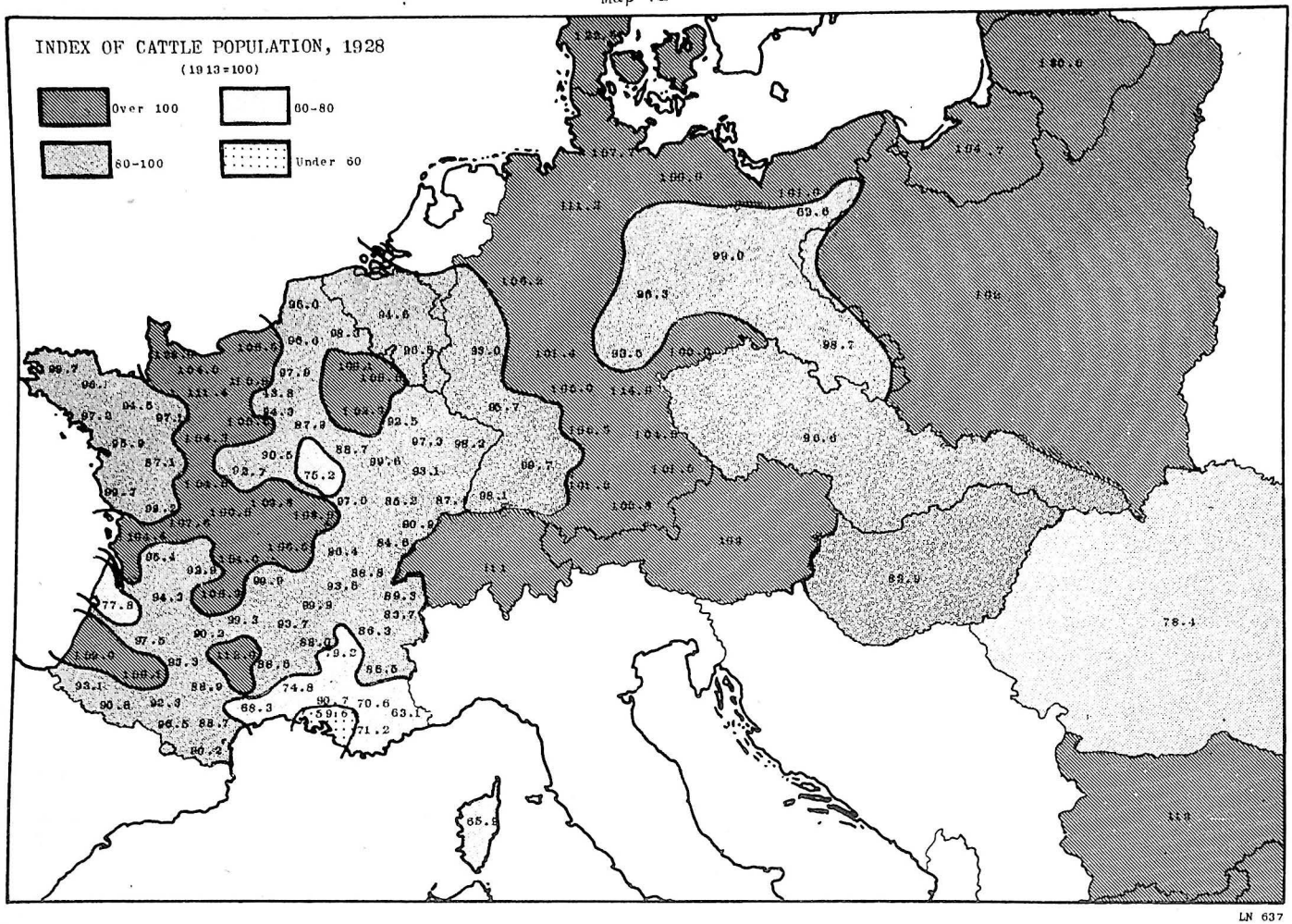

INDEX OF CATTLE POPULATION, 1921
(1913=100)
Over 100
80-100
60-80
Under 60

LN 621

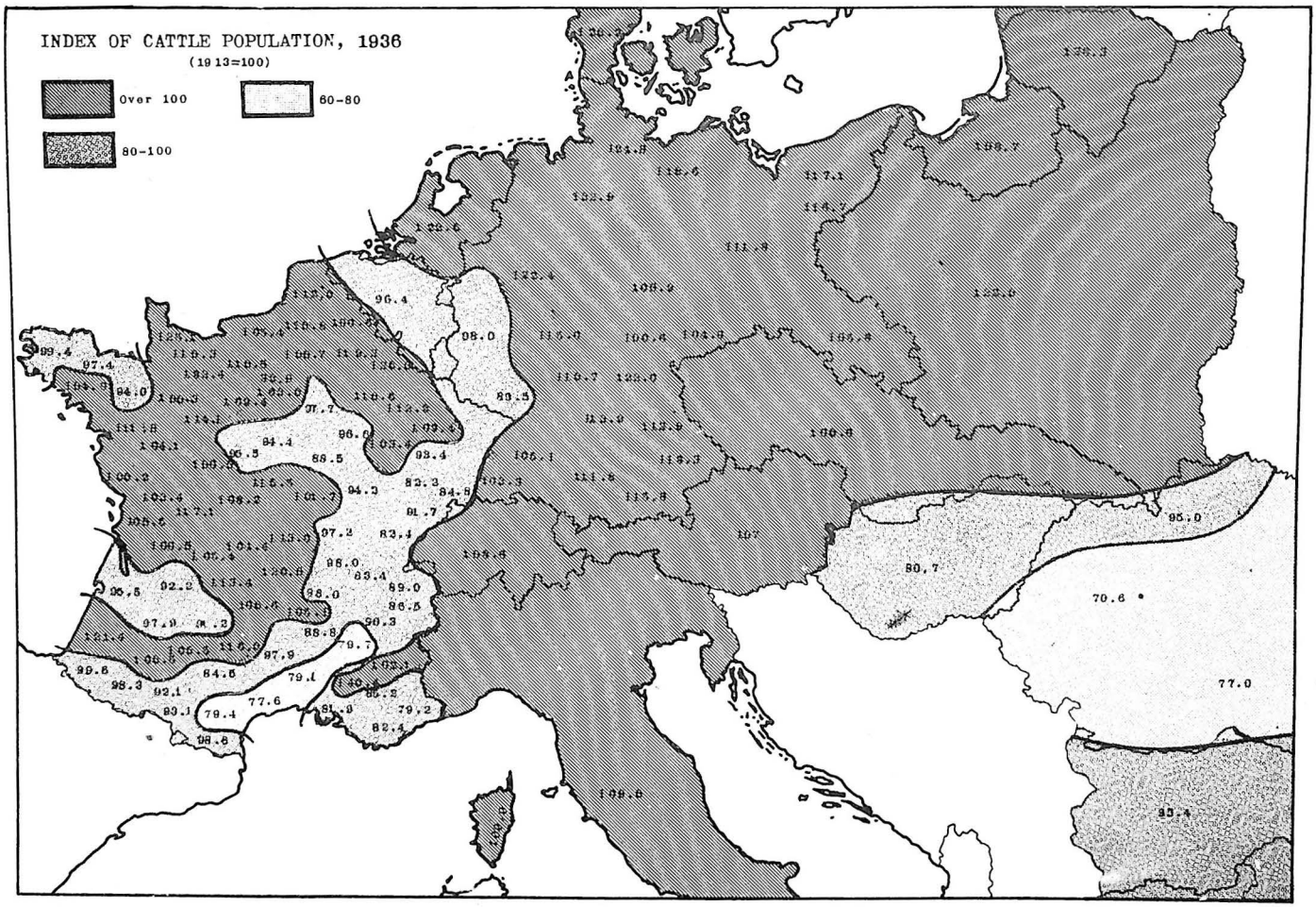
Map 7c


INDEX OF CATTLE POPULATION, 1924
(1913=100)
Over 100
80-100
60-80
Under 60

Map 7d

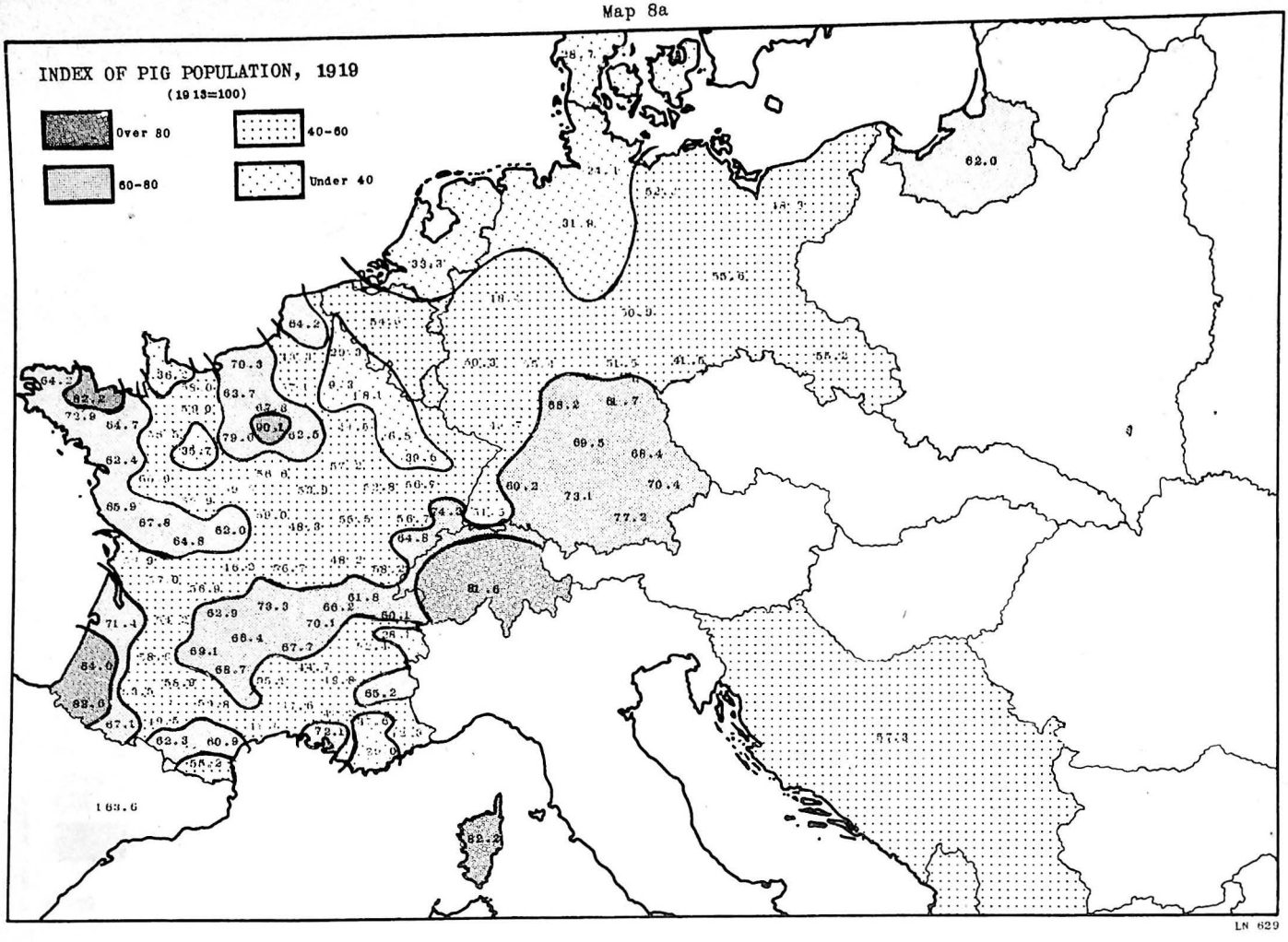

INDEX OF CATTLE POPULATION, 1928
(1913=100)
Over 100
80-100
60-80
Under 60
LN 637

Map 7e

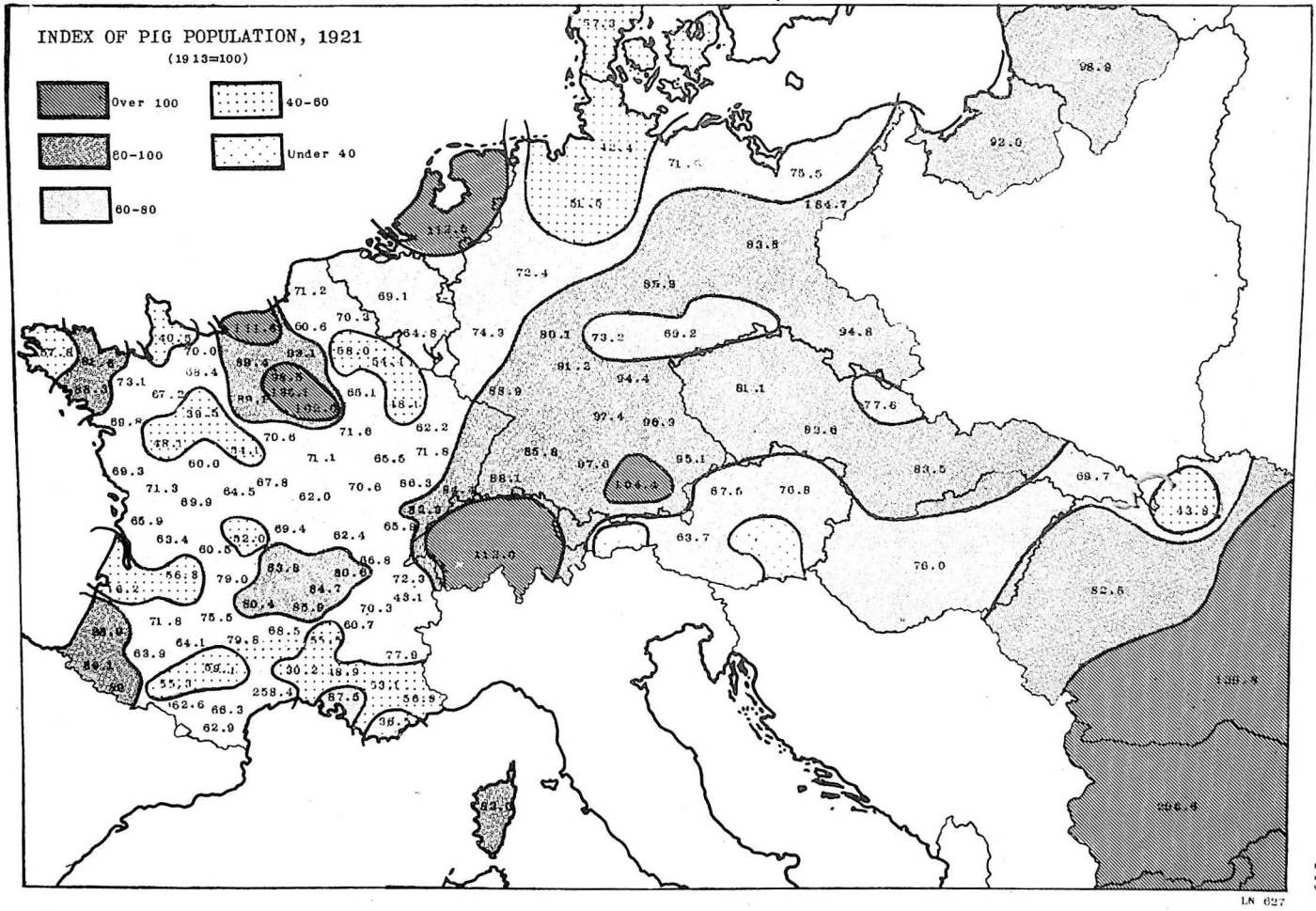

INDEX OF CATTLE POPULATION, 1936
(1913=100)
Over 100
80-100
60-80

LN 631

Map 8a

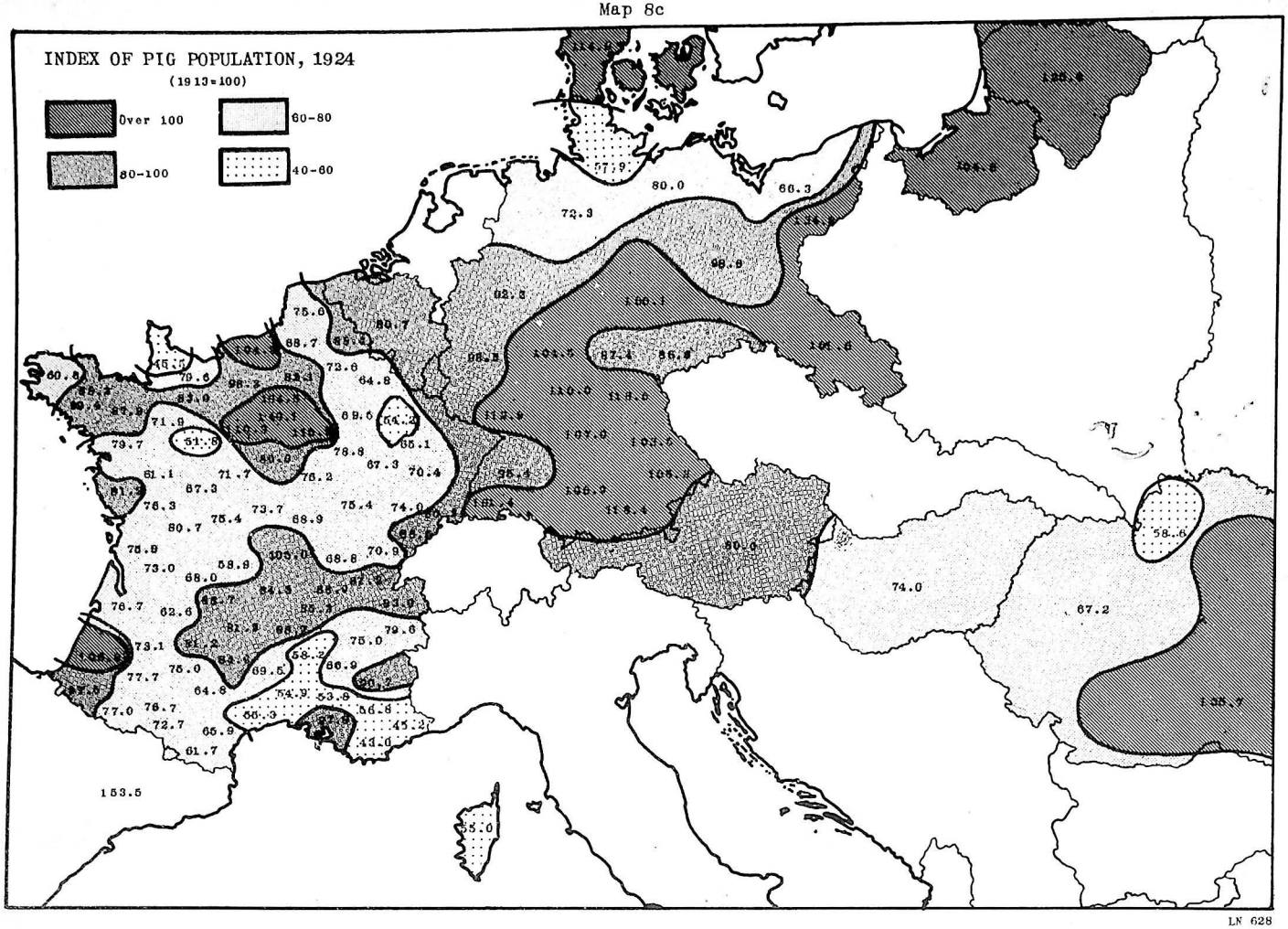

INDEX OF PIG POPULATION, 1919
(1913=100)
Over 80
40-60
60-80
Under 40
62.0
31.8
33.3
64.2
70.3
63.7
73.9
64.7
62.4
65.9
67.8
64.8
62.0
79.0
90.1
62.6
68.2
61.7
69.5
66.4
60.2
73.1
70.4
77.2
64.8
81.6
71.4
62.9
73.9
66.2
61.8
70.1
66.4
69.1
67.3
68.7
84.0
83.0
65.2
62.3
60.8
163.6
82.2
57.3
LN 629

Map 8b

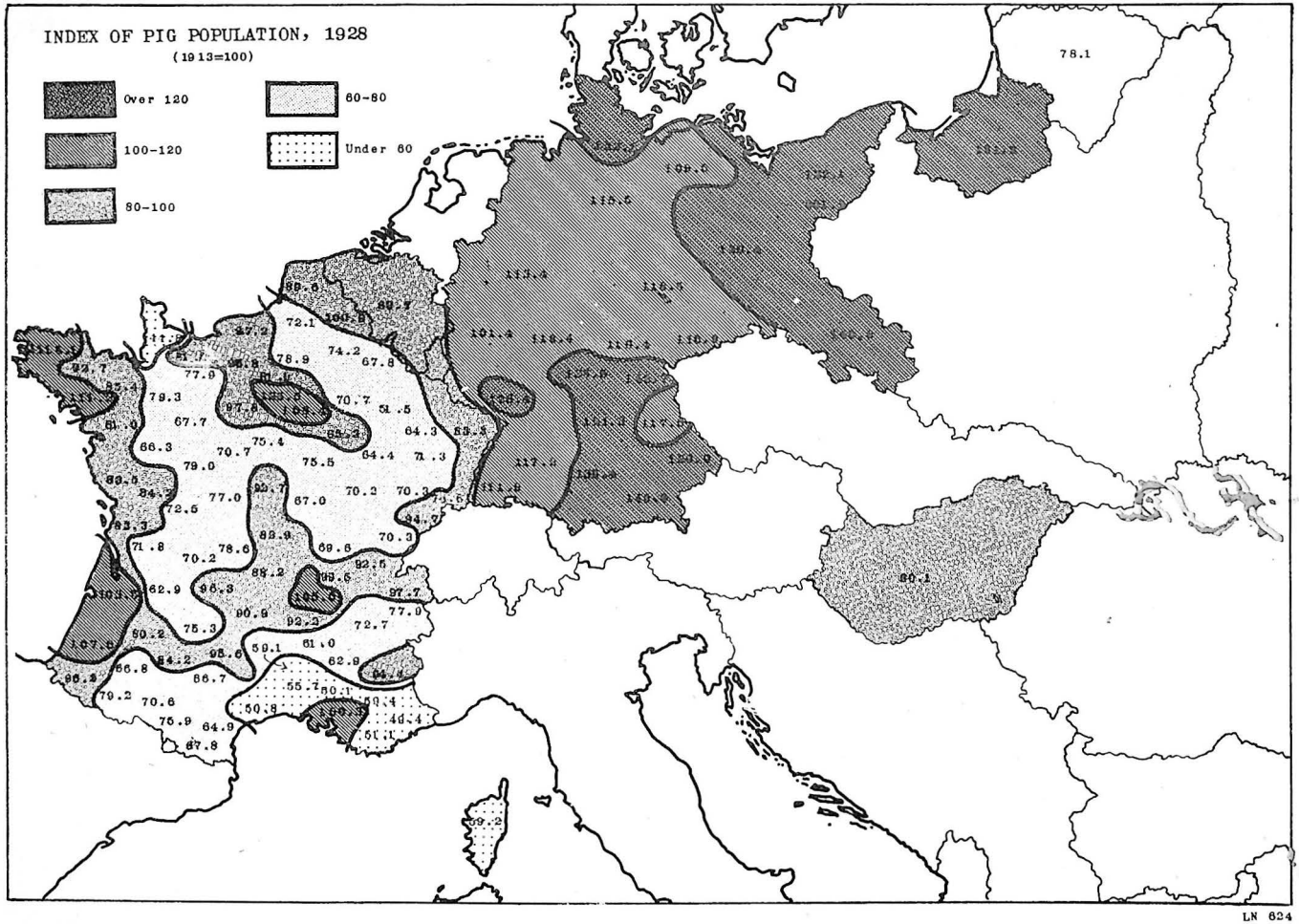

INDEX OF PIG POPULATION, 1921
(1913=100)
Over 100
80-100
60-80
40-60
Under 40

LN 627

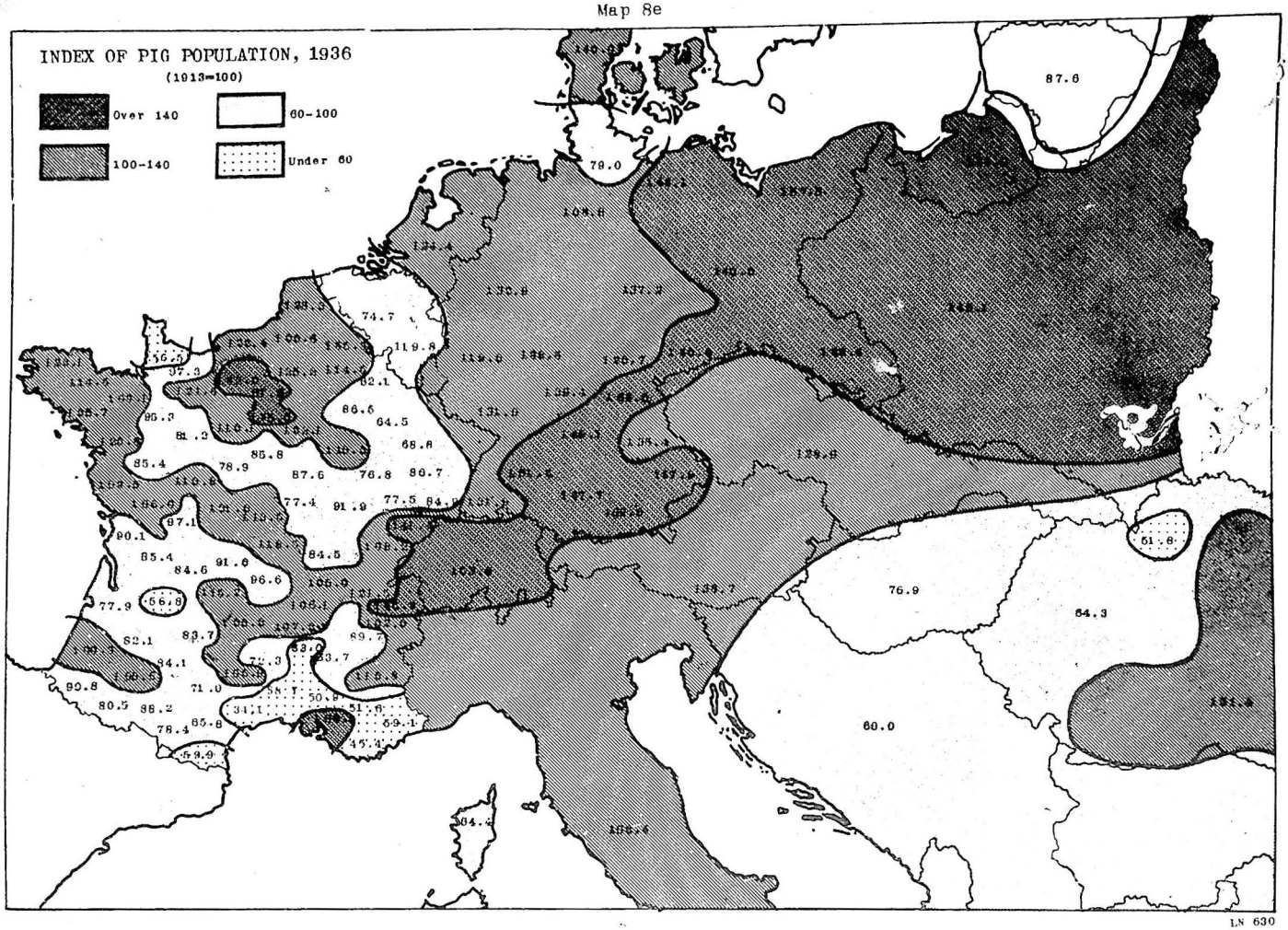
Map 8c


INDEX OF PIG POPULATION, 1924
(1913=100)
Over 100
80-100
60-80
40-60
LN 628

Map 8d


INDEX OF PIG POPULATION, 1928
(1913=100)
Over 120
100-120
80-100
60-80
Under 60
78.1
LN 624

Map 8e


INDEX OF PIG POPULATION, 1936
(1913=100)
Over 140
100-140
60-100
Under 60
87.6
79.0
74.7
86.6
64.5
68.8
85.4
78.9
87.6
76.8
86.7
91.9
77.5
84.5
85.4
84.6
91.6
96.6
77.9
82.1
83.7
89.7
84.1
71.0
80.5
88.2
78.4
85.8
59.9
45.4
51.8
76.9
64.3
60.0

LN 630