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THE WORLD WHEAT SITUATION, 1928-29

A REVIEW OF THE CROP YEAR

This review is designed to present a balanced, comprehensive statement of a year's developments in the world wheat situation, in the light of fuller information than is available in the course of the year. The series of annual reviews, of which this is the sixth, not merely furnishes a continuing historical record, but makes for an increasingly reliable understanding of the permanent factors in the wheat market and contributes an essential background and basis for analyses, judgments, and forecasts regarding current and future developments. In the present review we have sought to consider the year 1928-29 in the light of post-war trends that are now beginning to appear, and have laid less stress than in earlier reviews upon details of the general wheat situation.

SUMMARY

The crop year 1928-29 may be characterized with moderate assurance as an unusual one, chiefly because uncommonly high yields per acre of wheat were secured in many important producing countries throughout the world. Wheat supplies were distinctly abundant. Prices were relatively low, especially in exporting countries; but in retrospect they seem to have been maintained surprisingly well. The international trade in wheat and flour was by far the largest in history, though it was the movement to ex-Europe rather than to Europe that was extraordinary. Consumption was unquestionably heavy, yet presumably not so far above its line of post-war trend as was wheat production. As a result the world outward carryover was built up in the course of the year to an extremely high level.

The world acreage harvested for the wheat crop of 1928 (ex-Russia, China, and Asia Minor) reached a new post-war peak and stood over 7 per cent above the 1922-27 average; the yield per acre, perhaps never surpassed in two decades unless in 1915, stood 8 per cent above; the production, the largest in history, stood 16 per cent above. By comparison with earlier post-war years, the largest acreages were in Australia, Argentina, and Canada. The area sown in the United States was also high; but abandonment, centering in the soft red winter-wheat area, was so heavy that the harvested acreage was not of exceptional size. Relatively

the best yields per acre were obtained in Canada, Argentina, and in the contiguous countries in Europe running from Belgium in the northwest to Bulgaria in the southeast. Australia had a low yield per acre, but her crop was a large one because of the area sown. The poorest outturns

were in India, Spain, Portugal, and Asia Minor. All told, the world wheat crop of 1928 ranked with those of 1915 and 1923 as exceptional in size, trend of production considered; but unlike these, it followed upon another large world wheat crop.

In most countries consumption was doubtless heavy, not only because the trend is upward and

wheat prices were low, but also because a relative scarcity of corn and high prices of the feed grains in relation to wheat must have tended to encourage the use of wheat for feed. Nevertheless such fragmentary evidence as is available suggests that the surplus supplies of 1928-29 were used in a more striking degree to build up stocks than to expand actual consumption. Direct estimates of stocks suggest that the process of upbuilding was more marked in the United States than elsewhere; but significant increases clearly occurred in Canada and Argentina. Less tangible evidence suggests that the increase of stocks was probably very great in the Danube countries, and substantial in some of the European importing countries, notably in France and in Italy.

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Wheat prices in the principal exporting countries and on the British import market stood on the average during 1928-29 at their lowest post-war level except that of 1923-24, and only a little higher than in that year; but in some European countries the level of prices in 1928-29 was much higher than in 1923-24. Taken alone, the world statistical position in wheat as it is usually shown seems to indicate that prices, in so far as they are determined by it, might have been expected to prove lower than in fact they were. A rather tight feed grain position lent some support to wheat prices; so also did the exceptional demand of India and Asia Minor for imports, and various psychological factors most apparent in the United States. Argentine wheat, quality considered, was the cheapest type available to importers for a longer period of the year than usual; United States prices stood above export parity practically throughout the year; and Canadian prices moved to a level that did not permit a free flow of wheat to export in the later months of the year. Fluctuations in prices were fairly small until the second half of the year. Beginning early in January 1929, however, there was an upward movement induced in part by the extraordinarily cold winter in the Northern Hemisphere, in part by less tangible influences. Largely under the pressure of heavy stocks, from mid-February until the end of May prices declined, eventually reaching their lowest post-war level. In June and July decidedly unfavorable growing weather for spring wheat in North America was the principal occasion for a spectacular advance, similar in its causes and timing to one that occurred in the same months of 1924, but even more extreme. So far as one can judge from wheat values per acre, the year on the whole was not a remunerative one to wheat growers; but (except perhaps in Australia) it was by no means so unsatisfactory as 1923-24, especially if costs have tended downward over the interval of years. The year was conducive to agitation in many countries for governmental or other price-raising devices.

The volume of international trade in wheat and flour, as measured by net exports, was about 940 million bushels in 1928-29, or over 90 million larger than ever before. Argentina made record ship-

ments on account of her huge crop, the relatively low prices prevailing there, and the absence of a holding policy. Canada also exported an unprecedented amount, but less than might have been expected in view of her crop and inward carryover; the spring movement was restricted when Canadian prices moved out of line with British and Argentine prices in the latter months of the year. The United States exported less freely, supplies considered, than any of the other leading exporting countries. Here the incentives for holding wheat were stronger than elsewhere, and the financial resources of holders as well as the facilities for holding are greater than in most competing countries, notably Argentina. India was a net importer rather than an exporter. Russia neither exported nor imported; her wheat crop was fairly large, but other cereal crops were short, and in addition there were such difficulties in collecting grain that bread had to be rationed in many consuming centers. India's position and the prevailing low wheat and flour prices stimulated shipments to ex-European countries, and these were the largest on record. European imports were not so strikingly large. The total movement in international trade consisted more largely than usual of wheat rather than flour; by comparison with 1923-24, at least, the flour trade of 1928-29 was considerably smaller, while the wheat trade was much larger.

Mill output was apparently of record size in many countries. On the whole the year was a satisfactory one in milling partly because of this. There was also some further reduction in excess capacity; the prices of millfeeds stood advantageously high in relation to wheat, though they declined in the closing months; and there were ample supplies of wheat of good quality from which to select the desired blends. The Japanese, Hungarian, and Canadian millers probably experienced the most favorable combination of circumstances. For the Japanese and Canadians, the outstanding favorable feature of the year was the abundance of cheap low-grade wheat in the big Canadian crop of 1928. In the United States, premiums for protein content were advantageously low, and perhaps only the millers of soft red winter wheat, who faced an unusually short crop, encountered greater difficulties than usual.

I. THE SUPPLY POSITION

The crop year 1928-29 opened with stocks of wheat and flour in the principal exporting countries and afloat for Europe distinctly larger than in any of the preceding six years, and in Europe as well stocks were of good size. To these ample and in some degree burdensome world stocks were added, as the harvest progressed, notably large crops in most countries, until by far the largest wheat crop in history had been secured. The crop year 1928-29 thus stands out as one characterized by extremely abundant wheat supplies, and most of the significant developments of the year had their origin in this circumstance.

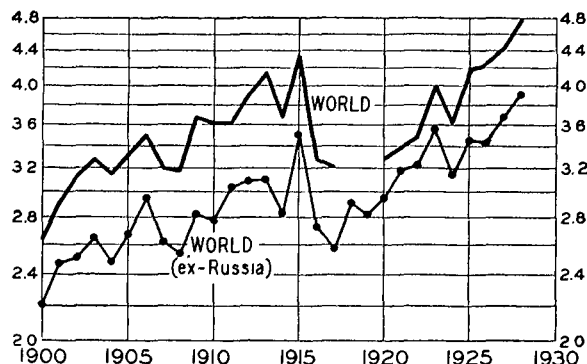
WORLD WHEAT CROPS SUMMARIZED

The world wheat crop of 1928 (excluding China, the only large wheat-producing country for which crop estimates are not available) was the largest in history by a wide margin. According to the United States Department of Agriculture's estimates summarized in Chart 1, it approximated 4,760 million bushels, an increase of about 360 million bushels or 8 per cent over the next largest post-war crop, that of 1927, and about 435 million or 10 per cent over the largest pre-war crop, that of 1915.¹ The increase of the 1928 crop in the world excluding Russia as well as China was about 240 million bushels or 6.5 per cent over that of 1927, and 400 million or 11.5 per cent over that of 1915.

The crop year 1928-29 was clearly an abnormal one as regards world wheat production. Chart 2 (p. 44) shows world (ex-Russian) production, acreage, and yield per acre during the period 1920-28, in terms of percentage deviations from the average of 1922-27. World acreage in 1928 reached a

new peak for the period covered in the chart, over 7 per cent above the 1922-27 average. The yield per acre was much higher than in any of the preceding eight years, over 8 per cent above the 1922-27 average. The relatively heavy production of 1928, some 16 per cent above the 1922-27 average, was therefore the result both of high acreage and of high yield per acre, especially the latter. It seems probable, though the point need not be examined

CHART 1.—WORLD WHEAT PRODUCTION, 1900-1928*
(Billion bushels; logarithmic vertical scale)



* Data of the U.S. Department of Agriculture as published in *Agriculture Yearbook*, 1928, p. 680, and *Foreign News on Wheat*, October 21, 1929, p. 4, except that the Russian figure for 1923 is from *International Yearbook of Agricultural Statistics*, 1926-27. Russian figures for 1920-22 are incomplete; and in several respects later data on Russian production differ from data published by the International Institute of Agriculture.

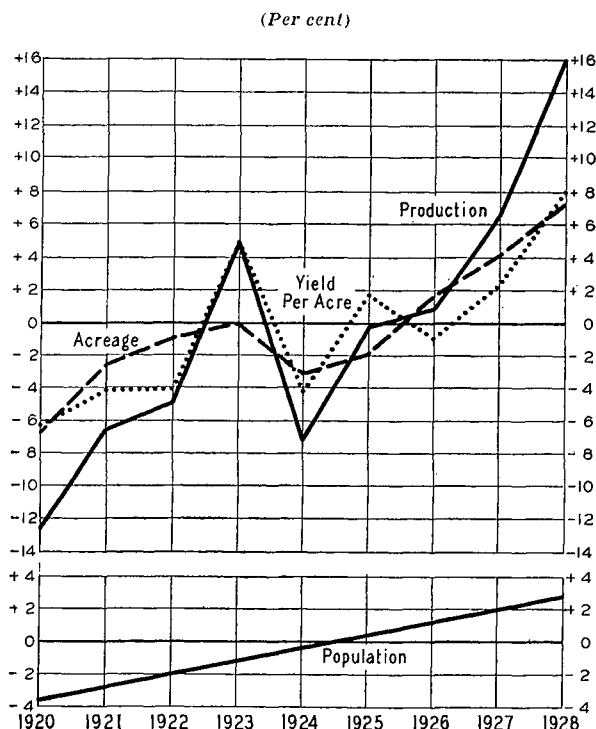
exhaustively here, that the weather conditions resulting in the crop of 1928 were favorable to the wheat plant to a degree seldom witnessed. In the past two decades, approximately similar favorable conditions seem to have prevailed only in 1915 and 1923. In 1928 as in 1927, weather conditions during the later months of the growing season were decidedly favorable in the Northern Hemisphere.

The relatively high world acreage of wheat in 1928 as compared with 1927 was due principally to marked increases in Australia, Argentina, and Canada. Less noteworthy increases occurred in the Danube countries, India, and northern Africa. On the other hand, the harvested acreage in the United States declined, though the area sown was the highest since 1919. As with

¹ These comparisons are to be regarded as approximations only. The Department of Agriculture's estimates take no account of what seem to us to be official underestimates in the crops of certain countries both in 1927 and 1928; the Russian official crop estimate of 1915 is not complete; Russian pre-war estimates are said by some students to be too low; and the Department's data on Russia do not check with estimates as published by the International Institute of Agriculture for the four years 1926-29 (see below, p. 50). For our tentative alterations of official crop estimates in the post-war years, see Table 1, p. 45.

acreage, yield per acre in 1928 was exceptionally high in some regions but not in all. Canada, Argentina, the Danube basin, and the several countries of northern Europe were favored by the highest yields per acre recorded in the period 1920-28. In the

CHART 2.—WORLD (EX-RUSSIAN AND CHINESE) WHEAT PRODUCTION, ACREAGE, AND YIELD PER ACRE, AND POPULATION, IN TERMS OF PERCENTAGE DEVIATIONS FROM THE 1922-27 AVERAGE, 1920-28*



* Production, acreage, and yield per acre figures based on detailed statistics shown in Appendix Tables I-III. Population figures in part from official sources, in part through *International Yearbooks of Agricultural Statistics*, and adjusted for particular countries to give consistent trends; the principal regions omitted are Russia, China, the East Indies and Malay regions, and most of Africa.

United States the yield per harvested acre was slightly higher than in any other year of this period except 1924. In southern Europe, however, considerably higher yields had been obtained in 1921, 1923, and 1925; the Australian yield was lower than any except that of 1927; and the Indian was the lowest obtained during the period. And in northern Africa, South Africa, Japan, and New Zealand taken as a group, the yield per acre of 1928 was lower than in 1921, 1923, 1925, or 1927.¹

Despite the recurrent lack of evidence on the obscure subject, it seems reasonable to say that as a whole the world wheat crop of 1928 was probably above the average of recent years in quality. It was certainly better than the crop of 1925, when Europe, Argentina, and the United States harvested crops of decidedly poor quality. It was also better than the crop of 1924, which was poor in quality in Europe and not good in Canada. It was probably better than the crop of 1927, which was rather poor in Europe and the United States. On the other hand, it was not so good as the crop of 1923, and perhaps little if any better than the crop of 1926. The high percentage of low-grade wheat in the Canadian crop of 1928 did not suffice to lower the general good quality of the world crop; for the lower grades of Canadian wheat proved eminently satisfactory for use in the mill mixes of European countries. All told, available world supplies of wheat in 1928-29 were not only abnormally large quantitatively, but were also of good though not exceptional quality.

The data summarized in Chart 2 warrant brief comment with respect to the apparent trends in world acreage, yield per acre, production, and in population. These trends are to be regarded merely as suggestive, as fairly definitive only with respect to developments during the period 1920-28, and as unsuited for extrapolation. Of the four curves, that of wheat production has tended upward more rapidly than the others, roughly at the rate of 2 per cent per year. Both yield per acre and acreage have tended upward at a less rapid rate. Population² has apparently increased at a rate of somewhere between $\frac{3}{4}$ of 1 per cent and 1 per cent per year, less rapidly than production of wheat and possibly than either acreage or yield per acre. But one cannot infer from these curves that the present tendency is for wheat production to increase with considerably greater rapidity than world demand for wheat. In the first place, per capita consumption is probably

¹ The bases for the statements made in this paragraph may be found in Charts 3 to 10 and Appendix Tables I and II.

² The population curve shown in Chart 2 is a very rough approximation. Account is taken of only about 54 per cent of the total world population, estimated by Professor Walter F. Willcox to have been about 1,746 million persons in 1925.

increasing, and no account is taken of this factor in the chart. Again, the period 1920-28 includes several years at its beginning when Europe was recovering from the effects of the war, and at its end a year abnormally favorable to world wheat production. The addition of data for subsequent years may be expected substantially to alter in a downward direction the apparent trends at least in yield per acre and production.

In its distribution between the various important producing areas, the world crop of 1928 was not distinctly unusual, for relatively large crops were harvested in most areas. The data are summarized in Table 1.

which contributed about 71 per cent of the world total (excluding Russia, China, and Asia Minor), as against a similar figure in 1922 but only some 64 per cent in 1925; the crop year 1925-26 now appears clearly to have been characterized by the most unusual distribution of world wheat crops witnessed in the past seven years. Among the European importing countries, only the British Isles, Spain, and Portugal harvested short crops in 1928-29, and most others except France obtained record or near-record post-war outturns. The crop in Asia Minor, not shown in our tables, appears to have been notably small, and the Egyptian was below average. All told, there was ex-

TABLE 1.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS, PRE-WAR AND POST-WAR*

(Million bushels)

Year	United States	Canada	Soviet Russia	Lower Danube ^a	Other Europe	Northern Africa	India	Japan, Chosen	Northern Hemisphere ex-Russia ^b	Argentina	Australia	Southern Hemisphere	World ex-Russia ^b
1922	868	400	...	224	819	71	367	40	2,805	196	109	354	3,160
1923	797	474	419	260	996	106	372	35	3,060	248	125	427	3,485
1924	864	275	472	204	853	85	361	35	2,690	191	165	407	3,095
1925	700	430	757	296	1,100	105	331	40	3,015	191	115	359	3,375
1926	870	415	899	294	915	90	325	41	2,960	221	161	434	3,395
1927	878	480	752	272	995	106	335	40	3,120	290	118	470	3,590 ^c
1928	930	567	783	369	1,039	104	291	39	3,355	340	160	560 ^c	3,915 ^c
Average 1909-13 .	690	197	757 ^d	330	1,017	92	352	32	2,725	147	90	280	3,004
1923-27 .	822	415	660	265	972	98	345	38	2,970	228	137	419	3,390

* Summarized from most recent official data for individual countries (see Appendix Table III), as reported by the U.S. Department of Agriculture and International Institute of Agriculture, but figures in italics represent our adjustments for apparent underestimates of crops, as shown in Appendix Table XXX. China, Asia Minor, Brazil, and a number of small producers are not included. All estimates are for areas within post-war boundaries.

^a Hungary, Bulgaria, Roumania, Jugo-Slavia. ^b Rounded figures. ^c Includes our estimate for Peru and Chile.

^d Regarded as too low by some Soviet officials, whose estimate is 908 million bushels.

There was relatively heavy concentration of production in the exporting countries,¹

¹ Canada, the United States, Argentina, Australia, India, the four Danube countries, Algeria, Morocco, Tunis, Uruguay, and Chile.

² This estimate appeared on December 18, 1929, when this study was in the later stages of printing. In a few of our charts and tabulations we have found it necessary to use the earlier estimate of 902 million bushels.

³ The evidence suggests that this figure, if inaccurate at all, is slightly too low. As appears from Appendix Table XXX, a calculation which takes account of available supplies on the one hand and items of disposition on the other suggests that only 49 million bushels of wheat were used for feed and waste (and changes in unrecorded stocks) in 1928-29. This quantity seems rather small; for our reasoning on the subject see WHEAT STUDIES, December 1928, V, 46, note 2, and September 1929, V, 438.

⁴ Appendix Table VI shows the areas of winter wheat sown, abandoned, and harvested since 1920.

ceptional shortage of wheat in 1928-29 only in India, Asia Minor, Spain, and Portugal; and there was exceptional abundance in many other countries, notably in North and South America and the Danube basin.

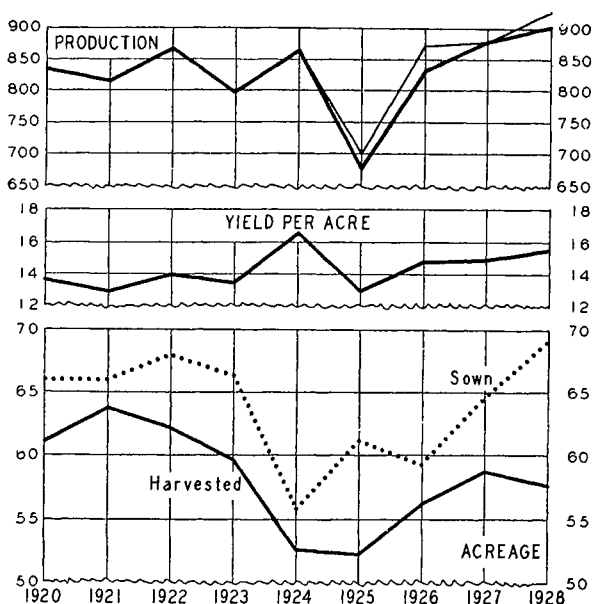
NORTH AMERICAN CROPS

The latest official estimate² of the United States wheat crop of 1928 is 915 million bushels.³ As appears from Chart 3 (p. 46), this was the largest outturn during the period 1920-28, and it was indeed the fourth largest in history, being smaller only than the crops of 1915, 1918, and 1919. The area harvested was less strikingly large, principally because the area of winter wheat abandoned, 11.1 million acres, was much the largest in two decades, 1917 excepted;⁴

the area sown, 69.4 million acres, was the largest on record except that of 1919. The yield per harvested acre of 15.7 bushels was high, but had been equaled or surpassed in 5 of the preceding 19 years.

CHART 3.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE SOWN AND HARVESTED IN THE UNITED STATES, 1900-1928*

(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III and VI. Yields are per harvested acre. Data for 1928 differ slightly from the latest official estimates shown in these tables. The light solid line represents production according to our tentative adjustments as shown in Table 1, p. 45. If the adjusted production figures and the official acreage figures are correct, some of the yield per acre figures shown in the second section of the chart are too low.

Both the winter- and the spring-wheat crops were of relatively large size. Of the two, the spring-wheat crop was the more remarkable. Larger spring-wheat crops have been harvested in only 2 years since 1909, whereas larger winter-wheat crops have been harvested in 8 years of this period. The area in spring wheat,¹ 22.06 million acres, was the largest in the period 1909-27 except for 1919.

¹ See Appendix Table IX for acreage, production, and yield per acre of winter and spring wheat since 1920.

² Appendix Table VIII shows the course of certain private and official crop forecasts and estimates during April-December 1928.

³ The final estimate for the crop of 1920, however, was 126 million bushels above the May 1 forecast; but the August 1 estimate was only 48 million above.

⁴ See Appendix Table VII for data since 1920.

The distinctly good harvest of 1928 represented a noteworthy reversal of crop prospects. An unfavorable winter led to extremely heavy abandonment of the area sown to winter wheat. The winterkilling was concentrated in the soft red winter-wheat area, especially in Ohio, Indiana, Illinois, and Kentucky. Here the abandoned area ranged between 60 and 64 per cent of the area sown, by far the highest ever recorded (at least since 1901) in these states, and indeed close to the highest ever recorded in any state. The earliest official estimate of condition for the total winter-wheat crop, 68.8 per cent as of April 1, was one of the three lowest since 1879. There was deterioration in the month of April, and unofficial forecasts of production as of May 1 were drastically lowered from the figures issued a month earlier. But the weather turned favorable in early May, and on the whole persisted so. The official winter-wheat crop estimate as of August 1 stood (at 579 million bushels) nearly 93 million, or some 19 per cent, above the forecast as of May 1. May and July rather than June appear to have been the months of most favorable weather.² So marked an increase (measured in bushels) in the official figures of production from May 1 to August 1 had not been witnessed in the period 1912-27,³ and a decrease of equal magnitude only in 1919. These data suggest that weather conditions in May-July 1928 must have been extraordinarily favorable to the winter-wheat plant in the United States. In July and August, the weather seems to have been exceptionally favorable to the spring-wheat plant. The official estimate of production as of October 1 was 69 million bushels, or nearly 27 per cent, above the July 1 forecast. Over the period 1912-27 as large an increase as this occurred only in 1924, though there were three instances of decreases of greater magnitude.

The distribution by classes⁴ of the crop of 1928 was most noteworthy for the distinctly short crop of soft red winter wheat. Although the total United States crop was the largest of any in the period 1920-28, the crop of soft red winter, about 140 million bushels, was much the smallest; even the short crop of 1925 was over 21 per cent larger. The crop of white wheat, 86 million bushels, was only of average size;

larger crops had been harvested in four of the eight years 1920 to 1927. The crops of durum and of hard red winter wheat, some 98 and 384 million bushels respectively, were the largest in this period; and the out-turn of hard red spring had been exceeded only in 1927.¹

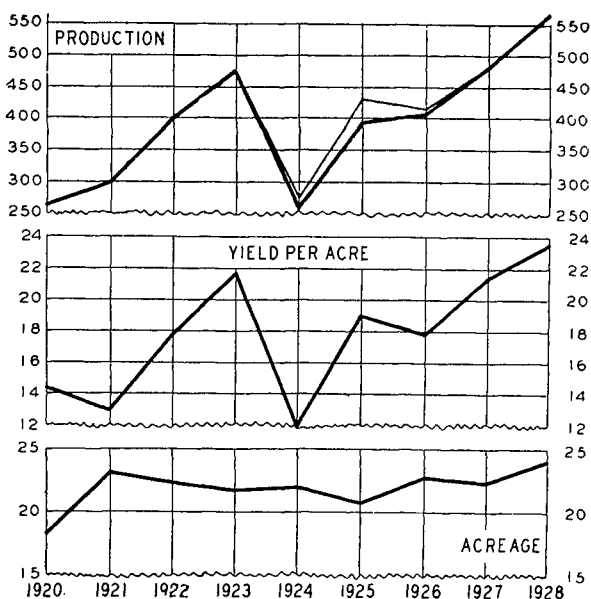
The United States wheat crop of 1928 was on the whole relatively good in quality. As judged by the number of bushels of wheat required in mills to produce a barrel of flour, it was the best of any in the period 1921-28, with the single exception of the crop of 1926.² As judged by official estimates of the percentage of the crop of high medium grade, however, it was perhaps not so good: higher percentages for winter wheat were estimated not only for 1926, but also for 1923, 1924, and 1925; but the spring-wheat crop (especially of hard red spring) appears to have contained more of the high medium grades than any of this period except that of 1924.³ As judged by weight per measured bushel (58.5 pounds in 1928) the crop was not so good in quality as those of 1924 and 1926 and no better than that of 1927, but was superior to others during the period 1921-27. The absence of unusual premiums for protein suggests relatively good quality with respect to this factor. Perhaps the most important exceptions to the generally good quality of the crop were the presence of considerable amounts of bin-burnt grain in the Southwest, the result of use of the combine in wet weather; and the scarcity of high-quality amber durum wheat of good color.

The Canadian crop, now officially placed at 567 million bushels, was by far the largest on record. Data on production, yield per acre, and acreage in Canada since 1920 are summarized in Chart 4. The crop of 1928 exceeded the next largest crop, that of

1927, by more than 18 per cent. Both the acreage and the yield per acre were higher than in any other year during the period 1920-28. The yield per acre of 23.5 bushels was the highest since 1915, when the average was 26 bushels. The high yield of 1928 as compared with that of 1915 is the

CHART 4.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN CANADA, 1920-28*

(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III: The areas are areas sown. The significance of the light solid line is explained in the note to Chart 3.

more remarkable in view of the great expansion of wheat acreage which has occurred over the interval. A marked upward trend appears in the yield per acre of Canadian wheat since 1920. At present this trend cannot be regarded as reflecting a continuing change in any fundamental factor; more probably it represents merely variation in climatic conditions over the relatively short period of years.

Unlike the United States crop, the Canadian progressed favorably practically throughout the growing season, though there were frosts in August, which appear to have affected the quality rather than the quantity of the grain. As a result of the generally favorable weather, observers agreed in anticipating a relatively large crop, but there was wide divergence of opinion as to how large it would prove. The official forecast as of August 31, 1928,

¹ All these comparisons, of course, include no allowance for probable underestimates of the production of one or another of the several classes of wheat in 1925 or 1926; and data for 1928 are not final.

² Wheat required per barrel of flour (census estimates raised 1.5 per cent to account for unreporting small mills) ran as follows in the past eight years, in bushels:

1921-22	4.727	1925-26	4.705
1922-23	4.701	1926-27	4.639
1923-24	4.700	1927-28	4.689
1924-25	4.651	1928-29	4.646

³ Precise comparisons are impossible because estimates of the quality of hard red spring and of durum wheat were combined before 1927 but separated thereafter. See *Crops and Markets*, November 1928, V, 410.

was for 550 million bushels; but this was reduced to 501 million as of October 31, and subsequently raised to 534 million as of December 31. In August 1929, it was officially stated to have reached about 567 million, on evidence deduced from statistics of export, domestic disappearance, and stocks. Private estimates issued at various times in the summer and autumn of 1928 differed widely from the official.¹

Uncertainty with regard to the quality of the Canadian crop was added to uncertainty regarding its precise size. It became apparent early in the harvesting season that there was a relatively small proportion of the higher grades and a relatively large proportion of the lower. Table 2 shows the proportions of the inspections

TABLE 2.—PERCENTAGES OF VARIOUS GRADES OF CANADIAN HARD RED SPRING WHEAT TO TOTAL WHEAT INSPECTED IN THE WESTERN DIVISION, SEPTEMBER–AUGUST, 1923–29*

Grading	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29
No. 1	37.3	19.3	22.4	9.2	.9	1.5
No. 2	25.8	18.3	27.1	17.5	7.7	12.3
No. 3	22.9	18.5	13.9	7.8	22.3	19.7
No. 4	6.3	16.3	3.1	3.2	12.3	19.8
No. 5	1.9	8.1	.9	1.4	5.0	17.4
No. 6	1.0	3.2	.2	.9	2.9	15.2
Feed .....	.6	1.2	.1	.3	1.2	5.6
No grade ^a ...	1.0	11.7	28.6	51.2	43.0	1.4
Other ^b	3.2	3.4	3.7	8.5	4.7	7.1

* Data from *Canadian Grain Statistics*.

^a Wheat of the straight grades except that it contains a higher proportion of moisture. Aside from higher moisture content, it may be of as good quality as these grades.

^b Largely durum.

of hard red spring wheat according to grade during the past five years. With rough allowances for "no grade" wheat, it seems clear that the crop of 1928 contained smaller percentages of Nos. 1 and 2 Northern Manitoba than in any of the four pre-

¹ See *Wheat Studies*, January 1929, V, 115-16.

² This view was expressed by Secretary of Agriculture Jardine, in a statement issued October 27, 1928.

³ Canadian millers used less wheat per barrel of flour during 1928-29 than they did in 1927-28, despite the relatively large quantities of low-grade wheat milled for the Oriental flour trade. Probably the great proportion of tough wheat in the crop of 1927 was one factor that tended to make the flour yield in 1927-28 lower than that of 1928-29 despite the great proportion of the low grades in the crop of 1928. The higher weight per measured bushel of the crop of 1928 as compared with that of 1927 was another factor working in the same direction.

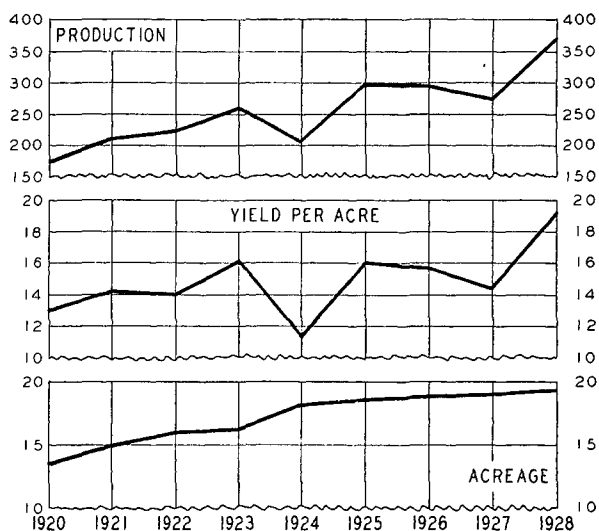
ceding years, and much more of Nos. 4, 5, and 6 and of feed wheat. The large supplies of these lower grades, and the then prevailing uncertainty regarding their value for milling and baking, led some students of the world wheat situation to believe that as much as 50 million bushels of the crop might not enter the market as milling wheat.² In so far as these commentators further accepted the official Canadian crop estimate as of October 31 (501 million bushels) they were during November-December 1928 in a position to adjudge Canada's effective contribution to the world bread wheat supply as something like 100 million bushels less than it later proved to be.

In retrospect it seems clear that relatively small quantities of the lower-grade Canadian wheat were used for animal feed. Certainly there is no evidence that it was used extensively for feed in North America or in the Orient. It may have been imported in some degree for feed use into some countries of continental Europe, especially Denmark. Nevertheless it is clear from European journals that millers found Nos. 4, 5, and even 6 Canadian wheat suitable for their mill mixes, and tended to employ these grades in preference to the higher ones on account of their lower prices. They were the better able to do so because the lower grades were sufficiently high in protein content to provide the strength necessary in a standard flour. On the whole, it may now be said that the proportion of the Canadian crop of 1928 unsuitable for human use did not prove exceptional, and that the lower grades were of better quality than usual; and so far as one can judge from Canadian statistics alone, the yield of flour per bushel of the total crop was not exceptionally low.³ It is pertinent to observe that, as judged by the record of the four preceding years, the prices of the lower grades of Canadian wheat at Winnipeg did not stand at relatively heavy discounts under the prices of the higher grades despite the unusual abundance of the one and the scarcity of the other. In Canada the farm interests regarded these discounts as too great in consideration of the uses that could be made of the lower grades. We see no way of determining the validity of this position in the light of economic principles.

EUROPEAN WHEAT CROPS

As with the United States, the 1928 wheat crop in Europe ex-Russia was the largest in the period 1920-28, but by no means so exceptional a crop as that of Canada. At about 1,400 million bushels, it was only a trifle larger than that of 1925, though it exceeded the two other largest crops of the period, those of 1923 and 1927, by around 150 and 140 million bushels respectively. Charts 5, 6, and 7 serve to emphasize

CHART 5.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN THE DANUBE BASIN, 1920-28*
(Million bushels; bushels per acre; million acres)



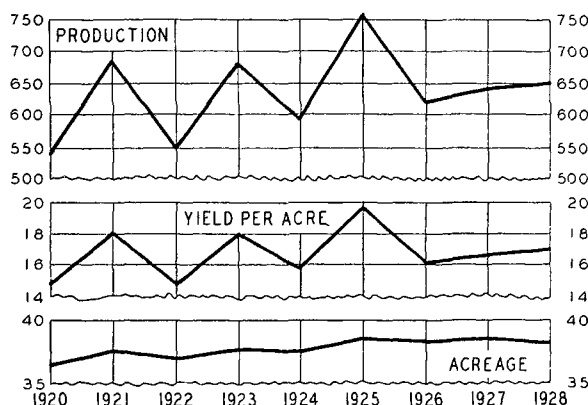
* Data from Appendix Tables I-III. The "Danube Basin" includes Hungary, Jugo-Slavia, Roumania, and Bulgaria.

the regions in which production, yield per acre, and acreage were most unusual in 1928. The area harvested was not particularly large in any region in view of the gradual upward trend of recent years; on the whole, therefore, the large crop was the result of relatively high yield per acre. As in the United States, it seems to have been the later rather than the earlier months of the growing season which were especially favorable to the wheat plant.¹ Practically throughout Europe the crops were harvested under favorable weather

¹ It is of interest to note that on July 18, 1928, the United States Department of Agriculture published forecasts and estimates of the European wheat crop totaling 1,255 million bushels, over 150 million or 11 per cent below the official figures now standing.

conditions; hence the general quality was good, probably the best since 1923.

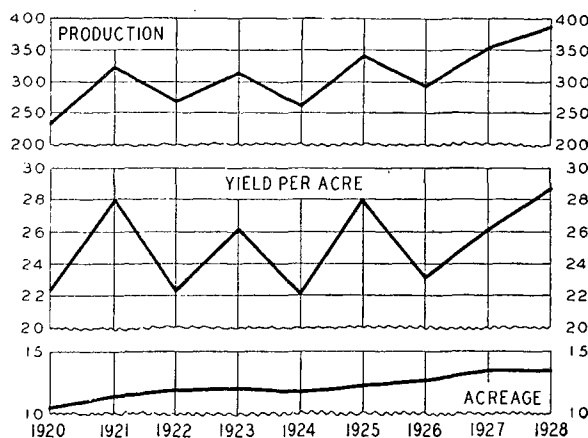
CHART 6.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN SOUTHERN EUROPE, 1920-28*
(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III. "Southern Europe" includes Spain, Portugal, France, Italy, and Greece.

As the charts show, the yields per acre and the crops were noticeably large in northern and eastern Europe rather than in southern Europe. The exceptional out-

CHART 7.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN NORTHERN EUROPE, 1920-28*
(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III. "Northern Europe" includes the British Isles, Germany, Poland, Czecho-Slovakia, Belgium, Holland, Switzerland, Austria, Denmark, Norway, Sweden, Finland, Latvia, Esthonia, and Lithuania.

turns and yields in the Danube basin were obtained in Jugo-Slavia, Hungary, and Bulgaria, not in Roumania. Of the fifteen countries included in the group we have

called "northern Europe," only five—Germany, Austria, Czecho-Slovakia, Holland, and Belgium—obtained in 1928 the highest yields per acre recorded in the period 1920-28. It is of interest to observe that these countries, taken in conjunction with the Danube basin, are geographically contiguous, crossing continental Europe from the northwest to the southeast. Of the countries of southern Europe, mostly bordering the Mediterranean Sea, none obtained a record yield per acre for the period under consideration, and in Spain and Portugal both yield per acre and crop were the smallest of the period.

In Russia¹ the wheat crop of 1928, some 783 million bushels, appears to have been the second largest of the post-war period, though it was not much larger than the crops of 1925 and 1927, and much smaller than that of 1926. Early estimates were for a much larger crop, some 860 million bushels. Partly as a result of heavy winterkilling,² the acreage of winter wheat harvested fell far below the harvested area of 1927, and the total area in wheat was smaller than in 1927 or 1926. The yield per acre seems to have been only fair, and the best yields were obtained in the northeastern districts remote from the consuming or export centers. Whether or not the crop of 1928 attained the pre-war (1909-13) aver-

age is not certain; for some Russian authorities think that the official pre-war figure of 757 million bushels is far too low, and ought to be raised to about 908 million. Even though the crop of 1928 was a moderately large one for post-war years, it provided no surplus for export, and bread had to be rationed in many cities. In part this situation is to be explained by the rather small crop of rye, and in part by the fact that state collections of both bread grains, notably rye, fell off rather sharply in 1928-29.³ This decline in collections may represent in some part a tendency for the larger producers who have surpluses for sale to restrict their acreage; but a clear picture of the Russian situation, especially the progress of the renewed conflict between the state and the larger producers, the kulaks, is not to be drawn from the data available to us.

OTHER NORTHERN HEMISPHERE WHEAT CROPS

The feature of principal significance in the wheat supply situation of 1928-29 in countries of the Northern Hemisphere lying outside of Europe and North America was the short crop harvested in India. Here, though the area in wheat was the largest in the period of 1920-28, as appears from Chart 8, the yield per acre was the smallest; and the crop, 291 million bushels, was the smallest since that of 1921. Following as it did three crops of only moderate size, the outturn of 1928 was so short as to

¹ The brief statements which we venture regarding Russia are made in the light of statistical information which in many respects is fragmentary or contradictory. For example, the latest available figures on wheat acreage and production in 1925-29 as published by the United States Department of Agriculture compare as follows with data published by the International Institute of Agriculture; figures in million acres and million bushels.

Year	Acreage		Production	
	U.S.D.A.	I.I.	U.S.D.A.	I.I.
1925.....	59.77	61.47	730.1	757.4
1926.....	70.87	72.18	819.7	899.4
1927.....	77.24	77.24	745.9	751.9
1928.....	68.04	68.17	859.8	783.2

Both sets of figures for wheat acreage for the years 1926-28 fall several million acres below those appearing in the (Russian) *Economic Review*, No. 3, 1929, which are stated to include the areas in state and collective farms as well as the areas cultivated by individual producers. We have employed the data of the International Institute in such brief comments as we venture.

² Some observers attribute part of the decline—in wheat acreage as well as in the acreage of all cereals—to a conflict between the state and the richer peasants, who are said to have curtailed their cultivation in retaliation to official attempts to secure their grain at prices which they regard as unremunerative.

³ According to the *Economic Review*, state collections of the several grains have been as follows, in thousand tons, for July-June crop years. The figures for 1928-29 in parentheses are data published in *Economic Review of the Soviet Union* (New York), October 15, 1929, p. 371; and the discrepancies between the two sets of data serve to emphasize the difficulties encountered in analyzing the wheat situation in Russia.

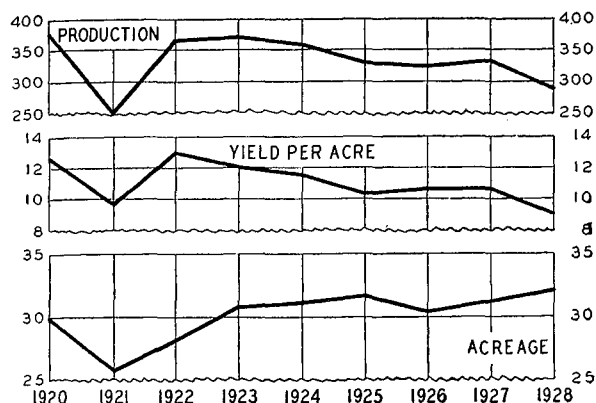
Grain	1926-27	1927-28	1928-29
Wheat	6,141	5,436	4,315 (4,450)
Rye	2,286	2,507	997 (1,325)
Total	8,427	8,033	5,312 (5,784)
Other grains ^a	2,379	2,079	2,996 (3,765)
Grand total	10,806	10,112	8,308 (9,549)

^a Barley, oats, corn, buckwheat, millet, beans, peas, and miscellaneous.

place India, usually a net exporting country, among the list of net importers in 1928-29. In Asia Minor also the wheat crop was a very short one, and this region imported much more heavily than usual.

CHART 8.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN INDIA, 1920-28*

(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III.

Egypt secured a crop below average in size, and here as in India, the yield per acre was the lowest in nine years, though the acreage was fairly high. Morocco, Algeria, and Tunis together, however, harvested somewhat the largest crop of recent years except for that of 1925, on account of high acreage rather than high yield per acre. In Japan and Chosen the wheat crop was about of average size; the variations in production from year to year are not striking. As usual, no estimates are available for China. There was a decided shortage of wheat in the northern region tributary to Tientsin, and of other grain as well; in the interior at least famine prevailed throughout the year. In the region around Shanghai and in Manchuria, the wheat crops appear to have been satisfactory ones.

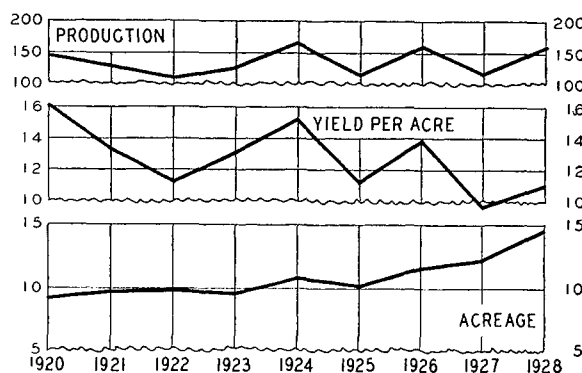
SOUTHERN HEMISPHERE WHEAT CROPS

Chart 9 shows wheat production, acreage, and yield per acre in Australia from 1920 to 1928. The acreage has tended upward as in Europe, though with relatively greater rapidity in the past three years; in 1928 it reached a strikingly high peak. The yield per acre, on the other hand—and

in sharp contrast with other areas except India—has tended downward, and in 1928 was lower than in any other year of the period except 1927. Thus weather conditions in 1928 seem to have been less favorable to the wheat plant in Australia and India than in the other great wheat-producing regions. The relatively low Australian yield per acre of 1928 was apparently due chiefly to drought during August and most of September. Heavy rains in late September and October are said to have prevented a crop failure that seemed imminent in mid-September. At 161 million bushels the crop of 1928 proved to be one of the three largest since the war, ranking with those of 1924 and 1926. In those years the acreage was much smaller, the yield per acre much larger.

CHART 9.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN AUSTRALIA, 1920-28*

(Million bushels; bushels per acre; million acres)



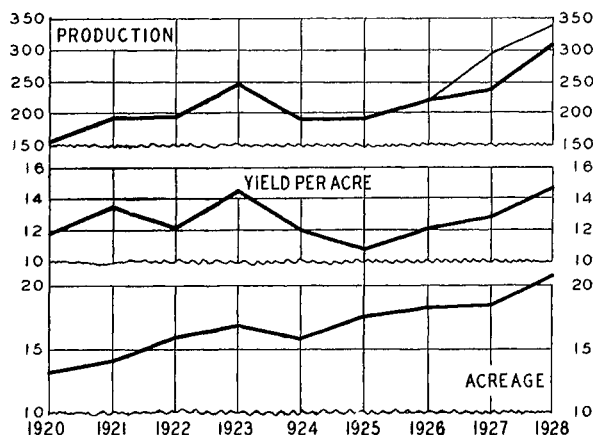
* Data from Appendix Tables I-III.

The precise size of the Argentine crop of 1928 is not known. It is officially estimated¹ at 307 million bushels, but this figure now seems too low in the light of accumulated information on exports and

¹ The first official estimate appeared only in July 1929, after much of the crop had been exported; the delay appears to have been due to a change (in December 1928) of the political administration of the Argentine Republic. On January 24, 1929, the United States Department of Agriculture (see *Foreign News on Wheat* of this date, p. 5) was carrying the Argentine crop at "roughly 250 million bushels" on the basis of a statistical forecast involving data on temperature and rainfall; and even as late as May 18 this organization thought the crop to be around 275 million bushels (*ibid.*, May 18, 1929, p. 12). Broomhall had placed the crop at 315 million bushels as early as January 1.

domestic disappearance,¹ and we judge that it must have approximated 340 million. As Chart 10 shows, the 1928 crop even at 307 million bushels was the largest in the period 1920-28, and indeed the largest in history. Comparisons of acreage and yield per acre as yet must remain

CHART 10.—WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE IN ARGENTINA, 1920-28*
(Million bushels; bushels per acre; million acres)



* Data from Appendix Tables I-III. For 1928 the acreage figure applies to area sown; areas harvested in earlier years. If there was abandonment in 1928, the yield per acre in that year is made to appear too low. The significance of the light solid line is explained in the note to Chart 3, p. 46.

tentative; data are not available on the area harvested in 1928, and if abandonment in that year should be allowed for, the curve of acreage shown on the chart would presumably incline upward less steeply, and the curve of yield per acre more steeply. On the whole, however, it is reasonable to suppose that both the harvested acreage and the yield per harvested acre in Argentina, as well as the crop of wheat, reached new post-war peaks in 1928. The huge Argentine crop, distinctly good in quality, was of major importance for its bearing on world wheat prices, trade, and stocks in the second half of the crop year 1928-29, and in the earlier months of the crop year 1929-30 as well.

In passing, it is pertinent to observe, by comparison of Chart 10 with Charts 3-9, that (even though the Argentine figure

¹ See the disposition statistics in Appendix Table XXX. The crop of 1927 was even more greatly underestimated.

for 1928 admittedly stands somewhat too high in relation to earlier years) in Argentina the wheat area has tended during the period 1920-28 to increase more rapidly than in any other major wheat-producing region of the world ex-Russia. If this tendency is maintained, and if, as some observers suppose, the use of selected seed and of improved cultural methods is proceeding apace, Argentina may be expected to assume an increasingly important rôle in the world wheat market. This might result in striking changes in the wheat position, for Argentina is the only country which at the same time is a large producer of semi-hard wheat and markets the bulk of it in the second half of the European crop year.

WHEAT SUBSTITUTES AND SUPPLEMENTS

As we have seen, the crop year 1928-29 was characterized by abnormally abundant world wheat supplies. It was also a year of abundant supplies of rye. Table 3

TABLE 3.—EUROPEAN (EX-RUSSIAN) GRAIN AND POTATO CROPS, 1920-28*

(Million bushels)						
Year	Wheat	Rye	Potatoes	Corn	Barley	Oats
1920.....	947	533	3,351	520	551	1,478
1921.....	1,218	765	2,988	393	566	1,509
1922.....	1,042	720	4,531	423	599	1,544
1923.....	1,256	831	3,715	468	649	1,666
1924.....	1,057	656	4,045	590	565	1,569
1925.....	1,396	933	4,584	626	672	1,708
1926.....	1,209	752	3,711	655	673	1,845
1927.....	1,267	802	4,605	480	659	1,739
1928.....	1,408	901	4,532	379	744	1,877
Average 1909-13...	1,347	977	4,162	581	701	1,931
1923-27...	1,237	795	4,132	564	652	1,755

* Summarized from most recent official data for individual countries, as reported by the U.S. Department of Agriculture. Excludes a few minor European producers. Pre-war averages are estimates for territory within present boundaries, and include 2-year or 4-year averages for a few countries.

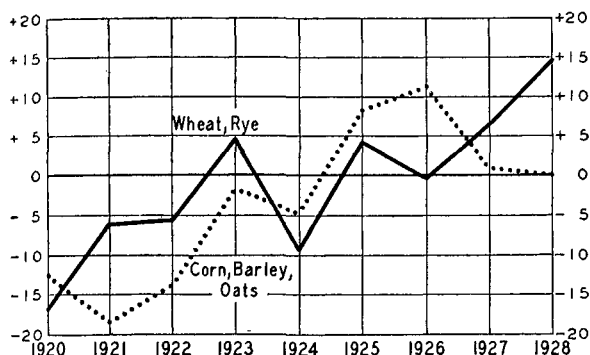
shows the European (ex-Russian) crops of wheat, rye, potatoes, corn, barley, and oats since 1920. At 901 bushels, the European rye crop of 1928 was larger than any other of the period except that of 1925. Since Europe is the great rye-producing and rye-consuming area of the world, the large European rye crop of 1928, in conjunction with the huge world wheat crop, made for

a notably easy world position in the principal bread grains.

Chart 11 represents an attempt to summarize the world position in the principal

CHART 11.—SUPPLIES OF WHEAT AND RYE AND OF CORN, BARLEY, AND OATS READILY AVAILABLE TO EUROPEAN IMPORTING COUNTRIES, IN TERMS OF PERCENTAGE DEVIATIONS FROM THE 1922-27 AVERAGE, 1920-28*

(Per cent)



* Based largely on data in Tables 1 and 3, pp. 45 and 52. "Readily available supplies" of wheat are defined to include the world wheat crop ex-Russia, China, and Asia Minor, with our adjustments for apparent official underestimates; of rye, barley, and oats to include only the European ex-Russian crops; and of corn the crops of Europe, Argentina, and South Africa. All data were reduced from bushels to equal units of weight (tons) before percentages were computed.

bread grains as contrasted with the situation in the principal feed grains since 1920. In terms of weight and of percentage deviations from the average (1922-27), supplies of the two bread grains readily available to importing countries¹ in 1928-29 were much above the line of trend. In the same terms, however, the readily available supplies of corn, barley, and oats combined were distinctly below the line of trend. This evidence suggests that the international feed-grain situation in 1928-29, unlike the bread-grain situation, was a relatively tight one, the more so because the livestock population in western Europe seems to have increased more rapidly than the human population.² The tightness of the feed-grain position was due predominantly to the short crop of corn in Europe, for both the European and the world crops of barley and oats in 1928 were the largest harvested in the period 1920-28. This view of the feed-grain situation is accorded some support by the fact that in 1928-29, British import prices of the three feed grains stood higher

in relation to wheat prices than in any other year of the period beginning with 1922-23. On the whole one may reasonably infer that, in so far as it affected the wheat position, the tight feed-grain situation in 1928-29 tended to lend support to wheat prices, and probably encouraged substitution of both wheat and rye for the feed grains.

THE STATISTICAL POSITION

Numerous methods of approach may be and have been devised to express numerically or graphically the international statistical position in wheat; but it is perhaps not inaccurate to say that the sole feature common to all methods is the desire of their originators to show how the supply-and-demand situation differs in one year from what it was in another, and from these differences to explain or to forecast changes in the levels of wheat prices. It is unnecessary and impossible here to examine in detail various set-ups of the international statistical position for wheat in 1928-29 as compared with earlier years. A few examples will suffice to show that the position of 1928-29 was probably the easiest since the war, even easier than that of 1923-24,³ when world wheat prices reached

¹ In order to secure figures approximately representing what we have called "supplies readily available" we have employed the world wheat crops ex-Russia, the corn crops in Europe, Argentina, and South Africa only (omitting the United States, whose huge crops furnish but small exports), and the rye, barley, and oats crops of Europe only. The results would not be appreciably different if world crops had been employed for all crops except corn. For purposes of the broad contrasts which we wish to emphasize, our method seems satisfactory; but it is not designed to provide a basis for the discussion of details. The chart serves principally to bring out a point not apparent from the figures given in Table 3—that, on account of the short crop of corn in Europe in 1928-29, the European or the international feed grain situation was a rather tight one in spite of large European and world crops of barley and oats.

² According to data published by the U.S. Department of Agriculture (*Agriculture Yearbooks*), the population of swine and cattle (combined on the basis of 5 hogs = 1 cow) in the British Isles, Denmark, Norway, Belgium, France, Germany, and Hungary has increased at an average rate of more than 1.5 per cent per year between 1920 and 1928. The human population of western Europe can hardly have increased by as much as 1 per cent per year.

³ In our current surveys of the wheat situation (see *WHEAT STUDIES*, January 1929, V, 136), we described the statistical position in 1928-29 as probably a little less easy than that of 1923-24. The appearance of revised official crop estimates and of evidence that in some countries the crops of 1928 were officially underestimated leads us to alter this view.

their lowest post-war level—a level below that of 1928-29.

Each year Broomhall, in his *Corn Trade News*, evaluates the international statistical position by setting world exportable surpluses against world import requirements, altering his estimates from time to time each year as more accurate information becomes available. According to his estimates, the margin between surpluses and requirements in 1928-29 was the largest in the past seven years, as is shown by the following figures, in million bushels:¹

1922-23	138	1926-27	138
1923-24	263	1927-28	113
1924-25	69	1928-29	345
1925-26	110		

The United States Department of Agriculture now summarizes the statistical position as follows: to the world wheat crops ex-Russia and China are added (1) that part of the world carryover which is measured statistically and (2) the shipments of wheat from Russia; and adjusted figures are secured by allowing 70 million bushels for what the Department believes to be the annual increase in world demand. Thus figures are reached which are designed to show the relative abundance or scarcity of wheat supplies when demand is accounted for.² On this basis also the statistical position in 1928-29 was the easiest of any in the past six years. World supplies of wheat were as follows, in million bushels, after adjustment for the annual increase of 70 million bushels in world demand:³

1923-24	4,227	1926-27	3,890
1924-25	3,780	1927-28	4,083
1925-26	3,969	1928-29	4,351

Two set-ups of our own, involving exportable surpluses (crops less seed and food requirements) in the four major exporting

countries, and in the one (column A) import requirements calculated to increase by 18 million bushels, in the other (column B) by 39 million bushels annually, give margins between exportable surpluses and import requirements as follows in million bushels:⁴

	A	B
1922-23	196	238
1923-24	428	449
1924-25	104	104
1925-26	256	235
1926-27	273	231
1927-28	392	329
1928-29	647	563

Both of the set-ups, like the others, seem to indicate that the statistical position for wheat was easier in 1928-29 than in any other of the seven years, even 1923-24.

The point of significance for present purposes is that the statistical position for wheat in 1928-29, when it is evaluated by fairly simple methods and is made to include only the more obvious factors influencing it, seems in retrospect to have been so easy as to justify the expectation of a lower level of world wheat prices than actually prevailed, and the more so because wholesale prices in general have tended to decline. As we shall see, the fact is that less obvious influences, which are omitted or which cannot be treated satisfactorily in various evaluations of wheat position, worked in 1928-29 in the direction of sustaining wheat prices, notably in comparison with the lower price level of 1923-24. The simpler methods of evaluating the international statistical position for wheat serve fairly well to explain why prices were lower in 1928-29 than in

more easy than that of 1923-24. This is largely the result of upward changes in crop estimates for 1928, which have appeared since June.

⁴ These set-ups are not presented as in our view the best ways of giving numerical expression to the statistical position, but merely as alternative to other methods and little if any less satisfactory. In them we employ our own rough corrections of official crop estimates in the exporting countries. Our allowances for the average annual growth of import requirements are rough approximations to the maximum and the minimum; and we are not disposed to assume that the concept of a constant or nearly constant growth in requirements is a useful one for purposes of evaluating the statistical position over the period of years considered here. These set-ups also take no account of certain other factors of some importance to the statistical position; for example, the exportable surpluses of the minor exporting countries, world carryovers, variations in quality of wheat, and the position of rye and the feed grains.

¹ Each figure is the average of several figures published in the course of each year. Since the earliest estimates each year often differ widely from later ones, we have not included them in the averages.

² See especially *Foreign News on Wheat*, June 15, 1929, pp. 7-10.

³ These figures are derived from the total unadjusted supply data given in *Foreign News on Wheat*, November 18, 1929, p. 4. To adjust for the annual increase in demand of 70 million bushels, the figure for total supply in 1928-29 is left as it stands; to the figure for supply in 1927-28 is added 70 million bushels; to that for 1926-27 is added 140 million; to that for 1925-26, 210 million, and so on. In the presentation of the statistical position given in *ibid.*, June 15, 1929, the position in 1928-29 appears less rather than

1927-28; but qualifications are necessary in order to explain why the wheat price level of 1928-29 remained above that of 1923-24,¹

and still further qualifications will probably be required to explain the level of 1929-30 when the year has run its course.

II. STOCKS AND CARRYOVERS

Extraordinarily heavy stocks of wheat in various positions characterized the crop year 1928-29 throughout its course. On the one hand, the inward carryover was large and the crop of 1928 was a huge one; on the other, while consumption was undeniably heavy, it was not heavy enough to prevent a striking upbuilding of stocks. This upbuilding of stocks, particularly in the United States and Canada, was one of the outstanding features of the crop year. It assumes special importance because, thus far in the crop year 1929-30, a short world wheat crop in 1929 has not resulted in as high a level of wheat prices as many have anticipated; and the exceptionally large carryover out of 1928-29 has undoubtedly contributed to this situation. It is desirable, therefore, to measure and to explain as accurately as may be the general increase in carryover, and to ascertain in what countries and positions the increases were most noteworthy.

VISIBLE SUPPLIES

Chart 12 (p. 56), showing the weekly course and level of visible wheat supplies in North America and afloat for Europe and in ports of the United Kingdom, serves to

¹ See below, pp. 65-66.

² The monthly marketings by farmers "as reported by about 3,500 mills and elevators" were as follows, in percentages of the year's receipts, for the months of July-October, July-December, November-June and January-June, in the past seven crop years:

Crop year	July-Oct.	July-Dec.	Nov.-June	Jan.-June
1922-23	58.3	74.3	41.7	25.7
1923-24	61.4	77.1	38.6	22.9
1924-25	65.4	79.6	34.6	20.4
1925-26	62.8	78.4	37.2	21.6
1926-27	65.3	76.1	34.7	23.9
1927-28	66.2	79.5	33.8	20.5
1928-29 ^a	65.1	77.5	34.9	22.5

^a Data supplied by the Bureau of Agricultural Economics. Data for earlier years are given in *Agriculture Yearbook, 1928*, p. 682.

These figures do not suggest that farmers followed in a noteworthy degree the advice of officials of the U.S. Department of Agriculture, frequently reiterated in the autumn of 1928, to hold their wheat for higher prices. Nor do the data on receipts at primary markets when reduced to percentages marketed monthly (see Appendix Table XIV for receipts in million bushels by months).

emphasize the characteristically high level of this category of wheat stocks throughout 1928-29. The three other years for which data are presented were also years of relatively high visibles; but the level of 1928-29, so far as concerns visibles in the United States and Canada and the total, was so much higher than in these earlier years as to render detailed comparisons unnecessary. In spite of a record volume of international trade in 1928-29, however, the level of visible supplies afloat for Europe and in ports of the United Kingdom was not strikingly high. Only shipments to Europe affect these visibles, and the ex-European rather than the European trade in 1928-29 was extraordinarily large.

The factors which caused the upbuilding and maintenance of visible supplies in the United States and Canada are discussed below in connection with the upbuilding of total stocks; here it suffices to emphasize certain features of the course of visibles throughout the year. In the United States, the great increase of more than 100 million bushels from early July to late October was striking. It can hardly be ascribed to the *rate* of marketing by farmers; for, according to official statistics,² 65.1 per cent of the year's receipts fell in the July-October period, almost the same as or a little less than the proportion marketed in the same months of 1924, 1926, and 1927, which were years of large crops and relatively heavy marketings. Of course, in absolute amount farm marketings were larger than usual because the crop was larger. This sharp increase in the visible resulted mostly from a relatively restrained export movement, and it was achieved in the face of heavy purchases by domestic millers. A second striking feature of the course of the United States visible was its rapid rise in July 1929. This was due on the one hand principally to heavy marketings of new-crop wheat stimulated by a sharp increase in prices, on the other to an export movement unusually small for the season, available supplies considered; the spread between domestic and international prices,

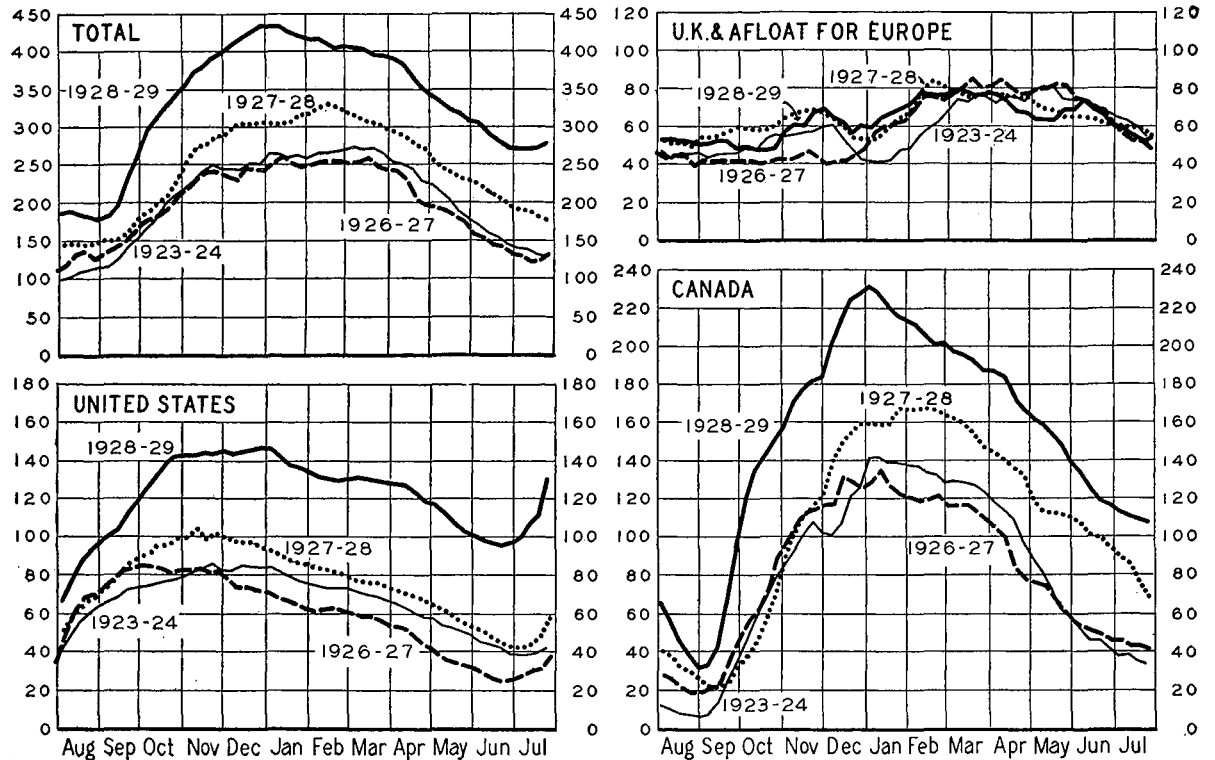
that was too narrow to permit free exportation, persisted as in earlier months.

In Canada visible supplies declined very rapidly in August 1928, with an exception-

The rapid reduction in the visible during January-March reflects exceptionally heavy exportation from stocks earlier accumulated on the American seaboard, and

CHART 12.—VISIBLE WHEAT SUPPLIES IN THE UNITED STATES, CANADA, AND UNITED KINGDOM PORTS AND AFLOAT TO EUROPE, WEEKLY, 1923-24, AND FROM AUGUST 1926*

(Million bushels)



* Data from *Grain World*, *Northwestern Miller*, and *Canadian Grain Statistics*.

ally heavy export movement for the season; thereafter they rose with great rapidity to reach a peak of unparalleled height, timed somewhat early, in the first week of January. This great increase seems to have been merely an accompaniment of the huge crop; the rate of marketing by farmers, so far as it can be judged by receipts at the principal terminals, was not exceptionally rapid for a year of large crop and favorable harvesting weather,¹ nor was the rate of export movement unusually slow.

¹ The percentages of the year's receipts at Fort William and Port Arthur, Vancouver, and Prince Rupert for the months of August-December have been as follows in the past six years, as calculated from official data shown in Appendix Table XIV:

1923-24	67.3	1926-27	66.5
1924-25	69.7	1927-28	57.4
1925-26	72.6	1928-29	69.6

also from Canadian ports on the Pacific Coast.

OUTWARD CARRYOVERS IN NORTH AMERICA

Total wheat (including some flour) stocks in the United States approximated the huge total of about 262 million bushels on June 30, 1929. This was by far the largest carryover of recent years, as the following figures in million bushels show:

June 30	Total stocks ^a	June 30	Total stocks
1922	130 ^b	1926	111
1923	150 ^b	1927	138
1924	165 ^b	1928	142
1925	135	1929	262

^a Includes wheat stocks on farms, in country mills and elevators, in terminal elevators (Bradstreet's visible), and in city mills. Flour is included in city mill stocks. See Appendix Table XXX for other qualifying notes.

^b For these years we have roughly estimated the stocks held by city mills; census data are not available prior to June 30, 1925.

The magnitude of the total is impressive;¹ it was enough wheat to supply the wheat food requirements of the United States for half a year or of the British Isles for a year. It represented nearly 30 per cent of the crop of 1928, whereas the carryover out of 1923-24, itself a relatively large one, represented but little more than 20 per cent of the smaller crop of 1923. The magnitude of the increase in carryover during the course of the year is even more striking; it amounted to about 120 million bushels, as against an increase of some 27 million in 1926-27, when the greatest previous increase in any of the past eight crop years occurred.

All of the component parts of the total carryover increased in the course of 1928-29. Chart 13 shows the stocks remaining on farms, in country mills and elevators, and in the visible supply (in terminal elevators) on June 30 of the past eight years. For this period, each item reached a new high level in 1929. But stocks on farms and in country mills and elevators² were not so extraordinarily large as stocks in the visible supply. Stocks held by city mills, the fourth component of the total carryover, were apparently at an exceptionally high level, but, like farm and country elevator stocks, they stood less high in relation to earlier years than did the visible supply. City mill stocks have varied from 42 to 63 million bushels in the four years 1925-28, but reached 81 million in 1929; precise comparisons involving earlier years are not available.³ The increase in city mill stocks reflects marked accumulation of wheat rather than flour, for mill carryovers of flour (in terms of wheat) have fluctuated between the narrow range of 14.67 to 17.98 million bushels during 1925-29.

¹ Even this total is not complete for any year. No account is taken of flour stocks on the way from mills to consumers, or of wheat stocks in some positions.

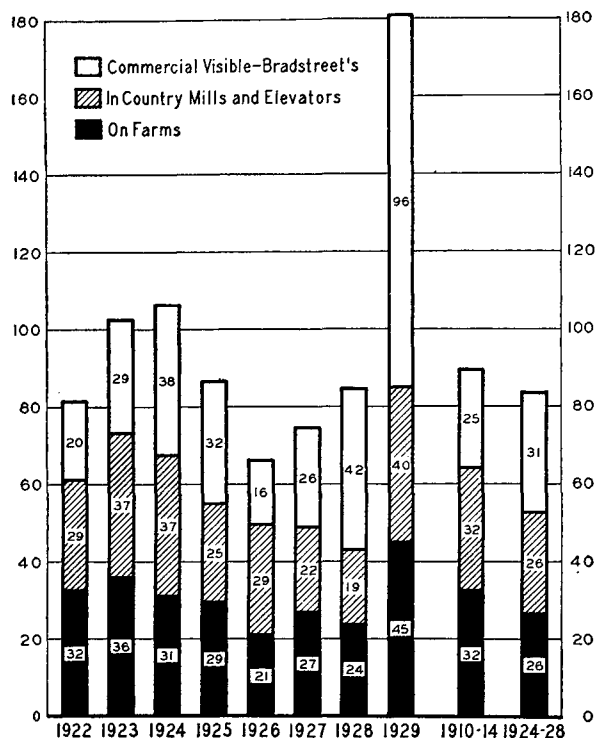
² The figures for this item are not strictly comparable over the period 1922-29.

³ See Appendix Table XXIII. The figures given above represent the total there given minus city mill stocks held in country elevators and public terminal elevators. The subtraction is made in order to avoid possible duplication with the official estimate of country mill and elevator stocks and with Bradstreet's statement of the visible supply.

⁴ See Appendix Table XXX for our estimates of wheat consumed for food.

The causes of the tremendous upbuilding of the United States carryover during 1928-29 are now fairly clear. To an inward carryover of average size was added a huge wheat crop. The quantity of wheat required for domestic consumption⁴ does

CHART 13.—WHEAT STOCKS IN THE UNITED STATES, JULY 1, 1922-29, WITH COMPARISONS*
(Million bushels)



* Official data except Bradstreet's visible, as tabulated in Appendix Table XXII. Country mill and elevator figures for 1926-29 are estimated on a new basis, and probably are not strictly comparable with figures for earlier years.

not vary greatly from year to year; consequently there was a large surplus available for export. Exports, however, were exceptionally small in view of the supplies available. They were small because wheat prices in the United States, though low by comparison with earlier years, practically throughout the year stood high in relation to prices in other exporting countries and in the international market. Foreign importers naturally filled their requirements by buying more liberally of the cheaper than of the dearer wheats available to them. The upbuilding of the United States carryover was thus a result of the inter-

national rather than of the domestic wheat price situation.¹ It is true that in the domestic markets the distant futures sold for exceptionally large premiums over the near, and that this situation provided dealers with exceptionally strong motives to carry wheat, hedged, on account of the profits envisaged in the operation. But this was an incident in, and a consequence of, the general upbuilding of the carryover rather than a cause of it. The total carryover could have been built up to its actual level in the absence of these wide spreads between near and distant futures. If farmers had held back enough wheat, there need not have been an increase in the visible supply, and without this, the wide spreads between the futures would not have prevailed.

The Canadian carryover out of 1928-29, like the American, was apparently the largest on record. As of July 31, 1929, it was officially placed at 104 million bushels, some 26 or 28 million bushels above the record figure for earlier years, 76 or 78 million, recorded the year before; from 1924 to 1926, the carryovers ranged from 26 to 51 million bushels.² These figures apply only to wheat remaining in Canada. There were in addition about 23 million bushels of Canadian wheat in store in lake and Atlantic ports of the United States, a record quantity for recent years.³ Flour mills and elevators in Canada held record stocks, but the supplies in transit were below those of 1928 and stocks on farms were smaller than in 1924.

The upbuilding of stocks in Canada seems properly to be ascribed to somewhat different causes than were dominant in the

United States. It occurred not throughout the crop year, but in the later months. Thus, total Canadian wheat stocks on March 31, 1929, were only about 20 and 40 million bushels larger than they had been on the same dates in 1928 and 1924 respectively, not large differences in view of the facts that the crop of 1928 exceeded those of 1927 and 1923 by 93 and 87 million bushels respectively, and that storage capacity has grown. The movement to export, which had been consistent with the size of the crop during August-March 1928-29, declined to relatively small proportions in April-July as Canadian prices moved upward in relation both to British, American, and Argentine prices. It was this price movement in the second half of the crop year,⁴ due in itself to a different set of circumstances from those which kept United States prices above export parity, that brought the Canadian carryover to so extreme a height, though even in its absence the carryover might have been a sizable one merely because the crop of 1928 was so large. There seems no good reason to suppose that the preponderance of the lower grades in the crop, or any difficulties in merchandising them, were especially important causes of the upbuilding of the carryover. The Canadian Pool, according to its *Annual Report*, owned 48 million bushels of wheat on August 31, 1929, a figure which does not suggest that the Pool tended to hold its wheat more strongly than independent dealers. But such an inference as this rests on highly uncertain grounds; for the *Report* does not describe the precise physical position of the Pool carryover of wheat.

SOUTHERN HEMISPHERE STOCKS

The evidence is now fairly convincing that wheat stocks in Argentina on August 1, 1929, were much higher than in any recent year. In the absence of direct estimates of stocks covering a period of years,⁵ the best notion of the Argentine stocks position can be gained from export figures taken in conjunction with reasonably reliable estimates of domestic consumption of wheat for food. Net exports of wheat and flour from Argentina totaled 63.3 million bushels in August-October 1929. Broomhall's shipments from November 1

¹ The factors influencing the international price situation are discussed below, pp. 66-68.

² See Appendix Table XXII. The official estimates of carryover there shown do not agree precisely with other official estimates, as shown in Appendix Table XXX, presumably on account of some differences in accounting for wheat in transit. But the discrepancies are small.

³ See below, Table 4, p. 62.

⁴ See below, pp. 74-75.

⁵ Partial direct estimates have appeared occasionally since June 30, 1928. The estimate as of June 30, 1928, however, proved considerably too low; it implied stocks of around 70 million bushels as of August 1, 1928, but exports plus domestic consumption during August and December 1928 totaled at least 80 million, and some old-crop wheat was left in Argentina on January 1, 1929.

to December 13 totaled about 15 million. Some 5 million bushels of wheat per month must have been used for domestic food consumption during August–December, or 25 million bushels. On this showing alone the stocks on August 1 must have reached at least 103 million bushels. In fact they must have been larger: some old-crop wheat has certainly been shipped between December 14 and December 31; and some old-crop wheat will be carried over into the next calendar year. With an allowance for a carryover as of December 31, 1929 of 10 million bushels,¹ it seems reasonable to conclude that Argentine stocks on August 1 stood at a minimum of 120 million bushels, or 30 million more than on August 1, 1928, and around 55 million more than in any other of the past seven years.

Thus Argentine year-end stocks, like the United States and Canadian carryovers, were built up in the course of 1928–29. The increase, however, is not to be attributed to high prices in Argentina relative to other markets, for Argentine wheat was a relatively cheap import wheat on the international market throughout the crop year with the exception of August–September 1928. It seems rather to have been a reflection of the fact that the Argentine wheat crop harvested in December–January 1928–29 was so huge that stocks remained large up to August 1 even in the face of an extremely heavy export movement. Although there was apparently considerable discontent in Argentina with the low level of wheat prices in 1928–29, the evidence does not suggest that domestic marketings were restrained to a notable degree. There are, of course, certain physical limitations on the quantities that can be handled at Argentine ports.

Year-end stocks in Australia on August 1, 1929, may be estimated only as the residual quantity after subtraction of the various items of disposition in 1928–29 from the available supplies.² If our estimate of the inward carryover and the standing official estimate of the crop of 1928 are correct, the outward carryover approximated

45 million bushels, somewhat larger than in earlier years. That there was some upbuilding of stocks in the course of the year is consistent with the situation elsewhere, and also with the apparent tendency of Australian stocks to stand relatively high on August 1 in years when the outlook for the new crop to be harvested in November–January is unfavorable, as has been the case in 1929. But changes in Australian stocks are of such small magnitude as compared with changes in the United States, Canada, or Argentina that inaccuracies of measurement are of little moment so far as concerns the world wheat situation.

EUROPEAN STOCKS

The statistical information regarding European year-end stocks is so scanty as to be of almost negligible value in any attempt to ascertain what is an average level, or what may be the changes in this level and in what years and direction the changes occur. There is statistical information on port stocks in the United Kingdom,³ and for some years in Amsterdam; records are kept of stocks in customs warehouses in France, and unofficial French estimates are sometimes made of stocks on farms, in mills, and in bakeries; fragmentary information also exists regarding certain stocks, not precisely described, in Hungary and Poland; and for Germany there are in recent years estimates of stocks on farms and in Berlin. But it is at present impossible to ascertain, for any European country, the size of total wheat and flour stocks—on farms, in transit, in mills, in ports, in commercial channels, in bakeries—or even of the principal components of the total, over a period of years. Any evaluation of the general stocks position in Europe at the end of 1928–29 must rest upon inference rather than upon direct statistical evidence.

Data on domestic utilization⁴—crops plus net imports or minus net exports—provide an approach to the problem. We may consider first the figures for the four exporting countries of the Danube basin. Chart 14 (p. 60) gives the apparent domestic utilization in these countries by crop years since 1920–21 in terms of percentage deviations from the average 1922–27. In absolute terms over 80 million bushels more

¹ We assume in our calculation that under ordinary circumstances these stocks remain constant from year to year.

² See Appendix Table XXX.

³ See Appendix Table XXIV.

⁴ See Appendix Table XXVIII.

wheat were retained for all uses in 1928-29 than in any other post-war year; in percentage terms, over 35 per cent more. Doubtless there has been an upward trend in per capita consumption of wheaten flour

CHART 14.—APPARENT DOMESTIC UTILIZATION OF WHEAT IN THE DANUBE BASIN IN TERMS OF PERCENTAGE DEVIATIONS FROM THE 1922-27 AVERAGE, CROP YEARS 1920-21 TO 1928-29*

(Per cent)



* Data from Appendix Table XXVIII.

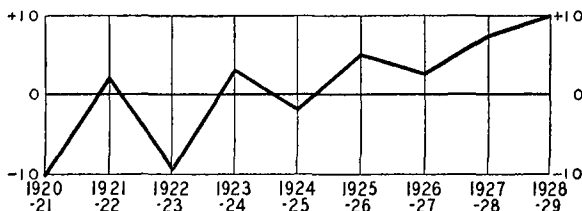
over this period, though it may well have been a steeper trend in the earlier than in the later years. The population also increases rather rapidly. Hence there is reason to suppose that wheat consumption for food must have been larger in 1928-29 than in any other post-war year, the more so because wheat prices were at a low level and the corn crop was short. These factors must also have tended to encourage the use of wheat for animal feed and industrial use; and utilization of wheat for seed was at a high level. Nevertheless it is difficult to believe that consumption in its various forms was so greatly expanded that the carryover remained only a normal one. Consumption habits here as elsewhere probably change gradually, and one can hardly suppose that the standard cereal

food of the Roumanian and Jugo-Slavian peasants, boiled corn meal, was to any marked degree supplanted by flour in any form. Nor does it seem likely that animals were fed wheat rather than the customary barley, which was in plentiful supply and provided net exports; and at best the feeding of grain is not extensive in these regions. With recognition of the factors making for relatively heavy wheat consumption, we doubt if available domestic supplies that amounted in 1928-29 to over 45 per cent more than the 1922-27 average could have been anything like fully consumed in the course of the year. Moreover, exports from these countries since August 1, 1929, have been far larger than in any other post-war year; and this in itself suggests a huge carryover. The magnitude of it can only be guessed. It may have exceeded 50 million bushels, and it may have been more than twice as large as other outward carryovers of recent years. Possibly, even probably, the year 1928-29 witnessed an upbuilding of stocks larger in both absolute and percentage terms than occurred in either Australia, Argentina, or Canada. Of the several countries, the increase was doubtless greatest in Jugo-Slavia.

Chart 15 shows the apparent domestic utilization of wheat in European import-

CHART 15.—APPARENT DOMESTIC UTILIZATION OF WHEAT IN THE IMPORTING COUNTRIES OF EUROPE IN TERMS OF PERCENTAGE DEVIATIONS FROM THE 1922-27 AVERAGE, CROP YEARS 1920-21 TO 1928-29*

(Per cent)



* Data from Appendix Table XXVIII, with a few estimates for some countries in some years.

ing countries since 1920-21, also in terms of percentage deviations from the average 1922-27. Here also the total domestic utilization in 1928-29 stood at the highest figure of post-war years, some 1,653 million bushels as compared with 1,610 million in

1927; or 10.6 per cent above the 1922-27 average as compared with 7.7 per cent above.¹ Population has certainly not grown as rapidly over this period as has total utilization—probably at a rate of not more than one per cent per year. Its growth accounts for some of the growth in utilization; growth in wheat acreage accounts for a little more. But utilization has grown also on account of an increase in per capita consumption of wheat for food, common to most countries though perhaps not to such important ones as the United Kingdom, France, and Spain. If one could measure with some precision the trend in per capita consumption, it would be easier to reach inferences respecting changes in year-end stocks. Probably the immediate post-war years witnessed a strong tendency toward increase in per capita consumption, stimulated or made possible by general economic recovery and increase of purchasing power; and in these years—say prior to 1925-26—there could have been little upbuilding of carryover. The later years may have witnessed a considerably lesser tendency toward increase in per capita consumption, and hence some upbuilding of stocks, unless there has also been an increasing tendency to utilize wheat as animal feed.

At present the actual course of events is obscure. But it is clear that, even considering trends in population and per capita consumption, the year 1928-29 was the only year in the period when liberal supplies of wheat followed a previous year of liberal supplies. One may say with some assurance that supplies were sufficiently abundant in 1928-29, not only to permit expansion of human consumption under the stimulus of low wheat prices, but also to permit, relative to other years, either the feeding of wheat to farm animals to an exceptional degree, or an unusual upbuilding of stocks, or both. Perhaps both occurred, but principally the upbuilding of stocks. The tight feed grain position would act to stimulate feeding of wheat, though the good quality of the domestic wheat crop presumably worked in the opposite direction; and the low prices of wheat would encourage farmers to hold rather than to sell their grain and would encourage millers to maintain their stocks, thus building up the outward carryover. We are

not disposed to be dogmatic on the subject in view of the fragmentary evidence. Nevertheless we believe that wheat of good quality in the form of wheat rather than mill offals is not fed extensively to livestock in Europe; that variations in the quantities so fed are likely to depend about as much upon wheat quality as upon price relationships or changes;² and that variations from year to year are not large in absolute amount, though they may be in percentage terms. On these grounds we are led to believe that the carryover of wheat out of 1928-29 was considerably the largest of recent years in the European importing countries, and that an upbuilding of stocks was a noteworthy feature of domestic utilization there. The evidence of increase is admittedly not as convincing as the evidence regarding the increase of stocks in the Danube countries. It is in some degree corroborated, however, by non-statistical statements in trade journals, wherein mention is made of exceptionally large year-end stocks of domestic wheat in France, Italy, and even Spain³ (these countries produce more than half of the wheat crop in the European importing countries), and of import wheat in Germany.

SUMMARY OF YEAR-END STOCKS

In Table 4 (p. 62) we bring together such information on year-end stocks in various positions as lends itself to fairly precise numerical expression. The figures apply only to wheat in the principal exporting countries, and afloat (chiefly from these) to Europe, and in ports of the United Kingdom. The total as of around August 1, 1929, was some 598 million bushels, about 176 million bushels or nearly 42 per cent more than in 1928, when these stocks reached the highest level of recent years. This total by no means represents the

¹ These figures include minor revisions of the data used in Chart 15.

² In this connection it is desirable to recall that rye, the less preferred bread grain, is available for animal feed as well as wheat. Some observers state that, in Germany at least, rye will be fed to animals rather than wheat when both rye and wheat are plentiful and other feed grains are scarce.

³ We find it difficult to believe that, in the face of the very short crop of 1928, the carry-over of domestic wheat out of 1928-29 could have been a large one. It is not altogether unlikely, however, because Spain imported much wheat in 1928-29, which may have been used instead of the native product; and it is possible that per capita consumption is declining.

world total; at a minimum, European importing countries probably hold year-end stocks of at least 150 million bushels, and one can readily believe that a large carry-over might be perhaps twice as large as the minimum.¹ It is possible that world stocks

TABLE 4.—APPROXIMATE CARRYOVERS OF WHEAT IN EXPORTING COUNTRIES, AFLOAT FOR EUROPE, AND IN PORTS OF THE UNITED KINGDOM, AUGUST 1, 1924-29*

(Million bushels)						
Location	1924	1925	1926	1927	1928	1929
United States ^a	165	135	111	138	142	262
Canada	41	26	35	48	78	104
Canadian in United States ^b	3	3	4	5	14	23
Argentina	66	56	61	65	90	120
Australia	38	36	30	34	43	45
Afloat for Europe	42	33	39	46	45	38
United Kingdom ports ..	10	9	4	8	10	6
Total	365	298	284	344	422	598

* Data summarized from Appendix Tables XXIV and XXX, except as noted.

^a Data as of July 1. Includes flour stocks in city mills.

^b Canadian wheat in store in lake and Atlantic ports of the United States. Data from *Canadian Grain Statistics*, as of dates nearest to August 1.

at the end of 1928-29 may have increased not by around 176 million bushels in the course of the year, but rather by 176 million plus more than 50 million bushels if stocks in all of Europe ex-Russia are included in the calculation. There is little doubt, moreover, that ex-European stocks stood rather high. So much may be inferred from the record movement of wheat and flour to

ex-European destinations, even though there is reason to suppose that in India year-end stocks could not have been large, and that in other ex-European countries the low prices of 1928-29 resulted in an increase of consumption probably more marked than in Europe or in the wheat-exporting countries.² In Russia the stocks in consuming regions were unquestionably very small; but whether or not the large quantity of wheat that the officials were unable to collect from peasants in the producing regions was consumed practically in its entirety, or was used in part to increase stocks, is not clear.

It is apparent, then, that the upbuilding of carryovers in 1928-29 was practically a world-wide phenomenon. It is to be viewed mainly as the result of a huge world crop following a good-sized one, trend of production considered. Consumption was heavy, doubtless also above its trend, and was encouraged by low wheat prices; but prices were not low enough, or consumption was not sufficiently elastic, to prevent a great accumulation of stocks. That prices remained as high as they did was in some part due to the very upbuilding of the carryover, in so far as this was effected by accumulation in the channels closest to the producers and most remote from ultimate consumers. The great accumulation of stocks at the end of 1928-29—in our view a good deal larger than many students have been inclined to suppose—has in the first few months of 1929-30 played an important part in depressing wheat prices below the approximate level that might reasonably be expected to prevail in a year of short wheat crops.

III. WHEAT PRICE MOVEMENTS

THE GENERAL LEVEL OF PRICES

In most of the world's important markets, the level of wheat prices in 1928-29 was distinctly low. Chart 16 shows annual average prices in the four principal exporting countries, and of import wheat in

the United Kingdom since 1923-24. Chart 17 shows similarly changes³ in the level of

¹ Stocks of 150 million bushels would not be enough to fill consumption requirements for six weeks under the supply situation prevailing in the past five years.

² In Japan, North China, and Egypt, at least, stocks seem to have been rather large if the statements of traders and commercial agents are accurate.

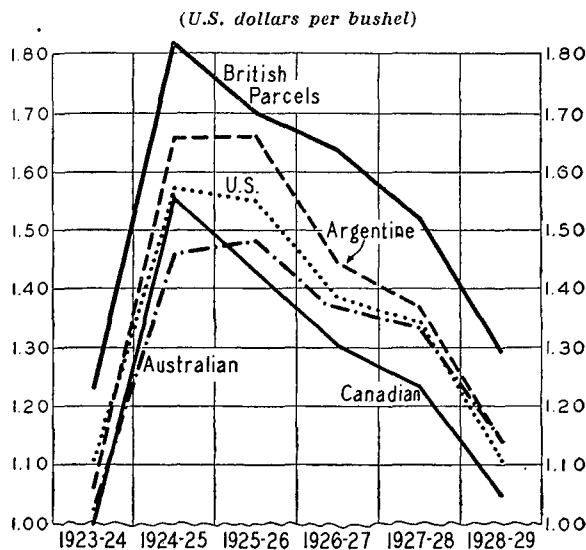
³ Both charts are designed primarily to show changes in wheat price levels from year to year in various countries. We have sought to secure price series fairly well representative of the range of terminal prices that exists each year in each country. The Argentine series, however, is less representative than others; it applies to wheat of high weight per unit of volume (80 kilograms per hectolitre), for which premiums are paid. In some part this explains why the level of Argentine prices is usually made to appear the highest among the four exporting countries.

the prices of domestic wheat in the four most important countries of Europe. Prices in the United States, Canada, Argentina, Australia, Germany, and the United Kingdom (both imported and domestic wheat) were lower in 1928-29 than in any other year shown on the charts except 1923-24, the year of lowest post-war prices.¹ But in

both in direction and amount than the changes of domestic wheat prices in importing countries, where both tariffs and (partly because of the tariffs) local conditions may play a more important rôle.

Even the facts as to changes in the wheat price level in all of the important wheat-consuming countries of the world are diffi-

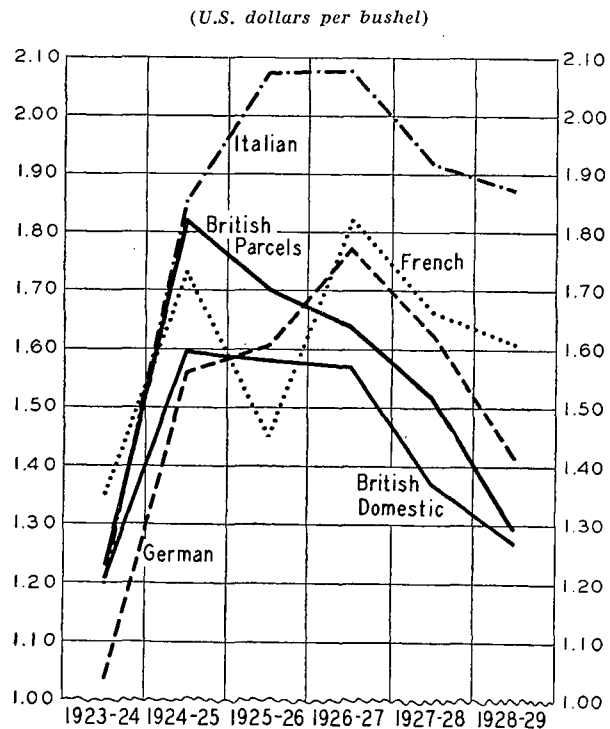
CHART 16.—AVERAGE ANNUAL WHEAT PRICES IN THE PRINCIPAL EXPORTING COUNTRIES, AND BRITISH PARCELS PRICES, BY CROP YEARS FROM 1923-24*



* Simple averages of monthly averages which are themselves averages of weekly prices except for the United States series, which is an average of the monthly weighted average prices of all classes and grades of wheat in six markets as published in *Agriculture Yearbook, 1928*, p. 688. British parcels and Canadian prices compiled from our series; see *WHEAT STUDIES*, July 1928, IV, No. 8, and March 1929, V, No. 5. Australian and Argentine prices from series described in Appendix Table XXVI. Annual averages are for August-July crop years.

France the level of prices in 1928-29 was higher than that of two other years, 1923-24 and 1925-26; and in Italy prices in 1928-29 were higher than in both 1923-24 and 1924-25. The charts show clearly that on the whole the year-to-year changes of prices in exporting countries and on the import wheat market are more similar

CHART 17.—AVERAGE ANNUAL PRICES OF DOMESTIC WHEATS IN FOUR IMPORTING COUNTRIES, AND BRITISH PARCELS PRICES, BY CROP YEARS FROM 1923-24*



* For sources and method of compilation, see Appendix Table XXVII and note to Chart 16.

¹ Data are not available to show the prices prevailing in 1922-23 in all of the countries under consideration. British prices of import wheat, however, were higher in 1922-23 than in 1928-29 or 1923-24; so also were Canadian and American prices. The year 1922-23 ranks with 1923-24 and 1928-29 as one characterized by the lowest wheat prices in post-war years; but on the whole prices were probably not so low in 1922-23 as in these two years.

cult to establish. Still more difficult is explanation of all such changes as are known to have occurred. It is easy to understand why, for example, with the change from a large to a small world wheat crop, prices advanced greatly in all countries between 1923-24 and 1924-25; but it is not so easy to explain why they rose to the precise extent that they did, or to show definitely why British and French prices of domestic wheats rose less than prices in other countries. The changes from the levels of 1924-25 to those of 1925-26 were extremely diverse from country to country, and pre-

sent still greater difficulties of interpretation; and so with the changes from 1925-26 to 1926-27. Here we need attempt to explain only the changes between 1927-28 and 1928-29 and between 1923-24 and 1928-29.

Little need be said in explanation of the fact that in all countries prices were lower in 1928-29 than in 1927-28. Not only was the world wheat crop of 1928 far larger than the crop of 1927 (some 16 per cent above the 1922-27 average, whereas the crop of 1927 was less than 7 per cent above), but in each of the countries under consideration except the British Isles, the crop of 1928 was larger than the crop of 1927. British prices of domestic wheat declined less than international or export prices partly because the crop of 1928 was smaller rather than larger than that of 1927. Yet the smaller decline in British domestic prices may have been due in part to the fact that the crop of 1927 was of poor quality and suffered heavy discounts (in this connection it is pertinent to point out that British domestic prices declined more sharply between 1926-27 and 1927-28 than did international or export prices), whereas the crop of 1928 was of good quality. The change in the size of the crop between 1927 and 1928 serves partly to explain why French prices declined less than export prices, for the French crop of 1928 was very little larger than the crop of 1927. But other factors were perhaps more influential. The French tariff was raised on May 23, 1929, and farmers appear to have held back their wheat from market partly in anticipation of the increase. Italian prices also declined less than export or international prices, but certainly not because the crop of 1928 was smaller than that of 1927. In fact it was much larger; and here the relatively small decline seems to have resulted from two factors similar to those operating in France, holding by producers and two increases in the tariff. In Germany, restricted marketings by farmers were not in evidence. The crop of 1928 was larger than that of 1927, and the tariff duties were not raised until late in the crop year; hence the decline in prices was much the same as in export markets.

In cents per bushel, international and export prices in 1928-29 were lower than in 1927-28 by amounts as follows:

British parcels	22.7
Canada	18.2
Argentina	23.1
United States	23.3
Australia	19.3

Little is to be gained from detailed analysis of the differences shown, for the annual average prices as we have compiled them do not constitute a perfect measure of changes in price levels.¹ Nevertheless even these imperfect figures reflect some interesting price phenomena. Australian and Canadian prices declined somewhat less than United States, Argentine, or British (import) prices. The decline in Australian prices would have been even smaller if the crop of 1927 had not been a short one. This tended to keep Australian prices relatively high in 1927-28, and thus it was all the more surprising that Australian prices declined only as much as they did in the face of a much larger crop in 1928 than in 1927. Probably the purchase of wheat in considerable volume by India, especially in the winter months of 1928-29, was the major price-sustaining factor. The spread between British parcels prices and Australian prices was smaller in 1928-29 than in any other post-war year shown on Chart 16, and Australian prices stood higher than usual in the range of export prices. This could not have resulted either from a relatively short Australian crop or from exceptionally low ocean freight rates in 1928-29.²

¹ Moreover, in a sense, all discussion of changes in average annual prices such as we employ may fail to be illuminating. An average annual price is necessarily derived from prices that have prevailed from day to day throughout the year. In the course of almost any crop year, wheat prices are affected by changes either in the actual or in the prospective supply-and-demand situation; but the more feasible methods of discussing changes in annual average prices involve the assumption that the supply-and-demand situation of a given year remains substantially unchanged. In the mid-winter months of 1928-29 extremely cold weather in the Northern Hemisphere created a presumption that the winter-wheat crops of 1929 might prove short; this lent support to prices and so brought the average annual prices of 1928-29 above what they otherwise would have been, but it was not a price-making factor that lends itself to statistical expression when one is attempting to determine why average annual prices were higher in 1928-29 than in 1923-24. Similarly, the average annual prices both of 1923-24 and 1928-29 were somewhat higher than otherwise they would have been because prices rose sharply in June and July of both years as the result of an unfavorable outlook for crops in the years following, but the outlook for new crops can hardly be included in a statistical expression of the supply situation for a given crop year.

² See Appendix Table XXI for ocean freight rates on wheat.

Canadian prices also showed less of a decline between 1927-28 and 1928-29 than might reasonably have been expected in view of her bumper crop with its large proportion of the lower grades. This was due to the fact that Canadian prices in the later months of 1928-29 moved out of line with prices elsewhere; a holding movement developed in Canada in the latter part of the crop year. There was an even stronger tendency to hold back wheat in the United States, but it was evident throughout the whole year and indeed extended back into 1927-28. Consequently United States prices declined about as much as the Argentine while the Canadian did not between these two years (there was no holding policy in Argentina), but United States prices declined less than the Argentine between the years 1926-27 and 1927-28.

To determine why the general level of prices was not as low in 1928-29 as in 1923-24 is a more difficult problem, and one hardly susceptible of an answer satisfactory to all. As we have seen,¹ the simpler set-ups of the international statistical position suggest that the level of international wheat prices at least, which may be said to be measured by British parcels prices, ought to have been lower in 1928-29 than in 1923-24, not higher. Two great difficulties with these set-ups¹ are perhaps that carryovers of wheat are not accounted for with sufficient precision, and that far too little is known about changes in demand to justify a rigid assumption with regard to the magnitude of changes in it from year

to year or over a period of years. Statistical set-ups (except Broomhall's)² must ordinarily involve some such rigid assumption—for example, that world demand for wheat increases 70 million bushels each year—if only because the information on demand is too scanty to permit a more elastic one. As we have pointed out above, changes in world wheat stocks may possibly be of considerably greater magnitude than statistical estimates now available of stocks suggest;⁴ and it is also possible that the demand for wheat in the world or specified parts of it has not increased during the post-war period by a constant amount or a constant percentage from year to year, but has fluctuated rather widely. For example, it is not unreasonable to suppose that European demand rather suddenly shifted to a higher level some time in the course of the years 1924-25 and 1925-26, and that its growth per year, rapid enough on the average when the whole period since say 1921-22 is considered, was not so rapid as this either before or after 1924-25 or 1925-26. We are not disposed to press this point far, and refer only to the fact that the Dawes agreement of 1924 is commonly thought by competent observers to have marked a sudden access of purchasing power in Europe. Since such a change in purchasing power must have had an effect upon demand for wheat, the point seems at least to deserve mention.

If it were possible at present to evaluate the changes in demand for wheat between 1923-24 and 1928-29 even as accurately as may be done for supplies, fairly adequate and detailed reasons for the higher prices of 1928-29 would possibly appear. Perhaps one of the major factors in demand, growth of population, can be measured accurately enough for the purpose; but two other major factors, the growth and change in per capita human consumption of wheat and the extent and elasticity of substitution of other foods for wheat, seem not yet to be susceptible of measurement. Nevertheless it is undoubtedly true that wheat prices were higher in 1928-29 than in 1923-24 because requirements for consumption increased more between these years than did wheat supplies—an obvious though apparently an exact generalized explanation. More specifically, there were certain striking differences in the demand

¹ See above, pp. 53-55.

² Perhaps the really outstanding difficulty is that wheat prices often do not promptly and accurately reflect the current relationship between supplies and consumptive demand. There is much evidence that in some periods wheat prices fail to respond fully to a changed statistical position and in other periods respond to an exaggerated degree.

³ It is pertinent here to observe that Broomhall, when he sets exportable surpluses against import requirements, does not set demand against supply in a way that can be interpreted in explanation of prices or as a forecast of prices. He treats demand not only as a cause of price but as a result, and alters his estimates of import requirements from time to time as the evidence, including prevailing prices, suggests that more or less wheat than he has earlier estimated will move in international trade in a given year. In effect he forecasts the probable volume of wheat shipments each crop year, not the requirements of importers if these requirements are regarded as the quantities likely to be required regardless of price.

⁴ See above, p. 62.

situation between the two years. The world population was larger in 1928-29 than in 1923-24; in Europe especially purchasing power per capita was much greater, as was probably true in China also; the distribution of 1928 crops which forced India, Spain, and Asia Minor into the unusual rôle of importers made for demand from unusual sources; the world feed grain situation was seemingly a good deal tighter; and farmers everywhere were in a better financial position to hold back their wheat if they chose. The sum of these differences perhaps accounts sufficiently well for the higher prices of 1928-29, or at least makes the outcome appear to be explicable; but it is impossible to determine what contribution each item made to the total, and one cannot be certain that all significant factors are included in the list. The fact that prices of domestic wheat in Germany, France, and Italy in 1928-29 stood much farther above 1923-24 prices than was true of export and international prices of course reflects in part simply the successive upward revisions of tariff duties that have occurred in these countries in the course of the past six years; but it probably reflects general economic recovery and growth of purchasing power as well.

PRICE RELATIONSHIPS ON THE IMPORT MARKETS

An especially significant feature of the world wheat price situation in 1928-29 was the unusual relative cheapness of Argentine wheat on the world import market. This is brought out by Chart 18, which shows spreads in the United Kingdom between British parcels prices (the series used as a base) and the prices in the United Kingdom of No. 3 Northern Manitoba from Canada, No. 2 Winter from the United States, Rosafé from Argentina, and Australian. The Rosafé, the No. 3 Northern, and the No. 2 Winter may be regarded as roughly but not completely competitive wheats. The point requiring emphasis is that Rosafé was the cheapest of these wheats in every month of the crop year 1928-29 except August and September 1928—in ten months out of twelve. In other years this variety was the cheapest wheat for a briefer period: for one month in

1923-24, one month in 1924-25, five months in 1925-26 (when, however, the relative cheapness was unquestionably a reflection of very poor quality), five months in 1926-27, and five months in 1927-28. But never before in the six-year period under consideration was Rosafé cheaper than competitive varieties or grades for so long a period during the crop year; nor has it ever been so *much* cheaper, at least than No. 3 Northern, if we rule out 1925-26, the year of abnormally poor quality of Argentine wheat.

The unusual relative cheapness of Argentine wheat on the British import market—and almost certainly on all the European markets—had significant consequences. British importers curtailed their purchases of other wheats and expanded their purchases of Argentine¹ in so far as flour standards permitted; it is altogether likely that the same thing happened elsewhere. Argentina therefore furnished an uncommonly larger proportion of world exports. Canadian and particularly United States exports were more or less restricted, size of available supplies considered; and in North America, especially in the United States, the carryover was greatly built up in the course of the year.

What, then, were the reasons that Argentine wheat so far undersold competing wheats on the import markets for so many months in 1928? It was not, as in 1925-26, because Argentine wheat was of poor quality, for it was exceptionally good in 1928-29; nor was it because ocean freight rates from Argentina to Europe were relatively lower than rates from North America. In part the causes were general and persistent in their nature; in part they were the reflection of conditions not in Argentina, but in North America. In the first place, Argentina is always a debtor nation, her imports must be paid for by commodity exports, and wheat is an important item on the list of commodity exports; in this respect there is always more pressure to sell wheat abroad than there is in the United States. Second and more important is the fact that Argentina is regularly in a relatively unfavorable position to hold wheat within the country. Modern storage equipment is much less in evidence than in North Amer-

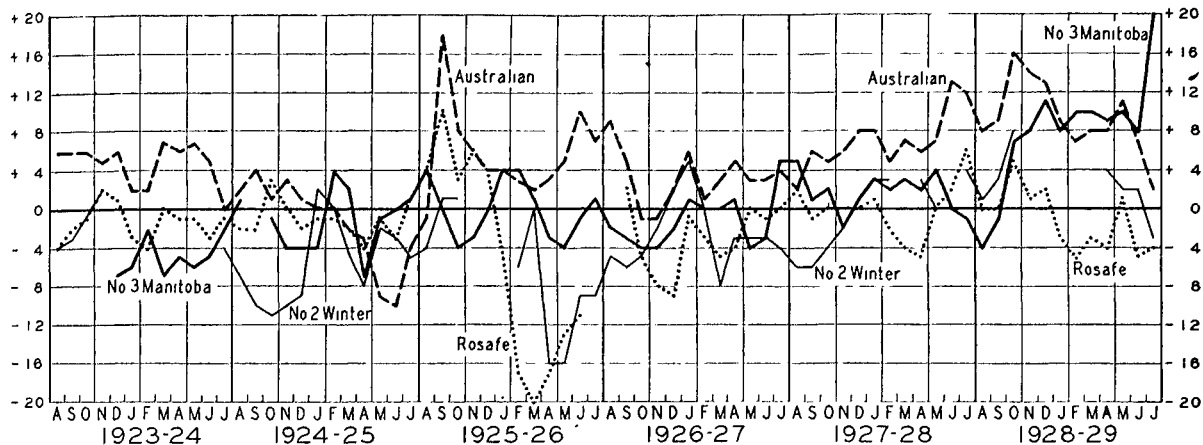
¹ See below, p. 85.

ica; capital is less freely available to finance the holding of wheat; and the whole system of marketing from farms provides little incentive for producers to hold wheat on the farms. Producers in Argentina generally sell their wheat "at a price to be fixed"; they may send it along as soon as it is harvested, obtaining a certain payment in advance, yet may be paid in full for it

North America than in Argentina. One may reasonably suppose, however, that certain factors—in the United States general over-optimism regarding profits, the continued upward trend of the stock market, bullish statements by prominent officials, prospects that a Federal Farm Board would come into existence and would operate to raise prices, and in mid-winter and

CHART 18.—RELATIONS BETWEEN AVERAGE PRICES OF REPRESENTATIVE IMPORT WHEATS AT LIVERPOOL, IN TERMS OF DEVIATIONS FROM BRITISH PARCELS PRICES, MONTHLY FROM AUGUST 1923*

(U.S. cents per bushel)



* For description of the several price series see note to Chart 16 and Appendix Table XXVII.

not at the moment but at any (within certain limits) subsequent date. In Canada, members of the Pool have no more incentive than Argentine producers to hold their wheat; but the Pool handles not much over half the crop, and in any event handles it in the interest of producers, as Argentine exporters have less incentive to do. Finally, Argentina entered the crop year 1928-29 with an exceptionally large carryover, and harvested a record crop. But Canada was in the same position and the United States in almost the same; and this hardly serves to explain the cheapness of Argentine wheat. The broad fact is that in North America there were rather better facilities than in Argentina for resisting low prices, and that there was a disposition to do so. Of the facilities it is unnecessary to say more. Of the disposition, little can be said; it is impossible to be certain that North American farmers were more dissatisfied with prices than Argentine farmers, or that the information disseminated on the wheat situation was more bullish in its nature in

early spring the rather poor outlook for American winter wheat; and in Canada in late winter and spring the shortage of subsoil moisture—had a stronger tendency to encourage the disposition to hold wheat either physically or in the form of futures in North America than they could have had in distant Argentina. As Chart 18 suggests, the United States was not in a favorable position to export wheat in any month of the crop year; in fact exports were so small that for the five mid-season months, quotations of No. 2 Winter wheat at Liverpool were too scarce to permit the compilation of monthly averages. In August and September 1928, Canadian wheats were the cheapest; thereafter Argentine wheats were cheapest. It must not be inferred from the chart, however, that Canadian wheat could not be sold in the United Kingdom after September 1928. It simply obtained increasing premiums over Argentine as the year wore on, and this led importers not only to prefer to buy Argentine wheat in so far as their mill mix permitted, but also to

buy progressively more of the cheaper Canadian grades and less of the dearer ones. In this connection it is necessary to recall that Argentine wheat was of high quality, and that the lower grades of Canadian wheat were rich in protein content.

THE GENERAL COURSE OF PRICES

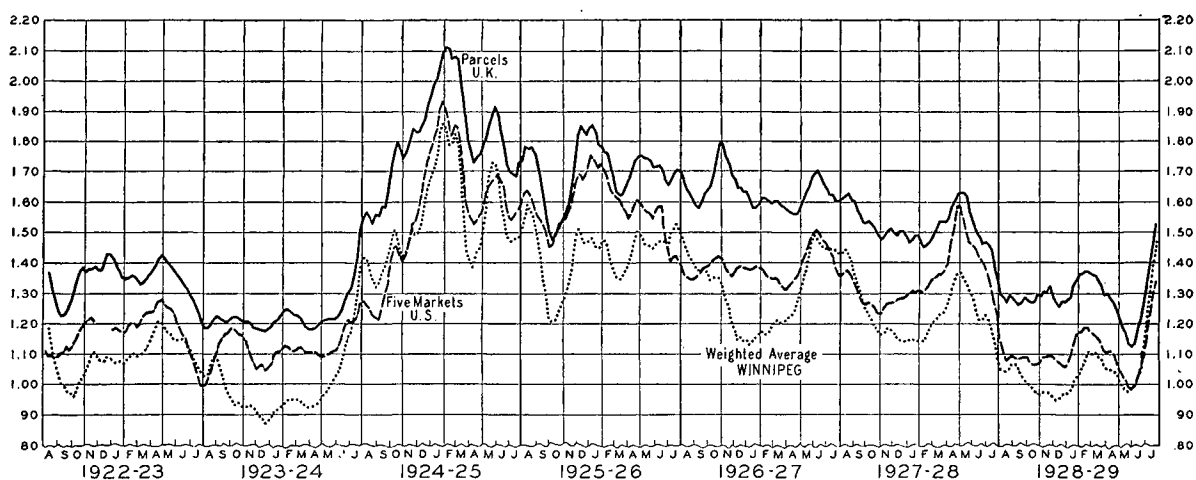
The course of prices in 1928-29 was characterized by unusual stability in the first half of the crop year, but by decided instability in the second half. Rough comparisons with earlier years are afforded by Chart 19, which shows the major move-

broadly reflects the distinctly easy international statistical position, which was sufficiently apparent in the opening weeks. As in 1923-24, there was for some months little reason to anticipate wide movements of prices in either direction once the transition from the old to the new crop year was completed. Speculative activity remained at a low level.¹ In the latter half of the crop year, however, the outlook for new crops and other things as well made the basis for speculative dealing more attractive, and prices fluctuated widely.

The major price movements of the year may best be perceived by reference to

CHART 19.—BRITISH PARCELS, WINNIPEG, AND UNITED STATES CASH WHEAT PRICES, WEEKLY FROM AUGUST 1922*

(U.S. and Canadian dollars per bushel; 3-week moving averages)



* British parcels and Winnipeg prices as described in *WHEAT STUDIES*, July 1928, IV, No. 8, and March 1929, V, No. 5. United States prices are weighted averages of all classes and grades of wheat in six markets (five markets prior to December 1926) from *Crops and Markets*.

ments of British parcels, American, and Canadian weekly average cash prices during the past seven crop years, in terms of three-week moving averages. Only in the first half of 1923-24 were British parcels prices as stable as they were in the first half of 1928-29, and only in 1923-24 were the fluctuations similarly narrow for so long a period of time. United States and Canadian cash wheat prices usually fluctuate more widely than the British import prices, partly because the local supply conditions and crop prospects are subject to greater change than the international; but these were also uncommonly stable in the first half of 1928-29. The characteristic stability of prices in the first half of the year

Chart 20, which shows the daily closing prices of wheat futures on four great markets of the world. The first few days of August 1928 saw the end of the long and precipitous decline that had begun in May. The absence of an appreciable recovery after such a decline is noteworthy. Thereafter the fluctuations were confined within narrow limits for about four months; there were minor bulges and depressions, but no definite trend. This period of stability prevailed until early January 1929. It was followed by an upward movement, well-defined at least in Chicago and Winnipeg,

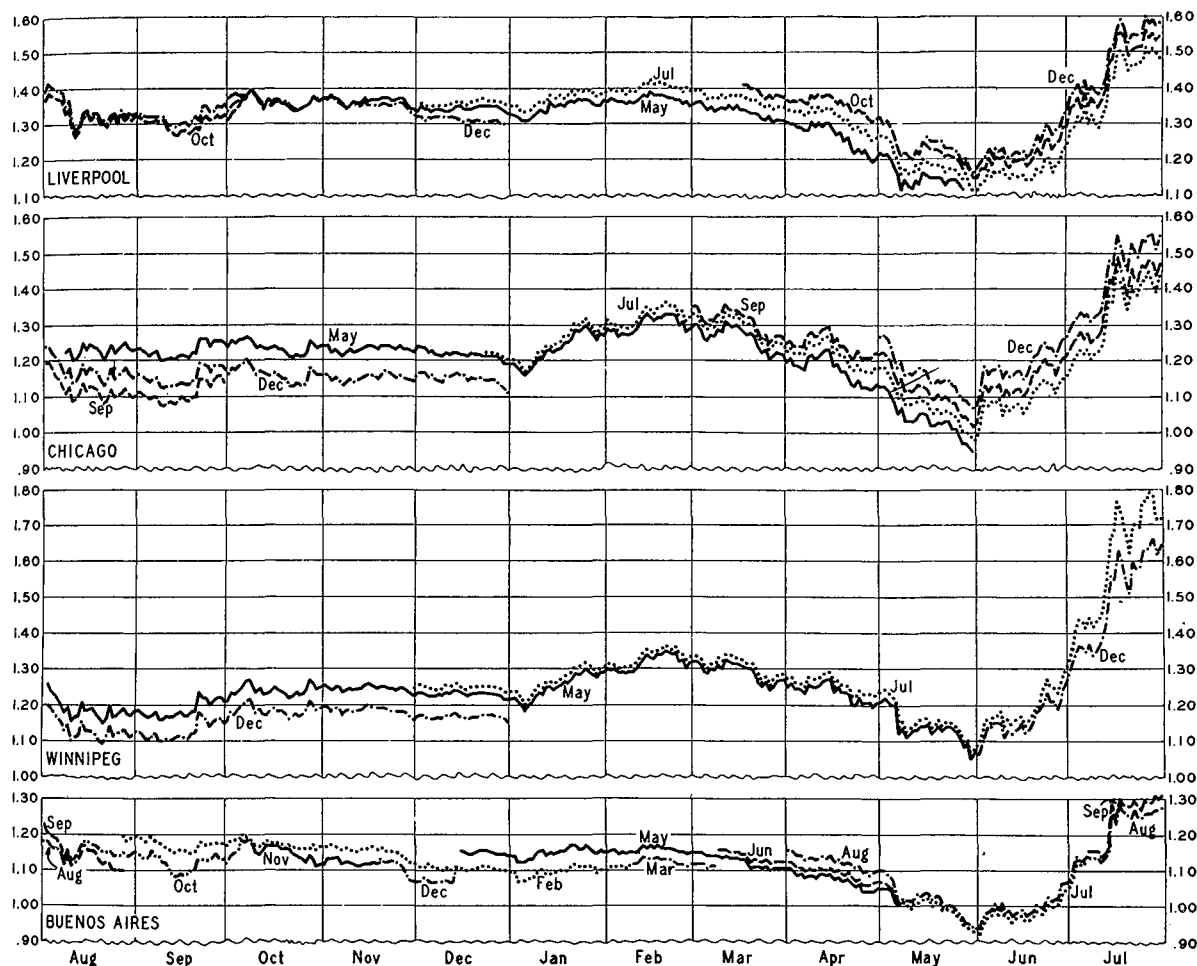
¹ See Appendix Table XXIX, which shows by months the average daily volume of futures trading in the United States.

which culminated in the latter half of February. Subsequently prices declined, at first gradually and then sharply, until the end of May. During May, June, and the first half of July the movement was very

The decline of prices in early August 1928 was the final phase of a much more extended decline begun in May 1928,² and may be said to have completed the transition from the crop year 1927-28 to 1928-29.

CHART 20.—DAILY CLOSING PRICES OF PRINCIPAL WHEAT FUTURES IN FOUR IMPORTANT MARKETS, AUGUST-JULY 1928-29*

(U.S. dollars per bushel)



* Data from *Chicago Journal of Commerce* and *Daily Trade Bulletin*, Chicago.

sharply upward, especially from mid-June to mid-July. The last few weeks of the year witnessed a period of uncertain movements, with wide changes from day to day. These major movements of futures prices differed even between markets considered in the chart; and they were considerably less closely approximated by cash wheat price movements in other markets than these four.¹

The relative stability that prevailed from mid-August to the end of the calendar year was unusual. It is seldom indeed, in a

¹ See Charts 21 and 22, and Appendix Table XXVII. The most striking divergence appears with regard to the prices of domestic wheat in Italy and France at the close of the year. Instead of rising sharply during June-July 1929 as did the futures prices shown in Chart 20, cash prices in these countries rose little or even declined.

² See *WHEAT STUDIES*, December 1928, V, 72-73.

period ordinarily characterized by uncertainty regarding outturns in the North American spring-wheat belt, in many European countries, and later in the Southern Hemisphere, that futures prices fluctuate within such narrow limits. But Canadian crop developments were so consistently favorable that a large crop appeared distinctly probable as early as July 1928. The crop of 1928 approached maturity rather early, so that fears of frost damage were less prevalent than is often the case, and rust was never in evidence sufficiently to cause alarm. In Europe and in the United States all early indications of large crops were substantiated by subsequent developments, and later the news from Argentina was favorable. On the other hand, general expectations were not raised appreciably by all these favorable developments, partly because distinctly large crops were anticipated even at the beginning of the crop year, and partly because there were some unfavorable developments such as the August-September drought in Australia and unexpectedly poor grading of Canadian wheat in September and October.

The long period of stable prices included some fairly sharp short-time movements in both directions. Thus there was a bulge in prices on August 22 and 23, a reflection of frosts in Canada. For about a month after September 10 prices tended to rise, with a sharp upturn on September 21 that amounted to as much as 6 cents a bushel in Winnipeg. Since this upward movement was more marked in Winnipeg than in the other futures markets, we infer that it was due to the appearance of so large a proportion of low-grade wheat in the Canadian crop; but the bulge on September 21 seemingly represented hurried covering by speculative short sellers, who had as reasons for alarm not only the grading situation, but also continued reports of drought in Australia, and in addition a rumor that a prominent Chicago speculator had "gone long." There was a sharp break on October 8, following the publication of an estimate by the Northwest Grain Dealers' Association that placed the Canadian crop in the Prairie Provinces alone at 558 million bushels, which at the time was a comparatively high figure. A second sharp upturn occurred on October 27, most marked in Chicago. Like the first, it seems to have

reflected short covering, perhaps induced in this instance jointly by Mr. Hoover's announcement of his intention, if elected President of the United States, to convene a special session of Congress to deal in part with farm relief; by a statement of Secretary of Agriculture Jardine's further urging farmers to hold their wheat; and by news of drought in southern Argentina. A second sharp downward turn in prices occurred between December 29, 1928, and January 5, 1929. It appears to have reflected the appearance of private estimates of a huge crop in Argentina, together with considerable pressure of offers of old-crop Argentine wheat on import markets at the holiday season, when demand was inactive.

Comparative stability of prices gave way to instability with this decline. Prices rose from January 5 to February 15-20, by 17 cents in Chicago, 16 in Winnipeg, but only 8 in Liverpool; and in Buenos Aires, between the low point of January 4 and the high one of January 21/22, the advance was only 5½ cents. Thus it is probable that the factors causing the upswing were localized in North America, but to evaluate the several influences with precision is impossible. Some of them were decidedly intangible, or at least based rather upon vague hopes or fears than upon ascertainable facts. Among the more tangible influences were restriction of offers by the Canadian Pool for a time after January 5; firmness in the prices of corn, enhanced by dry weather in Argentina; and, above all, extremely cold weather (with alternations of freezing and thawing in parts of the United States) throughout the Northern Hemisphere, together with the abnormally dry weather in Canada. These fairly tangible developments in some part explain why the atmosphere of the wheat markets turned bullish, particularly in North America; the weather conditions gave special encouragement to a notion already widespread, notably in the United States, that wheat crops in 1929 must prove considerably smaller than those of 1928, if only because yield per acre in 1928 has been exceptionally large in most of the great wheat-producing countries. But some less tangible influences seem also to have been significant. At the time the trade journals laid some stress upon what was regarded evidence of unexpectedly heavy wheat consumption throughout the

world, though how convincing this evidence was to traders it is impossible to say. In the United States, the bullish atmosphere of the stock markets was presumably shared in some degree by the grain markets; and many "longs" may well have been encouraged by expectations that domestic wheat prices would be raised through legislation for farm relief apparently to be passed during the special session of Congress convened in April.

The bullish atmosphere of the markets tended to disappear after mid-February, and prices moved downward, at first slowly and then rapidly, until at the end of May they stood at the lowest point in post-war years.¹ A sustained decline during March-May was an occurrence unprecedented since 1910 in these months of the year. Toward the end of February and in early March, Argentina shipped exceptional quantities of wheat, much of which was unsold on open consignment and pressed all the more heavily upon European markets because heavy port stocks had already accumulated—a result of the extremely severe winter, which froze the inland waterways. The cold winter thus had its bearish as well as its bullish effect. The heavy shipments of Argentine wheat remained an important bearish factor during the rest of the crop year. As the spring season advanced, evidence accumulated tending to show that winterkilling would prove less extensive than had been hoped

(or feared) either in the United States or in Europe. Hopes that American wheat prices during the remainder of the current crop year at least would be supported by legislation were apparently dampened when proposals to introduce the "debenture plan" into the Senate bill threatened to delay legislation indefinitely. Stock prices declined sharply on March 26, and call money rates were exceedingly high. The winter-wheat crop of the United States progressed favorably in April and May. Attention began to focus upon the extremely large stocks of wheat accumulated; and on the whole it seems probable that actual pressure of these stocks combined with good progress of the United States winter-wheat crop and a fair or an obscure outlook elsewhere was the dominant cause of the decline. Certainly the pressure of offers by Argentine and seemingly by Canadian exporters was the central feature of the wheat situation in Europe at the time; and this pressure sprang primarily from the heavy supplies available for sale.

Nevertheless some well-informed American observers attributed the decline largely or entirely to what were called either misdirected efforts to put up the price of wheat in the United States or unwise advertisements of the United States surplus that undermined confidence in prices. These efforts or advertisements took essentially the form of statements (emanating, among others, from Senator Capper of Kansas) that railway freight rates must be reduced in order to move our burdensome surplus to export. Temporary reductions were made; but one cannot perceive from the statistical evidence that either prices or exports or stocks were appreciably or demonstrably affected by them.² It is possible, even probable, that the so-called misdirected efforts or unwise advertising actually caused the decline of prices in some part. But since no startling new information about the United States stocks position was brought out in such statements as were made, we infer that the decline in prices was due predominantly to the stocks situation as most traders here and abroad probably knew it, and not merely to advertisement of it. It is only natural that charges and counter-charges directed toward particular persons or organizations, and not usually well founded, occupied a

¹ This is not true of Winnipeg futures prices, which reached even lower levels in September 1922 and July-September 1923.

² Several of the southwestern carriers had endeavored to have the export freight rate to Gulf ports reduced. The carriers operating through the Missouri gateways and in the direction of Gulf ports, with the support of the carriers in the eastern trunk region, in furtherance of the farm relief policy of the national administration, co-operated to initiate a temporary reduction in the export freight rates, in the nature of an emergency adaptation to facilitate the export of wheat and relieve congestion in elevators in central terminal points and in Atlantic and Gulf ports. Meeting with the approval of the administration as a possible factor in the relief of wheat growers and in conformity with the spirit of the Hoch-Smith Resolution, the temporary reduction was authorized by the Interstate Commerce Commission to take effect on May 29 and terminate on September 30, to be concluded at export ports not later than November 15. The reduction amounted to 2 cents from Buffalo to New York and 6.9 cents from Kansas City to Gulf ports. The rate applied to Canadian grain in transit through the United States and was at once met by lowering of the export rate by the two Canadian carriers.

good deal of space in the public press at a time when at Chicago the May and July futures prices were around or even below \$1.00, as they were late in May and early in June. In any event the period of recrimination passed quickly as prices moved swiftly upward in the latter part of June and the first half of July.

This June-July advance was spectacular, concentrated as it was practically within 30 days, from June 17 to July 17. Between these dates futures prices as shown in Chart 20 moved upward 62 cents per bushel in Winnipeg, 39 cents in Chicago, 34 cents in Liverpool, and 31 cents in Buenos Aires. The maximum increase during all of June-July was larger—70 cents in Winnipeg, 47 in Chicago, 39 in Liverpool, and 35 in Buenos Aires. In Chicago at least, so marked an increase in prices during these two months has not been recorded over the whole period 1881-1928, excluding the war years.

The initial impetus of this movement, in so far as it was not simply a reaction, appears to have been in the United States, where on June 3 and 4 encouragement was afforded to traders by dispatches from Washington which were interpreted to mean that governmental action would be taken to raise wheat prices after passage of farm relief legislation. For about two weeks after June 4 the movement of prices was horizontal or slightly downward. Lack of subsoil moisture in Canada and drought in Argentina and Australia evoked comment as potential causes of damage, though not at the time actually damaging if rain should come later. The sustained and rapid rise in prices began about June 18, and seems definitely attributable to important crop developments. There was news of heavy damage, as shown by threshing returns, to American winter wheat in the Southwest, and to spring wheat from continuing dry and hot weather both in the United States and Canada. Toward the end of June crop reports from the United States winter-wheat belt became more favorable. But the continued drought in the North American spring-wheat belt gave rise to almost daily increases in prices during late June and the first half of July, except on occasional days of reaction or of more or less rain. The greatest advances were recorded on July 13, 15, and 17—not,

apparently, because these were the particular days in which crop damage was greatest, but rather because the sentiment of traders crystallized and speculative activity became intense. Probably the week ending July 20 witnessed the greatest activity in wheat futures trading known in post-war years, in Winnipeg and Liverpool and possibly other foreign markets as well as in the United States. Certainly the month of July 1929 was characterized by the greatest average daily volume of futures trading known in the United States since records were first obtained in January 1921. In July 1929 the average daily volume was 111.1 million bushels; the previous record figure of 90.3 million bushels was established in December 1925.¹

From July 18 to the end of the month prices fluctuated rapidly without a definable trend. Deterioration of the North American spring-wheat crop continued, but reports of damage lost much of their force, as was only natural after so extreme an advance. During the advance, the persistently unfavorable stocks position had fallen into the background, only to assume renewed significance in the early months of the crop year 1929-30.

DIVERSE MOVEMENTS OF FUTURES PRICES

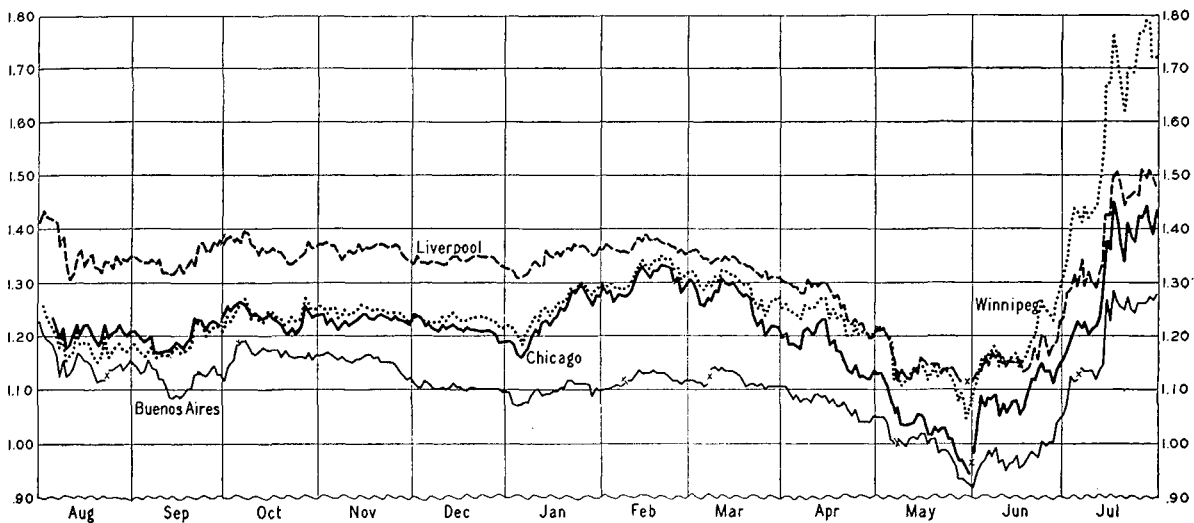
Thus far we have given little consideration to the fact that all markets did not participate to the same extent in the major movements of prices common to them all. Chart 21, showing the course of futures prices in four great markets in relationship one to the other, permits closer comparisons of the diversity of price movement than are feasible from Chart 20. It lends emphasis to important facts already mentioned, which are graphically set forth in Chart 18, p. 67: that Argentine wheat was relatively cheap on the international market practically throughout the year; that Canadian wheat was relatively cheap only in August and September 1928; and that United States wheat was not cheap even for a few consecutive weeks. The spread between Buenos Aires and Liverpool prices was at all times wide enough to permit heavy exportation; the spread between Chicago and Liverpool prices was never, except possibly in early August 1928 and in

¹ See Appendix Table XXIX.

late May 1929, wide enough to permit exportation in a volume historically consistent with the size of the crop and inward carryover; and the spread between Winnipeg and Liverpool prices tended to narrow practically throughout the crop year, though this narrowing, as it happened, had little bearing on the Canadian export movement at least of the lower grades of wheat

one, and under the conditions of marketing prevailing in Argentina it prevented a seasonal rise in Argentine prices (and a narrowing of the Buenos Aires–Liverpool spread) that usually occurs in the latter part of the Argentine crop year, say in June–December. The prospects for and advent of the huge new crop maintained the spread and even widened it. Percep-

CHART 21.—COMPARISON OF THE COURSE OF WHEAT FUTURES PRICES IN FOUR IMPORTANT MARKETS, AUGUST–JULY 1928–29*
(U.S. dollars per bushel)



* Daily closing prices from *Chicago Journal of Commerce* and *Daily Trade Bulletin*, Chicago. The x indicates a change in the future. September, October, February, March, May, July, and August futures successively in Buenos Aires; March, May, and July futures in Chicago and Liverpool; May and July futures in Winnipeg.

until the closing months. So much may be said without reference to changes in the costs of transporting wheat from either Canada, the United States, or Argentina to the United Kingdom.¹

The fact that the Buenos Aires–Liverpool spread was maintained throughout the year is to be explained partly by a reference to phenomena already mentioned. The Argentine carryover of old-crop wheat on August 1, 1928 was an exceptionally large

¹ See Appendix Table XXI. The data there given suggest that, while some part of the changes in spreads between futures prices may have been due to fluctuations in ocean freight rates, this part was a small one. In general ocean rates were highest in the middle third of the crop year, lowest in the first third. In so far as these costs affect the price spreads, one would expect the smallest spreads to have prevailed in the first third of the year, the largest spreads in the middle third; but this was not true of any price spread shown on the chart.

tible narrowing of the Buenos Aires–Liverpool spread occurred only in April–May 1929. This probably reflects merely the sympathetic movement of futures prices; at the time Chicago prices were sinking rapidly, and the Liverpool future moved fairly closely with the export market that showed the greatest day-to-day weakness, the more so because there were ample port stocks of wheat in Liverpool at the time. At the end of the crop year, in July, the Buenos Aires–Liverpool spread was again not much narrower than it had been in December–March, a reflection of the huge stocks still remaining in Argentina, and a repetition of the unusual situation that had prevailed at the opening of the crop year 1928–29.

The Chicago–Liverpool spread was a narrow one practically throughout the

year;¹ as judged by the futures prices shown on the chart, it never exceeded 15 cents, and occasionally was as small as 3 cents. Here we are concerned not with the characteristically narrow spread, but with its fluctuations. There was no marked change until early January 1929. Thereafter until mid-February, Chicago prices rose faster than Liverpool prices and the spread narrowed. This perhaps reflected a seasonal movement in part; but it seems to have been aided by the facts that American traders were naturally more concerned than others with the prospects for farm relief legislation then being discussed; that it was in the United States that evidence of possible damage to the oncoming winter-wheat crop seemed most convincing; and possibly that the bullish atmosphere of the stock markets exerted a stronger sympathetic influence on the grain markets in the United States than elsewhere. From mid-February to the end of May the Chicago-Liverpool spread tended to widen, though not without temporary interruptions. The general movement reflected the increasingly apparent abnormal situation in visible supplies, weakness (at times) in the stock market, and the reversal in the outlook for winter wheat. By the end of May a spread wide enough to permit free exportation was nearly in evidence; but in the first few days of June a sharp upturn apparently based upon renewed hopes of farm relief narrowed it again. Later the spread was kept narrow in large part because the eyes of European traders were fixed more upon the heavy world stocks and the free export movement from Argentina than was true of traders in North America, who were closer to the unfavorable progress of the North American spring-wheat crop.

The Winnipeg-Liverpool spread narrowed practically throughout the year, until in July the Winnipeg futures sold far above the Liverpool. Up to mid-February, the causes of this narrowing were much the same as those that caused the narrowing of the Chicago-Liverpool spread, with perhaps one outstanding difference. In September and October 1928, Winnipeg prices moved upward slightly more than prices in other markets, probably a reflection of the fact that the grading returns showed a disappointingly small and progressively smaller proportion of the higher

grade, notably No. 1 Northern, which is the only one of the principal grades deliverable without discount on futures contracts at Winnipeg. The tendency for the Winnipeg-Liverpool spread to narrow faster than the Chicago-Liverpool spread was not striking until about the end of March 1929. Possibly the fact that the new-crop outlook remained more precarious in Canada than in the United States or Europe, especially because subsoil moisture was scanty, explains this movement. In June the Winnipeg future rose and thereafter remained above the Liverpool, reflecting the extraordinarily poor progress of the Canadian crop of 1929.

The situation was thus most unusual at the end of the crop year. Never before in post-war years has the Winnipeg July future stood higher in price than the Liverpool July future in June or July—not even in June-July 1924, when the outlook for the Canadian crop was similarly poor. The situation was all the more remarkable in view of the extraordinarily heavy stocks of wheat remaining in Canada. It was one that doubtless could not have existed in the absence of heavy shipments from and abundant supplies of wheat in Argentina, for without these Liverpool prices would presumably have followed the North American movement more closely. On the other hand, it might not have supervened in the absence of such an organization as the Canadian Pool, though this is by no means certain.² Subsequent months have

¹ It cannot be described as a narrow one in the historical sense, at least in recent years; for over the past six years the spread has been comparably narrow in many months of 1923-24 and 1925-26, as well as in the latter half of 1927-28. But the narrow spreads of 1923-24 and 1925-26 were recorded in the presence of short crops in those years; whereas the narrow spread prevailing in most of the 18-month period January 1928 to July 1929 was unusual in the sense that ample supplies of wheat were available within the country. The Chicago-Liverpool spread was wide in the greater part of 1924-25 and 1926-27 and in the first half of 1927-28; these are the years most like 1928-29 with regard to supplies; and hence a wide rather than a narrow Chicago-Liverpool spread would have reflected a normal price situation. The reasons why United States prices were out of line with international prices in 1928-29 have been considered above, and the same line of reasoning explains why they were out of line in the latter half of 1927-28.

² By way of a theoretical illustration one can readily conceive that, quite in the absence of the Canadian Pool, if Canada harvested only 150 million bushels of wheat in a year when other countries harvested crops of average size, the premiums on

brought to light the Pool's belief that Canadian wheat can be and ought to be marketed in such a manner as to bring higher premiums than have obtained on the international markets—whether in every year or only in 1929-30, however, is not clear. And subsequent months have witnessed a continuation of the relationship of Winnipeg and Liverpool futures prices. It remains to be seen how such a theory will work out, either in the long run or in 1929-30, when the Canadian crop is short. There can be little doubt that the change in the Winnipeg-Liverpool spread in June-July 1929 was due partly to the operations of the Pool; we have stressed the poor prospects for the 1929 crop as the dominant cause because there can be even less doubt that it presumably conditioned the Pool's operations, and those of independent traders as well. It was probably the crop outlook that caused the Pool to carry 48 million bushels of wheat out of the crop year 1928-29.

The narrowing of the Winnipeg-Liverpool spread, and indeed the higher futures prices in Winnipeg than in Liverpool, did not completely dry up the export movement either in June-July or in subsequent months. One reason is that the prices of the lower grades of Canadian wheat failed to rise as rapidly as the prices of the higher grades or of futures, and hence the large quantities available of the lower grade remained more freely on an export basis than did the higher grades. Another reason is that a great shortage of hard wheat such as was foreshadowed by the deterioration of the Canadian crop in June-July could hardly fail to enlarge the premiums paid in world markets for hard wheat.

UNITED STATES CASH PRICES

As a result of the distinctly short soft red winter-wheat crop of 1928 in the United States, this variety of wheat brought high premiums as compared with hard red

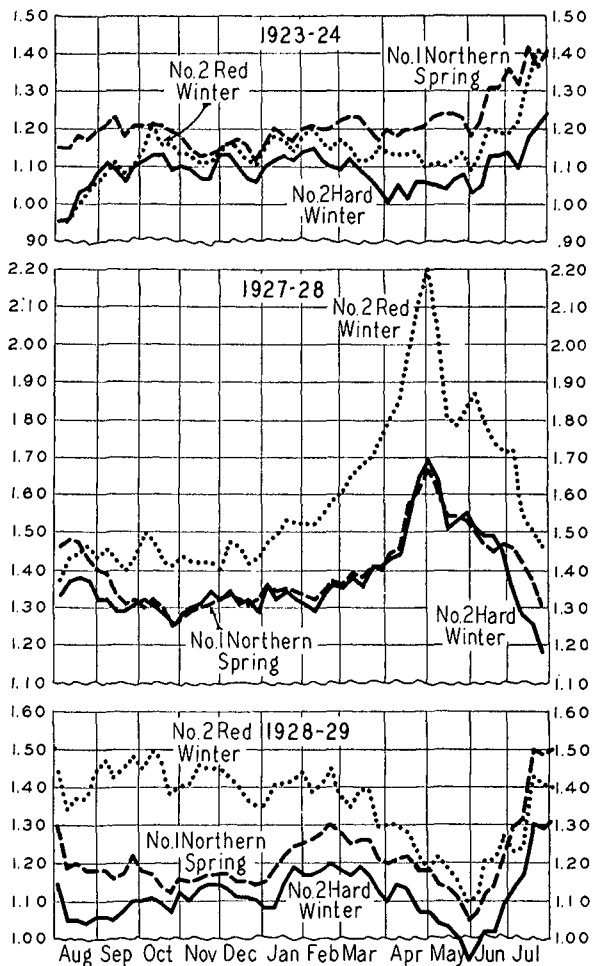
Canadian wheat in the world markets might well be so large that Winnipeg futures should rule persistently higher than Liverpool futures, other wheats than Canadian being then as now deliverable on futures contracts at Liverpool.

¹ Since soft white wheat was in plentiful supply on the Pacific Coast, rather more of this variety than usual was moved eastward by rail, and there was also a fairly large movement of flour made from soft white wheat by water through the Panama Canal to Atlantic ports.

winter and hard red spring wheat during most of the crop year. Chart 22 shows weekly weighted average prices in 1923-24, 1927-28, and 1928-29 of No. 2 Red Winter, No. 2 Hard Winter, and No. 1 Northern

CHART 22.—WEEKLY AVERAGE CASH PRICES OF TYPICAL WHEATS IN UNITED STATES MARKETS, 1923-24, AND FROM AUGUST 1927*

(U.S. dollars per bushel)



* No. 2 Red Winter at St. Louis, No. 2 Hard Winter at Kansas City, and No. 1 Northern Spring at Minneapolis. Data from *Crops and Markets*.

Spring, the grades quantitatively most important in each variety. The relative scarcity of soft red winter wheat led to a considerable amount of substitution of soft white¹ and bleached hard red winter or yellow hard winter for it, but the extent of this substitution was apparently not great enough to eliminate the premiums obtained

by soft red winter. In the course of the crop year, particularly after January, the premium diminished rather rapidly, reflecting distinctly good early prospects for the crop to be harvested in the summer of 1929. In the latter half of 1927-28, the reverse of this had occurred: the premium of soft red winter widened as it became increasingly certain that the soft red winter-wheat crop of 1928 must prove to be a distinctly short one, if only because of the severe winterkilling. In the closing months of 1928-29, the premium on soft red winter disappeared, and one on spring wheat supplanted it. This reflected the new-crop outlook, which was for a short crop of spring wheat in 1929, but a good crop of soft red winter.

Other features of the cash wheat situation in the United States, not shown by the chart, deserve mention. First, cash wheat sold at unusually large discounts under the futures in the principal markets practically throughout the year, a phenomenon traceable to the persistently large commercial stocks, and related to the exceptional premiums of distant futures over the near.¹ This situation was necessarily a favorable one for any dealer in a position to buy cash wheat of contract grade, hedge it in a distant future, and store it for future delivery. It was through this mechanism that visible supplies were built up to such extreme heights; but the building up of stocks is to be regarded rather as a cause than as a result of the wide spreads between cash and futures prices, or between near and distant futures. Second, the crop year was characterized by low or moderate premiums for protein content in both hard red winter and hard red spring wheats; there were no such extreme premiums as prevailed in 1927-28, when at times millers paid as high as 10 cents per bushel for each additional per cent of protein above 11 per cent. The bread wheats of the crop of 1928 were of higher average protein content than those of 1927. This situation was favorable to millers, whose hedging operations provide less adequate insurance when protein premiums are high and fluctuate widely. Fi-

nally, the spread between roughly comparable grades of American and Canadian wheats was never so large as to permit an extensive import business of duty-paid Canadian wheat into the United States over the 42-cent tariff wall; the price of No. 3 Northern Manitoba at Winnipeg was never more than 20 cents below the price of No. 1 Dark Northern Spring at Minneapolis, and in July 1929 it was even 2 cents above.² Only around 80,000 bushels of Canadian wheat were imported duty-paid. The plentiful supply and the cheapness of the lower grades of Canadian wheat and the good market for flour milled from them, however, encouraged relatively heavy duty-free importation for milling in bond. The total imported for this purpose during July-June 1928-29 was 21.68 million bushels, 6.64 million more than in any other year since the tariff duties of 1921 were adopted.³ Without these exports, the reported exports of American flour were low for the crop.

RETURNS TO WHEAT GROWERS

On account of the low wheat prices prevailing in 1928-29, the year was not a remunerative one for wheat producers in many countries of the world. Nevertheless the evidence suggests that it was by no means so unsatisfactory as 1923-24, partly because prices were not so low, but partly because production costs were probably, though not demonstrably, rather lower. The criteria for measuring the remunerativeness of wheat production from year to year in any country are necessarily imperfect, and such comments and data as follow are conditioned by this fact.

In Table 5 we have attempted to set forth the approximate values per harvested acre of wheat produced in various countries annually since 1923-24, using official crop estimates (sometimes corrected) multiplied by annual average prices to reach crop values, and dividing the crop values by the areas (apparently the harvested areas for most countries)⁴ to reach values per acre. The figures are not designed to permit comparisons of values per acre *between different countries*, but only *from year to year in the same country*; for the price data used are terminal prices in some countries but farm prices in others.

¹ See Chart 20, p. 69.

² See Appendix Table XXVI.

³ See Appendix Table XII.

⁴ The acreage figures included are clearly areas sown, not harvested, in Canada.

Australia is the only country of the eight where the value of wheat per acre was lower in 1928-29 than in 1923-24. The total Australian crop of 1928 was a large one, and the total crop value was much larger in 1928-29 than in 1923-24; but the record acreage of 1928 reduced the crop value per acre to a low figure. Even so, it was not so low as in 1927-28, when the total crop was small and the acreage was almost as high.

TABLE 5.—APPROXIMATE VALUES PER ACRE OF WHEAT CROPS IN SELECTED COUNTRIES, 1923-24 TO 1928-29*
(U.S. dollars per acre)

	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29
United States .	12.35	21.05	19.51	18.99	17.93	15.98
Canada	14.53	15.23	25.44	19.74	21.37	18.78
Argentina	15.43	19.84	17.99	17.42	20.32	18.60
Australia	13.42	22.18	16.57	18.82	11.81	12.55
British Isles . .	39.67	52.76	54.14	48.81	44.83	43.62
France	27.29	35.68	34.53	32.54	35.07	34.95
Germany	30.14	38.40	49.48	42.68	45.14	47.07
Italy	23.58	28.01	42.93	37.78	30.57	34.83

* Calculated from official crop estimates (sometimes corrected) multiplied by annual average prices to reach crop values; value figures divided by acreage figures to reach values per acre. The crop estimates used appear in Appendix Table III and in Table 1, p. 45. The prices used are for the United States the official weighted average farm price; for Canada the official farm price; for other countries terminal prices described in Appendix Tables XXVI and XXVII. The acreage estimates used appear in Appendix Table I, except that a lower figure than is there shown for the Argentine area in 1928 was used in order to place the Argentine crop value per acre more nearly on the basis of value per harvested acre.

In the four European countries, Great Britain, France, Germany, and Italy, the value per acre in 1928-29 was much higher than in 1923-24, a result to be attributed partly to good yield per acre and partly to much higher prices.¹ Among these four countries, values were in fact relatively high in 1928-29 in Germany, where the yield per acre of 1928 was the highest in post-war years, and also in France. In

Italy too the value per acre was larger than in 1923-24, 1924-25, or 1927-28, but it was much smaller than in 1925-26. Value per acre of wheat in the United States was likewise the lowest since 1923-24, but considerably higher than in that year. Canada had lower values both in 1923-24 and 1924-25; and Argentina had somewhat lower values in 1923-24, 1925-26, and 1926-27, but not much higher ones in 1924-25 or 1927-28. So far as one may infer from these figures, the crop year 1928-29 was rather more discouraging to producers in Australia than in the other exporting countries, and least discouraging in Argentina. Complaints regarding the low level of prices were numerous in all these countries, and in France, Germany, and Italy at least the complaints led to governmental action in the form of increased tariff duties. Nevertheless the situation of producers could hardly have been as difficult as it was in 1923-24, a year that was followed by reduced acreage in the United States, Argentina, and parts of Europe.²

It is probable, moreover, that in general the operative costs of wheat production (rent of land excluded and yield per acre constant), in so far as they may be said to have changed at all in the past six years, have drifted downward. Practically no conclusive evidence is available, but all are aware of the progress in the use of labor-saving machinery, especially the harvester-thresher combine and especially in the United States³ and Canada, seemingly also in Argentina. All this points in the direction of lower operative costs of producing wheat. If any reduction has occurred, the situation of wheat growers in 1928-29 probably compares more favorably with their position in earlier years, especially 1923-24, than is suggested by the data on values per acre shown in Table 5.

IV. INTERNATIONAL TRADE IN WHEAT AND FLOUR

Several features of the movement of wheat and flour in international trade in 1928-29 were striking. The total volume of trade was unprecedented; net exports approximated 940 million bushels, a quantity over 90 million larger than ever before. The movement exceeded forecasts made early in the year, largely because the true size of exportable surpluses became ap-

parent only in the later months. Canadian exports reached a new high level, as did

¹ See Chart 17, p. 63.

² See above, Charts 3-10.

³ According to official estimates, net costs per acre excluding or including land rent show no definite trend over the past six years, but in 1928-29 were slightly the lowest of the period. See June issues of *Crops and Markets*. These estimates, however, are of costs per acre in which the yield per acre is a variable, and here we speak of operative costs under constant yield per acre.

the Argentine—the result of bumper crops. For the third time in a decade Argentina exported more wheat and flour than the United States. The United States and the Danube countries exported much less than was available for export, and thus enlarged their carryovers greatly. Russia, despite a supposedly fair wheat crop, contributed nothing to the export movement; on the other hand, she failed to import despite reiterated predictions from other sources that imports must become necessary before the crop year closed. For the second time in a decade India was a net importer rather than a net exporter of wheat and flour. Imports into ex-European countries were strikingly heavy, partly because of India's unusual position, partly because wheat prices were so low, partly because China was in a position to import large quantities. Among the European countries, Spain appeared as a net importer of substantial quantities of wheat for the first time since 1921-22. Imports into the Scandinavian and Baltic countries were exceptionally large. Most other European countries imported more moderately, though the importations were in many instances rather heavy in view of the domestic wheat crops and their good quality.

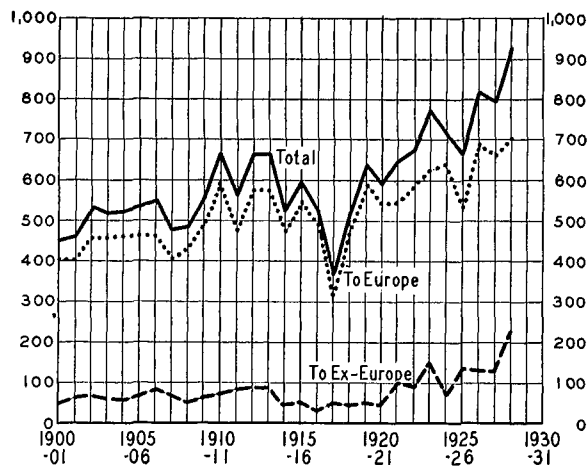
VOLUME AND COURSE OF TRADE

The extraordinary size of the international movement of wheat and flour in 1928-29 is shown graphically in Chart 23, which summarizes Broomhall's records of overseas shipments by crop years since 1900-1901. Shipments in 1928-29 totaled 928 million bushels, over 100 million more than ever before.¹ The growth of trade during the post-war period has been strikingly rapid, reflecting in general not only the growth of wheat consumption and production, but also the more rapid expansion of wheat acreage and production in the exporting than in the importing countries of the world. The extraordinarily high figure of 1928-29 reflects in part the heavy requirements of importing countries (considered as the quantities required regardless of price); in part the greater concentration of the huge crop of 1928 in exporting than in importing countries; and in part the low prices prevailing throughout the year. The total volume of trade in

1928-29 was above the line of post-war trend for much the same reasons as were effective in 1923-24. As the chart shows, it was the movement to ex-European rather than to European destinations that was exceptional, trends considered; and so it was in 1923-24.

CHART 23.—BROOMHALL'S SHIPMENTS OF WHEAT AND FLOUR, BY CROP YEARS FROM 1900-1901*

(Million bushels)



* Data from Broomhall's *Corn Trade Year Books* and *Corn Trade News*.

A large volume of trade as compared with earlier years was generally foreseen in the early months of 1928-29, but not so large a movement as actually transpired. From August 7, 1928 to February 12, 1929, Broomhall maintained his estimate of importers' purchases² (or probable shipments) at 840 million bushels or below, or some 88 million bushels or even more below the figure finally recorded. Our own estimate, reached in December 1928, was for net exports of 900 million bushels; somewhat incomplete data now point to actual net exports of 940 million.³ Our

¹ The figure for 1928-29, however, is for shipments during 53 weeks, as in several other years, the most recent of which was 1923-24.

² See Appendix Table XI.

³ Net exports always exceed Broomhall's shipments (for some of the reasons see *WHEAT STUDIES*, November 1927, IV, 10-12, and August 1928, IV, 340), but the discrepancy has tended to grow smaller in recent years. The discrepancy is especially small in 1928-29 partly because shipments are for 53 weeks. For the past eight years, net exports compare with overseas shipments as follows, in million bushels. Both sets of figures show the international trade of 1928-29 to

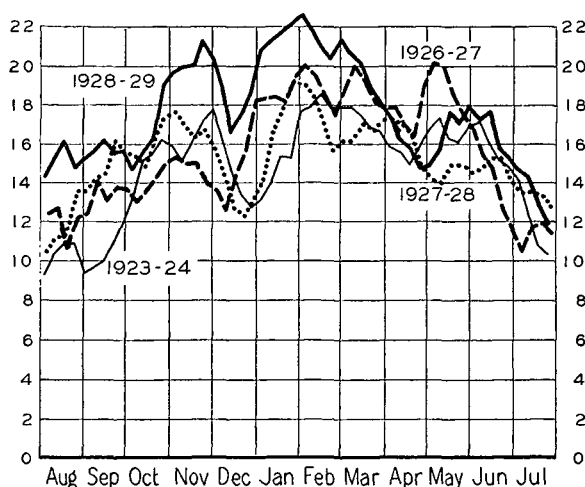
own early forecasts, and those of Broomhall and the United States Department of Agriculture as well,¹ were farthest from the mark as regards Argentine exports. It was not until rather late in the crop year that the full size of the Argentine crop came to be recognized. Our forecasts of Canadian exports proved appreciably too high; we failed to anticipate the crop developments that toward the end of the year caused Canadian prices to rise more rapidly than prices elsewhere and tended to divert Canadian wheat to the upbuilding of stocks rather than to export channels.

Chart 24 shows the course of Broomhall's shipments in recent years of heavy trade, in terms of three-week moving averages of weekly data. Each year the movement is in some respects different from what it was in any other year. Yet there is usually a peak in October or November, a trough in December, a higher peak in January or February, a trough in April or early May, a minor peak in May, and another (and the deepest) trough in July or August. The course of shipments in 1928-29 showed these customary changes, and thus was not a peculiar one, especially by comparison with 1926-27, a year when a great bulge in ocean freight rates in September-December 1926 caused shipments to be unusually small in the first half of the crop year and unusually large in the second half. The most striking feature of the movement in 1928-29, aside from the extraordinarily high level characteristic of the year, was perhaps the noticeable concentration of the year's shipments in the first seven months; in the last five months shipments were not

unusually large. This concentration suggests that importers purchased wheat freely while prices remained stable, but

CHART 24.—INTERNATIONAL SHIPMENTS OF WHEAT AND FLOUR, WEEKLY, 1923-24, AND FROM AUGUST 1926*

(Million bushels; 3-week moving average)



* Broomhall's data, from the *Corn Trade News*.

bought more cautiously both on the decline in prices during March-May and on the sharp rise during June-July.

SOURCES OF EXPORTS

Total net exports of wheat and flour in 1928-29, at about 940 million bushels, were by far the largest in history. Net exports by countries are shown in Table 6 (p. 80). Two of the leading exporting countries, Argentina and Canada, made exports of unprecedented size. Even in these countries, as we have seen, the carryovers were built up in spite of the record flow of wheat to export; but exports from the United States and the Danube countries were small, size of crops and exportable surpluses considered, and here the carryovers were more strikingly enlarged than in Argentina or Canada.² In the absence of net exports from India and Russia, and with exports from the Danube basin, Australia, and "other countries" only moderately large, the percentage of total net exports furnished by North America and Argentina was unusually high. Argentina, however, was the only country which in 1928-29 ex-

have exceeded trade in other years so far that close comparisons are superfluous.

Year August-July	Net exports ^a	Broomhall's shipments ^b
1921-22.....	697	647
1922-23.....	711	676
1923-24.....	823	775
1924-25.....	768	715
1925-26.....	692	668
1926-27.....	846	818
1927-28.....	815	793
1928-29.....	940	928

^a See Table 6, p. 80. Partially estimated, especially with reference to Russian exports.

^b See Appendix Table XV.

¹ See WHEAT STUDIES, May 1929, V, 212, for forecasts of the volume of international trade in 1928-29 that were current before and around May 1, 1929.

² See above, pp. 56-62.

ported a larger proportion of total world net exports than ever before. At 224 million bushels, Argentine net exports exceeded American exports by 74 million bushels. In both 1919-20 and 1923-24 Argentina exported more wheat than the United States; but in these years only 26 and 45 million bushels more, respectively. The importance of Argentina as a source of exports was in many ways more striking in 1928-29 than in earlier years.

TABLE 6.—NET EXPORTS OF WHEAT AND FLOUR FROM PRINCIPAL EXPORTING COUNTRIES, AUGUST-JULY, 1923-29*
(Million bushels)

Exporting area	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29
United States .	127	256	103	199	184	150
Canada	346	192	324	292	332	406
Argentina . . .	172	123	94	143	178	224
Australia . . .	86	124	77	103	71	109
India	20	38	8	12	9	... ^a
Danube basin ^b	34	26	45	45	32	37 ^c
Russia	21 ^d	...	27 ^a	49 ^d	... ^e	... ^f
Other countries ^g	17	9	14	3	9	14
Total	823	768	692	846	815	940

* See Appendix Table XVI for sources and further details.

^a Net import of 25 million bushels.

^b Bulgaria, Hungary, Jugo-Slavia, and Roumania.

^c Partially estimated.

^d July-June.

^e Exports from Russia during July-June 1927-28 totaled 7 million bushels; but there were imports in July, and for the August-July crop year we assume that imports equaled exports.

^f Probably a small net import.

^g Includes Morocco, Algeria, Tunis, Chile, Spain, and Poland, for the years in which these countries were net exporters.

Net exports (not including shipments to possessions) from the United States in 1928-29 were decidedly small in view of the large crop of 1928 and an inward carryover of average size. As appears from the data summarized in Table 6, net exports from the United States were smaller in both 1923-24 and 1925-26 than they were in 1928-29; but these, especially 1925-26, were years of relatively small wheat crops, whereas the crop of 1928 was the largest since 1919. In all three of these years domestic prices were too high in relation to international prices to permit wheat to flow freely to export. But only in 1928-29 was the restricted export movement ac-

companied by a great upbuilding of domestic wheat stocks, and these developments stamp the year 1928-29 as a most unusual one in the United States. As we have seen, Argentine wheat was both plentiful and cheap in 1928-29, and the factors that make for firm holding were not present in Argentina as they were in the United States.

American exports of wheat rather than of flour were notably small. Flour exports in terms of wheat were 63 million bushels, about the same as in 1924-25, 1926-27, and 1927-28, but 18 million larger than in 1925-26 and 17 million smaller than in 1923-24. Despite their fair size, however, the flour exports of 1928-29 might have been considerably larger, as in 1923-24, in the absence of so much low-grade wheat in the Canadian crop. China purchased an unusual amount of flour in 1928-29, but obtained relatively more from Canada than from the United States as compared with 1923-24,¹ when the Canadian wheat crop consisted much more largely of the higher grades. The United States flour exports of 1928-29 contained more flour made from Canadian wheat than in any of the preceding five years—probably, in terms of wheat, around 6 million bushels more.²

The exports of wheat grain by classes from the United States in the past six crop years (July-June) have been as follows, in million bushels, according to estimates of the United States Department of Agriculture.³

July-June	Hard red spring	Durum	Hard red winter	Soft red winter	White	Total
1923-24	2	19	27	11	20	79
1924-25	21	34	121	8	11	195
1925-26	5	27	10	2	19	63
1926-27	2	22	73	31	28	156
1927-28	6	31	65	14	30	146
1928-29	2	45	38	3	15	103

Exports of durum, 45 million bushels in 1928-29, constituted a larger proportion of the total than in any other year, and in absolute amount were the largest on rec-

¹ See Appendix Table XVIII.

² See Appendix Table XII, which shows the quantities of Canadian wheat withdrawn annually for milling in bond since 1921-22.

³ These estimates appear for the first time in 1929; the data above are from *Foreign News on Wheat*, October 21, 1929, p. 11.

ord. The durum crop was of record size, and apparently the general price situation had little effect on the export movement of this variety of wheat. It had likewise relatively little effect upon the movement from the Pacific Coast, even though exports of white wheat of 15 million bushels were rather small in view of the fairly large crop; for flour exports from the Pacific Coast were large. The small exports of soft red winter wheat, only 3 million bushels, were not surprising in view of the fact that the crop of this type was an extremely short one in 1928; nor were the negligible exports of hard red spring wheat unusual, even in view of the large crop. Apparently the price position that in general tended to restrict the total export movement of American wheat and flour in 1928-29 had its most striking effect upon the movement of hard red winter wheat. Of this variety there was a bumper crop of 384 or more million bushels; but a smaller crop of some 360 million bushels in 1926 had provided exports of 73 million bushels as against only 38 million in 1928-29.

The seasonal movement of United States exports was in a few respects unusual in 1928-29. It was not marked by so exceptional a concentration of exports in the first half of the crop year as occurred in 1927-28.¹ The concentration was in fact rather heavy in the second half of the crop year. There were unusually heavy net exports in the month of May,² when more wheat and flour was shipped than in any other May in the preceding seven years. An increasing spread between Chicago and Liverpool prices³ may have been the cause of this unusual feature of the seasonal export movement; but it may have been due also merely to the opening of navigation on the Great Lakes and release of durum

wheat stored in Duluth-Superior. Another feature of the seasonal course of exports was that the peak for the crop year came in October 1928, later than in any other recent year except 1924-25; this probably reflects the exceptional proportion of durum, a relatively late-harvested wheat, in the export movement of the crop year. A third feature was the relatively large movement of flour in January-March, when (as in 1923-24) Chinese purchases were heavy.

Canadian net exports of 406 million bushels were of record size, some 60 million bushels larger than ever before. The huge crop and the inward carryover of unprecedented size predicated a tremendous export movement; but even larger exports might have been made in the absence of such developments as occurred late in the crop year. Net exports during April-July 1929 totaled 92.0 million bushels, as against 102.9 million in the same months of 1924, and 83.9, 82.4, and 106.4 million in 1926, 1927, and 1928 respectively; the quantity looks relatively small in view of the huge crop of 1928 and the heavy stocks remaining in Canada on March 31. During these months, as we have seen, the spread between Winnipeg and Liverpool prices was narrowing and Canadian wheat, especially of the higher grades, was naturally purchased more sparingly by foreign importers and was held more tightly by exporters. In the course of the year a record quantity of wheat and flour, 108 million bushels, was exported from Vancouver,⁴ but the proportion of the total exports handled by this port was only a trifle larger than in 1927-28.

Argentine net exports of 224 million bushels were also of record size, some 46 million larger even than those of 1927-28. They were the result of an abnormally large inward carryover combined with a huge crop. The seasonal flow of exports⁵ was unusual. In August-December net exports totaled 55.6 million bushels, over 20 million bushels more than in the same months of any of the preceding seven years, a reflection of the relatively large stocks remaining in the country on August 1, 1928. In January-April 1929 the total net exports were not exceptionally large by comparison with earlier years. In the aggregate they reached 104.5 million bushels, about

¹ The percentages of total net exports leaving the United States in the first and second halves of the past seven years are as follows:

Year	July-June	July-December	January-June
1922-23	66.5	33.5
1923-24	65.2	34.8
1924-25	70.6	29.4
1925-26	53.7	46.3
1926-27	66.6	33.4
1927-28	77.6	22.4
1928-29	63.5	36.5

² See Appendix Table XIX.

³ See above, Chart 21, p. 73.

⁴ See Appendix Table XIII.

⁵ See Appendix Table XIX.

2 million less than in 1928, and only 15 and 13 million more than in 1924 and 1927 respectively. During these months no official estimate of the Argentine crop of 1928 was available, and one could hardly infer from the export statistics that it was appreciably larger than the crop of 1927. In May-July, however, net exports of 63.8 million bushels were over 20 million bushels larger than in 1928 and over 15 million larger than in 1924, and it became increasingly apparent that a wheat crop large enough to furnish such exports must be a bumper one. As we have pointed out above,¹ the evidence suggests that in spite of heavy exports stocks were built up in the course of the year, and that there was no strong tendency to hold back wheat from export as there was in the United States or Canada.

Australia exported net 109 million bushels of wheat and flour as wheat, rather more than in 1926-27, but considerably less than in 1924-25, years in which the crops were of similar size. Like Argentine exports, the Australian in August-December were larger than usual, reflecting rather heavy stocks on August 1, 1928. Australian wheat moved fairly rapidly to export in January-April, though not so rapidly as in 1925, when prices were much higher; but they were distinctly small in May-July, possibly because prevailing drought made the new-crop outlook unfavorable and encouraged a tendency to hold for higher prices, but possibly also because the market for Australian wheat in India contracted somewhat when the new Indian crop became available in March-May 1929. Australia enjoyed a wider market for wheat in India in 1928-29 than in any other post-war year.

India was a net exporter of wheat and flour only in the first three months of the crop year, and in these months her exports were small. For the year as a whole, Indian net imports totaled 24.8 million bushels. In 1921-22 also India had been a net importer. In that year the 1921 crop of 250 million bushels was 40 million smaller than the crop of 1928, so that the net imports in 1921-22, 13.8 million bushels, seem surprisingly small by comparison with those of 1928-29. But prices were higher in 1921-

22, and the short crop of 1921 followed and was followed by decidedly large crops, whereas the crop of 1928 followed and was followed by crops of rather small size. India drew almost all of her imports from Australia, but a few cargoes were brought from Canada and Argentina.

In 1928-29 Russia remained, as in 1927-28, neither definitively a net exporter nor a net importer of wheat. For the August-July crop year she was possibly a net importer, for a few million bushels of wheat appear to have been imported in August 1928.² Practically throughout the crop year statements appeared tending to show, or flatly to predict, that Russia must import rather heavily, despite her fair crop. For the most part this view was based on the fact that there was difficulty in collecting wheat for use in the consuming regions, to an extent that resort was had to the use of bread cards. Precisely why imports failed to be made is not clear; but one may mention on the one hand the governmental policy of avoiding imports of foodstuffs, and on the other the difficulties involved in obtaining foreign credits.

Exports from the Danubian countries as a group, some 37 million bushels, were strikingly small in view of a wheat crop over 70 million bushels larger than in any other post-war year. In our judgment the relatively small export movement is not to be explained merely by the short corn crop of 1928, but also, and to a greater extent, by a tendency for peasants to hold that resulted in a great increase of wheat stocks in the course of the year.³ The situation differed between the four countries. Hungary exported net some 26 million bushels, a quantity more consistent with the size of her crop than was true elsewhere, and the largest in post-war years. Jugo-Slavian exports made up most of the balance, but were smaller than in 1924-25, 1925-26, or 1926-27, though the crop of 1928 exceeded the crops available in these years by 46, 25, and 32 million bushels respectively. Seemingly it was in Jugo-Slavia that stocks were most extensively built up during 1928-29. Wheat from the Danube region was apparently not high in protein content in 1928-29, and this may in some part account for the restricted export movement, especially because Danubian wheat had to compete in some degree with the cheap low-grade

¹ See pp. 58-59.

² See *WHEAT STUDIES*, December 1928, V, 84.

³ See above, pp. 59-60.

Canadian wheats that were high in protein content.

Algeria, Morocco, and Tunis furnished practically all of the 14 million bushels of wheat and flour shown as exported by "other countries" in Table 6. Chile supplied little, and Spain and Poland were net importers. Of the three exporting countries of northern Africa, only Tunis appears to have exported an unusual quantity of wheat in 1928-29.

DISTRIBUTION OF IMPORTS

The outstanding feature of the distribution of imports in 1928-29 was the volume of ex-European takings. Broomhall's shipments to Europe, to ex-Europe, and in total were as follows, in million bushels, with comparisons:

August-July	To Europe	To ex-Europe	Total
1923-24 ^a	626	149	775
1924-25.....	640	75	715
1925-26.....	532	135	668
1926-27.....	683	132	815
1927-28.....	662	131	793
1928-29 ^a	703	225	928

^a For 53 weeks.

According to these data, ex-European countries imported some 76 million bushels more in 1928-29 than ever before, while European countries imported only 20 million more. Even with allowance for the unusual position of India as a net importer in 1928-29, the ex-European countries that are normally net importers took record quantities. Broomhall's shipments to India were 27.6 million bushels; and India's net imports were 24.8 million; hence shipments of roughly 200 million bushels went to other countries, or around 50 million more than ever before.

It is impossible to secure an altogether adequate insight into the distribution of imports. Net imports statistics are not available for all countries, and if they were, total net imports would probably never equal total net exports. One cannot analyze net exports by destinations, partly because of the manner in which official statistics are presented, partly because there are always large shipments to "orders" (without designated final destinations) mostly from

Argentina. The following tabulation shows the sum of net exports to ex-European destinations as compiled from official statistics of the four major exporting countries, the sum of net exports from all the exporting countries (except Uruguay), and the difference between these totals, which may be regarded as an approximation to the total net exports destined to Europe. The tabulation (in million bushels) is not an entirely satisfactory one because net exports to ex-Europe are for July-June crop years, while total net exports are for August-July crop years.¹

Crop year	Total net exports	Exports to ex-Europe	Exports to Europe
1923-24.....	823	164	659
1924-25.....	768	96	672
1925-26.....	692	132	560
1926-27.....	846	126	720
1927-28.....	815	135	680
1928-29.....	940	207	733

Like Broomhall's data, these figures show that the movement to ex-Europe rather than to Europe was exceptional in 1928-29. In other respects the two sets of data are not consistent; in particular, our own calculation suggests that ex-European takings, with allowance for India's unusual position, were not so much larger in 1928-29 than in 1923-24 as Broomhall's figures indicate. Nevertheless they were considerably larger, and the movement of wheat to ex-Europe in 1928-29 is clearly to be described as extraordinarily large. Neither Broomhall's figures nor our own are as large in any year as total net imports of ex-European countries would be; for European countries ship to ex-Europe a good deal of flour of which both compilations take no account. Our own figures certainly understate the total movement to ex-Europe and overstate the movement to Europe.

The principal ex-European importing countries or groups of countries are ordinarily China, Japan, Brazil, Egypt, the West Indies, and South Africa. All of these

¹ For total net exports see Table 6, p. 80. Exports to ex-Europe are summations of exports from the United States, Canada, Argentina, and Australia not only to the principal ex-European importing countries shown in Appendix Table XVIII, but to a long list of others as well.

except Japan, South Africa, and possibly China imported more wheat and flour than in any other post-war year.¹ Japanese net imports, however, were larger both in 1923-24 and 1925-26. South African imports were larger in 1927-28. Chinese imports were probably not so large as in 1923-24; at least exports from North America and Australia to China were 37.24 million bushels in 1928-29 as against 50.51 million in 1923-24, and it seems improbable that China imported enough flour from Japan in 1928-29 to bring her total imports up to those of 1923-24. Nevertheless Chinese imports were heavier than in other years, and in considerable part her takings account for the record volume of ex-European trade in 1928-29. Low international wheat prices, a short crop of wheat and other cereals in the northern provinces near the port of Tientsin, and greater stability of government with attendant relative ease of transportation, together seem to account for the heavy Chinese imports, especially by comparison with the immediately preceding years. It is impossible to determine which of these factors—or others—may have been most effective.

Egyptian imports were of record size. Some of the other ex-European countries imported much more wheat and flour than in 1923-24, and only a little more than in 1927-28; still others imported only a little more than in 1923-24, but considerably more than in 1927-28. Brazil exemplifies the former, the West Indies the latter. The statistical information upon which inferences must rest is too insecure to warrant detailed analysis. In Brazil at least it is probable that low prices were not so effective in causing heavy imports as was the growth of population and of preference for wheaten bread, but in many other coun-

tries and dependencies low prices were probably the major stimulus.

A noteworthy feature of ex-European trade was the heavy movement from Canada. Some 58 million bushels of Canadian wheat and flour as wheat passed to ex-European destinations in July-June 1928-29, as against the next largest quantity of 38 million in 1925-26. Some 22 million bushels went to Japan in the form of wheat, largely displacing wheat from the United States; and China took 8.6 million bushels of wheat grain, as well as the large quantity of 13.9 million bushels of flour as wheat. With India requiring imports, Australia also exported an unusual amount of wheat to ex-Europe, some 70 million bushels or 64 per cent of her total net exports.

Table 7 summarizes the net imports of European countries for the past five crop

TABLE 7.—NET IMPORTS OF WHEAT AND FLOUR BY PRINCIPAL EUROPEAN IMPORTING COUNTRIES, AUGUST-JULY, 1924-29*
(Million bushels)

Importing area	1924-25	1925-26	1926-27	1927-28	1928-29
British Isles ^a	227.9	209.9	237.2	232.2	219.3
Italy	88.7	67.9	86.6	87.7	87.4
Germany	80.9	57.4	91.8	88.5	77.6
France	58.5	10.3	62.3	47.1	54.4
Belgium	39.0	39.2	39.5	41.8	41.9
Netherlands	26.8	27.2	28.5	31.0	30.0
Scandinavia ^b	22.7	18.8	19.5	26.2	33.9
Switzerland	13.9	15.6	16.3	18.4	16.6
Austria	16.0 ^c	14.7 ^d	16.9	16.5	14.6
Czecho-Slovakia	21.5	21.7	20.1	21.4	17.4
Poland	17.1	... ^e	8.1	8.6	2.5
Baltic States ^f	7.3	7.8	7.7	8.7	11.2
Spain	0.8	... ^g	... ^g	2.9	20.0 ^h
Greece	20.8	18.8	19.4	19.5	22.2
Total	641.9	509.3	653.9	650.5	649.0

* See Appendix Table XVI for sources and further details.

^a Includes Irish Free State.

^b Norway, Sweden, Denmark.

^c Partially estimated.

^d July-June.

^e Net export of 4.6 million bushels.

^f Finland, Latvia, Estonia.

^g Net exports of .7 and 1.0 million bushels for 1925-26 and 1926-27 respectively.

^h Partially estimated. Imports during August-December were 8.2 million bushels.

¹ See Appendix Tables XVI and XVIII.

² The totals here given are not adapted for comparison with our rough estimate of net exports to European destinations as shown above, for our estimates necessarily are larger than a complete summation of European net imports would be; and the net import statistics themselves are incomplete, notably because adequate data are not available on the net imports of Portugal, Albania, Malta, Turkey in Europe, and various principalities. Total net imports of Europe in 1928-29 would fall somewhat below total net exports to Europe if only because an exceptional amount of Canadian wheat (included as a net export from Canada) remained in lake and Atlantic ports of the United States on July 31, 1929.

years. The total in 1928-29, some 649 million bushels, was of much the same size as in 1924-25, 1926-27, and 1927-28; these data also suggest that European importation was not notably heavy in 1928-29² by com-

parison with earlier years. The total European net imports were heavy, however, in view of the large size and good quality of the wheat crop of 1928 in most of the countries concerned. If prices had been the same in 1928-29 and 1927-28, even with allowance for growth of wheat consumption, one would hardly expect imports to have been as large in 1928-29 as they were in 1927-28; for the crop of 1928 was some 44 million bushels larger than that of 1927,¹ and was of much better quality. In general the lower prices of 1928-29 appear to have stimulated importation of wheat into some European countries, but by no means in all. Imports in 1928-29 were as large as they were partly because Spanish imports, ordinarily very small, were large in 1928-29, perhaps around 20 million bushels. On the whole we are disposed to ascribe the fairly heavy European net imports of 1928-29, size and quality of crops and trend of utilization considered, not so much to any stimulus afforded to human or animal consumption of wheat by low wheat prices as to a situation which in France and Italy especially led to an increase of stocks. The inference is supported by the following brief analysis of imports by countries, imperfect as it must be in view of the scanty evidence on many factors affecting imports, notably variations in the quality of domestic wheat crops.

Net imports of the British Isles were rather small, only 219.3 million bushels. The domestic wheat crop was also a small one, and not so much of it as usual was marketed from farms.² Probably the relatively small imports of 1928-29 are to be explained partly by a tendency for per capita bread consumption to decline in the British Isles, but in part also by the general course of prices over the crop year. Almost throughout the year the situation was such that British importers might reasonably expect prices to decline somewhat, though the level was low in April and May 1929; and these were the months when imports (seasonal tendencies considered) were largest. The advance of prices in June-July was so

rapid as to justify one in inferring that importers curtailed their purchases; and in these months British imports were notably small for the time of year. On the whole it is reasonable to suppose that hand-to-mouth buying was exceptionally in evidence in 1928-29, that this accounts in considerable part for the rather small net imports, and that stocks were somewhat reduced in the course of the year. Low prices failed to stimulate British imports, on the whole probably because even lower prices were anticipated in many months of the year.

For the year as a whole, British wheat imports contained an unusually large percentage of wheat from Argentina, and an unusually small percentage from North America but especially from the United States. Imports from India were naturally a very small proportion of the total, since India was a net importer during most months. The following tabulation, based on official import statistics, shows the origin of British imports (wheat as grain only) in terms of the percentages of the annual totals supplied by the various exporting countries during the past six August-July crop years:

Exporting countries	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29
United States ^a	7.6	19.8	13.2	16.4	17.8	9.5
Canada ^a	50.6	37.1	50.9	49.3	44.3	46.9
Argentina . .	22.5	14.3	15.4	15.1	20.9	27.5
Australia . . .	8.7	14.0	11.7	11.2	10.8	12.2
India	7.2	12.7	1.7	3.0	4.6	.5
Others	3.4	2.1	7.1	5.0	1.6	3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

^a These figures are estimated. British import statistics show as imports from the United States a great deal of Canadian wheat shipped through the United States. In order to approximate more closely the imports from each country, we have taken as the imports from the United States the quantities of United States wheat officially recorded in American statistics as exported to the United Kingdom. Figures for imports from Canada were reached by subtracting, from the imports from the United States and Canada together, these exports of American wheat to the United Kingdom. Such adjustment, of course, is only approximate.

These figures are of interest in connection with the international price situation, and illustrate the manner in which British millers adapt their mill mixes in accordance with available supplies and prevailing prices.³ Both Canada and the United States

¹ See Table 1, p. 45.

² We infer this from data on farmers' deliveries as published in the *Corn Trade News*; according to these data some 2 million bushels less wheat were marketed in 1928-29 than in any other post-war year.

³ See above, p. 66.

had large enough supplies available to have exported more wheat to the United Kingdom than in fact they did, were it not for a price situation that favored British importation of Argentine wheat. Moreover, indirect evidence is available to show that British importers took less of the higher grades of Canadian wheat as the year wore on, for the lower grades proved more attractive when prices of the higher grades rose with greater rapidity than those of the lower grades.

Italian net imports of 87.4 million bushels were strikingly large in 1928-29, about as large as in any other year since 1922-23, despite a decidedly big wheat crop in 1928. We see little reason to suppose that the short crop of corn tended noticeably to stimulate either wheat consumption or wheat importation. Domestic wheat seems to have been dear as compared with imported wheat because farmers restrained their marketing in the hope and expectation of higher prices to be brought about by increases of the tariff.¹ The result was that stocks of domestic wheat were built up in the course of the year, while importation was heavy. Doubtless more wheat was actually consumed in Italy in 1928-29 than in 1927-28, but not enough more to account for an increase in apparent domestic utilization (crop plus net imports) amounting to some 33 million bushels.²

German net imports of 77.6 million bushels were not large by comparison with those of several earlier years, but were strikingly so in view of the record post-war domestic wheat crop of 1928, which was more than 20 million bushels larger

than any other. The import figure was high partly because much more wheat than usual was imported in July 1929 in anticipation of an increase in the tariff.³ But since stocks of domestic wheat were not built up in the course of the year, the heavy imports of 1928-29 in part reflected low wheat prices and an increase in per capita wheat consumption that appears to be more marked in Germany than in any other large European nation.

French net imports of 54.4 million bushels were only moderately large. As in Italy, however, imports were stimulated by the cheapness of foreign wheat as compared with domestic; French producers also tended to hold back their wheat from market in anticipation of higher prices to be brought about by increases in the tariff duties,⁴ and stocks of domestic wheat were built up. There is no evidence that consumption was notably heavy in 1928-29, despite the fact that on December 4, 1928, admixture of other cereals with wheat in flour was made optional, and millers were allowed to produce a pure wheat flour of whatever extraction they chose.

Among the minor importing countries, Belgium, Holland, Switzerland, Austria, Czecho-Slovakia, and Poland imported but little more or even somewhat less than in most earlier years. These countries harvested relatively large crops of good quality. In most of them apparent domestic utilization stood at a rather high level in 1928-29, but not at a level high enough to warrant the inference that either consumption or importation was greatly stimulated by low wheat prices. Indeed, stocks were probably somewhat increased. The situation was different in the Scandinavian and Baltic countries; here both net imports and apparent domestic utilization were extraordinarily large in 1928-29. There may have been more utilization of wheat for feed in Denmark than usual, but possibly not elsewhere. The heavy importation and apparent consumption in these countries seem to have reflected not only the low wheat prices and the rather small crops of rye,⁵ but also a continuing tendency for wheat to displace rye in the diet, as in Germany. Yet there was probably room for some increase in stocks; and this may have occurred also in Greece, whose net imports were larger than ever before in post-war years, 22.2 million

¹ The tariff duty on wheat was raised from 7.50 gold lire per 100 kilograms to 11.00 lire on September 14, 1928, and again to 14.00 lire on May 23, 1929. Duties on flour were increased from 11.50 to 16.75 to 20.30 lire on the same dates.

² See Appendix Table XXVIII.

³ This increase was effective July 10, 1929. The general rate of 5 reichsmarks per 100 kilograms on wheat standing since August 1, 1926, was replaced by a general rate of 7.50 and a conventional rate of 6.50. The conventional import duty of 11.50 reichsmarks per 100 kilograms of flour, standing since September 6, 1927, was canceled at this time, and for it was substituted a general rate of 14.50 reichsmarks, which also supplanted the earlier general rate of 12.50 reichsmarks.

⁴ On May 23, 1929, the duty on wheat was raised from 35 to 50 francs per 100 kilograms; on flour of 70 per cent extraction or over, from 60 to 80 francs.

⁵ See Appendix Table IV.

bushels, although her crop was likewise the largest since the war.

INTERNATIONAL TRADE IN WHEAT FLOUR

The events of 1928-29 served further to illustrate the tendency of international trade in wheat to increase more rapidly than trade in wheat flour, as a result of tariff and other barriers raised by many importing countries in order to foster their domestic milling industries and to secure mill offals for feed. As we have seen, the volume of international trade in wheat and flour combined in 1928-29, as measured by total net exports, was about 940 million bushels, nearly 120 million bushels more than in 1923-24. But the volume of trade in wheat flour alone, as measured by gross exports, was about 43.1 million barrels in 1928-29, some 5 million barrels smaller than it was in 1923-24. The following figures, in million barrels, show gross exports of flour for the past six years, according to somewhat incomplete data of the International Institute of Agriculture:

1923-24	.....	48.1	1926-27	.....	38.2
1924-25	.....	45.0	1927-28	.....	37.3
1925-26	.....	38.3	1928-29	.....	43.1

It is true that trade in flour in 1928-29 was much heavier than in any year since 1924-25, some 6 million barrels heavier than in 1927-28. But even with wheat prices almost as low as those of 1923-24, the flour trade of that year was not approached, an outcome hardly to be expected if the level of wheat prices and growth in demand for flour in importing countries were the only factors affecting the volume of trade in flour.

The volume of trade in flour proved as large as it did only because certain ex-European countries were encouraged, largely by low prices, to purchase more flour than usual. Among these were Egypt, the West Indies, and China, though China possibly took very little more than in 1923-24.¹ Japan took almost no flour, but imported wheat heavily; here, and in Brazil and South Africa as well, tariffs designed to encourage the importation of wheat rather than of flour are palpably having the desired effect. Among the principal net flour importers of Europe—the British Isles, Holland, Austria, Czecho-Slovakia,

and Finland—all but Finland imported rather small quantities in 1928-29. The small imports of Great Britain and Holland probably represent in part increased efficiency of the domestic milling industries, but in part, as in 1927-28, an advantage of domestic millers over the millers of distant flour-exporting countries in the form of prevailing high prices of mill offals in relation to wheat. Offals cannot be shipped advantageously over long distances, while wheat can be. The rather small net imports of Austria and Czecho-Slovakia, however, represent in some part the cumulating effect of tariffs designed to encourage wheat imports at the expense of flour imports. The course of events was similar in Poland, where net imports were negligible; in Greece, where imports were the smallest in seven years; and in Germany also, which even became a net exporter of flour for the first time since the war. In addition to Finland, a few other countries of Europe took fairly large quantities of flour in 1928-29. These were Norway, Sweden, Denmark, and France; but the quantities imported into these countries were not large enough to counterbalance the small quantities imported elsewhere in Europe. On the whole European imports of flour in 1928-29 were rather small, while ex-European imports were large.

Among the countries which are normally the leading net exporters of flour—the United States, Canada, Australia, Hungary, Japan, and Argentina—three exported (net) record quantities of wheat flour in 1928-29. These were Australia, Japan, and Hungary. The large exports of Australia, over half a million barrels larger than in any other post-war year, represent on the one hand her large wheat crop, on the other a strong ex-European demand for flour, especially in India and Egypt. Japan exported net over a million barrels more than

¹ See Appendix Tables XVII and XVIII. One can only infer what total Chinese imports may have been. In 1923-24 exports to China from the principal sources, the United States, Canada, and Australia, were 30.3 million bushels of flour as wheat, as against 25.9 million in 1928-29. In the interval of years Japan has become an important source of Chinese flour imports; but even if one adds to exports to China from the other three sources the total net export of Japan, the total indicated imports of China in 1928-29 are only 36.7 million bushels, a figure too high because not all of Japan's net exports go to China.

ever before, in part a reflection of the continued development of the Japanese milling under tariff protection, in part of large sales to China despite a boycott that reached its height in about April 1929. Much of the Japanese flour went to the leased territory of Kwantung, and was thence sent northward into Manchuria. Large exports from Hungary were facilitated not only by the big wheat crop, but also by continued efforts of the Budapest milling industry to improve its efficiency and to regain markets lost during and since the war. Argentine flour exports were only of moderate size; her trade with ex-Europe is never extensive. Canadian net exports of 11,730 thousand barrels were the largest since 1923-24, and within 203 thousand barrels of the exports in that year; but they were large only because the small volume of business with Europe was more than compensated by the heavy trade with China in low-grade flours. Canada exported to China over 100 per cent more flour than in any other post-war year. Net exports from the United States were relatively small, some 13,326 thousand barrels, a quantity somewhat in excess of the exports of 1927-28 and much in excess of those of 1925-26, but otherwise the smallest in the past nine years. An exceptional quantity of the net exports of flour from the United States was milled in bond from Canadian wheat; hence exports of flour milled from domestic wheat in 1928-29 may have been smaller than in any of the past nine years except 1925-26. The ability of Canada to compete with low-grade flours in the Orient and the general high level of United States wheat prices, as compared with other wheat markets during most of the crop year, were the principal causes of so small a flour export movement in the face of a large wheat crop. Probably the competition of low-grade Canadian wheat was the more important influence, for in 1923-24, when United States wheat prices were also somewhat out of line with prices elsewhere, American exports of flour were by far the largest in post-war years. In that year, when the Canadian crop graded high, heavier sales of American low-grade flours to China were made than was possible under Canadian competition in 1928-29.

All told, the smaller exportation of flour from the United States in 1928-29 than in

1923-24—a reduction of nearly 4 million barrels—goes far to account for the decline in gross world exports of flour between these years, which amounted to 5 million barrels. As between these two years, other countries showing marked declines in flour exports were India, Jugo-Slavia, Roumania, Italy, and Belgium (not to include France, which exported net 254 thousand barrels in 1923-24 but was a net importer in 1928-29) which together exported net some 2.7 million barrels less in 1928-29 than in 1923-24. Declines in these countries were rather more than offset by the increases in flour net exports from Japan, Australia, Hungary, and Germany. To explain the decline in world flour exports by reference chiefly to the movement from the United States is to view the matter from the side of supply; from the more fundamental side of demand, the principal factor was the tendency among many importing countries to foster importation of wheat rather than of flour. The outstanding fact with regard to the flour trade in 1928-29 is that it was of much smaller volume than in 1923-24 despite low wheat prices in both years and an increase in the consumptive demand over the interval.

THE YEAR IN MILLING

One may infer, partly from the statistics of international trade, partly from the fact that low wheat prices must have encouraged flour consumption, and partly from the very abundance of wheat supplies, that in most countries mill grindings of wheat stood at an exceptionally high level in 1928-29, doubtless the highest in history. Doubtless also there was some further liquidation of the excess milling capacity that has been characteristic in most countries since the war. Hence it is reasonable to conclude that in general active flour mills operated more nearly approaching capacity than usual, and that operations were profitable in so far as unusual activity makes for profitable operation. Profitable operation may have been facilitated by the fact that in North America and Europe the prices of mill offals—"wheatfeed," according to the new terminology now coming to be used in England—stood high in relation to wheat or flour prices; and also, in Europe at least, by the wide range of wheat

supplies from which millers could choose their mixes and by the relative cheapness of good Argentine wheat, with which the leading flour-exporting countries had to compete indirectly. Such American milling concerns as possessed large storage facilities doubtless used them to profit during the season under review.

The situation of course differed widely from country to country, and here it is desirable merely to emphasize the more prominent points. To Canadian millers the proportion of low-grade wheats in the crop of 1928 was (rather paradoxically) advantageous in that it contributed to output; here the total outturn of 20,893 thousand barrels exceeded all records. Of this amount roughly 3,000 thousand went to China alone. It is interesting to note that, in spite of the heavy proportion of lower grades in the crop of 1928-29, only 4.54 bushels of wheat were used to make a barrel of flour as against 4.59 bushels in 1927-28. The annual statements of several important Canadian milling companies showed exceptionally large net profits in 1928-29.

The volume of net exports from Australia suggests that here also the mill output was relatively large; nevertheless complaints of unsatisfactory conditions were numerous. There may have been a tendency for wheat to sell unusually high in relation to flour because of the unusual demand from India; there were difficulties in holding domestic flour buyers to early contracts which millers had covered by purchases of wheat; and the profits in flour exportation perhaps suffered more than usual because the better markets like Great Britain would take less than usual, while the poorer markets like China and Egypt would take more. Further, Australian flour in the latter markets had to compete with the very low-priced Canadian product ground from the lower grades of Canadian wheat.

Argentine flour exports also suffered somewhat from the weak demand of Great Britain, but we know of no evidence showing that Argentine milling was in a particularly unfavorable position either as regards volume of output or otherwise.

Cheap wheat from Canada was apparently advantageous to Japanese millers, who imported it in unprecedented quanti-

ties and milled it (under a customs rebate in effect since March 1926) largely for export to China. In spite of a huge rice crop that kept domestic flour prices low, the profits at least of the largest flour mill in Japan appear to have been excellent.

In Hungary, the quality of the flour produced from the crop of 1928 was seemingly good enough to enable her to extend her trade further into western Europe than in any year since the war. Net exports and probably total mill output were the largest in post-war years, and in the calendar year 1928 the commercial mills of Budapest operated to 39 per cent of capacity as compared with only 26-30 per cent in 1927.

Cheap low-grade wheat from Canada was not particularly advantageous to British millers; the principal ex-European markets where low-grade flours are readily salable are in effect closed to them by distance, and the domestic standard of flour is comparatively high. Relatively cheap Argentine wheat of good quality was a decided advantage, however, and flour imports from Canada, the United States, Australia, and Argentina were notably small in 1928-29—from the first three countries principally because both wheat and flour prices there were relatively higher than in Argentina, and from Argentina probably in some part because the prices of "wheat-feeds" in the United Kingdom were high enough in relation to wheat to provide British millers with an advantage. Mill output was probably distinctly large, and the industry seems to have progressed in efficiency through amalgamation and through further reduction of excess capacity. The milling industry in such countries as Holland, Belgium, and Germany likewise benefited from cheap Argentine wheat and relatively high prices of wheat-feeds. In France, however, relatively high domestic wheat prices reduced flour exports somewhat and increased flour imports, so that in 1928-29 for the second time since the war France was a net importer of flour. The situation favored the large commercial milling companies which utilized chiefly imported wheat. Operations in all mills have been made easier by relaxation of governmental milling regulations. In Italy as in France the large commercial mills were favored by the relative cheapness of imported wheat, and all mills were

freed from regulation regarding extraction. All told, complaints about the milling situation in Europe were conspicuously few in 1928-29. Perhaps more emanated from Germany than elsewhere; yet Germany managed to become a net exporter of flour for the first time since the war, and if (as seems moderately certain) wheat consumption is increasing with some rapidity, mill output at least must have been large.

Several interesting developments appeared in the flour milling industry in the United States, most of them corresponding to circumstances in or consequences of the wheat supply. The output of flour was apparently the largest since 1919-20, and, except for that record year, the largest in the history of the country, exceeding that of 1927-28 by 3 million barrels.¹ Net exports and shipments to possessions were almost identical with 1927-28; the increase in output over that year is attributable about equally to increased domestic consumption incident to the increase in population, and to the fact that year-end flour stocks were decreased from July 1, 1927 to July 1, 1928, and increased from the latter date to July 1, 1929. Fewer bushels of wheat were required per barrel of flour than in most of the years since the war, only 4.646 com-

pared with 4.639, the low rate of 1926-27.² The average number of pounds of offal produced per barrel of flour was 79.2, compared with 81.0 in 1927-28.

The increase in flour output for the year was unevenly distributed by regions, as indicated by the following totals, in million barrels, for monthly reporting mills:

	1926-27	1927-28	1928-29
4 spring-wheat states	23.3	25.3	24.0
6 hard winter-wheat states	39.7	35.9	39.9
9 soft winter-wheat states	20.3	20.0	18.8
3 Pacific Coast states	8.5	9.4	10.6
New York State	11.8	12.5	13.2
United States	111.0	111.2	115.3
Percentage reporting	91.0	92.2	93.4

In the last line of the tabulation is shown our estimate of the percentage of the total United States flour output included in the monthly milling reports for each crop year.

Premiums for protein content in the hard wheat areas were lower than in 1927-28, but not so low as in 1926-27. Soft wheat millers, however, were compelled to pay premiums on quality in the central states. If it be assumed (what may or may not be true) that for each region the percentage of the reported to the total mill output increased about 1.2 per cent in each year, as for the United States as a whole, it appears that the 1928-29 flour production in the spring-wheat states fell about 1.6 million barrels short of that of 1927-28 but was close to that of 1926-27. In the hard winter-wheat states the total output was large, probably exceeding by nearly 4 million barrels the output of 1927-28 and approaching the level of the unusually good year 1926-27. The mills in the soft winter-wheat area held their volume surprisingly well in view of the short crop, though the total output was apparently some 8 or 10 per cent under that of the previous two years; they were forced, however, to employ low-protein hard winter wheats in more than the usual degree.³ The mills of the Pacific states exceeded by at least 10 per cent the output of 1927-28 and by 20 per cent the output of 1926-27 despite the intense competition to which they were subjected in export markets. The New York State production, representing chiefly output of Buffalo mills,⁴ increased over half a million barrels, reflecting a large increase in Canadian wheat milled in bond.

Since as a rule, other things equal, mill

¹ The output of mills reporting monthly to the Department of Commerce was 4 million barrels larger in 1928-29 than in 1927-28, but about 1 million barrels of this increase is attributable to increase in comprehensiveness of the monthly milling reports. For subsequent comparison of output by regions, only the data from the monthly milling reports are available. They are to be interpreted in the light of the probability that in most states the comprehensiveness of the reports was increased close to one per cent, or for the United States as a whole. See Appendix Table XXV for our estimates of total mill output since 1923-24.

² See above, p. 47.

³ Recently published estimates of the output of self-rising flour in the United States, which is largely milled from soft red winter wheat, are as follows, in thousand barrels:^a

July-June	Output
1924-25	8,438
1925-26	9,042
1926-27	9,100
1927-28	9,086
1928-29	9,764

^a Estimates of the Department of Commerce, based on information obtained from manufacturers of bicarbonate of soda as to the amount sold to millers of self-rising flour.

⁴ Data compiled by the *Northwestern Miller* (Almanack, 1927 and 1928). The output of Buffalo mills in 1927-28 was 10.3 million barrels, or 82 per cent of the reported New York State output shown above.

profits are supposed to rise with volume of operations, it would be inferred that the year was a favorable one for milling concerns, especially in view of reduction of costs and overhead achieved through mergers. The reports of milling companies in general would seem to confirm this inference, but in the milling journals, the jeremiads persist with little change.

One particular feature of the year was the heavy use made by mills of their storage facilities. It was possible throughout the crop year to buy cash wheat at a figure considerably under the price of futures and to replace the wheat in storage as wheat was withdrawn for grinding. This circumstance with appropriate handling of the hedging account meant profit for mills on their storage facilities just as it meant profit for elevator men on their storage facilities. Since many of the mills own large elevators, there is reason to believe that profits on storage of wheat during the crop year constituted substantial contributions to the income of many milling concerns. Most of the mills went into the new crop year with elevators filled to working capacity, and from this point of view the crop year 1929-30 opened auspiciously for the milling industry.

Mill feed prices stood on the whole at a somewhat lower level during 1928-29 than during 1927-28, though relative to the price level of wheat the difference was not marked. During the second half of the year, however, prices were less satisfactory and the spring peak in mill feed prices that usually develops during April and May did not appear. Many of the large milling concerns have their millfeed outturn so involved in the manufacture of mixed feeds that their direct dependence on quoted millfeed prices is considerably less than used to be the case.

As we have seen, the export of flour corresponded closely with that of the previous

crop year, a little under 13 million barrels; but with adjustment for flour ground in bond from imported Canadian wheat, it follows that the export of flour ground from domestic wheat was considerably reduced. Circumstances involved in the plentiful supply of low-grade Canadian were responsible; and these circumstances resulted both in the record grind of Canadian mills and in the large output of Buffalo mills grinding Canadian wheat in bond. There was some reduction in flour from domestic wheat exported from the Atlantic seaboard, but a particularly heavy reduction in export from the Gulf. With such competition as existed in the Orient with flour ground from Canadian wheats, an increase in Pacific flour exports represented a noteworthy achievement of the American mills. The character of the competition in the Orient may be illustrated by the fact that western Canadian mills ground No. 6 wheat or mixtures of No. 6 and feed wheat, or even feed wheat straight, using around 6 bushels to the barrel of flour, thus securing for Oriental markets a flour with over 10 per cent of protein, with which no Pacific Coast flour could be directly compared. The experiences in the export flour trade during the year confirmed again the well-established fact that the price levels of wheat in competitive countries influence directly the price levels and the exportability of competitive flours from the same countries.

The year witnessed a continuation in the organization of mergers of flour mills. This development is not only in the interest of economy and efficiency, but is one forced on the milling industry by mergers of bakers and growth of chain stores. Apparently the day is not far distant when both buying power and selling power in respect to wheat flour will be concentrated into units limited in size only by the application of anti-trust laws.

This issue is the work of M. K. Bennett, with the advice of Alonzo E. Taylor and Holbrook Working, and the aid of Katharine Merriam and Janet Murray

APPENDIX

TABLE I.—WHEAT ACREAGE IN PRINCIPAL PRODUCING AREAS, 1920-29*

(Million acres)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugoslavia	Romania	Soviet Russia	Mexico
1920	61.14	18.23	29.95	9.07	13.22	1.26	.70	2.66	2.17	3.56	5.00	.....	....
1921	63.70	23.26	25.78	9.72	14.10	1.34	.81	2.89	2.23	3.70	6.15	.....	2.28
1922	62.32	22.42	28.21	9.76	16.06	1.47	.66	3.52	2.30	3.67	6.55	.....	2.62
1923	59.66	21.89	30.85	9.54	17.04	1.54	1.06	3.29	2.38	3.84	6.65	39.16	3.05
1924	52.54	22.06	31.18	10.82	15.98	1.43	.85	3.50	2.49	4.24	7.84	52.73	1.40
1925	52.37	20.79	31.78	10.20	17.62	1.43	.96	3.52	2.55	4.31	8.16	61.47	1.13
1926	56.36	22.90	30.47	11.69	18.26	1.46	.99	3.71	2.62	4.18	8.22	72.13	1.29
1927	58.78	22.46	31.30	12.28	18.56	1.53	1.04	4.02	2.67	4.52	7.66	77.24	1.31
1928	58.27	24.12	32.19	14.81	20.90 ^a	1.98	1.26	4.14	2.78	4.75	7.92	68.17	1.28
1929	61.14	25.25	32.01	14.50	16.19	....	1.12	3.57	2.62	5.29	6.76	.....	1.25
Average 1909-13	47.10	9.94	29.22	7.60	14.88	1.00	.79 ^b	3.71	2.41	3.98	9.52 ^b	74.01	2.17 ^c
1923-27	55.94	22.02	31.12	10.91	17.49	1.48	.98	3.61	2.54	4.22	7.71	60.55	1.64

Year	Morocco	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Netherlands	Denmark	Norway	Sweden
1920	1.99	3.45	1.32	1.19	1.98	12.59	3.40	11.38	.31	.15	.18	.04	.36
1921	1.96	3.04	1.49	1.46	2.08	13.30	3.56	11.88	.34	.18	.22	.04	.36
1922	2.07	3.74	1.07	1.52	2.07	13.07	3.40	11.40	.30	.15	.24	.02	.36
1923	2.25	3.17	1.61	1.54	1.84	13.67	3.65	11.45	.35	.15	.20	.03	.36
1924	2.46	3.53	1.21	1.42	1.63	13.62	3.62	11.28	.34	.12	.15	.02	.32
1925	2.62	3.61	1.62	1.38	1.57	13.87	3.84	11.67	.36	.13	.20	.02	.36
1926	2.56	3.74	1.84	1.53	1.68	12.97	3.96	12.15	.35	.13	.25	.02	.38
1927	2.30	3.47	1.41	1.65	1.74	13.06	4.32	12.30	.39	.15	.27	.02	.56
1928	2.66	3.66	2.01	1.59	1.49	12.96	4.27	12.26	.42	.15	.25	.03	.56
1929	2.84	3.62	1.73	1.62	1.39 ^d	12.75	3.96	12.28	.43	.11	...	...	.57
Average 1909-13	1.70	3.52	1.31	1.31	1.89	16.50	4.03	11.79	.40	.14	.15	.01	.26
1923-27	2.44	3.50	1.54	1.50	1.69	13.44	3.68	11.77	.36	.14	.21	.02	.40

Year	Spain	Portugal	Switzerland	Austria	Czechoslovakia	Poland	Finland	Latvia	Estonia, Lithuania	Greece	Japan, Chosen	South Africa	New Zealand
1920	10.25	1.10	.12	.37	1.57	1.79	.02	.04	.19	1.08	2.18	.88	.22
1921	10.39	1.09	.12	.38	1.56	2.42	.03	.05	.21	.95	2.14	.99	.35
1922	10.31	1.16	.11	.46	1.53	3.02	.04	.07	.25	1.06	2.12	.85	.28
1923	10.49	1.05	.11	.48	1.51	2.99	.04	.11	.26	1.06	2.07	.78	.17
1924	10.38	1.04	.10	.48	1.50	3.16	.04	.11	.25	1.15	2.03	.75	.17
1925	10.72	1.05	.10	.48	1.53	3.20	.04	.12	.33	1.15	2.04	.97	.15
1926	10.78	1.06	.13	.50	1.55	3.25	.04	.12	.36	1.30	2.04	.88	.22
1927	10.83	1.06	.13	.50	1.58	3.36	.04	.14	.36	1.23	2.06	.91	.26
1928	10.48	1.10	.13	.51	1.87	3.19	.05	.16	.46	1.33	2.10	.98	.26
1929	10.48	....	.17 ^c	.51	1.89	3.43	.05	.14	.57	....	2.11	.94	.23
Average 1909-13	9.55	1.21 ^f	.10	.64	1.72	3.35	.01	.08	.23	1.13 ^g	1.75	.74 ^b	.24
1923-27	10.64	1.05	.11	.49	1.53	3.19	.04	.12	.31	1.18	2.05	.86	.19

* Data of U.S. Department of Agriculture and International Institute of Agriculture. For 1909-13, including U.S. Department of Agriculture estimates for area within post-war boundaries. Figures for 1929 are preliminary. Dots (...) indicate that data are not available.

^a Estimate for area sown, not harvested.

^b Four-year average.

^c Two-year average.

^d Excluding Irish Free State.

^e Includes spelt.

^f Three-year average.

^g One year only.

TABLE II.—WHEAT YIELD PER ACRE IN PRINCIPAL PRODUCING AREAS, 1920-29*

(Bushels per acre)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugo-Slavia	Roumania	Soviet Russia	Mexico
1920	13.6	14.4	12.6	16.1	11.8	18.4	11.1	14.2	13.8	12.1	12.3	....	...
1921	12.8	12.9	9.7	13.3	13.5	17.6	12.3	18.3	13.1	14.0	12.8	....	2.2
1922	13.9	17.8	13.0	11.2	12.2	17.6	7.8	15.5	14.2	12.1	14.1	....	5.2
1923	13.4	21.7	12.1	13.1	14.5	18.2	12.6	20.6	12.2	15.9	15.4	10.7	4.5
1924	16.5	11.9	11.6	15.2	12.0	17.1	11.7	14.7	9.9	13.6	9.0	9.0	7.4
1925	12.9	19.0	10.4	11.2	10.8	18.7	10.4	20.3	16.2	18.2	12.8	12.3	8.1
1926	14.7	17.8	10.7	13.8	12.1	15.9	10.3	20.2	14.0	17.1	13.5	11.5	8.0
1927	14.9	21.4	10.7	9.6	12.9	18.5	14.8	19.1	15.8	12.5	12.6	9.7	9.1
1928	15.7	23.5	9.0	10.8	14.7	....	12.1	24.0	18.2	21.7	14.6	11.5	8.6
1929	13.2	11.6	9.9	7.7	....	....	....	20.1	13.0	18.0	14.8	....	9.2
Average													
1909-13	14.7	19.8	12.0	11.9	9.9	20.0	8.2 ^a	19.3	15.7	15.6	16.7 ^a	10.2	...
1923-27	14.5	18.3	11.1	12.5	12.5	17.7	11.7	19.0	13.7	15.4	12.6	10.9	6.8

Year	Morocco	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Netherlands	Denmark	Norway	Sweden
1920	9.0	4.7	4.0	26.6	28.7	18.8	24.3	12.5	33.6	39.4	41.1	25.0	28.8
1921	11.9	9.4	6.0	25.4	35.4	24.3	30.3	16.3	42.3	47.6	50.7	23.7	34.3
1922	6.2	5.1	3.4	23.7	31.5	18.6	21.2	14.2	35.4	41.1	39.0	25.7	26.7
1923	8.9	11.3	6.2	26.5	32.9	20.2	29.1	19.6	38.8	40.3	43.2	23.5	30.4
1924	11.7	4.9	4.2	24.1	33.0	20.6	24.6	15.1	38.2	39.9	39.4	23.5	21.1
1925	9.1	9.1	7.2	26.2	34.1	23.8	30.8	20.6	39.7	43.8	49.2	22.3	36.8
1926	6.3	6.3	7.1	24.3	31.0	17.9	24.1	18.2	36.6	41.6	35.4	26.6	31.9
1927	10.7	8.2	5.9	26.9	32.9	21.1	27.9	15.9	41.7	40.2	35.0	30.2	28.3
1928	9.3	8.3	6.0	23.5	34.2	21.7	33.2	18.6	42.5	49.6	48.8	26.7	34.2
1929	9.7	9.4	7.1	27.9	34.2 ^b	25.1	29.2	21.2	37.2	42.7	....	....	32.8
Average													
1909-13	10.0	10.0	4.8	26.0	31.6	19.7	32.6	15.6	37.6	36.1	41.1	25.5	31.8
1923-27	9.3	7.9	6.2	25.7	32.8	20.8	28.8	17.9	38.9	40.0	40.5	27.5	29.5

Year	Spain	Portugal	Switzerland	Austria	Czechoslovakia	Poland	Finland	Latvia	Estonia, Lithuania	Greece	Japan, Chosen	South Africa	New Zealand
1920	13.5	9.4	30.1	14.6	16.8	12.7	12.1	10.0	13.4	10.4	18.9	8.7	31.2
1921	14.0	7.4	32.5	17.3	24.9	16.7	20.7	17.0	15.9	10.8	18.6	8.8	29.9
1922	12.2	8.5	23.2	16.1	22.0	15.5	18.7	13.7	17.0	8.5	18.8	7.4	30.4
1923	15.0	12.5	34.5	18.7	24.0	18.4	17.2	15.5	14.3	8.3	17.0	7.7	24.0
1924	11.7	10.2	29.9	17.6	21.5	11.9	21.4	14.9	15.2	6.7	17.4	9.5	32.6
1925	15.2	11.9	33.5	22.0	25.8	20.0	25.1	18.2	18.5	9.8	19.7	9.5	30.4
1926	13.6	8.1	33.4	18.9	22.0	16.2	23.7	15.2	13.9	9.5	20.0	9.4	36.1
1927	13.4	10.6	32.4	23.7	25.6	18.2	27.3	18.8	17.6	10.5	19.5	6.3	36.7
1928	11.4	6.8	33.6	25.1	27.5	18.6	20.0	15.6	16.0	9.8	18.8	7.1	33.8
1929	14.2	....	33.4 ^c	22.5	25.4	17.6	22.0	16.9	17.7	....	19.5	11.9	....
Average													
1909-13	13.7	....	31.6	20.2	22.0	19.0	17.1	17.4	15.5 ^d	14.4	18.2	8.4 ^a	28.7
1923-27	13.8	10.8	34.5	20.2	23.9	16.9	22.0	16.5	16.1	9.0	18.7	8.5	33.2

* Computed from acreage and production figures in Appendix Tables I and III. Dots (...) indicate that data are not available.

^a Four-year average.

^b England and Wales only.

^c Includes spelt.

^d One year only.

TABLE III.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS, 1920-29*

(Million bushels)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugoslavia	Romania	Soviet Russia	Mexico
1920	833.0	263.2	377.9	145.9	156.1	23.2	7.8	37.9	29.9	43.0	61.3	.....	15.0
1921	814.9	300.9	250.4	129.1	191.0	23.6	10.0	52.7	29.2	51.8	78.6	.....	5.1
1922	867.6	399.8	367.0	109.5	195.8	25.9	5.2	54.7	32.6	44.5	92.0	.....	13.6
1923	797.4	474.2	372.4	125.0	247.8	28.1	13.3	67.7	29.1	61.1	102.1	419.1	13.7
1924	864.4	262.1	360.6	164.6	191.1	24.5	9.9	51.6	24.7	57.8	70.4	472.2	10.4
1925	676.4	395.5	331.0	114.5	191.1	26.7	10.0	71.7	41.4	78.6	104.7	757.4	9.2
1926	831.0	407.1	324.7	160.8	220.8	23.3	10.2	74.9	36.5	71.4	110.9	899.4	10.3
1927	878.4	479.7	335.0	118.2	239.2	28.3	15.4	76.9	42.1	56.6	96.7	751.9	11.9
1928	914.9	566.7	290.9	159.7	307.4	....	15.2	99.2	50.7	103.3	115.5	783.2	11.0
1929	806.5	293.9	317.6	112.0	.....	....	....	71.8	34.5	95.0	99.8	.....	11.6
Average													
1909-13	690.1	197.1	351.8	90.5	147.1	20.1	6.5 ^a	71.5	37.8	62.0	158.7 ^a	756.9 ^b	11.5 ^a
1923-27	809.5	403.7	344.7	136.6	218.0	26.2	11.5	68.6	34.8	65.1	97.0	660.0	11.1

Year	Morocco	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Netherlands	Denmark	Norway	Sweden
1920	17.9	16.2	5.2	31.7	56.8	236.9	82.6	142.3	10.3	6.0	7.4	1.00	10.3
1921	23.2	28.5	9.0	37.0	73.8	323.5	107.8	194.1	14.5	8.6	11.1	.97	12.3
1922	12.9	18.9	3.7	36.0	65.2	243.3	71.9	161.6	10.6	6.2	9.2	.64	9.5
1923	20.0	35.8	9.9	40.7	60.5	275.6	106.4	224.8	13.4	6.2	8.9	.59	11.0
1924	28.8	17.3	5.1	34.2	53.9	281.2	89.2	170.1	13.0	4.7	5.9	.49	6.8
1925	23.9	32.7	11.8	36.2	53.7	330.3	118.2	240.8	14.5	5.7	9.7	.49	13.4
1926	16.2	23.6	13.0	37.2	52.2	231.8	95.4	220.6	12.8	5.5	8.8	.59	12.2
1927	24.6	28.3	8.3	44.3	57.2	276.1	120.5	195.8	16.3	6.2	9.4	.60	15.8
1928	24.7	30.3	12.1	37.3	50.9	281.3	141.6	228.6	18.0	7.3	12.2	.80	19.2
1929	27.5	34.0	12.3	45.2	45.5 ^c	319.9	115.6	260.7	16.0	4.7	....	.73	18.7
Average													
1909-13	17.0	35.2	6.2	33.7	59.6	325.6	131.3	184.4	15.2	5.0	6.3	.31	8.1
1923-27	22.7	27.5	9.6	38.5	55.5	279.0	106.0	210.5	14.0	5.6	8.5	.55	11.8

Year	Spain	Portugal	Switzerland	Austria	Czechoslovakia	Poland	Finland	Latvia	Estonia, Lithuania	Greece	Japan, Chosen	South Africa	New Zealand
1920	138.6	10.4	3.6	5.4	26.4	22.7	.27	.39	2.58	11.2	41.1	7.6	6.9
1921	145.1	9.3	3.8	6.5	38.7	40.5	.58	.78	3.34	10.3	39.7	8.7	10.6
1922	125.5	10.0	2.6	7.4	33.6	46.8	.71	.96	4.17	9.0	39.8	6.3	8.4
1923	157.1	13.2	3.8	8.9	36.2	54.9	.69	1.64	3.70	8.8	35.2	6.0	4.2
1924	121.8	10.6	3.1	8.5	32.2	37.5	.79	1.58	3.86	7.7	35.3	7.1	5.4
1925	162.6	12.5	3.5	10.7	39.3	63.9	.93	2.16	6.08	11.2	40.0	9.2	4.6
1926	146.6	8.6	4.2	9.4	34.1	52.5	.92	1.86	5.02	12.4	40.7	8.3	8.0
1927	144.8	11.4	4.1	12.0	40.4	61.1	1.06	2.64	6.35	13.0	40.1	5.7	9.5
1928	119.9	7.5	4.3	12.9	51.5	59.2	1.00	2.50	7.36	13.1	39.4	6.9	8.8
1929	149.3	....	5.8 ^d	11.6	48.1	60.3	1.10	2.37	10.09	14.0	41.1	11.2	...
Average													
1909-13	130.4	11.8 ^e	3.3	12.8	37.9	63.7	.14	1.48	3.63	16.3 ^e	32.0	6.3 ^a	6.9
1923-27	146.6	11.3	3.8	9.9	36.5	54.0	.88	1.98	5.00	10.6	38.3	7.3	6.3

* See corresponding footnote under Table I.

^a Four-year average.^b Regarded as too low by some Soviet officials, whose estimate is 908 million bushels.^c England and Wales only.^d Includes spelt.^e One year only.

TABLE IV.—RYE PRODUCTION IN PRINCIPAL PRODUCING AREAS, 1920-29*

(Million bushels)

Year	United States	Canada	Argentina	Hungary	Bulgaria	Jugo-Slavia	Roumania	Soviet Russia	France	Germany	Italy	Belgium	Netherlands
1920	60.5	11.3	0.8	20.6	6.2	6.1	9.4	.....	34.5	194.2	4.5 ^a	18.2	14.8
1921	61.7	21.5	1.7	23.2	6.1	6.2	9.1	.....	44.4	267.6	6.5	21.3	15.0
1922	103.4	32.4	3.5	25.1	6.4	4.5	9.2	.....	38.4	206.0	5.6	18.4	17.1
1923	63.1	23.2	3.9	31.3	5.2	5.9	9.6	.....	36.5	263.0	6.5	20.8	14.6
1924	65.5	13.8	1.5	22.1	4.3	5.5	6.0	737.0	40.2	225.6	6.1	20.7	15.6
1925	46.5	9.2	4.7	32.5	7.2	7.9	8.0	888.6	43.7	317.4	6.7	21.7	16.4
1926	40.8	12.2	3.3	31.4	7.1	7.5	11.2	925.6	30.1	252.2	6.5	20.1	13.6
1927	58.2	15.0	6.6	22.4	7.0	5.9	9.3	944.6	34.0	269.0	5.9	21.9	13.5
1928	43.4	14.6	7.7	32.6	9.2	7.5	11.5	755.8	34.1	335.5	6.5	23.2	17.3
1929	41.6	12.9	...	33.0	7.7	8.3	13.1	.....	39.4	319.3	6.8	19.9	13.3
Average													
1909-13	36.1	2.1	0.6	31.4	8.3	9.0	20.6 ^b	744.4	52.5	368.3	6.3	23.6	16.4
1923-27	54.8	14.7	4.0	27.9	6.1	6.5	8.8	874.0 ^b	36.9	265.4	6.3	21.0	14.7

Year	Denmark, Norway	Sweden	Spain	Portugal	Switzerland	Austria	Czecho-Slovakia	Poland	Finland	Latvia	Estonia	Lithuania	Greece
1920	14.2	22.4	27.8	5.2	1.6	10.1	32.9	73.7	7.1	4.7	6.2	16.7	1.0
1921	13.2	26.6	28.1	4.6	1.6	13.2	53.7	174.9	11.7	9.8	5.9	21.0	1.1
1922	15.1	22.1	26.3	5.4	1.5	13.6	51.1	203.5	10.5	6.8	5.8	25.4	1.1
1923	15.9	23.4	28.1	5.2	1.6	15.8	53.3	242.8	9.4	10.8	6.5	23.8	0.6
1924	11.1	10.9	26.3	6.8	1.4	16.2	44.7	147.9	11.3	7.9	5.5	18.3	0.9
1925	14.4	26.6	29.9	4.6	1.9	21.7	58.1	265.4	13.7	12.4	7.2	26.1	1.6
1926	13.1	23.1	23.5	3.6	1.8	18.7	45.9	204.0	11.9	6.1	4.5	13.8	1.6
1927	11.0	15.1	26.5	4.7	1.8	20.1	49.3	231.8	12.9	10.2	6.7	21.2	1.5
1928	10.2	17.2	14.4	3.4	2.0	19.9	70.0	240.5	11.0	8.5	5.5	18.7	1.7
1929 .....	....	16.4	22.9	...	1.6	19.0	63.6	246.4	13.1	9.4	5.8	21.9	2.6
Average													
1909-13	20.1	24.1	27.6	2.3	1.8	23.8	63.5	218.9	10.5	13.1	8.1	24.3	1.1
1923-27	13.1	19.8	26.9	5.0	1.7	18.5	50.3	218.4	11.8	9.5	6.1	20.6	1.2

* See corresponding footnote under Table I.

^a Old boundaries.^b Four-year average.

TABLE V.—POTATOES AND CORN PRODUCTION IN PRINCIPAL EUROPEAN PRODUCING AREAS, 1920-28*

(Million bushels)

Year	Potatoes							Corn (Maize)					
	British Isles	France	Germany	Belgium, Holland	Czecho-Slovakia	Poland	Soviet Russia ^a	Hungary	Bulgaria	Jugo-Slavia	Roumania	Soviet Russia	Italy
1920	238	428	1,024	204	184	665	.....	50.2	20.9	101.1	182.0	.....	89.3
1921	245	305	961	179	159	527	.....	31.7	16.4	73.8	110.6	.....	92.3
1922	322	465	1,494	307	333	948	.....	48.7	16.4	89.8	119.8	.....	76.8
1923	221	364	1,197	211	229	825	.....	49.2	21.8	84.8	153.0	.....	89.2
1924	219	564	1,338	208	239	831	1,332	74.1	24.8	149.4	155.5	90.9	105.7
1925	281	558	1,533	230	276	909	1,419	88.0	25.8	149.2	163.7	168.4	110.0
1926	249	409	1,103	220	185	786	1,579	76.5	27.3	134.2	229.9	128.6	118.1
1927	275	644	1,380	214	370	984	1,514	68.3	21.0	83.0	139.1	133.8	83.9
1928	297	414	1,516	276	316	1,016	1,466	49.6	14.8	71.6	108.5	133.0	65.0
Average													
1909-13	254	527	1,374	215	245	890	742	60.8	26.3	111.9	193.2	52.6	102.7
1923-27	249	508	1,310	216	260	867	1,461 ^a	71.2	24.1	120.1	168.2	130.4 ^a	101.4

* See corresponding footnote under Table I.

^a Four-year average.

TABLE VI.—UNITED STATES WHEAT ACREAGE,
1920-29*

(Million acres)

Crop of	Winter wheat			Spring wheat harvested	Total harvested
	Planted	Abandoned	Harvested		
1920.....	44.9	4.84	40.0	21.1	61.1
1921.....	45.6	2.21	43.4	20.3	63.7
1922.....	47.9	5.57	42.4	20.0	62.3
1923.....	46.1	6.58	39.5	20.2	59.7
1924.....	38.9	3.26	35.7	16.9	52.5
1925.....	40.0	8.60	31.3	21.0	52.4
1926.....	39.9	2.90	37.0	19.4	56.4
1927.....	43.4	5.65	37.7	21.1	58.8
1928.....	47.3	11.10	36.2	22.1	58.3
1929.....	42.8	2.66	40.1	21.0	61.1
Average					
1909-13..	32.0	3.64	28.3	18.7	47.1
1923-27..	41.7	5.40	36.3	19.7	56.0

* Official data of U.S. Department of Agriculture. See especially *Agriculture Yearbook*, 1928, p. 676, and crop reports.

TABLE VII.—UNITED STATES WHEAT PRODUCTION
BY CLASSES, 1920-29*

(Million bushels)

Crop of	Hard red spring	Durum	Hard red winter	Soft red winter	Pacific white	Total
1920.....	140	52	302	247	91	833
1921.....	131	57	290	237	99	815
1922.....	170	91	280	248	79	868
1923.....	127	55	241	272	102	797
1924.....	192	66	365	189	52	864
1925.....	156	65	206	170	80	676
1926.....	121	48	360	229	73	831
1927.....	202	83	317	181	95	878
1928.....	195	98	384	139	86	902
1929.....	136	57	330	190	79	792

* Classification by U.S. Department of Agriculture. See especially *Agriculture Yearbooks*, and *Foreign News on Wheat*, October 21, 1929, p. 11. These are estimates only, and are made on a basis which does not lead to highly reliable results. Figures for 1928 and 1929 are preliminary.

TABLE VIII.—UNITED STATES WHEAT CROP FORECASTS AND ESTIMATES, 1928, 1929*

(Million bushels)

Date	1928 Bryant	1928 Cromwell	1928 Murray	1928 Snow	1928 Official	1929 Official
WINTER WHEAT						
Apr. 1 ...	556	529	543	510	.....	.....
May 1 ...	487	485	466	455	486.5	595.3
June 1 ...	507	505	512	531	512.3	622.1
July 1 ...	509	516	522	528	543.8	582.5
Aug. 1 ...	540	561	552	595	578.6	568.2
Sept. 1 ...	540	561	565	595	578.6	568.2
Oct. 1 ...	540	561	565	595	578.6	568.2
Dec. 1 ...	...	...	...	...	579.0 ^a	578.3
SPRING WHEAT						
June 1 ...	248	245	264	260	.....	.....
July 1 ...	240	253	245	250	256.2	251.4
Aug. 1 ...	273	282	301	302	312.7	205.7
Sept. 1 ...	310	314	319	325	322.5	217.5
Oct. 1 ...	301	314	315	333	325.3	223.5
Dec. 1 ...	...	...	...	...	323.8 ^a	228.2
TOTAL WHEAT						
June 1 ...	755	750	776	791	.....	.....
July 1 ...	749	770	767	778	800.0	833.9
Aug. 1 ...	813	843	853	897	891.3	773.9
Sept. 1 ...	850	875	884	920	901.1	785.7
Oct. 1 ...	841	875	880	928	903.9	791.7
Dec. 1 ...	...	...	...	...	902.8 ^a	806.5

* Data from official and commercial crop reports and *Daily Market Record*, Minneapolis.

^a The figures given are the revisions made as of December 1, 1928. The final estimates for the 1928 crop, published in December 1929, were as follows, in million bushels: 578.7, winter; 336.2, spring; 914.9, total.

TABLE IX.—UNITED STATES WINTER- AND SPRING-
WHEAT ACREAGE, PRODUCTION, AND YIELD
PER ACRE, 1920-29*

Year	Acreage (Million acres)		Production (Million bushels)		Yield per acre (Bushels per acre)	
	Winter	Spring	Winter	Spring	Winter	Spring
1920.....	40.02	21.13	610.6	222.4	15.3	10.5
1921.....	43.41	20.28	600.3	214.6	13.8	10.6
1922.....	42.36	19.96	586.9	280.7	13.8	14.1
1923.....	39.51	20.15	571.8	225.6	14.5	11.2
1924.....	35.66	16.88	592.3	272.2	16.6	16.1
1925.....	31.35	21.02	401.7	274.7	12.8	13.1
1926.....	37.01	19.35	627.4	203.6	17.0	10.5
1927.....	37.72	21.06	552.7	325.6	14.7	15.5
1928.....	36.21	22.06	578.7	336.2	16.0	15.6
1929.....	40.16	20.98	578.3	228.2	14.4	10.9
Average 1923-27..	36.25	19.69	543.2	260.3	15.0	13.2

* Data of U.S. Department of Agriculture. See especially *Agriculture Yearbook*, 1928, p. 676, and press releases.

TABLE X.—CANADIAN WHEAT PRODUCTION FORE-
CASTS AND ESTIMATES, 1923-29*

(Million bushels)						
Date	1924	1925	1926	1927	1928	1929
June 30.....	319	365	349	325	...	...
July 31.....	282	375	317	357	...	...
Aug. 31.....	292	392	399	459	550	294
Oct. 31.....	272	422	406	444	501	294
Dec. 31.....	262	411	410	440	534	...

* Canadian Dominion Bureau of Statistics, *Monthly Bulletin of Agricultural Statistics*, and press releases. See Appendix Table XXX for evidence respecting apparent errors in crop estimates.

TABLE XI.—BROOMHALL'S FORECASTS OF EXPORT-
ERS, SURPLUSES AND IMPORTERS'
PURCHASES, 1928-29*

(Million bushels)					
Date of report	Available for export	Margin over importers' purchases	Importers' purchases		
			Total	Europe	Ex-Europe
Aug. 7	1,104	280	824	640	184
Aug. 14	1,144	320	824	640	184
Nov. 20	1,128	288	840	656	184
Jan. 1	1,192	352	840	656	184
Jan. 8	1,240	400	840	656	184
Feb. 12	1,240	360	880	672	208
May 7	1,248	352	896	688	208

* Data from Broomhall's *Corn Trade News*.

TABLE XII.—UNITED STATES IMPORTS OF WHEAT
AND FLOUR FROM CANADA, 1920-21 TO 1928-29*

(Million bushels)					
Crop year July-June	Withdrawn for con- sumption, duty-paid	Withdrawn for mill- ing in bond, free	General imports ^a		
			Wheat grain	Flour as wheat	Total
1920-21.....	.....^b	.....^b	51.00	6.39	57.39
1921-22.....	8.46 ^c	6.17 ^d	14.46	2.79	17.25
1922-23.....	7.41	9.28	18.01	1.93	19.94
1923-24.....	13.68	13.90	27.28	0.76	28.04
1924-25.....	0.27	5.81	6.17	0.03	6.20
1925-26.....	1.64	13.47	15.60	0.08	15.68
1926-27.....	0.05	13.17	13.24	0.03	13.27
1927-28.....	0.16	15.04	15.71	0.03	15.74
1928-29.....	0.08	21.68	21.43	0.01	21.44

* Data of U.S. Department of Commerce, in part compiled from *Monthly Summary of Foreign Commerce*, and *Agriculture Yearbook*, 1925, p. 761; in part supplied direct.

^a Practically all from Canada. No deduction made for re-exports, which rarely reach 1 million bushels.

^b Distinction established by emergency tariff act effective May 28, 1921. Before this date no duties had been in force since April 17, 1917.

^c Including June 1921.

^d Nine months only (October-June).

TABLE XIII.—CANADIAN WHEAT AND FLOUR EX-
PORTS OVERSEAS, 1920-21 TO 1928-29*

(Million bushels)				
Crop year Aug.-July	Total	Through U.S. ports	Through all Cana- dian ports	Through Vancouver alone
1920-21 ^a	112.3 ^a	63.6 ^a	48.7 ^a	1.1 ^a
1921-22.....	168.0	109.7	58.3	9.4 ^a
1922-23.....	263.3	150.8	112.5	21.5 ^a
1923-24.....	323.6	164.7	158.8	58.4 ^b
1924-25.....	189.5	99.1	90.4	26.0
1925-26.....	314.0	161.3	152.7	58.7
1926-27.....	285.2	150.8	134.4	39.7
1927-28.....	324.5	151.5	173.0	85.7
1928-29.....	397.5	172.2	225.3	108.1

* Official data from *Reports on the Grain Trade of Canada and Canadian Grain Statistics*. These figures do not include exports by lake and rail to the United States; hence the totals do not represent Canada's gross or net exports.

^a September-August.

^b Eleven months, September-July.

TABLE XIV.—MONTHLY WHEAT RECEIPTS AT PRIMARY MARKETS IN THE UNITED STATES AND CANADA*
(Million bushels)

Month	United States primary markets				Port William and Port Arthur				Vancouver			
	1925-26	1926-27	1927-28	1928-29	1925-26	1926-27	1927-28	1928-29	1925-26	1926-27	1927-28	1928-29
Aug.	43.3	71.6	81.6	84.2	1.2	1.5	2.4	3.5	.55	.12	.09	1.07
Sept.	57.9	48.7	79.7	73.3	45.7	32.8	8.6	39.1	.28	.29	.32	2.61
Oct.	36.1	37.1	73.3	84.4	53.2	56.1	51.4	81.4	7.04	6.37	6.17	12.69
Nov.	34.1	29.8	44.8	43.6	51.5	60.5	71.0	72.9	9.79	7.22	10.78	14.65
Aug.-Nov.	171.4	187.2	279.4	285.5	151.6	150.9	133.4	196.9	17.66	14.00	17.36	31.02
Dec.	34.9	22.4	26.5	33.0	53.5	26.3	41.0	51.6	6.14	6.63	11.81	13.53
Jan.	21.6	24.6	23.5	22.5	10.5	14.0	21.1	11.0	10.03	6.83	16.49	13.90
Feb.	16.2	21.0	22.5	28.7	4.0	8.6	9.5	2.9	7.74	4.27	12.54	9.25
Mar.	15.1	16.6	26.3	27.2	3.2	6.3	3.3	5.2	6.98	5.94	10.50	15.46
Dec.-Mar.	87.8	84.6	98.8	111.4	71.2	55.2	74.9	70.7	30.89	23.67	51.34	52.14
Apr.	14.0	14.4	18.0	17.5	1.8	12.6	.9	9.7	3.58	3.58	10.88	7.31
May	15.7	19.2	25.9	18.6	17.2	17.3	17.6	13.8	1.20	1.56	7.43	3.91
June	21.0	20.7	15.6	25.7	13.6	7.3	20.1	14.7	.22	.61	3.66	3.04
July	77.0	58.8	72.6	94.2	6.4	10.7	14.4	14.6	.27	.14	2.44	3.30
Apr.-July	127.7	113.1	132.1	156.0	39.0	47.9	53.0	52.8	5.27	5.89	24.41	17.56
Aug.-July	386.9	384.9	510.3	552.9	261.8	254.0	261.3	320.4	53.82	43.56	93.11	100.72

* United States data are unofficial figures compiled from *Survey of Current Business*; Canadian data are official figures from *Reports on the Grain Trade of Canada* and *Canadian Grain Statistics*. Vancouver figures include receipts at Prince Rupert after October 1, 1926.

TABLE XV.—INTERNATIONAL SHIPMENTS OF WHEAT AND RYE (BROOMHALL), ANNUALLY FROM 1921-22*
(Million bushels)

Crop year ending approximately August 1	Wheat, including wheat flour								Rye, including rye flour			
	Total	North America	Argentina	Australia	Russia	Balkans	India	North Africa and Chile	North America	Russia, Danube	Other	Total
1921-22.....	647.2	404.0	118.8	110.4	....	14.0 ^a	....	....	34.9	.02	1.3	36.2
1922-23.....	676.4	455.1	138.3	47.8	....	9.1 ^a	26.1	....	58.7	2.7	1.5	62.9
1923-24 ^b	775.3	454.4	174.4	77.9	23.2	27.9 ^a	17.5	....	26.8	41.3	....	68.1
1924-25.....	715.2	422.6	121.4	117.1	....	13.5	31.7	8.9	61.9	.4	.1	62.4
1925-26.....	667.6 ^c	413.2	94.0	74.0	23.6	28.8	4.8	14.8	15.1	3.9	19.2 ^d	38.2
1926-27.....	817.6	484.0	139.2	104.0	44.4	31.2	10.4	4.4	32.5	8.1	6.6	47.2
1927-28.....	792.8	489.6	177.6	74.4	4.8	29.2	7.2	10.0	42.8	3.0	4.5	50.3
1928-29 ^b	927.6	542.9	223.7	112.1	....	37.4 ^a	.2	11.3 ^c	17.8	.5	11.4	29.7

* Data from *Corn Trade News*. These are Broomhall's cumulative totals, presumably revisions of his weekly shipment figures. They do not agree precisely with other figures of Broomhall's, particularly in 1924-25. Dots (....) indicate no shipments reported.

^a Includes also shipments from other areas.

^b For 53 weeks.

^c Includes 14,400 thousand bushels shipped from Germany.

^d Chiefly Germany.

^e Approximate distribution.

TABLE XVI.—INTERNATIONAL TRADE IN WHEAT (INCLUDING FLOUR), ANNUALLY FROM 1920-21*

(Million bushels)

A.—NET EXPORTS

Crop year August-July	United States	Canada	India	Australia	Argen- tina	Chile	Hungary	Bulgaria	Jugo- Slavia	Rou- mania	Russia	Morocco
1920-21.....	307.9	165.8	15.1	88.9	64.0	2.2 ^a	(.01)	1.77	3.76	1.41	....	0.3 ^a
1921-22.....	251.8	185.4	(13.8)	114.6	118.1	0.1 ^a	9.40	4.52	3.90	3.51	....	0.7 ^a
1922-23.....	200.2	279.0	28.6	50.3	139.4	1.5 ^a	5.15	4.32	1.01	1.64	....	0.2 ^a
1923-24.....	127.4	346.1	20.1	85.6	172.2	5.6	16.79	2.45	5.84	8.98	21.4 ^b	1.7 ^a
1924-25.....	256.4	192.1	38.1	123.6	123.1	7.7	13.54	(1.70)	9.55	3.21	....^{bc}	0.7 ^a
1925-26.....	103.4	324.1	8.0	77.2	94.4	1.0	19.79	4.37	10.81	9.93	27.1 ^b	0.8 ^a
1926-27.....	198.6	292.5	11.5	102.7	143.0	0.3 ^a	21.88	2.25	9.70	11.20	49.2 ^b	2.4 ^a
1927-28.....	184.1	332.5	8.5	70.7	178.1	0.5 ^a	21.84	2.04	.55	7.48 ^d	7.0 ^b	4.0 ^a
1928-29.....	149.8	406.2	(24.8)	108.6	224.0	...	26.00	0.66 ^e	8.81	1.59 ^d	....	...
Average												
1909-14.....	110.0	95.6	49.8	55.2	84.7	2.4 ^a	43.14 ^f	11.27 ^f	....	54.62 ^f	164.5 ^f	0.3 ^a
1923-28.....	174.0	297.5	17.2	92.0	142.2	3.0	18.77	1.88	7.29	8.16	....	1.9 ^a

B.—NET IMPORTS

Crop year August-July	Algeria	Tunis	Egypt	United Kingdom	Irish Free St.	France	Germany	Italy	Belgium	Nether- lands	Denmark	Norway
1920-21.....	5.6	1.3	11.21	200.1		68.3	59.8 ^g	99.4	32.2	18.9	0.35	3.86
1921-22.....	(4.2)	(1.3)	6.84	208.2		17.1	69.5 ^g	100.5	40.5	19.8	4.01	5.16
1922-23.....	2.3	0.7	7.68	205.5 ^h	4.8 ^h	45.6	37.5 ^g	115.7	39.5	23.9	6.28	6.90
1923-24.....	(7.2)	(2.8)	8.52	219.4	20.3	53.3	30.7 ^g	69.9	40.0	26.7	9.28	6.11
1924-25.....	0.5	(0.2)	9.90	208.8	19.1	58.5 ⁱ	80.9 ^g	88.7	39.0	26.8	6.55	5.57
1925-26.....	(4.6)	(2.6)	12.79	191.1	18.8	10.3 ⁱ	57.4	67.9	39.2	27.2	6.00	6.70
1926-27.....	1.6	(0.3)	8.77	217.3	19.9	62.3 ⁱ	91.8	86.6	39.5	28.5	7.24	6.22
1927-28.....	(5.3)	(0.6)	6.60	213.6	18.6	47.1 ⁱ	88.5	87.7	41.8	31.0	10.96	6.78
1928-29.....	(3.7) ^j	(5.3)	13.65	200.8	18.5	54.4	77.6	87.4	41.9	30.0	16.67	9.15
Average												
1909-14.....	(5.3)	0.8	8.32	217.7		43.6 ^f	67.8 ^f	53.0 ^f	50.2 ^f	22.6	6.66 ^f	3.78
1923-28.....	(3.0)	(1.3)	9.32	210.0	19.3	46.3	69.9	80.2	39.9	28.0	8.01	6.28

B.—NET IMPORTS (continued)

Crop year August-July	Sweden	Spain	Portugal	Switzer- land	Austria	Czecho- Slovakia	Poland	Finland	Latvia	Estonia	Greece	Japan
1920-21.....	6.61	19.83	6.6 ^a	12.9	14.6	18.3	....	2.47	0.58	0.61 ^a	10.6	5.8
1921-22.....	3.85	8.02	8.1 ^a	13.2	19.0	11.6	1.20	3.39	0.74	0.76 ^a	13.7	24.9
1922-23.....	8.78	(0.18)	6.5 ^a	16.6	13.4	10.2	2.52	5.12	1.11	1.18 ^a	17.5	14.5
1923-24.....	12.35	(0.32)	3.2 ^a	17.1	18.1	21.2	2.63	5.12	1.80	0.97	18.8	29.1
1924-25.....	10.58	0.80	6.0 ^a	13.9	14.7 ⁱ	21.5	17.10	4.54	1.94	0.86	20.8	12.2
1925-26.....	6.10	(0.73)	4.3 ^a	15.6	14.7 ^b	21.7	(4.60)	5.23	1.56	0.97	18.8	22.7
1926-27.....	6.02	(1.01)	7.9 ^a	16.3	16.9	20.1	8.07	5.14	1.68	0.91	19.4	15.3
1927-28.....	8.42	2.92	...	18.4	16.5	21.4	8.62	6.04	1.51	1.11	19.5	16.3
1928-29.....	8.05	8.16 ^k	...	16.6	14.6	17.4	2.45	6.93	2.97	1.25	22.2	17.2
Average												
1909-14.....	7.07	6.19	3.0 ^a	16.9	10.5 ^f	....	....	....	....	....	6.9 ^a	4.1
1923-28.....	8.69	0.33	5.4 ⁱ	16.3	16.2	21.2	6.36	5.21	1.70	0.96	19.5	19.1

* Data from official sources, in large part through International Institute of Agriculture. Figures in parentheses represent, under A, net imports, and under B, net exports. Dots (...) indicate that data are unavailable or that comparable averages cannot be computed.

^a Calendar years 1921 and following; averages for calendar years 1909-13 and 1924-28.

^b July-June figure.

^c Less than half a million bushels. Broomhall's shipments indicate imports of 9.4 million bushels.

^d Gross figure.

^e Ten months.

^f For pre-war boundaries; not comparable with post-war figures.

^g Data incomplete because of territory occupied by foreign armies.

^h Irish Free State separated after April 1, 1923.

ⁱ Statistics for 1924-25 and 1925-26 adjusted for imports of wheat under decree of December 30, 1924, permitting refund of duty. Figure for 1926-27 probably too low, for 1927-28 probably too high. For discussion see WHEAT STUDIES, II, 211 n., III, 427 n., and V, 80 n. From January 11, 1925, French shipments to the Saar region have not been counted as exports from France. These, consisting largely of flour, were 1.5 million bushels in 1922, 2.0 in 1923, and 3.2 in 1924.

^j Eleven months. ^k Five months. ^l Four-year average.

TABLE XVII.—INTERNATIONAL TRADE IN WHEAT FLOUR, ANNUALLY FROM 1920-21*
(Thousand barrels of 196 pounds)

A.—NET EXPORTS

Crop year August-July	United States	Canada	India	Australia	Argentina	Chile	Hungary	Bulgaria	Jugo- Slavia	Roumania
1920-21.....	13,665	6,688	835	2,281	353	138 ^a	(2)	83	426	150
1921-22.....	14,900	7,701	497	3,677	950	100 ^a	1,863	242	392	115
1922-23.....	14,457	10,936	538	4,081	842	151 ^a	1,137	166	163	293
1923-24.....	17,020	11,933	708	5,222	1,772	181	2,333	147	417	936
1924-25.....	13,882	10,108	892	4,625	1,625	196	2,025	(23)	697	619
1925-26.....	9,551	10,847	685	5,008	1,648	48	1,817	465	310	849
1926-27.....	13,378	9,238	717	5,313	1,730	(14) ^a	1,588	336	302	983
1927-28.....	12,678	9,794	671	4,381	1,828	23 ^a	2,108	115	(28)	441
1928-29.....	13,326	11,730	497	5,845	1,658	...	2,615	51 ^a	23	197 ^d
Average										
1909-14.....	10,639	3,898	613	1,802	1,307	67 ^a	7,443 ^f	502 ^f	...	1,092 ^f
1923-28.....	13,302	10,384	735	4,910	1,721	87	1,974	208	340	766

B.—NET IMPORTS

Crop year August-July	France	Italy	Belgium	Spain	Algeria	Tunis	Egypt	United Kingdom	Irish Free St.	Germany
1920-21.....	(67)	123	(2)	163	205	(4)	2,046	6,552	.....	306 ^g
1921-22.....	(372)	(91)	(237)	(53)	(36)	20	1,478	7,559	.....	61 ^g
1922-23.....	(478)	(393)	24	(43)	80	79	1,636	5,579 ^h	607 ^h	566 ^g
1923-24.....	(254)	(1,493)	(480)	(66)	(62)	(34)	1,798	2,764	2,126	4,166 ^g
1924-25.....	(393)	(1,245)	(787)	(59)	55	95	1,906	1,465	1,892	5,384 ^g
1925-26.....	(260)	(335)	(151)	(157)	5	.. ^m	2,436	2,483	1,748	1,411
1926-27.....	(28)	(195)	(64)	(218)	36	(24)	1,891	4,045	1,856	491
1927-28.....	126	(208)	(145)	(82)	(98)	(9)	1,490	3,161	1,907	2
1928-29.....	190	(445)	(176)	(36) ^k	110 ^j	(50)	2,586	2,129	1,677	(401)
Average										
1909-14.....	(133) ^f	(793) ^f	(704)	(12)	(126)	189	1,778	5,193		(1,827) ^f
1923-28.....	(162)	(695)	(325)	(111)	(13)	6	1,904	2,784	1,906	2,291

B.—NET IMPORTS (continued)

Crop year August-July	Nether- lands	Denmark	Norway	Sweden	Austria	Czecho- Slovakia	Poland	Finland	Greece	Japan
1920-21.....	592	45	241	272	1,361	3,135	.....	435	229	157
1921-22.....	560	555	456	34	1,811	2,130	115	724	149	559
1922-23.....	659	555	603	75	2,016	1,996	535	1,091	1,099	147
1923-24.....	1,286	476	635	264	2,607	3,584	530	1,098	1,301	37
1924-25.....	698	201	560	146	1,580 ^j	3,094	3,326	973	1,324	(518)
1925-26.....	1,269	495	775	(17)	1,279 ^b	3,252	43	1,115	1,506	(1,016)
1926-27.....	1,751	690	611	76	1,763	1,691	76	1,098	1,194	(591)
1927-28.....	2,008	828	754	136	1,821	2,106	84	1,293	617	(1,000)
1928-29.....	1,639	782	961	150	1,386	1,978	2	1,481	376	(2,309)
Average										
1909-14.....	2,028	586 ^f	639	87	.....	.....	.....	.....	92 ^{af}	181
1923-28.....	1,402	538	667	121	1,810	2,745	812	1,115	1,188	(618)

* For footnotes see under Table XVI, except as follows: ^m Net import of 224 barrels.

TABLE XVIII.—EXPORTS OF WHEAT AND FLOUR AS WHEAT FROM SPECIFIED EXPORTING COUNTRIES TO SPECIFIED IMPORTANT EX-EUROPEAN IMPORTING COUNTRIES, ANNUALLY FROM 1921-22*

(Million bushels)

A.—TO JAPAN FROM NORTH AMERICA AND AUSTRALIA

Year July-June	Wheat and flour			Total from			Wheat from			Flour from		
	Total	Wheat	Flour	United States	Canada	Australia	United States	Canada	Australia	United States	Canada	Australia
1921-22.....	25.39	21.85	3.54	13.96	3.62	7.81	11.00	3.35	7.50	2.96	.27	.31
1922-23.....	14.08	12.11	1.97	6.50	3.79	3.79	5.35	3.05	3.71	1.15	.74	.08
1923-24.....	32.12	30.29	1.83	11.06	7.25	13.81	10.26	6.96	13.07	.80	.29	.74
1924-25.....	14.89	14.55	.34	4.35	3.51	7.03	4.10	3.43	7.02	.25	.08	.01
1925-26.....	29.66	29.07	.59	5.28	13.48	10.90	5.18	13.03	10.86	.10	.45	.04
1926-27.....	19.97	19.27	.70	7.34	8.30	4.33	7.34	7.63	4.30	.00	.67	.03
1927-28.....	20.79	20.09	.70	6.30	11.25	3.24	6.30	10.59	3.20	.00	.66	.04
1928-29.....	31.55	31.32	.23	3.78	22.11	5.66	3.78	21.91	5.63	.00	.20	.03

B.—TO CHINA, HONG KONG, AND KWANTUNG FROM NORTH AMERICA AND AUSTRALIA

Year July-June	Wheat and flour			Total from			Wheat from			Flour from		
	Total	Wheat	Flour	United States	Canada	Australia	United States	Canada	Australia	United States	Canada	Australia
1921-22.....	10.50	2.17	8.33	9.30	.37	.83	2.03	.00	.14	7.27	.37	.69
1922-23.....	16.97	1.95	15.02	13.73	2.88	.36	1.11	.80	.04	12.62	2.08	.32
1923-24.....	50.51	20.21	30.30	32.87	11.95	5.69	8.30	7.40	4.51	24.57	4.55	1.18
1924-25.....	5.66	.57	5.09	3.29	1.72	.65	.37	.20	.00	2.92	1.52	.65
1925-26.....	19.91	8.12	11.79	5.29	13.72	.90	.00	7.69	.43	5.29	6.03	.47
1926-27.....	13.23	4.24	8.99	6.06	6.96	.21	.30	3.94	.00	5.76	3.02	.21
1927-28.....	15.12	1.26	13.86	8.72	6.11	.29	.00	1.26	.00	8.72	4.85	.29
1928-29.....	37.24	11.30	25.94	11.93	22.47	2.84	.00	8.61	2.69	11.93	13.86	.15

C.—TO BRAZIL FROM NORTH AMERICA AND ARGENTINA

D.—TO EGYPT FROM NORTH AMERICA AND AUSTRALIA

Year July-June	Wheat and flour			Wheat and flour from			Wheat and flour			Wheat and flour from		
	Total	Wheat	Flour	United States	Canada	Argentina	Total	Wheat ^a	Flour	United States ^a	Canada ^a	Australia ^b
1921-22.....	.....	.....	.....	.....	.....	.....	9.52	3.29	6.23	.89	.13	8.50
1922-23.....	18.38	13.63	4.75	2.24	.11	16.03	8.15	.04	8.11	1.38	.63	6.14
1923-24.....	21.93	15.53	6.40	2.49	.34	19.10	11.40	1.34	10.06	.61	.67	10.12
1924-25.....	20.50	13.16	7.34	3.24	.15	17.11	11.56	1.89	9.67	.92	.46	10.18
1925-26.....	21.94	13.52	8.42	4.06	1.00	16.88	12.28	.67	11.61	1.44	.76	10.08
1926-27.....	24.95	15.91	9.04	4.25	1.20	19.50	15.83	4.62	11.21	1.58	.67	13.58
1927-28.....	31.77	22.64	9.13	4.10	.17	27.50	12.55	3.83	8.72	.82	.62	11.11
1928-29.....	33.52	25.33	8.19	3.91	.05	29.56	20.12	5.49	14.63	1.03	1.65	17.44

E.—TO WEST INDIES FROM NORTH AMERICA

F.—TO SOUTH AFRICA FROM CANADA AND AUSTRALIA

Year July-June	Total flour ^c	Flour from		Wheat and flour			Total from		Wheat from		Flour from	
		United States	Canada	Total	Wheat	Flour	Canada	Australia	Canada	Australia	Canada	Australia
1921-22.....	11.18	8.18	3.00	2.73	1.35	1.38	.20	2.53	.02	1.33	.18	1.20
1922-23.....	12.85	8.66	4.19	4.94	2.66	2.28	.51	4.43	.11	2.55	.40	1.88
1923-24.....	14.40	9.76	4.64	6.72	4.59	2.13	1.19	5.53	.87	3.72	.32	1.81
1924-25.....	12.65	9.23	3.42	5.60	4.09	1.51	.71	4.89	.42	3.67	.29	1.22
1925-26.....	12.77	8.24	4.53	4.70	3.37	1.33	.49	4.21	.25	3.12	.24	1.09
1926-27.....	13.10	9.19	3.91	3.58	2.36	1.22	.66	2.92	.35	2.01	.31	.91
1927-28.....	13.19	8.93	4.26	8.84	7.44	1.40	.84	8.00	.50	6.94	.34	1.06
1928-29.....	14.52	9.49	5.03	7.78	6.29	1.49	2.46	5.32	2.15	4.14	.31	1.18

* Data from official trade statistics of exporting countries. Exports from Argentina to Brazil in 1921-22 not available.

^a Australia alone exports wheat to Egypt.^b Exports from Australia to Egypt and Sudan.^c Flour only, as wheat exports to the West Indies from these two countries never amounted to more than 150 thousand bushels during this period.

TABLE XIX.—INTERNATIONAL TRADE IN WHEAT AND FLOUR, MONTHLY FROM JULY 1928*

(Million bushels)

A.—NET EXPORTS

Month	United States	Canada	India	Australia	Argentina	Roumania	Hungary	Jugoslavia	Poland	Algeria	Tunis	Egypt
July	5.13	35.92	1.19 ^a	5.02	9.56	.04	.62	.17 ^c	(1.41) ^b	.58	.96	(.44) ^b
Aug.	12.87	29.18	.51 ^a	4.43	6.51	.36	2.46	2.96	(.53) ^b	.70	1.05	(.74) ^b
Sept.	21.29	30.89	.25 ^a	2.79	8.29	.29	2.38	2.03	(.53) ^b	.74	.78	(.73) ^b
Oct.	26.66	48.89	.05	4.55	12.00	.47	2.32	.58	(.20) ^b	.42	.56	(.75) ^b
Nov.	13.62	80.56	(1.36) ^b	5.93	12.74	.18	2.14	.22	(.13) ^b	.47	.41	(1.10) ^b
Dec.	10.97	53.22	(1.29) ^b	8.39	16.09	.09	2.44	.06	(.20) ^b	.45	.25	(1.37) ^b
Jan.	6.70	24.93	(6.50) ^b	18.66	22.19	.08	1.58	.03	(.18) ^b	...		(1.60) ^b
Feb.	7.18	19.19	(5.18) ^b	16.68	27.25	.09	1.55	.04	(.18) ^b	...	.15	(1.50) ^b
Mar.	7.90	27.37	(3.88) ^b	16.12	29.63	.01	2.14	.15	(.09) ^b	...	.07	(1.70) ^b
Apr.	7.73	10.43	(3.16) ^b	11.67	25.36	... ^c	2.45	.74	(.09) ^b	...	.12	(1.28) ^b
May	14.56	31.05	(1.64) ^b	7.89	23.27	... ^c	2.04	.51	(.11) ^b	...	.12	(1.15) ^b
June	7.99	29.76	(.76) ^b	7.05	23.02	... ^c	1.95	.40	(.09) ^b	(.04) ^b	.57	(.86) ^b
July	12.58	20.73	(.90) ^b	4.43	17.52	.02	2.55	1.09	(.11) ^b	...	1.23	(.88) ^b

B.—NET IMPORTS

Month	Irish Free St.	United Kingdom	France	Germany	Belgium	Italy	Netherlands	Scandinavia	Switzerland	Czechoslovakia	Baltic States ^d	Japan
July	1.37	19.36	3.26	6.96	3.68	8.57	1.71	1.78	1.41	1.33	.64	.63 ^a
Aug.	1.42	16.44	4.41	6.67	3.73	5.33	2.25	2.67	1.12	1.57	.88	.45 ^a
Sept.	1.77	14.17	5.13	7.71	3.95	5.56	3.52	2.87	1.24	1.88	.90	.43 ^a
Oct.	2.09	13.44	4.31	7.15	3.39	7.44	2.52	2.55	1.50	2.52	1.31	.85
Nov. ....	.73	15.92	3.83	4.99	3.79	7.21	2.55	2.85	1.14	1.73	1.17	.64
Dec.	1.57	20.54	3.47	4.54	3.65	7.09	2.54	3.16	1.69	1.36	.81	1.40
Jan.	1.44	18.13	3.92	4.43	2.89	6.96	2.80	2.78	1.30	1.25	.87	1.96
Feb.	1.59	14.14	2.51	2.18	2.90	5.94	1.69	1.71	.46	.94	.73	2.57
Mar.	1.43	18.14	3.48	2.88	3.13	8.88	2.55	2.34	.84	1.10	.63	2.87
Apr.	1.66	19.98	4.97	9.00	3.08	8.57	2.14	4.45	1.97	1.54	.72	2.14
May	1.45	18.96	5.64	6.05	4.20	9.67	2.29	3.59	1.55	1.16	.89	2.35
June	1.47	15.13	6.55	5.88	3.34	8.10	2.54	2.71	1.28	1.14	1.01 ^c	1.27
July	1.86	15.85	6.15	16.17	3.99	6.63	2.59	2.22	2.53	1.23	1.24 ^c	.72

* Data from official sources and International Institute of Agriculture.

^a Gross, not net.^b Net import.^c Net export of 4,700 bushels.^d Approximate distribution of Latvian June and July net exports.^e Finland, Esthonia, Latvia.

TABLE XX.—UNITED STATES WHEAT AND FLOUR EXPORTS, ANNUALLY FROM 1920-21*

(Thousand bushels)

Crop year July-June	Wheat inspected for export						Unclassified wheat	Total wheat exports	Flour as wheat	Total exports	Total imports (less re- exports)	Net exports
	Hard red spring	Durum ^a	Hard red winter	Soft red winter	White (Pacific)	Mixed ^b						
1920-21.....	10,081	4,872	132,701	34,281	27,729	68,615	14,989	293,268	76,046	369,314	56,404	312,910
1921-22.....	20,145	8,697	78,477	18,998	43,652	18,963	19,389	208,321	74,245	282,566	16,852	265,714
1922-23.....	8,718	12,271	51,654	20,846	13,602	25,047	22,813	154,951	69,949	224,900	19,735	205,165
1923-24.....	1,022	4,908	19,640	9,810	18,653	5,435	19,325	78,793	81,087	159,880	27,954	131,926
1924-25.....	16,760	5,945	90,840	6,944	10,063	9,386	55,552	195,490	65,313	260,803	6,106	254,697
1925-26.....	3,338	4,170	7,358	2,282	16,914	5,944	23,183	63,189	44,846	108,035	15,363	92,672
1926-27.....	1,829	611	66,874	29,980	26,615	1,398	28,943	156,250	62,910	219,160	13,164	205,996
1927-28.....	5,209	3,496	41,603	9,915	28,150	1,874	55,752	145,999	60,260	206,259	15,679	190,580
1928-29.....	1,766	1,045	30,660	2,782	14,710	1,473	50,678	103,114	60,556	163,670	21,387	142,283

* Data of U.S. Departments of Agriculture and Commerce. See especially *Agriculture Yearbook*, 1924, p. 579, and 1928, p. 684. Data for 1928-29 received direct. See text, p. 80, for new official estimates of wheat exports by classes.^a Durum exports are materially understated, in earlier years chiefly as explained in note b, in later years chiefly because inspections for export are limited to Atlantic, Gulf, and Pacific ports, so that large quantities of durum wheat that are exported from lake ports via Montreal escape classification.^b It was estimated that 20,030,000 bushels of durum were mixed with spring wheat in 1920-21. Other mixed wheat exports in 1920-21 were largely soft and hard winter wheat shipped through Gulf ports. In 1921-22 and 1922-23, 70 per cent of the exports of mixed wheat is estimated as durum. See *Agriculture Yearbook*, 1924, p. 579.

TABLE XXI.—OCEAN FREIGHT RATES ON WHEAT AND CORN, 1913 AND CROP YEARS 1921-22 TO 1928-29*

(Cents per bushel)

Period	Canada to United Kingdom	New York to Liverpool	Northern Range to United Kingdom	Northern Range to Genoa	Northern Pacific to United Kingdom	La Plata down river to United Kingdom	Karachi to United Kingdom	Australia to United Kingdom
1913 (Jan.-Dec.)	8.3	5.8	8.0	11.9	25.7	10.6	12.2	20.4
1921-22 (Aug.-July)	10.7	8.5	10.3	12.5	25.3	14.6	12.8	28.6
1922-23 (Aug.-July)	9.2	5.5	8.0	11.0	22.2	14.3	15.4	23.6
1923-24 (Aug.-July)	9.4	6.8	8.6	10.4	21.2	13.7	15.0	21.8
1924-25 (Aug.-July)	9.4	6.3	8.8	10.5	21.3	12.0	14.7	25.2
1925-26 (Aug.-July)	9.0	7.0	8.0	9.2	20.0	10.9	13.1	22.3
1926-27 (Aug.-July)	12.0	9.7	12.1	13.3	23.9	19.9	15.8	28.5
1927-28 (Aug.-July)	7.7	5.6	7.7	10.1 ^a	19.5	13.9	13.2	23.2
1928-29 (Aug.-July)	8.5	6.1	9.1	10.8 ^b	19.6	14.9	13.1	23.1
1928 July	8.4	4.6	6.8	n.q.	17.6	13.8	11.2	21.8
Aug.	9.5	5.2	6.8	n.q.	19.0	13.1	12.4	25.6
Sept.	9.8	5.3	6.8	n.q.	18.8	12.3	12.7	26.6
Oct.	10.6	8.1	6.8	10.9 ^c	18.8	13.5	12.7	26.5
Nov.	10.4	9.5	11.7	10.8	20.5	14.9	13.4	27.5
Dec.	8.5	7.6	11.2	n.q.	21.2	16.1	14.8	27.6
1929 Jan.	8.1	8.0	10.6	n.q.	21.5	16.2	14.9	26.4
Feb.	7.1	6.6	9.9	n.q.	20.1	16.2	14.1	25.2
Mar.	5.6	4.9	9.1 ^d	n.q.	19.7 ^d	15.6	12.6	22.4
Apr.	5.3 ^c	4.6	n.q.	n.q.	18.7 ^d	15.8	12.4	18.9
May	n.q.	4.6	n.q.	n.q.	18.7	15.7	12.6	17.2
June	n.q.	4.5	n.q.	n.q.	18.7 ^c	14.4	12.7 ^c	15.4
July	n.q.	4.6	n.q.	n.q.	18.5 ^c	15.3	10.4 ^c	17.6

* Averages of Friday rates published in *International Crop Report and Agricultural Statistics*. New York-Liverpool rates are for parcels in liners; others for cargoes. No quotation is signified by "n.q."

^a July-February.

^b October-November.

^c Two-week average.

^d Three-week average.

^e One week only.

TABLE XXII.—UNITED STATES AND CANADIAN CARRYOVERS OF WHEAT, 1919-29*

(Thousand bushels)

Year	United States (July 1)				Canada (August 31, 1919-23; July 31, 1924-29)				
	Total	On farms	In country mills and elevators	Commercial visible (Bradstreet's)	Total	On farms	In elevators	In transit	In flour mills
1919	49,806	19,261	19,672	10,873	.....^a	2,149	3,305	.....^a	.....^a
1920	110,254	49,546	37,304	23,404	.....^a	2,122	6,930	.....^a	238
1921	93,840	56,707	27,167	9,966	13,727	2,144	4,831	6,032	720
1922	81,457	32,359	28,756	20,342	20,590	2,360	11,024	4,578	2,628
1923	102,414	35,894	37,117	29,403	11,690	1,441	5,051	2,758	2,440
1924	106,204	30,981	36,626	38,597	45,159 ^b	7,363 ^c	27,400 ^b	5,856 ^b	4,539 ^b
1925	86,447	29,357	25,287	31,803	26,483	2,709	17,939	3,835	2,000
1926	65,949	20,973	28,490	16,486	35,601	3,987	25,451	3,163	3,000
1927	74,507	27,215	21,776	25,516	50,586	4,264	37,079	5,243	4,000
1928	84,514	23,729	18,856	42,208	76,484	4,186	53,570	13,728	5,000
1929	180,561	44,741	40,136	95,684	104,426	5,617	82,640	8,669	7,500
Average									
1910-14	89,411	32,485	31,600	25,326	.....^a	.....^a	.....^a	.....^a	.....^a
1924-28	83,524	26,395	26,207	30,922	46,863	4,502	32,288	6,365	3,708

* Bradstreet's visible, and official data of U.S. Department of Agriculture and Dominion Bureau of Statistics. See especially *Agriculture Yearbooks*, *Canada Yearbooks*, *Grain World*, and press releases.

^a Not available.

^b July 31, as for later years.

^c For 1924 quantities in farmers' hands relate to August 31; for subsequent years to July 31.

TABLE XXIII.—UNITED STATES CENSUS REPORTS ON CITY MILL STOCKS OF WHEAT AND FLOUR, 1925-29*
(Million bushels)

Date	U.S. flour output represented %	Wheat stocks in						Flour as wheat ^c	Grand total
		Country elevators	Public terminals	Private terminals ^a	Transit	Mills ^b	Total		
1925 June 30	87.4 ^d	2.16	3.44	26.72			32.31	15.73	48.04
Dec. 31	88.0 ^d	7.55	12.70	82.86			103.11	21.55	124.66
1926 Mar. 31	88.4 ^d	4.67	7.10	3.65	3.29	45.93	64.64	18.28	82.92
June 30	87.4 ^d	2.52	3.00	1.14	6.73	22.45	35.83	14.67	50.50
Sept. 30	87.4 ^d	8.92	12.04	8.57	15.38	79.87	124.77	19.82	144.59
Dec. 31	87.5 ^d	8.47	11.95	10.66	13.49	71.84	116.41	20.38	136.79
1927 Mar. 31	90.5 ^e	6.06	6.85	5.84	6.45	60.57	85.77	19.40	105.17
June 30	90.1 ^e	2.56	3.88	1.61	10.39	34.15	52.59	16.76	69.35
Sept. 30	89.1 ^e	6.23	12.15	3.98	16.12	77.25	115.73	20.05	135.78
Dec. 31	89.5 ^e	8.84	14.11	3.64	18.59	70.46	115.64	21.34	136.98
1928 Mar. 31	91.2 ^e	5.48	9.33	2.11	9.41	59.05	85.38	19.69	105.07
June 30	90.4 ^e	1.91	3.68	.55	10.16	29.78	46.08	17.08	63.16
Sept. 30	90.8 ^e	10.60	20.21	3.89	23.87	92.66	151.23	19.65	170.88
Dec. 31	92.8 ^f	9.94	27.78	5.08	22.84	88.23	153.87	21.61	175.48
1929 Mar. 31	93.1 ^f	5.76	14.45	3.99	8.67	74.35	107.22	20.47	127.69
June 30	93.6 ^f	3.52	8.32	2.16	15.44	45.91	75.35	17.98	93.33

* Data from press releases of U.S. Department of Commerce.

^a In private terminal elevators not attached to mills.^b In mills and elevators attached to mills.^c Wheat-flour stocks in wheat equivalent (4.7 bu.=1 bbl.).^d Based on total output (114,438,544 barrels) of wheat flour reported at the census of manufactures, 1923.^e Based on total output (114,689,930 barrels) of wheat flour reported at the census of manufactures, 1925.^f Based on total output (118,174,812 barrels, preliminary figures) of wheat flour reported at the census of manufactures, 1927.TABLE XXIV.—WORLD VISIBLE WHEAT SUPPLIES, AUGUST 1, 1920-29, AND MONTHLY, 1928-29*
(Million bushels)

Date	United States	Canada	Argentina	Australia	United Kingdom ports	Afloat to Europe	North America	Argentina, Australia	U.K. and afloat	Grand total	Total ex-Australia
1920 Aug. 1	42.7	8.2	3.7	27.5	12.8	76.2	50.9	31.2	89.0	171.1	143.6
1921 Aug. 1	56.2	8.9	3.7	30.0	7.6	57.9	65.1	33.7	65.5	164.3	134.3
1922 Aug. 1	43.1	19.3	2.2	3.0	7.1	48.9	62.4	5.2	56.0	123.6	120.6
1923 Aug. 1	73.3	14.1	4.4	18.0	8.2	39.0	87.4	22.4	47.2	157.0	139.0
1924 Aug. 1	72.1	31.6	6.8	30.0	9.9	41.8	103.7	36.8	51.7	192.2	162.2
1925 Aug. 1	57.3	23.4	7.7	8.4	9.2	33.3	80.7	16.1	42.5	139.3	130.9
1926 Aug. 1	64.2	28.3	4.1	6.2	4.3	38.6	92.5	10.3	42.9	145.7	139.5
1927 Aug. 1	65.9	42.7	5.9	12.7	7.8	46.1	108.6	18.6	53.9	181.1	168.3
1928 Aug. 1	88.1	69.2	5.9	9.5	10.1	44.7	157.3	15.4	54.8	227.5	218.0
Sept. 1	135.9	30.5	8.5	5.2	9.5	43.7	166.4	13.7	53.2	233.3	228.1
Oct. 1	181.8	76.5	7.3	3.4	7.8	41.1	258.3	10.7	48.9	317.9	314.5
Nov. 1	204.4	155.1	7.3	1.3	5.9	50.3	359.5	8.6	56.2	424.3	423.0
Dec. 1	208.0	169.5	4.4	8.0	5.7	63.5	377.5	12.4	69.2	459.1	451.1
1929 Jan. 1	204.7	218.6	5.9	75.0	6.2	54.4	423.3	80.9	60.6	564.8	489.8
Feb. 1	186.7	208.2	10.3	76.5	6.5	64.8	394.9	86.8	71.3	553.0	476.5
Mar. 1	179.8	195.2	12.8	63.0	5.8	70.1	375.0	75.8	75.9	526.7	463.7
Apr. 1	173.1	177.1	14.7	53.0	8.0	71.0	350.2	67.7	79.0	496.9	443.9
May 1	165.4	158.3	14.3	48.0	9.6	55.2	323.7	62.3	64.8	450.8	402.8
June 1	136.7	137.9	14.0	39.0	9.8	59.8	274.6	53.0	69.6	397.2	358.2
July 1	131.9	112.5	15.4	30.0	8.2	53.2	244.4	45.4	61.4	351.2	321.2
Aug. 1	190.3	99.8	16.2	20.0	6.2	37.6	290.1	36.2	43.8	370.1	350.1
Average, Aug. 1											
1910-14	58.8	10.8	1.3	5.9 ^a	15.4	35.2	69.6	7.2 ^a	50.6	127.4 ^a	121.5
1924-28	69.5	39.0	6.1	13.4	8.3	40.9	108.5	19.5	49.2	177.2	163.8

* A joint compilation by Broomhall, the *Daily Market Record*, Minneapolis, and the *Daily Trade Bulletin*, Chicago, here summarized from Broomhall's *Corn Trade News* and the *Daily Trade Bulletin*. Includes some flour stocks.^a For Australia, 4-year average, 1911-14.

TABLE XXV.—UNITED STATES FLOUR PRODUCTION, NET EXPORTS AND SHIPMENTS, AND DOMESTIC DISAPPEARANCE, MONTHLY FROM JULY 1923*

(Thousand barrels)

Years	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
A.—REPORTED PRODUCTION, ALL REPORTING MILLS													
1923-24	7,805	9,642	9,760	10,983	9,403	8,137	8,970	8,433	8,355	7,682	7,896	7,797	104,863
1924-25	8,465	9,842	10,459	11,371	9,187	8,855	9,853	8,248	7,347	6,781	6,942	7,745	105,095
1925-26	8,840	9,293	9,938	10,728	9,128	8,948	8,679	7,429	8,289	7,589	7,418	8,005	104,284
1926-27	9,570	10,447	10,843	10,678	9,618	8,909	8,624	8,023	8,936	8,309	8,497	8,528	110,982
1927-28	8,388	9,617	10,470	10,817	9,735	9,235	9,242	8,975	9,772	8,507	8,712	7,758	111,228
1928-29	8,516	10,370	10,512	11,587	9,909	9,269	10,014	9,026	9,207	8,636	9,334	8,912	115,292
B.—ESTIMATED TOTAL UNITED STATES PRODUCTION													
1923-24	8,965	11,069	11,123	12,442	10,604	9,184	10,081	9,477	9,394	8,657	8,898	8,780	118,674
1924-25	9,503	11,022	11,694	12,691	10,249	9,870	10,968	9,215	8,217	7,606	7,780	8,655	117,470
1925-26	9,869	10,374	11,094	11,957	10,181	9,974	9,671	8,276	9,213	8,438	8,242	8,868	116,157
1926-27	10,572	11,520	11,940	11,761	10,582	9,800	9,471	8,809	9,801	9,100	9,334	9,358	122,048
1927-28	9,196	10,506	11,417	11,766	10,565	10,009	9,971	9,696	10,526	9,166	9,365	8,377	120,560
1928-29	9,186	11,164	11,327	12,449	10,577	9,905	10,682	9,648	9,840	9,236	9,974	9,568	123,556
C.—NET EXPORTS AND SHIPMENTS TO POSSESSIONS													
1923-24	918	1,289	1,592	2,118	1,817	1,853	1,765	1,572	1,450	1,095	1,011	1,227	17,707
1924-25	831	993	1,511	1,909	1,653	1,510	1,060	976	1,425	1,012	746	859	14,485
1925-26	820	910	854	1,062	935	1,048	727	696	733	884	737	699	10,105
1926-27	848	1,403	1,617	1,429	1,400	1,270	1,084	905	929	1,062	1,162	914	14,023
1927-28	836	1,096	1,317	1,558	1,383	1,175	1,289	1,000	1,053	1,044	905	724	13,380
1928-29	683	1,001	1,066	1,436	1,261	998	1,429	1,273	1,312	1,156	986	1,051	13,652
D.—CALCULATED DOMESTIC DISAPPEARANCE													
1923-24	8,047	9,780	9,531	10,324	8,787	7,331	8,316	7,905	7,944	7,562	7,887	7,553	100,967
1924-25	8,672	10,029	10,183	10,782	8,596	8,360	9,908	8,239	6,792	6,594	7,034	7,796	102,985
1925-26	9,049	9,464	10,240	10,895	9,246	8,926	8,944	7,580	8,480	7,554	7,505	8,169	106,052
1926-27	9,724	10,117	10,323	10,332	9,182	8,530	8,387	7,904	8,872	8,038	8,172	8,444	108,025
1927-28	8,360	9,410	10,100	10,208	9,182	8,834	8,682	8,696	9,473	8,122	8,460	7,653	107,180
1928-29	8,503	10,163	10,261	11,013	9,316	8,907	9,253	8,375	8,528	8,080	8,988	8,517	109,904

* Reported production and trade data from U.S. Department of Commerce press releases, *Monthly Summary of Foreign Commerce*, and *Foodstuffs Round the World*. The estimates of total United States production are based on a new and detailed, but still partially incomplete, study of relations between monthly reported output and census totals and are subject to minor revisions. They replace earlier estimates which we have published and are believed to be the most trustworthy now available.

TABLE XXVI.—AVERAGE PRICES OF REPRESENTATIVE WHEATS IN LEADING EXPORTING AND IMPORTING MARKETS, MONTHLY, 1928-29*

(U.S. dollars per bushel)

Month	United States				Canada		Liverpool						Argentina	Australia
	No. 2 Red Winter (St. Louis)	No. 2 Hard Winter (Kansas City)	No. 1 Dark Northern (Minneapolis)	No. 2 Amber Durum (Minneapolis)	No. 1 Manitoba (Winnipeg)	No. 3 Manitoba (Winnipeg)	No. 1 Manitoba	No. 3 Manitoba	No. 2 Hard Winter	Pacific White	Australian	Argentine Rosafé	Barletta (Buenos Aires)	(Melbourne)
July	1.47	1.20	1.47	1.23	1.32	1.21	1.55	1.41	1.46	1.52	1.54	1.48	1.32	1.29
Aug.	1.38	1.06	1.24	1.08	1.19	1.08	1.39	1.25	1.30	1.36	1.37	1.29	1.21	1.18
Sept.	1.45	1.07	1.26	1.06	1.17	1.06	1.37	1.26	1.30	1.38	1.36	1.27	1.17	1.16
Oct.	1.44	1.10	1.23	1.12	1.24	1.11	1.47	1.35	1.36	1.43	1.44	1.33	1.20	1.16
Nov.	1.45	1.12	1.24	1.14	1.21	1.11	1.48	1.39	n.q.	1.43	1.45	1.32	1.17	1.16
Dec.	1.39	1.11	1.22	1.10	1.17	1.09	1.47	1.37	1.36 ^a	1.42	1.39	1.28	1.12	1.14
Jan.	1.42	1.14	1.29	1.27	1.21	1.12	1.50	1.40	n.q.	1.41	1.41	1.29	1.13	1.13
Feb.	1.40	1.18	1.36	1.29	1.28	1.20	1.55	1.47	n.q.	1.44	1.44	1.32	1.16	1.15
Mar.	1.35	1.16	1.32	1.24	1.27	1.19	1.52	1.43	n.q.	1.40	1.41	1.30	1.13	1.14
Apr.	1.25	1.10	1.29	1.18	1.23	1.15	n.q.	1.37	1.32 ^a	1.34	1.36	1.24	1.11	1.12
May	1.17	1.01	1.21	1.08	1.14	1.07	1.34 ^b	1.26	1.18	1.27	1.27	1.17	1.03	1.06
June	1.21	1.05	1.23	1.15	1.19	1.13	1.38 ^c	1.28	1.22	1.28	1.27	1.15	1.01	1.04
July	1.39	1.25	1.50	1.35	1.60	1.52	1.78 ^b	1.66	1.43	1.56 ^c	1.48	1.42	1.22	1.24

* United States prices are the U. S. Department of Agriculture monthly weighted averages of daily quotations for reported cash sales, compiled from *Crops and Markets*. Canadian prices are averages of weekly prices from *Canadian Grain Statistics*. Liverpool prices are averages of Friday quotations from *International Crop Report and Agricultural Statistics*, except Rosafé, No. 1 Manitoba, and No. 3 Manitoba at Liverpool which are averages of Tuesday quotations from *Broomhall's Corn Trade News*. Argentine prices are averages of weekly prices from *Revista Semanal*. Australian prices are averages of weekly quotations for export wheat furnished directly by an Australian correspondent. No quotation is signified by "n.q."

^a One week.^b Three-week average.^c Two-week average.

TABLE XXVII.—MONTHLY PRICES OF DOMESTIC WHEAT IN EUROPE, FROM AUGUST 1926*

(U.S. dollars per bushel)

Month	Great Britain			France (Chartres)			Italy (Milan)			Germany (Berlin)		
	1926-27	1927-28	1928-29	1926-27	1927-28	1928-29	1926-27	1927-28	1928-29	1926-27	1927-28	1928-29
Aug.	1.76	1.63	1.33	1.61	1.75	1.60	1.85	1.75 ^a	1.72	1.75	1.78 ^b	1.49
Sept.	1.46	1.43	1.19	1.77	1.57	1.58	2.03	1.73	1.81	1.71	1.68	1.36
Oct.	1.48	1.37	1.24	1.88	1.54	1.61	2.21	1.77	1.88	1.72	1.62	1.38
Nov.	1.62	1.32	1.28	1.96	1.48	1.60	2.20	1.90	1.87	1.78	1.57	1.37
Dec.	1.55	1.29	1.25	1.78	1.58	1.56	2.31	1.88	1.87	1.74	1.53	1.33
Jan.	1.55	1.29	1.25	1.88	1.58	1.59	2.13	1.93	1.92	1.72	1.52	1.35
Feb.	1.54	1.26	1.27	1.81	1.56	1.64	2.11	1.94	1.96	1.72	1.49	1.40
Mar.	1.52	1.27	1.27	1.70	1.65	1.68	2.11	2.00	1.95	1.73	1.59	1.44
Apr.	1.50	1.34	1.28	1.82	1.74	1.60	2.02	2.09	1.93	1.76	1.72	1.45
May	1.58	1.43	1.29	1.91	1.87	1.65	2.16	2.14	1.89	1.92	1.73	1.41
June	1.65	1.43	1.25	1.88	1.85	1.62	1.99	2.10	1.91 ^a	1.96 ^c	1.66	1.39
July	1.64	1.41	1.35	1.81	1.76	1.62	1.80	1.77	1.77	n.q.	1.60	1.62

* Data for Great Britain are averages of weekly average *Gazette* prices as given in the *Economist*; for France, averages of Saturday prices furnished directly by Federal Reserve Board; for Italy, averages of Friday prices of soft wheat as given in *International Crop Report and Agricultural Statistics*; for Germany, monthly average prices as given in *Wirtschaft und Statistik*. All data are converted, for convenience, from the domestic currency in which they are quoted in the above sources into U.S. money by monthly average exchange rates. No quotation is signified by "n.q."

^a Three-week average.^b Second half of August.^c First half of June.

TABLE XXVIII.—APPARENT DOMESTIC UTILIZATION OF WHEAT (CARRYOVERS DISREGARDED), ANNUALLY FROM 1920-21*

(Million bushels)

Crop year August-July	United States	Canada	India	Aus- tralia	Argen- tina	Chile	Hungary	Bulgaria	Jugo- Slavia	Rou- mania	Morocco
1920-21.....	525.1	97.4	362.8	29.4 ^a	90.2 ^a	21.0 ^a	37.9	28.1	39.2	59.9	17.9 ^b
1921-22.....	563.1	115.5	264.2	44.0	45.4	23.6	43.3	24.7	47.9	75.0	22.9
1922-23.....	667.4	120.8	338.4	46.5	55.4	24.4	49.6	28.3	43.5	90.4	12.2
1923-24.....	670.0	128.1	352.3	42.7	77.6	20.9	50.9	26.7	55.2	93.1	19.9
1924-25.....	608.0	70.0	322.5	44.4	73.9	19.3	38.0	26.4	48.2	67.2	27.1
1925-26.....	573.0	71.4	323.0	39.3	108.9	25.6	51.9	37.0	67.8	94.8	23.2
1926-27.....	632.4	114.7	313.2	54.7	56.7	23.6	53.0	34.3	61.7	99.7	15.4
1927-28.....	694.3	147.2	326.5	37.0	35.7	27.8	55.1	40.1	56.0	89.3	22.2
1928-29.....	765.1	160.5	315.7	....	....	....	73.2	49.9 ^c	94.5	114.0	20.7
Average											
1909-14.....	580.1	101.5	302.1	35.9 ^a	63.4 ^a	19.0 ^a	....	....	....	....	16.7 ^b
1923-28.....	635.5	106.3	327.5	43.6	70.6	23.4	49.8	32.9	57.8	88.8	21.6

Crop year August-July	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Nether- lands	Denmark	Norway	Sweden
1920-21.....	21.8	6.5	42.9	256.9	305.2	142.4 ^d	241.7	42.4	24.9	7.7	4.9	16.9
1921-22.....	24.3	7.7	43.8	282.0	340.6	177.3 ^d	294.6	55.0	28.3	15.2	6.1	16.2
1922-23.....	21.2	4.4	43.7	275.5	288.9	109.4 ^d	277.3	50.3 ^e	30.0	15.5	7.5	18.3
1923-24.....	28.6	7.1	49.2	300.2	328.9	137.2 ^d	294.7	53.7 ^e	33.0	18.1	6.7	23.4
1924-25.....	17.7	4.9	44.1	281.8	339.7	170.1 ^d	258.8	52.4 ^e	31.5	12.4	6.1	17.4
1925-26.....	28.2	9.1	49.0	263.6	340.6	175.6	308.7	54.2 ^e	32.9	15.8	7.2	19.5
1926-27.....	25.2	12.7	46.0	289.3	294.0	187.2	307.2	53.0 ^e	33.9	16.0	6.8	18.2
1927-28.....	23.0	7.7	50.9	289.4	323.3	209.1	283.4	58.8 ^e	37.1	20.4	7.4	24.3
1928-29.....	26.2	6.8	50.9	270.3	335.7	219.2	316.0	60.6 ^e	37.3	28.9	10.0	27.2
Average												
1909-14.....	29.8	7.0	41.9	277.3	361.2 ^f	219.9 ^f	236.3 ^f	65.4	27.6	11.8 ^f	4.1	15.2
1923-28.....	24.5	8.3	47.8	284.9	325.3	175.8	290.6	54.4	33.7	16.5	6.8	20.5

Crop year August-July	Spain	Portugal	Switzer- land	Austria	Czecho- Slovakia	Poland	Finland	Latvia	Estonia	Greece	Japan
1920-21.....	158.4	16.9 ^g	16.5	20.0	44.7	....	2.7	.97	....	21.8	35.9
1921-22.....	153.1	17.4	17.0	25.5	50.2	41.7	4.0	1.53	....	24.0	53.4
1922-23.....	125.3	16.5	19.1	20.8	43.9	49.3	5.8	2.06	....	26.5	43.8
1923-24.....	156.8	16.4	20.9	27.0	57.4	57.5	5.8	3.44	1.70	27.6	55.7
1924-25.....	122.6	16.6	17.0	23.2	53.8	54.6	5.3	3.52	1.40	28.5	39.2
1925-26.....	161.9	16.8	19.1	25.4	61.0	59.3	6.2	3.72	1.76	30.1	52.2
1926-27.....	145.6	16.5	20.6	26.4	54.2	60.6	6.1	3.54	1.75	31.8	45.5
1927-28.....	147.7	15.4 ^h	22.5	28.4	61.8	69.7	7.1	4.15	2.19	32.5	47.3
1928-29.....	139.5 ^g	....	20.9	27.5	68.9	61.7	7.9	5.47	2.28	35.2	48.0
Average											
1909-14.....	136.6	....	20.2	71.4 ⁱ	....	....	...	....	....	....	29.2
1923-28.....	146.9	16.3	20.0	26.1	57.6	60.3	6.1	3.67	1.76	30.1	48.0

* Computed from production and trade data given in Tables III and XVII. Dots (...) indicate that comparable production or trade figures are not available.

^a Crop of 1920-21 minus exports of 1921, and similarly for other years. Averages are for calendar years 1910-14 and 1924-28.

^b Crop of 1920 minus exports of 1920, and similarly for other years. Averages are for calendar years 1909-13 and 1923-27.

^c Trade figures partially estimated.

^d These figures are too low, as crops in earlier post-war years are underestimated and net imports, at least to 1924-25, are incomplete. See WHEAT STUDIES, December 1924, I, 17-18.

^e Luxemburg included with Belgium after May 1922.

^f Pre-war boundaries.

^g Crop of 1920 minus exports of 1921, and similarly for other years. Averages are for calendar years 1910-14 and 1924-28.

TABLE XXIX.—AVERAGE DAILY VOLUME OF TRADING IN WHEAT FUTURES IN UNITED STATES MARKETS, MONTHLY FROM JANUARY 1921*

(Million bushels)

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Year
1920-21 .....	.....	.....	.....	.....	.....	.....	39.1	44.1	39.5	52.5	46.1	49.8	45.2*
1921-22	45.5	39.6	57.1	54.0	53.7	43.3	36.5	67.9	61.3	48.9	37.4	41.8	48.7
1922-23	34.4	36.2	33.5	32.5	37.6	42.1	36.6	37.0	27.9	48.0	41.0	40.9	37.3
1923-24	32.3	31.4	28.3	30.2	27.1	21.1	14.3	18.1	22.8	18.0	14.4	34.0	24.3
1924-25	53.3	50.0	42.7	61.4	60.9	58.8	73.4	81.0	87.4	59.3	60.3	67.6	62.9
1925-26	56.2	60.0	59.0	60.4	65.2	90.3	60.6	58.3	69.0	55.8	48.8	46.3	60.9
1926-27	57.5	47.1	46.2	43.6	53.3	37.4	28.2	26.4	34.1	33.8	50.4	44.8	41.9
1927-28	40.7	42.4	36.9	36.7	34.9	20.9	15.4	22.1	34.2	66.2	56.6	36.2	37.0
1928-29	39.8	42.0	34.1	35.2	32.6	21.5	41.7	40.6	43.3	52.4	48.2	55.6	40.8
1929-30	111.1	83.9	58.4	66.8	75.2	.....	.....	.....	.....	.....	.....	.....	.....

* Data of Grain Futures Administration, U.S. Department of Agriculture. Not compiled prior to January 1921.

* Six-month average.

TABLE XXX.—APPROXIMATE DISPOSITION OF WHEAT SUPPLIES IN FOUR LEADING EXPORTING COUNTRIES, 1924-25 TO 1928-29*

(Million bushels)

Item	United States (July-June)					Canada (August-July)				
	1924-25	1925-26	1926-27	1927-28	1928-29	1924-25	1925-26	1926-27	1927-28	1928-29
Initial stocks	165	135	111	138	142	41	26	35	48	78
New crop	864	676	831	878	915	262	395	407	480	567
Total supplies	1,029	811	942	1,016	1,057	303	421	442	528	645
Net exports	258	95	209	194	147	192	324	292	332	406
Seed requirements	84	83	89	95	88	38	40	39	42	45
Consumed for food.....	479	493	494	508	511	42	42	43	42	44
Unmerchantable, lost in cleaning, fed on farms.....	73	29	12	77	49	22	18	31	34	44
Apparent error in crop estimate	—17	—38	—11	...	+2	—17	—38	—11	...	+2
Stocks at end.....	135	111	138	142	262	26	35	48	78	104
Total disappearance	1,029	811	942	1,016	1,057	303	421	442	528	645

Item	Argentina (August-July)					Australia (August-July)				
	1924-25	1925-26	1926-27	1927-28	1928-29	1924-25	1925-26	1926-27	1927-28	1928-29
Initial stocks	66	56	61	65	90	38	36	30	34	43
New crop	191	191	221	239	307	165	115	161	118	160
Total supplies	257	247	282	304	397	203	151	191	152	203
Net exports	123	94	143	178	224	124	77	103	71	109
Seed requirements	23	25	24	25	23	11	11	12	14	14
Consumed for food.....	53	54	57	59	61	29	29	30	30	31
Feed and waste.....	2	10	3	3	4	3	4	5	4	4
Apparent error in crop estimate	...	+3	—10	—51	—35	...	...	+7	—10	45
Stocks at end.....	56	61	65	90	120	36	30	34	43	45
Total disappearance	257	247	282	304	397	203	151	191	152	203

* Based so far as possible upon official estimates for the various items of supply and disposition. It is necessary, however, to supply estimates for certain items in all four countries, as well as to adjust official figures in order to place all data on the designated crop-year basis. The following notes explain our methods of estimation and adjustment.

UNITED STATES. Initial stocks. The figures for 1926-27, 1927-28, and 1928-29 (like the figure for stocks at the end of 1928-29) are sums of official estimates of stocks on farms and of stocks in country mills and elevators, Bradstreet's visible

TABLE XXX.—(Continued)

supplies, and wheat and flour stocks in city mills as reported by the Census Bureau. Flour stocks converted at 4.7 bushels per barrel. In order to avoid duplication with stocks in country mills and visibles, the quantities of wheat reported in "country elevators" and "in public terminal elevators" have been subtracted from the Census Bureau's totals. Published figures for country mill and elevator stocks on and prior to July 1, 1925, have been raised by 29 per cent, in accord with the Department of Agriculture's revision of the original estimate for July 1, 1926. In the absence of official data, city mill stocks on and prior to July 1, 1924, have been estimated roughly at 40 million bushels in 1923, and 50 million in 1924. Total initial stocks may be too low in 1923-24, too high in 1924-25; see WHEAT STUDIES, February 1928, IV, 169-70, 180. *New crop.* Official figures. *Net exports.* Official data for domestic exports, plus re-exports, less imports. Includes shipments to possessions. Flour exports and re-exports converted at 4.7 bushels per barrel; flour imports (almost entirely from Canada) at the official Canadian figure, 4.5 bushels per barrel. *Seed requirements.* Official data. *Consumed for food.* Estimated directly on the basis of the trend of domestic disposition of flour, and adjusted official data on wheat milled per barrel of flour. *Unmerchantable and lost in cleaning; fed on farms; apparent error in crop estimate.* In the absence of official data on any of these items, the three must be bracketed and calculated as a residual. In our judgment the composite item so calculated is of reasonable size for 1924-25 and 1927-28, though perhaps slightly too high in each of these years. The low figures for 1925-26, 1926-27, and 1928-29 establish the presumption that the crops were officially underestimated in these two years.

CANADA. *Initial stocks.* Official data after August 1, 1924. The figures are slightly lower than official estimates of carry-overs as shown in Appendix Table XXII, apparently because certain quantities of wheat in transit are excluded from the former. The figure for August 1, 1923, is obtained by adding to official stocks figures as of September 1 the net exports and domestic consumption in August. *New crop.* Official data. *Net exports.* Official data. *Seed requirements.* Official data. *Consumed for food.* Official data except for 1928-29. *Unmerchantable, lost in cleaning, fed on farms.* Official data for the first two categories; we assume that wheat fed on farms is included in "unmerchantable." *Apparent error in crop estimate.* Calculated as a residual. The figures may be regarded as fairly reliable in view of the completeness of official disposition figures.

ARGENTINA. *Initial stocks.* Figures for stocks on August 1, 1926, 1928, and 1929 rest in part upon direct estimates of stocks. See text, pp. 58-59; but all stocks figures are calculated on the assumption that stocks on January 1 remain constant at 10 million bushels, and that August 1 stocks must equal January 1 stocks plus net exports August-December, plus 5/12 of domestic consumption during the crop year. These estimates are tentative. *New crop.* Official data. *Net exports.* Official data. *Seed requirements.* Based on official data for acreage sown and average seed requirements per acre. The figure for 1925-26 has been made unusually high to allow for increased per acre requirements due to poor quality of seed. *Consumed for food.* Based on official data on flour milled less flour exported in calendar years, adjusted to present data for crop years. The figures for 1927-28 and 1928-29 contain a considerable element of estimate, since data for the calendar year 1928 are not available. *Feed and waste.* Rough approximations based on the assumption that feed use of wheat is normally very small in a country exporting large quantities of corn, and introduced chiefly because relatively large quantities were probably fed and wasted in the calendar year 1926, following a crop of poor quality.

AUSTRALIA. *Initial stocks.* Calculated on essentially the same assumptions as governed calculations of Argentine stocks. January 1 stocks of old-crop wheat are assumed to remain constant at 5 million bushels. *New crop.* Official data. *Net exports.* Official data. *Seed requirements.* Chiefly official data, but since 1926-27 the figures are partially estimated. These figures include wheat sown for hay as well as for grain. *Consumed for food.* Based on official monthly data on flour production, less exports of flour. Figures since 1927-28 estimated. *Feed and waste.* Based on official estimate of .5 to 1 bushel per capita utilization of wheat for feed, waste, and seed for green forage. *Apparent error in crop estimate.* The apparent over- and underestimates for 1926-27 and 1927-28 result merely from our assumption that stocks on January 1 remain constant at 5 million bushels. Stocks on January 1, 1927, were undoubtedly larger than this on account of reduced shipments in preceding months when ocean freight rates were high.