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W H E A T S T U D I E S

OF THE FOOD RESEARCH INSTITUTE

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DECEMBER 1931

THE WORLD WHEAT SITUATION, 1930-31 A REVIEW OF THE CROP YEAR

THE world wheat crop of 1930 (ex-Russia) unexpectedly turned out to be larger than in any preceding year except 1928. Because of a larger inward carryover, total supplies available for 1930-31, outside of Russia, were about as large as those of 1928-29. Russia had a bumper crop, and became a major exporter for the first time since the war.

Realization of these developments, the flooding of European markets with Russian wheat, and generally declining commodity prices and deepening world depression, brought about a sharp drop in world wheat prices in August-December 1930. Except in a few countries with effective price-raising measures in force, wheat prices since January 1931 have been lower than in any year since 1894. Throughout 1931 wheat has been unprecedentedly cheap in terms of commodities in general.

International trade in wheat and flour was of fairly large volume in 1930-31, though rather because of export pressure than because of insistent import demands. Ex-European importers bought heavily at the low prices. Increased restrictions on imports held down European takings.

World wheat consumption attained new high levels in 1930-31. Consumption for food was heavy in Russia and India, consumption for feed in several exporting countries. Nevertheless the year closed with world stocks at record heights, especially in North America. Stocks in European importing countries, however, were not high.

Stabilization operations in the United States kept domestic prices out of line with other markets and enhanced returns to wheat growers, but curtailed exports, enlarged visible supplies at the expense of other stocks, reduced mill grindings, and in many other ways altered the usual course of commercial transactions in wheat and flour.

STANFORD UNIVERSITY, CALIFORNIA

December 1931

W H E A T S T U D I E S

OF THE

FOOD RESEARCH INSTITUTE

The central feature of the series is a periodic analysis of the world wheat situation, with special reference to the outlook for supplies, requirements, trade, and prices. Each volume includes a comprehensive review of the preceding crop year, and three surveys of current developments at intervals of about four months. These issues contain a careful selection of relevant statistical material, presented in detail in appendix tables for reference purposes, and in summary form in text tables and charts.

Each volume also includes six special studies bearing on the interpretation of the wheat situation and outlook or upon important problems of national policy. Subjects of issues published in recent volumes are listed inside the back cover.

The series is designed to serve the needs of all serious students of the wheat market, in business, government, and academic circles, by summarizing and interpreting basic facts and presenting current developments in due perspective. The special studies are written not merely for students of the wheat market, but as well for various groups of readers who are especially concerned with the fields discussed.

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The Food Research Institute was established at Stanford University in 1921 jointly by the Carnegie Corporation of New York and the Trustees of Leland Stanford Junior University, for research in the production, distribution, and consumption of food.

THE WORLD WHEAT SITUATION, 1930-31

A REVIEW OF THE CROP YEAR

World wheat developments in 1930-31 were even more extraordinary than in either of the two preceding years.

In 1928-29, world wheat production (excluding Russia) was of record size; prices naturally ruled low; international trade attained record volume; and strikingly heavy stocks were carried forward, both in exporting and in importing countries. These big stocks, left over from the huge world crop of 1928, were at first carried rather easily; but they bore upon the market with increasing weight in the next two crop years.

In 1929-30, the aggregate world wheat crop was relatively short; but Europe harvested excellent crops not only of wheat but of other cereals and potatoes, and several countries restricted wheat imports as a means of strengthening prices for their own farmers. A striking decline in European demand was mainly responsible for a great shrinkage in the volume of trade, to lower levels than in any earlier post-war year. World visible supplies increased greatly as export surpluses, from carryovers and 1929 crops, found only limited foreign outlets. Weakened by these factors, amid general recessions in business activity and commodity prices, wheat prices declined, in January-July 1930, to the lowest level since the war. In the crop year as a whole, world wheat stocks were reduced by much less than was anticipated, and were concentrated more heavily in exporting countries. Outward carryovers in North America were higher than ever before.

In 1930-31, the world wheat crop, excluding Russia, unexpectedly turned out to be larger than in any preceding year except 1928; and because of a larger inward carryover, total supplies available for 1930-31, outside

of Russia, were about as large as those of 1928-29. Australia and several minor exporting countries had the biggest crops in post-war years, if not in history. More important, Russia too had a bumper crop, and became a major exporter for the first time since before the war. As these developments came to be realized and as Russian wheat flooded European markets, amid general price declines and deepening world depression, world wheat prices fell heavily in August-December 1930.

International trade in wheat and flour was fairly large in 1930-31, but rather because of export pressure than because of insistent import demands. At the low price levels that prevailed from December 1930 to July 1931, heavy purchases were made by ex-European countries as a group, and by China in particular, especially from Australia. India, though having a large apparent export surplus,

was a small net importer. Europe's imports were larger than in 1929-30 because European carryovers (outside of France) and 1930 crops were not, as a whole, as large as in 1929; but increased restrictions on imports limited the expansion of shipments to Europe, and led to general reduction of stocks in Continental importing countries as a group.

World wheat consumption attained new high levels in 1930-31, mainly because of increased human consumption in Russia and India and of liberal use for feed in several exporting countries. In spite of this, world wheat stocks stood at record heights at the end of the crop year. Even more than at the beginning, these stocks were most heavily concentrated in exporting countries, notably in the United States and Canada.

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In United States markets, the decline in wheat prices was resisted during August-October. Further declines were decisively checked, in mid-November, by stabilization operations authorized by the Federal Farm Board. Stabilization purchases held prices steady from December until June. Price relationships between the United States and foreign countries, and between old-crop wheat and new-crop futures, were such that flour-milling operations and exports of wheat and flour were curtailed. In spite of very extensive feed use of wheat in substitution for corn, the outward carry-over rose to still higher levels. It was unusually concentrated in visible positions, and the bulk of it was owned by the Grain Stabilization Corporation.

In June-July 1931 prices declined sharply in the United States as purchases in support of the market ceased. World wheat

prices also sagged to fresh low levels as abundant supplies pressed upon a world market that was subject to still more severe restrictions, and as financial crises in Europe further intensified the prolonged economic depression. Prospects for a short crop in Canada, unfavorable conditions for spring wheat in Russia, and substantial reductions in Australian and Argentine wheat acreage afforded some resistance to price declines, particularly in Canada; but they were inadequate to offset the combined forces that depressed world wheat prices to still lower levels in the summer and early autumn of 1931.

Generally, except in a few countries with effective price-raising measures in force, wheat prices have recently been lower than in any year since 1894. Throughout 1931 wheat has been unprecedentedly cheap in terms of commodities in general.

I. WHEAT SUPPLIES IN 1930-31

INITIAL STOCKS

Stocks of old-crop wheat in July 1930 stood at a level extraordinarily high. Only those of July 1929 had been larger, after accumulation from the bumper world (ex-Russia and China) wheat crop of 1928. As shown by the following tabulation of our estimates,¹ for the world ex-Russia, stocks in July 1929 and 1930 were, in million bushels, about twice as large as they had been at their low post-war level in July 1925:

Year	Total
1925	419
1926	482
1927	521
1928	590
1929	858
1930	809

If we take normal stocks as 500 million bushels, the level in July 1930 was around 300 million bushels above normal, that of July 1929 about 350 million above. Figures of this size are not far below 10 per cent of an average world wheat crop ex-Russia and China. They are larger than many changes in world crops from year to year. They represent around 40 per cent of the

average total volume of international trade in wheat and flour.

Prior to July 1929, it was possible to describe the world wheat supply position of a given crop year fairly satisfactorily by reference to the crop of that year. But since July 1929, stocks of old-crop wheat have bulked so large as to play a prominent part in the supply position. The stocks accumulated from the crop of 1928 were in no small degree responsible for the price decline of 1929-30, a decline that occurred in the face of the rather short world wheat crop of 1929. Similarly the stocks of old-crop wheat existing in July 1930 were in no small degree responsible for price declines in 1930-31. But whereas the new crop added to initial stocks was rather small in 1929, it was large in 1930.

Total world wheat supplies (crop plus carryover) available for the crop year August-July 1930-31 were of record volume. Both the world wheat crop and the inward carryover were larger in 1930 than in 1928. This much seems established, although precise comparisons cannot safely be made, since crop estimates are still subject to revision and our estimates of world wheat stocks (which are not all-inclusive) cannot be regarded as accurate. It was a big Rus-

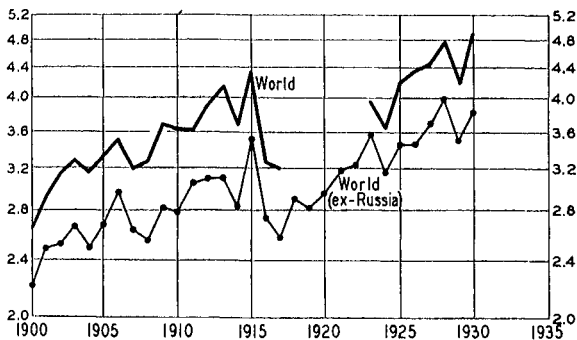
¹ See Appendix Table XXXII and below, in Section V.

sian crop, however, that largely accounted for the increase in world supplies in 1930-31 as compared with 1928-29. Exclusive of Russia's crop and exports, world wheat supplies (crop plus carryover) were probably of about the same size in 1930 and 1928; with Russian exports included, however, the supplies available to the world ex-Russia were of record size in 1930-31. In previous years it had been fairly safe to treat Russia's crop as a thing somewhat apart from the world wheat statistical position, and there are still reasons for giving it separate consideration; but Russia's striking return to the ranks of major exporters necessitates taking her production into account more directly than heretofore.

WORLD WHEAT CROPS SUMMARIZED

The world wheat crop of 1930 was a big one. This is clearly shown by Chart 1,

CHART 1.—WORLD WHEAT PRODUCTION, 1900-1930*
(Billion bushels; logarithmic vertical scale)



* World production exclusive of China and certain small producers.

Data of the U.S. Department of Agriculture as published in *Agriculture Yearbook, 1931*, and in *World Wheat Prospects*, September 22, 1931.

which rests on the latest available estimates. Exclusive of Russia, as well as China and a few minor producers, the 1930 crop was second only to the extraordinary crop of 1928; and about midway between the crop of 1927 and the crop of 1928. Russia, however, had a bumper crop; this is probably the fact, even though the figure we use may be significantly altered. Inclusive of Russia, the world wheat crop of 1930 was the largest in history, exceeding the crop of 1928, when Russia's harvest was of moderate size.

So it appears in retrospect. Early in the crop year so high a level of production was not anticipated. The Northern Hemisphere crop (ex-Russia) now appears over 100 million bushels larger than was expected in August 1930. The general magnitude of the Russian crop was not widely appreciated until late in the autumn, and not until May was an official statement of its size available. Southern Hemisphere crops, particularly in Australia, proved larger than was anticipated in August 1930. The latest estimates of the 1930 wheat crop of exporting countries exclusive of Russia are 150-175 million bushels larger than was indicated by evidence available in August 1930, and Russian exports proved at least 60 million bushels larger than most observers then expected.

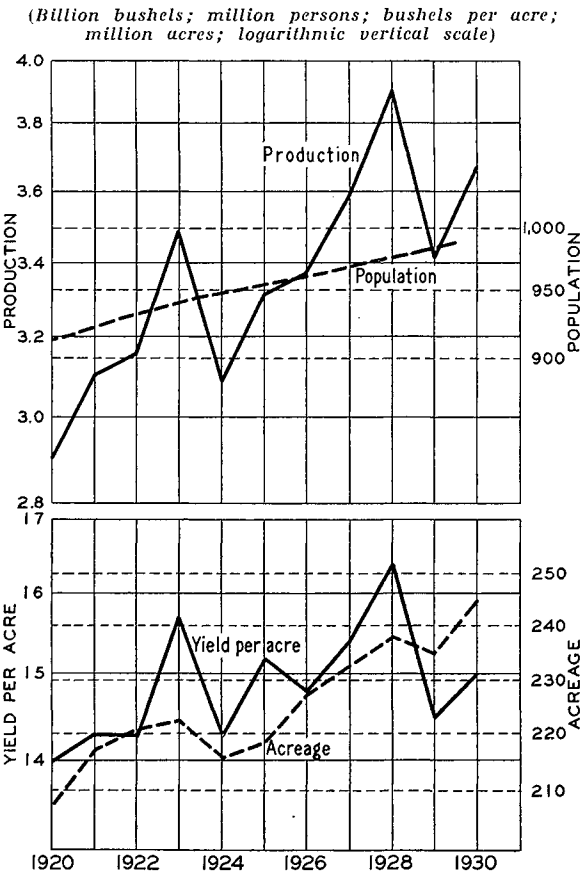
Big acreage, rather than high yields, was broadly responsible for the large wheat crops of 1930 (see Chart 2, p. 70). The average yield per acre outside of Russia now appears to have been 15 bushels, just about equal to the average for the ten years preceding; whereas in 1928 the average yield was 16.4 bushels, a very high figure. In India, however, high yields were mainly responsible for the record harvest; and in Russia, if we may trust the evidence now at hand, high yields were obtained on a record acreage.

Outside of Russia, the world wheat acreage harvested was about 7 million acres larger than in 1928, and about 10 million acres larger than in 1929; the increase in Russia may have been 12 and 3 million acres respectively.¹ In the world ex-Russia, no such increase in wheat acreage between two successive years had occurred before in the decade since the war. The net increase in total world acreage between 1929 and 1930 is largely accounted for on four grounds: (1) unusually light abandonment of fall-sown acreage in the United States and some other countries; (2) a striking increase of over 3 million acres in Australia, under the influence of widespread propaganda and the promise of an export bounty; (3) moderate increases in European importing countries whose govern-

¹ There is some doubt, however, about Russian acreage statistics, especially for 1929. See Appendix Table XII.

ment policies were stimulating wheat production; and (4) a substantial increase in Russia, partly in consequence of vigorous governmental measures.

CHART 2.—WORLD (EX-RUSSIAN) POPULATION, AND WHEAT PRODUCTION, ACREAGE, AND YIELD PER ACRE, 1920-30*



* Population figures in part from official sources, in part from *International Yearbooks of Agricultural Statistics*, adjusted for particular countries to give consistent trends; the principal regions omitted aside from Russia are China, Asia Minor, the East Indies and Malay regions, and most of Africa. Other data from Appendix Tables I-IV.

World wheat production since the war has been increasing at a more rapid rate than growth of population. This is suggested, for the world exclusive of Russia, China, and Asia Minor, by the upper section of Chart 2. Population has apparently been growing about 1 per cent per annum. During 1920-30 the trend of world wheat production has been upward at a rate of something like 4 per cent per annum; however, during 1922-30 (a period which ex-

cludes the years of immediate post-war adjustments in agriculture) the trend has been less steep—about 2 per cent per annum. Per capita production has therefore materially increased. The same has been true in Russia.

In the first two or three years after the war, the increase in wheat production was due in considerable measure to recovery of agriculture, generally in Europe and in some other countries, from reductions during the war and its immediate aftermath. Later, three factors were mainly responsible: (1) several years of high prices following the striking price advance of 1924; (2) notable cheapening of wheat production through the application of new machinery and technique, particularly on sub-humid lands; and (3) public policies, notably in Russia and several wheat-importing countries of Europe.

Most of the upward trend in world wheat production is accounted for by increases in wheat acreage, but the production trend is somewhat steeper, even on identical logarithmic vertical scales which permit direct comparison of rates of change. A trend line fitted to the yield data for 1920-30 would also be upward, but the slope would be slight. This upward slope of yield per acre is largely due to a succession of unusually low yields per acre in the early years after the war, which presumably reflect in part agricultural disorganization and in part adverse climatic factors, and to notably high acre-yields in 1928, which were largely accidents of Nature. It is not safe to infer that the 1920-30 trends of world production, acreage, or yield per acre will continue in 1930-40; but special warning should be given against expecting a continuance of the apparent upward trend of yield per acre.

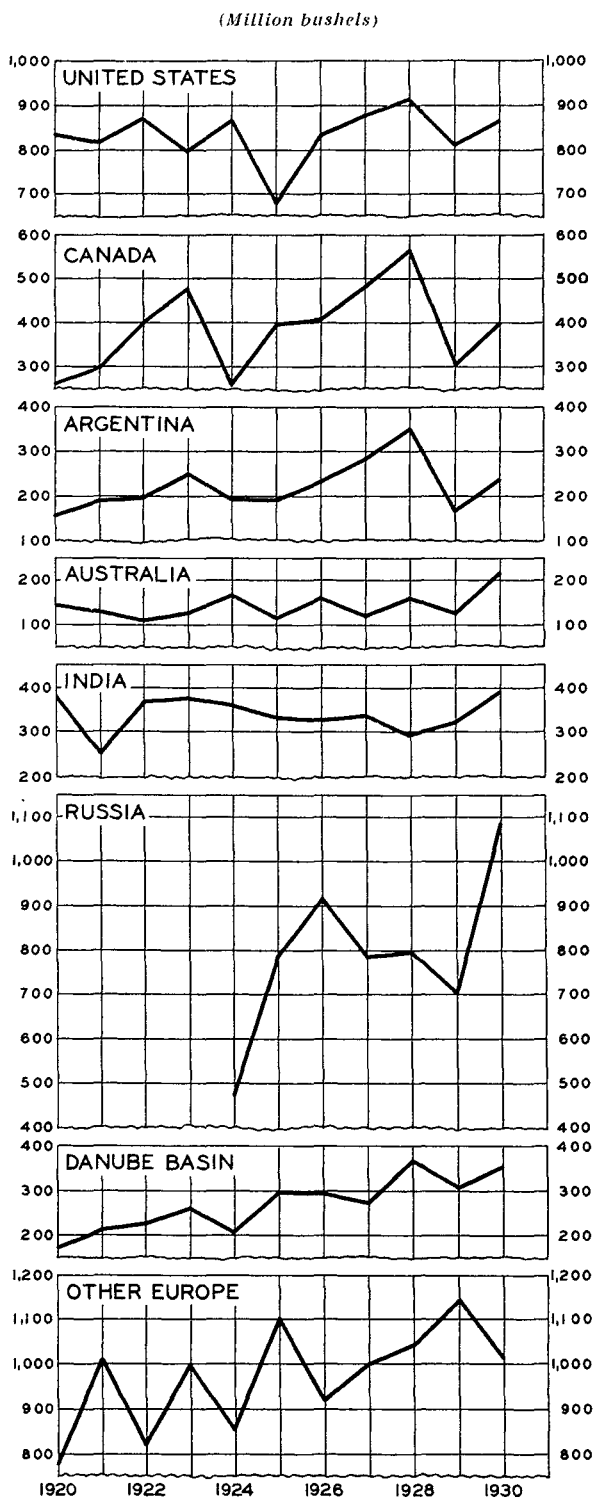
Whether or not world wheat production in 1930 was above the general post-war trend is of considerable importance and interest. There may well be considerable difference of opinion as to the exact slope of the post-war production trend; nevertheless, it seems probable that after a few more years have passed, the world (ex-Russia) crop of 1930 will appear to have stood somewhat above rather than below the trend for the period after 1922, though not

as far above it as the big crops of 1923, 1927, and 1928. However, since the production trend shows a steeper slope than the trend of population growth, the world (ex-Russia) crop of 1930 may have been larger relative to the demand for human consumption than either of the crops of 1923 or 1927; but it was presumably smaller than that of 1928.

Good crops were fairly general in 1930, not exceptional as in 1929. The distribution of the world wheat crop as well as the aggregate size is of considerable importance. Material for comparisons appears in Chart 3. In 1930, wheat production in Russia, Australia, and India broke all previous records. The aggregate wheat crop of the four Danubian exporting countries had been exceeded only in 1928; both Roumania and Bulgaria harvested their biggest crops since the war. The crops of Canada, the United States, and Argentina were not strikingly large. The same was true of European importing countries, taken as a group. In France, however, the crop was very short; in the British Isles it was the smallest in many years; and in Italy it was moderately small. Poland, the Baltic States, and Portugal had crops of record size, and the crops of Czecho-Slovakia and Germany were of near-record size. Wheat production in the Southern Hemisphere represented a larger portion of the world (ex-Russia) crop than usual, mainly because Australia's output bulked larger than ever before. Apart from Russia's large proportion, the distribution of the Northern Hemisphere crop was less exceptional than in several other post-war years, though the Danubian countries contributed an exceptionally large percentage of the total and France an exceptionally small one.

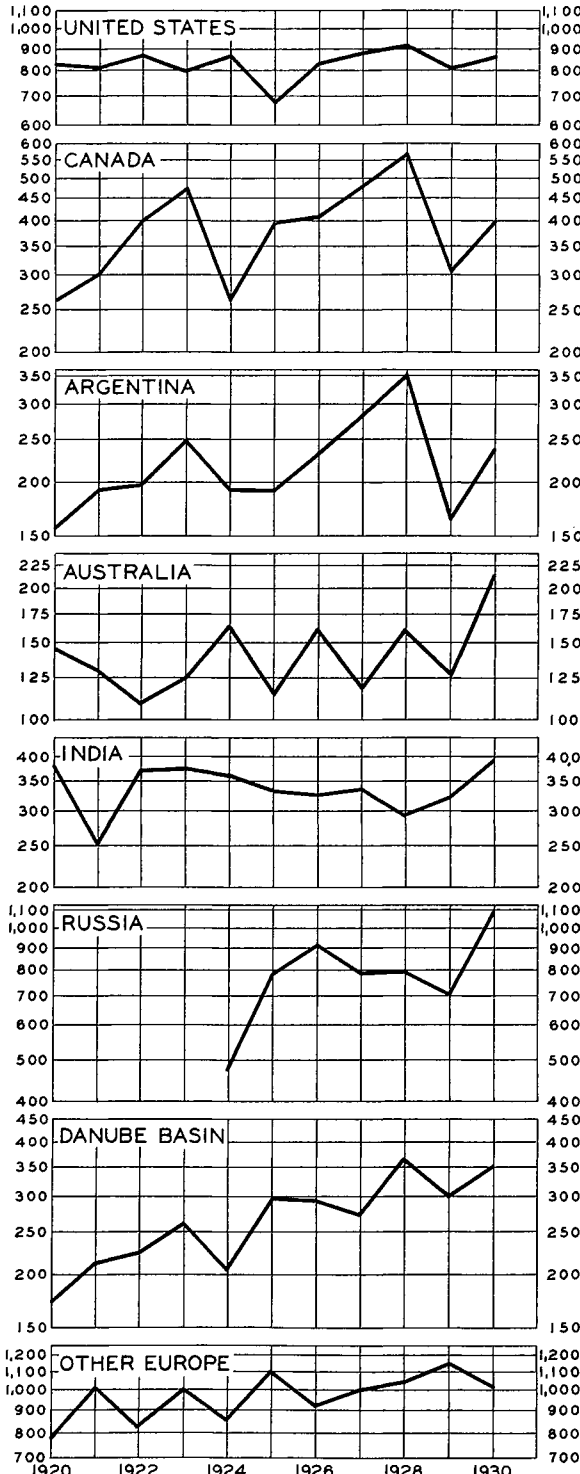
In all of the major producing areas, with the exception of the European importing countries, wheat production was notably larger in 1930 than it was in 1929. In percentage terms the increases in production between these two years were generally larger than between any other two successive years of the decade, except possibly 1924 and 1925. This may be seen by reference to Chart 4, which is plotted on a logarithmic vertical scale, in order to emphasize relative (rather than absolute) changes

CHART 3.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS, 1920-30*



* Data from Appendix Table IV.

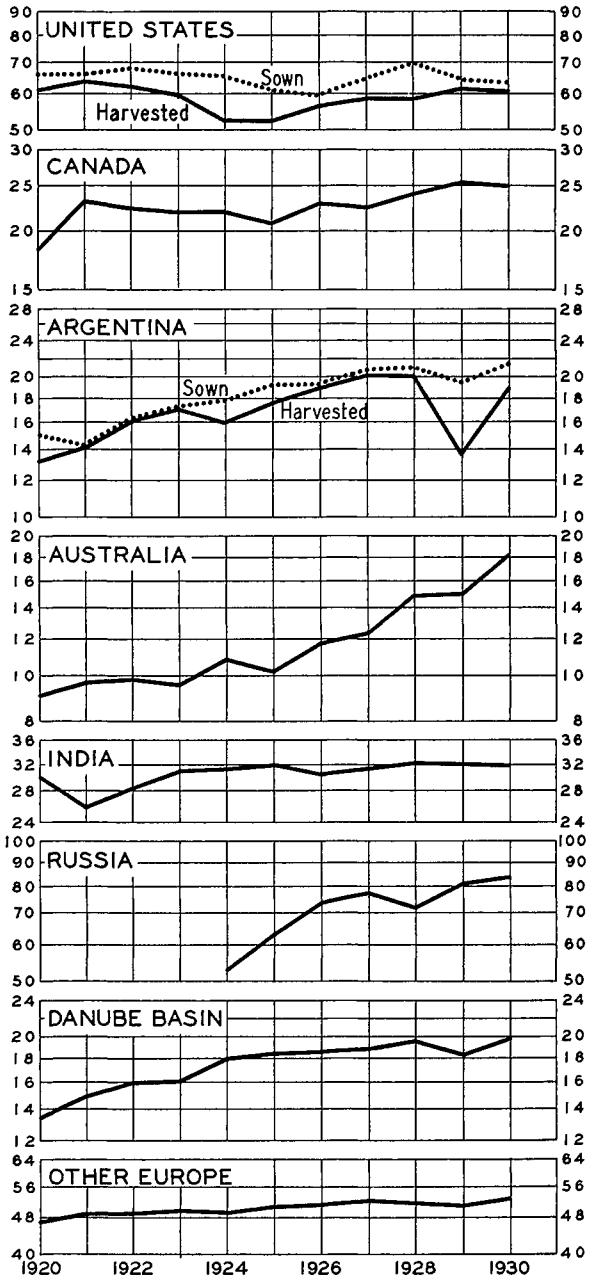
CHART 4.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS, 1920-30*
(Million bushels; logarithmic vertical scale)



* Data from Appendix Table IV.

in wheat production in different areas during 1920-30. The companion Chart 5 similarly deals with world wheat acreage, and is plotted on the same logarithmic scale to facilitate comparisons of relative changes in acreage and production. The largest

CHART 5.—WHEAT ACREAGE IN PRINCIPAL PRODUCING AREAS, 1920-30*
(Million acres; logarithmic vertical scale)



* Data from Appendix Table II.

percentage increases in production between 1929 and 1930 occurred in Australia, Russia, and Argentina—three of the four countries having the largest absolute increases in output. Australia and Argentina also showed greater percentage increases in harvested wheat acreage than did any of the other principal wheat producers; the acreage expansion in these two countries was large enough to account for a considerable part of their increased production.

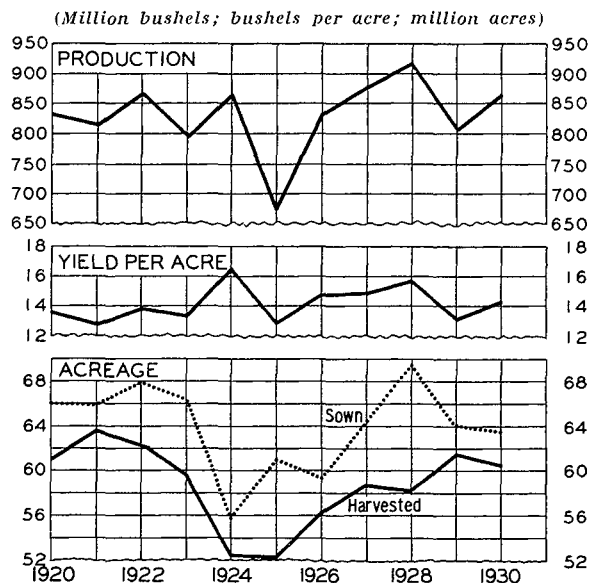
Over the past decade most of the important wheat-producing countries except the United States have expanded their wheat acreage. Notably large increases occurred in Argentina, Australia, Russia, and the Danube basin, while Canada and the group of European importing countries also increased their wheat areas, but by smaller percentages. Trends of production may be either steeper or less steep than trends of acreage. The most notable divergence is with regard to Australia, whose acreage has risen much more rapidly than has production, while the yield per acre declined for several years. In the Danube basin, Russia, and "other Europe," wheat production showed a somewhat steeper upward trend than did wheat acreage. This may be due in part to the chance occurrence of several years of relatively low yields per acre near the beginning of the period and a chance occurrence of several years of relatively high yields near the end; but in most of these producing areas the yield per acre has probably tended upward in consequence of post-war recovery and some basic improvements in methods of wheat cultivation.

UNITED STATES CROP

The United States crop of 1930 was one of several fairly large post-war crops; but it was not nearly as large as the crops of 1919 and 1928. As Chart 6 shows, the sizable outturn of 1930 was due to a fairly large harvested acreage rather than to a high yield per acre. The acre-yield was a small fraction below the average for the preceding ten years. On the other hand, the area harvested ranked as the largest since 1922, with the single exception of 1929. This, however, was due more to Nature than to farmers' intentions. The total

area sown to wheat for the 1930 crop¹ was only of average size; but an unusually favorable fall and winter led to small acreage abandonment. Only in two years of the preceding decade, 1921 and 1929, did the abandoned area represent a smaller proportion of the area sown than it did in 1930.²

CHART 6.—UNITED STATES WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-III and XII; but plotted figures for 1930 do not accord with latest revisions.

The winter-wheat crop of the United States, some 602 million bushels, was considerably larger than the average for the preceding five years; the outturn of spring wheat, 256 million bushels, fell appreciably below that average. Hard red winter wheat was relatively more abundant in 1930, as compared with other post-war years, than was any other class of wheat; in absolute terms the outturn of this class of wheat was the second largest in a decade (being exceeded only in 1928), while in proportion to the total crop it was larger than in any preceding post-war year except 1926. In

¹ No official estimate of the total wheat area sown in the United States is published. In Chart 6 and in the following discussion we use the term "total sown area" to refer to a summation of the official figures of acreage planted to winter wheat and of acreage under spring wheat (presumably harvested acreage).

² See Appendix Table XII.

respect to the abundance of hard red winter wheat, and, indeed, in the percentage distribution by all classes, the crop of 1930 markedly resembled the crop of 1929.¹

The acreage sown to winter wheat in the fall of 1929 was substantially smaller than the areas planted in most of the preceding ten years, though it considerably exceeded the areas sown for the crops of 1924, 1925, and 1926. Winter-killing, however, was unusually light, chiefly because of an open winter, and abandonment of acreage was so small that the winter-wheat area remaining for harvest was relatively large.

Early forecasts of winter-wheat production indicated the probability of a smaller outturn of winter wheat than that finally reported by the government. In the early spring, weather conditions were distinctly unfavorable for the development of the winter crop; drought prevailed throughout most of the winter-wheat belt, especially in the Southwest, until after the middle of April, and the resulting deterioration apparently was not offset by the improvement caused by generous rains later in the month. Successive official forecasts and estimates of production during May-August indicated a notable improvement in the prospects for the crop during the latter part of the growing period.² Rains in May and early June, and warm, clear harvesting weather during late June and July, were major factors responsible for the change in outlook. The final result was a moderately high yield per acre. As of August 1, 1930, the official estimate of winter-wheat production was 597 million bushels. The most recent official estimate of 602 million bushels is larger chiefly because of an increase of over a million acres in the estimate of harvested area; yield per acre was lowered.

The spring-wheat crop of the United States, sown somewhat earlier than usual, was favored by fair growing conditions up to July 1. During July, however, weather factors were distinctly unfavorable, drought

and excessive heat causing premature ripening and shrinkage of the wheat kernels. The hot, dry weather of early August resulted in further deterioration of late-sown wheat, but was favorable for the harvesting of the early-sown grain. In general, the outlook for the crop improved during August, and at the beginning of September spring-wheat production was officially estimated at 240 million bushels. The standing revised estimate is 16 million bushels higher; this increase reflects partly an upward revision in the estimate of spring-wheat acreage and partly an increase in the estimate of yield per acre.

The quality of the United States crop was excellent. As a whole the crop was rated at 91.5 per cent of high medium quality as compared with a ten-year average of 88.4 per cent; and the proportion of the crop meeting the requirements of the first two grades (Nos. 1 and 2) was relatively high in comparison with other post-war years. In weight per measured bushel the crop of 1930, which averaged 58.9 pounds, was equal or superior to all the crops of the preceding decade with the exception of the crop of 1926. Flour yield was likewise high,³ though it had been higher in two of the preceding six years—1925 and 1927. In protein content both the hard red winter- and hard red spring-wheat crops ranked high, representative tests indicating that the average protein content of spring wheat was 14.4 per cent, the highest in six years, and the protein content of winter wheat 12.4 per cent, a figure exceeded during the preceding five years only in 1925 and 1926.

CANADIAN CROP

The Canadian crop of 1930 turned out to be about of moderate size or a little larger. Now estimated at 398 million bushels, it appears to have been substantially exceeded only by the crops of 1923, 1927, and 1928. This would be true even if the crop is revised upward by roughly 20 million bushels, as seems probable in view of the fact that the Dominion Bureau of Statistics regards the standing estimate as 12-17 million bushels too low.⁴ Present estimates of production, acreage, and yield per acre for post-war years, some of which may be sub-

¹ See Appendix Tables IX and XIII.

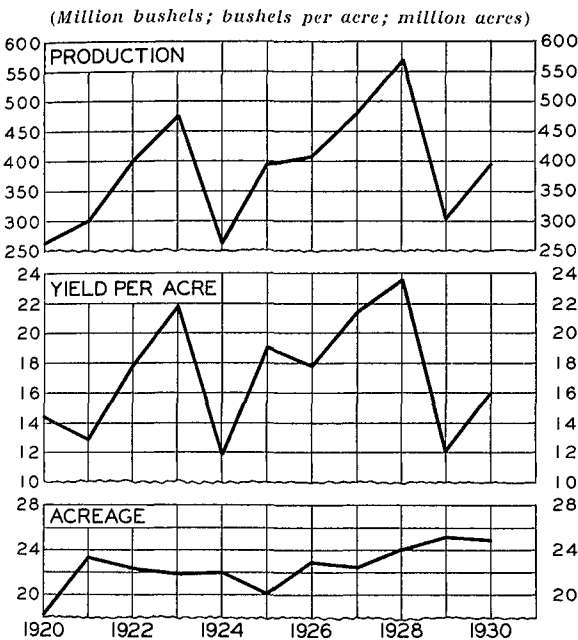
² See Appendix Table X.

³ It is difficult to say how far the high flour yield represented relatively high quality of wheat, how far long extraction to produce relatively large quantities of low-grade and self-rising flours.

⁴ See below, p. 126.

ject to considerable revision, are shown in Chart 7. The moderately good size of the crop of 1930 must be ascribed wholly to a big acreage; for the area sown was relatively large, while the yield per (sown) acre turned out to be low—though presumably not so low as in four earlier years, 1920, 1921, 1924, and 1929. Abandonment of acreage appears to have been heavier than usual in 1930 but probably not as heavy as in 1929.

CHART 7.—CANADIAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-III. The acreage figures are for areas sown.

Seeding of spring wheat in the Prairie Provinces was reported to have been completed earlier than usual in 1930. The crop made reasonably good progress in April and May, but during June and July suffered from high winds and drought in Saskatchewan and Alberta. In addition, hail and cutworms caused considerable damage in scattered localities. The result was a crop of "spotty" character. Weather conditions in September were favorable for harvesting and threshing; but rain and snow accompanied by low temperatures hindered threshing operations around the middle of October and again early in November.

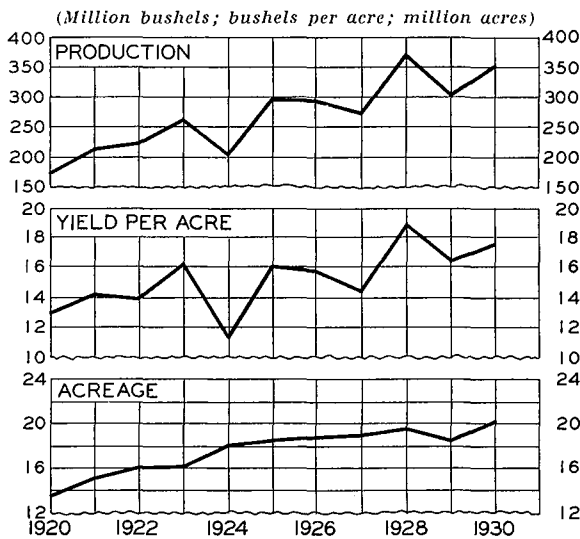
The unfavorable threshing weather is reported to have reduced the general grading of the crop by increasing the volume of tough and damp grain. But despite this, the percentage of inspected spring wheat which graded No. 1 and No. 2 Northern was the highest since 1923 with the exception of 1929; and the percentage rated as tough and damp was smaller than in three of the preceding seven years.¹ These comparisons may somewhat overrate the quality of the 1930 crop, since an unusually large quantity of wheat (presumably of the lower grades) was fed on farms in 1930-31. Not only upon the basis of grading, but also upon practically every other score, the marketed crop of 1930 was of high quality. The protein content, around 13.1 per cent on the average, was distinctly high, while the weight per measured bushel, 60.27 pounds, was the second highest in a decade. Finally, it appears significant that an average of only 4.47 bushels of wheat was used in the manufacture of a barrel of flour during 1930-31; this is the lowest figure in six years.

CROPS IN THE DANUBE BASIN

In the lower Danube basin the wheat crop of 1930, now estimated at 351 million bushels, was larger than in any other post-war year except 1928. As may be seen in Chart 8 (p. 76), the large 1930 crop was the result of a strikingly high yield per acre on an acreage of record size. Of the four Danubian countries all except Roumania had larger areas under wheat in 1930 than in any preceding year; and two of the countries, Roumania and Bulgaria, secured very high yields per acre. Hungary obtained a fairly high yield, but the yield per acre in Jugo-Slavia fell somewhat below average. As a result of these circumstances, Roumania and Bulgaria harvested record crops for the post-war period, Hungary harvested the second largest crop of post-war years, and Jugo-Slavia the third largest. The quality of the Danubian crop appears to have been neither strikingly good nor strikingly poor; on the whole, it may have been about of average quality or slightly below.

¹ See Appendix Table XIV. The quantity of wheat grading No. 1 Hard (the highest grade) was much the largest in several years.

CHART 8.—DANUBIAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Countries included are Hungary, Jugo-Slavia, Roumania, and Bulgaria. Data from Appendix Tables I-IV.

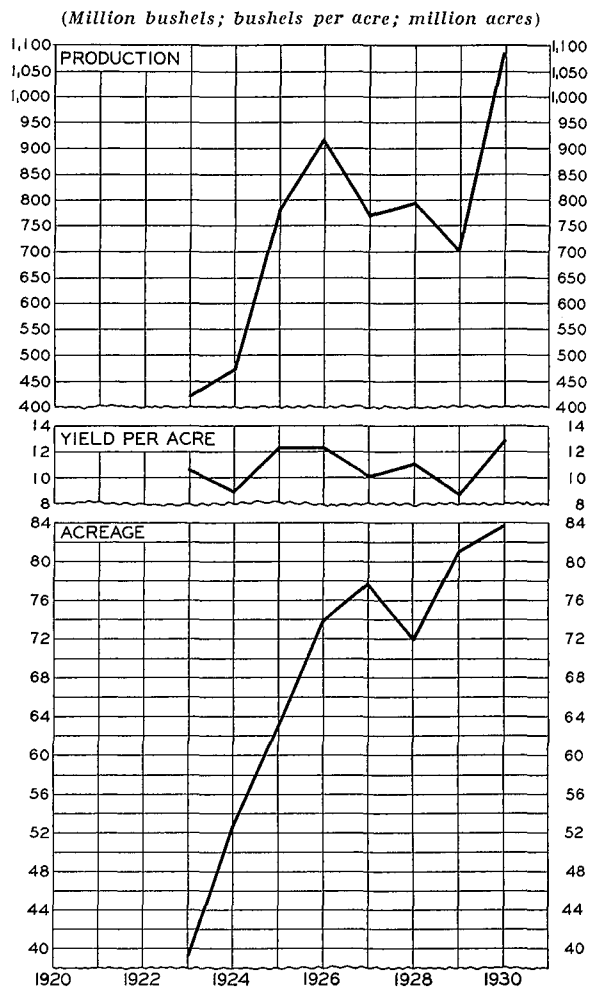
RUSSIAN CROP

The Russian wheat crop of 1930 was a huge one. The only official figure yet available is one of 1,084 million bushels, presented by Mr. Lubimoff, the official Russian delegate, to the London Wheat Conference held in May 1931. If we accept this figure, as Chart 9 shows, the crop was by far the largest harvested in the past eight years, exceeding the good crop of 1926 by about 170 million bushels, and the crop of 1929 by some 380 million bushels. It was undoubtedly the largest crop harvested since 1916. It may not have exceeded the crop of 1913, when the Russian Empire harvested what was probably its record crop, one of 1,028 million bushels according to pre-war Russian official estimates. Since many Russian statisticians believe that the pre-war official production estimates were too low by around 20 per cent, and since the post-war territory of Soviet Russia is smaller than the pre-war territory of the Russian Empire, it is not feasible to attempt other than rough comparison of the size of crops, within present boundaries, between pre-war and post-war years. Nevertheless, with allowance for loss of territory and for possible underestimation of pre-war wheat crops, it seems probable that the only crop of the twentieth century that could have

exceeded the crop of 1930 was the crop of 1913.

With similar allowances, it is possible to infer that the high sown acreage of 1930, some 83.8 million acres, was probably not

CHART 9.—RUSSIAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1923-30*



* Data from Appendix Tables I-III. Production and acreage figures for 1923 and 1924 are presumably somewhat too low for comparison with figures for later years, since data for state and collective farms were not included in the estimates prior to 1925. Acreage and yield per acre figures for 1929 as reported by U.S. Department of Agriculture; see Appendix Table XII for different figures. The acreage statistics are for areas sown.

as high as the record acreage sown in 1913, but was nevertheless not far from, and perhaps in some instances in excess of, areas sown in 1910-16. The sharp post-war increase of wheat area sown, as shown in Chart 9, probably represents recovery to

about the actual pre-war level, but not advance beyond that level.

The large crop of 1930 as compared with earlier post-war crops was due to the large acreage sown, probably also to light winter-killing, and to a relatively high yield per acre. If we accept the computed figure of 12.9 bushels per acre, the average yield was the highest in 8 years, though only about 4 per cent higher than the good yields of 1925 and 1926. The yield per acre in Russia seems seldom to have exceeded 12.5 bushels in pre-war years—perhaps (for the period 1901-16) only in 1909 and 1913;¹ consequently a yield as high as 12.9 bushels is to be regarded as a distinctly unusual occurrence. Detailed information is not now available to show in what regions of Russia the yield per acre was most or least strikingly high, to explain the high average yield by reference to weather conditions, or to ascertain whether spring or winter wheat was the more favored.

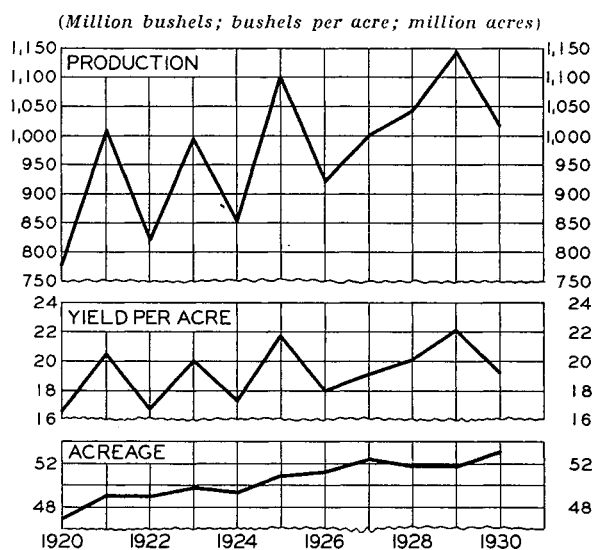
In evaluating the world wheat supply position of 1930-31 it would be significant to consider the production of rye in Russia. As yet, however, no estimate is at hand for the rye crop of 1930. The area sown, reported as 72.2 million acres, was slightly the largest in six years; but no information is available regarding the yield per acre or the extent of winter-killing, which in Russia is more significant in rye than in wheat. It may be proper to assume that in 1930 the yield per acre of rye was fairly high, like that of wheat, for the statistical record of the present century yields no instance of a high wheat yield per acre that was accompanied by a low or moderately low yield per acre of rye. Rye yields per acre were rather high in 1925, 1926, and 1927; and if the yield per acre in 1930 may reasonably be assumed to have approximated the yields in these good years, the rye crop of 1930 must have been a large one. For purposes of discussing the export movement of Russian wheat in 1930-31, the probable level of domestic wheat consumption, and

the wheat stocks position, we assume tentatively that the rye crop of 1930 may have approximated 950 million bushels, ranking as one of the largest post-war crops. If so, Russia would have had in 1930-31 far larger supplies of the bread grains than in any other post-war year. Needless to say, our explanations of developments in the Russian wheat situation are subject to substantial alteration if it should later appear that the Russian rye crop of 1930 was not large, but small, or that it was 10 or 20 per cent larger than 950 million bushels.

CROPS OF OTHER EUROPEAN COUNTRIES

In the group of European importing countries aggregate production was moderately large, the crop of 1930 having been exceeded only in 1925, 1928, and 1929. Post-war data of wheat production, acreage, and yield per acre for this group of countries are shown in Chart 10. In 1930 the area

CHART 10.—OTHER EUROPEAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-IV.

harvested was larger than in any other post-war year, while the average yield per acre was of moderate size as compared with earlier years.

Among the several countries, only the British Isles had a relatively small area devoted to wheat in 1930; wheat acreage there has been persistently declining since 1921.

¹ Direct comparisons of pre-war and post-war official statistics of yield per acre are regarded as improper by many Russian statisticians; the pre-war figures are asserted to be too low, perhaps by 9 per cent. But even if the pre-war figures are raised by 9 per cent, only in 1909 and 1913 would the yield have exceeded 12.5 bushels per acre.

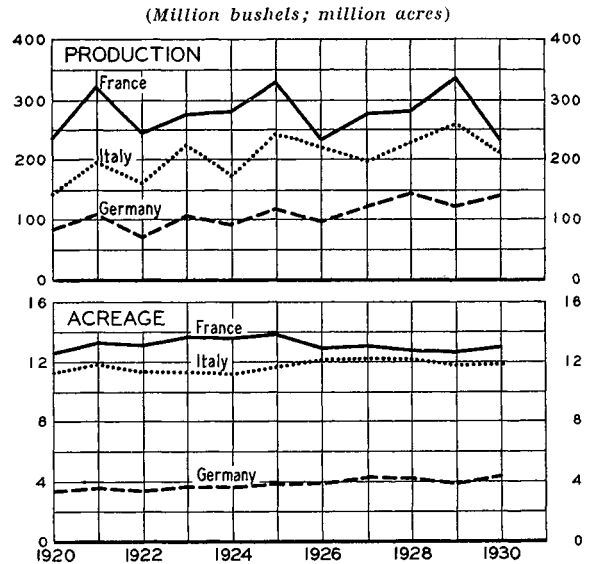
Most of the importing countries of Continental Europe harvested unusually large wheat areas; in Germany, Belgium, Sweden, Norway, Poland, Spain, and the Baltic States wheat areas were of record size, while in Portugal, Austria, and Czecho-Slovakia larger areas had been harvested in only one or two other post-war years. The acreage under wheat in Italy and Switzerland was also fairly large; but in Holland, France, and Greece areas of only moderate size were harvested.

High acre-yields in northern and central European countries tended to offset the relatively low yields per acre secured in western Europe; the result was a fair average yield per acre for the entire group. In northern and central Europe the wheat crops developed under unusually favorable conditions. Latvia, Estonia, Lithuania, and Poland secured record yields per acre, while Finland, the Scandinavian countries, Germany, Czecho-Slovakia, and Austria obtained notably high though not record yields. In western Europe, on the other hand, the wheat crop suffered from excessive precipitation during a considerable part of the growing period, and again in the harvesting period; consequently, complaints of excessive weed growth, rust, and lodging were common. France, Belgium, Switzerland, and the British Isles had poor yields, Holland and Italy fair ones. In the south, Spain, Portugal, and Greece had distinctly good yields.

Acreage and production of the most important variable importers of Europe are shown in Chart 11. The French crop was distinctly short, like that of 1926. The decrease in the wheat production of France between 1929 and 1930 was the largest change in production between any two successive post-war years, though a decrease almost as large had occurred between 1925 and 1926. Italy had a moderately small crop, trend considered. Germany, the third country in this group, harvested in 1930 the largest crop of the decade with the exception of that of 1928. The large outturn of Germany did not offset the small crop in Italy and the short crop in France; hence the aggregate wheat crop of the group of variable importers was distinctly small. Had the size of the crop been the sole factor

determining their imports, the aggregate net imports of these countries (consequently the net imports of Europe) would have been unusually large during 1930-31. Other factors, notably a big carryover in France and stringent milling regulations in Germany and France, prevented such an outcome.

CHART 11.—FRENCH, GERMAN, AND ITALIAN WHEAT PRODUCTION AND ACREAGE, 1920-30*



* Data from Appendix Tables I and II.

The occasional importers of Europe, Spain and Poland, produced in 1930 fair and record high crops, respectively. Their production was such as to suggest that Poland would be a net exporter, as she was, and that Spain would not be a net importer in 1930-31.

Of the remaining European countries, which constitute a group whose aggregate imports are relatively constant from year to year, only the United Kingdom secured a notably small crop in 1930—the smallest, indeed, in post-war years. In contrast, Sweden, Norway, the Baltic States, and Portugal harvested record crops, and Denmark, Austria, Czecho-Slovakia, and Greece strikingly large ones. In Belgium, Holland, and Switzerland only moderate-sized outturns were obtained.

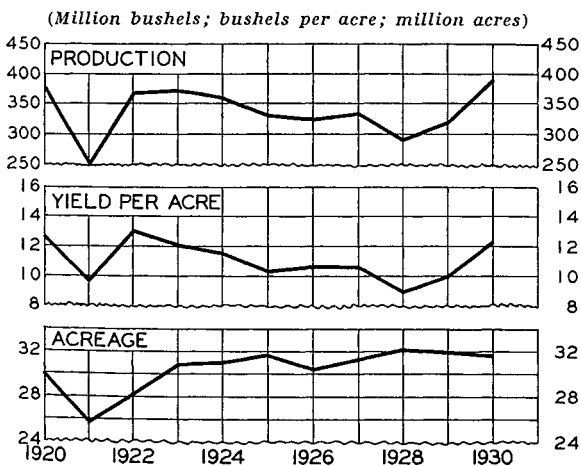
The quality of a large portion of the European wheat crop was decidedly low

in 1930 as a result of excessive rain during the harvest period. The average weight per measured bushel of the French crop, 55.9 pounds, was the lowest in a decade; at 61 pounds per bushel the British crop was relatively but little better in comparison with past years; while in Germany only 37 per cent of the outturn weighed over 59 pounds a bushel, as contrasted with 57 per cent in 1928, and 61 per cent in 1929. Trade comments suggest that the crops of Holland, Belgium, Czecho-Slovakia, and perhaps Italy were also relatively light in weight and high in moisture content. In the absence of data for other countries, we assume that most of the northern and eastern European countries did not suffer as marked a deterioration in the quality of their wheat crops as occurred in the western countries.

OTHER NORTHERN HEMISPHERE CROPS

Of the remaining wheat-producing countries of the Northern Hemisphere, India alone produced a crop of record size in 1930—now officially reported as 391 million bushels. In general, the large size of the crop is to be attributed mainly, as may be seen in Chart 12, to an unusually high

CHART 12.—INDIAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-III.

yield per acre, although the acreage harvested was somewhat larger than the harvested areas of six of the ten preceding years.

In northern Africa, the three French dependencies produced an aggregate crop of 64 million bushels, an outturn which appears only of moderate size in comparison with the crops of other recent post-war years. Tunis and Morocco harvested average and small crops of wheat, respectively, mainly as a result of unfavorable growing conditions; Algeria secured a fairly large crop from the largest acreage harvested since the war. In Egypt, as in Algeria, the wheat crop of 1930 turned out to be comparatively large primarily because an exceptionally large acreage was devoted to wheat; the yield per acre was only moderately high.

Mexico, on the other hand, obtained her highest acre-yield of the decade in 1930, harvesting a crop of fair size from a very small wheat area—the smallest of any post-war year except 1925.¹

Japan and Chosen, whose aggregate wheat crop has varied little in recent years, produced a crop of about the usual size in 1930, with neither acreage nor yield per acre notably above or below normal. No official or accredited private estimate of the Chinese crop exists; but trade reports and advices of the United States Department of Agriculture indicate that the Chinese crop of 1930 was appreciably larger than the outturn of 1929, and presumably of good size in comparison with the crops of other post-war years.

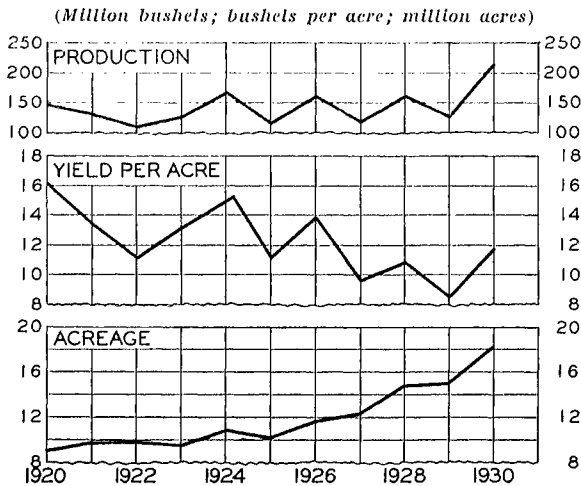
SOUTHERN HEMISPHERE CROPS

In the Southern Hemisphere, the aggregate crop of the chief wheat-producing countries, now estimated at 500 million bushels, was the second largest in history, exceeded only by the record crop of 1928, which was 70 million bushels larger. At 213 bushels, the Australian wheat crop appears to have broken all previous production records. The Argentine outturn, estimated at 236 million bushels, while not as large as the crops of 1923 or 1927, and far below the bumper crop of 1928, was still of fairly good size. Calculations of disposition suggest that the crops actually harvested

¹ The trustworthiness, and more particularly the comparability over the post-war decade, of the Mexico figures given in Appendix Tables I-III are open to question.

may not have reached these figures, but the overestimation, if any, was probably not large. As may readily be seen from Charts 13 and 14, the large crops of both of these

CHART 13.—AUSTRALIAN WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-III.

countries were primarily the result of large acreage rather than of exceptional yields per acre.

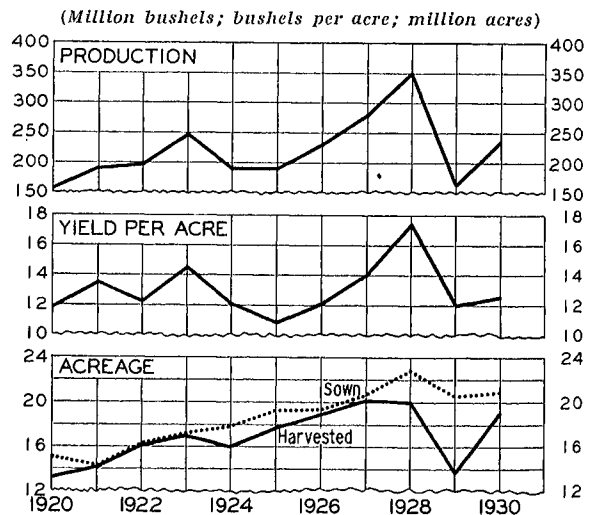
In Australia, although subsoil moisture reserves were low, and planting conditions therefore not especially favorable, an acreage of record size was sown to wheat. There were hopes of an export bounty, and officials urged increase of acreage.

The latest estimate of the area harvested for wheat grain in 1930-31 is 18.2 million acres, the highest on record by over 3 million acres. In general, the Australian crop developed under moderately favorable conditions. The deficiency in moisture became somewhat disturbing at times during May-June and again in September, but rainfall in July, August, and October was sufficient for satisfactory development of the crop. Presumably some deterioration resulted from these dry spells, and also from frost in August and from rust in October; however, the damage caused by excessive rains in December was much more striking. The rains, coming as they did at harvest-time, delayed the harvest, greatly lowered the general quality of the crop, and probably reduced the total yield. The weight per

Imperial bushel of wheat of fair average quality of the 1930 crop of Victoria was set at 58½ pounds, apparently the lowest weight in 35 years. In New South Wales the quality of the wheat was so varied that the officials established two grades of millable wheat for the first time in the state's history, the weight of the F. A. Q. standard being established at 59½ pounds (the lowest since 1920-21), and the weight of the second milling grade at 56½ pounds.¹

The average yield per acre of wheat for the entire commonwealth in 1930, 11.7 bushels, was somewhat below the post-war average, and about in line with the apparent downward trend of wheat yields since 1920. This apparent post-war trend, however, probably has little significance as to probable future yields, since the yields per acre of 1920 and 1924 were the two highest of the present century and the yield in 1926 was the fourth highest. These high yields

CHART 14.—ARGENTINE WHEAT PRODUCTION, YIELD PER ACRE, AND ACREAGE, 1920-30*



* Data from Appendix Tables I-III.

appear to have been mainly due to the chance occurrence of favorable seasons, and the lower yields of 1927-30 to a succession of less favorable seasons. The average yield per acre in 1930 would probably have been lower than it actually turned

¹ *Wheat and Grain Review* (Melbourne), March 6, 1931, p. 9, and *Official Year Book of New South Wales*, 1928-29.

out to be, if the percentage increase in acreage had not been considerably greater in New South Wales and Victoria (the states having the highest average yields and also the highest yields in 1930) than in the other two major wheat-producing states of the commonwealth.

In Argentina the area sown to wheat in 1930 was about 1.5 million acres smaller than the area sown in 1928; otherwise it was the largest on record. Abandonment was heavy enough to make the harvested acreage smaller than those not only of 1928, but also of 1927 and (slightly) 1926. But while the 1927 and 1928 crops developed under exceptionally good weather conditions, the crop of 1930 was not so favored; as a result, the yield per acre was strikingly lower in 1930. Seeding and early growing conditions were unusually favorable in Argentina in the spring of 1930, with rainfall above average during April-June. From July to mid-September, however, precipitation was deficient; and drought apparently caused appreciable damage to wheat in certain sections of the country. In September, frosts appear to have taken some small toll of the crop; but rains during the latter part of the month considerably improved the general outlook. The deterioration suffered by the crop during July-September appears inconsiderable in comparison with that which occurred after the middle of October. As a result first of rust infection (mainly yellow-stripe rust), and later of excessive rains at harvest-time, the total yield was substantially reduced, and the quality appreciably lowered. While much of the grain turned out to be of light weight and of only fair milling quality, the crop of 1930 was apparently somewhat better in general than the crop of 1929 and definitely superior to that of 1925.

CROPS OF OTHER CEREALS AND POTATOES

In the major producing countries of the world aggregate crops of rye, barley, corn, oats, and potatoes were strikingly large in 1930-31 as compared with earlier post-war years. Relative to the increasing requirements for food and feed, however, they appear to have been only moderately large, and in one or two instances perhaps rela-

tively small. Outstanding features of the distribution of the crops of 1930 include a record corn crop in Argentina (by far the principal exporting country) harvested in March-April 1931, and a notably small crop of corn in the United States—the smallest since 1901. In Europe, rye, potato, and feed grain crops were considerably smaller in 1930 than in 1929, but generally larger than in 1928 (oats excepted).

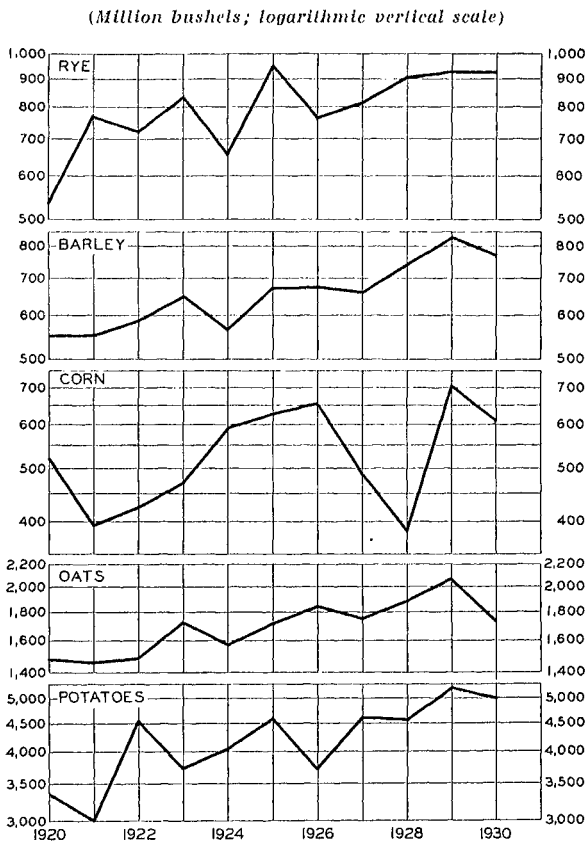
For students of the wheat situation, special interest attaches to the rye, potato, and feed grain situation in Europe; for it is generally believed that under suitable conditions of supply and price a more or less extensive substitution may occur in some countries of Europe between these products on the one hand, and wheat on the other. Chart 15 shows the domestic supply positions of the various cereals and potatoes in Europe (ex-Russia) during 1920-30. Although the 1930 crops were notably large in absolute quantities, they appear to have been only moderately large when judged on the basis of their own (approximate) production trends. For the feed grains, these trends appear somewhat steeper than the trends of animal population in Europe, excluding Russia; but in any event there seems to be no reason to doubt that feed grain supplies in Europe were less abundant relative to requirements in 1930 than in 1929, and probably also than in 1925. A similar situation seems to have obtained in respect to rye and potatoes.

Rye production in Europe¹ (ex-Russia) was large in 1930, though smaller than in 1925 or 1929. The major producing countries, Poland, Germany, and Czecho-Slovakia, had all harvested larger rye crops in 1929, and the latter two countries also had larger crops in 1928. At the beginning of 1930-31, therefore, a burdensome carryover of rye remained in Germany at least. In Scandinavia, where rye production has tended downward since the war, the crop of 1930 was larger than any of the three preceding, though smaller than the crops of most of the earlier post-war years.

The crops of Russia, the United States, and Canada also have some bearing upon European rye prices. Up to the present

¹ See Appendix Tables V and VII.

CHART 15.—EUROPEAN (EX-RUSSIAN) PRODUCTION OF RYE, BARLEY, CORN, OATS, AND POTATOES, 1920-30*



* Data from Appendix Tables V and VI.

time no estimate of the important Russian crop has appeared; but, as noted above, there seems to be good reason to assume that that crop was notably large, perhaps about the largest of the decade. In the United States and Canada rye production was also large (considering the downward trend), being about 16 million bushels larger than in 1929.

The 1930 barley crop of Europe (ex-Russia) was the second largest of post-war years, being exceeded only in 1929. Of the major producers, Spain alone harvested a crop of record size; the Danubian and Scandinavian countries had produced

¹ See Appendix Table V.

² Broomhall's shipments data, which probably understate the total exports, show 46.4 million bushels shipped from South Russian ports in August-July 1930-31.

³ See Appendix Tables V and VI.

larger crops in 1929, and Germany, Poland, and Czecho-Slovakia had produced larger ones in each of the two preceding years. Outside of this area, the barley crops of Russia, the United States, Canada, and Argentina¹ are presumably most important in influencing international prices of barley. No estimate of Russian production in 1930 is yet available, but one may infer that the crop was large, for very substantial shipments of barley were made from Russia.² United States and Canada both harvested notably large crops—the largest of post-war years with the exception of 1928—and Canada's carryover of barley was also heavy. Argentina, whose barley production is less important, had a crop of only moderate size. In total, the barley production figures of 1930 suggest relatively abundant supplies for the international market, if perhaps less abundant than in 1929.

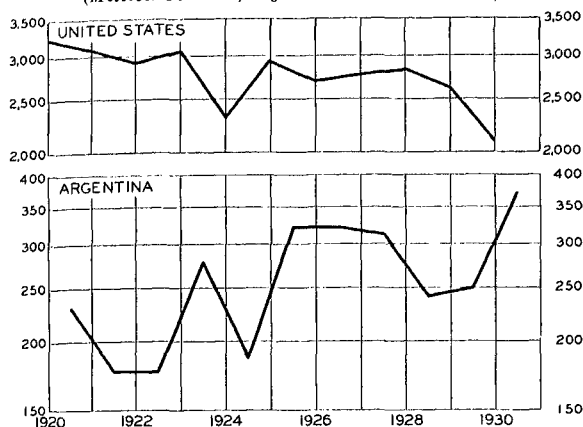
The corn crop of Europe (ex-Russia) was moderately large in 1930; but in relation to requirements it was probably smaller than in 1924 to 1926, or 1929. The Danubian crop, which constitutes the major portion of the European outturn, was almost 125 million bushels smaller in 1930 than in the preceding year, while the Italian crop, though larger than in 1929, showed an increase of only 20 million bushels.³

In the important producing countries outside of Europe corn production was also lower in 1930 than in 1929; indeed, in the aggregate it was smaller than in any of the preceding five years. Especially noteworthy are the 1930 crops of the United States and Argentina; these crops are shown in comparison with other post-war crops in Chart 16, which is drawn on a logarithmic vertical scale to permit comparisons of relative changes in production. As a result of summer drought, the United States secured a very short crop, now estimated at only 2,060 million bushels—the smallest outturn since 1901. In Argentina, on the other hand, growing conditions were almost ideal, and a crop of record size, 371 million bushels, was harvested in March-April 1931. From the standpoint of the international corn position the size of the Argentine crop is regularly more important than the size of the United States crop. Consequently, although the increase in the Argentine crop

was much less than the reduction in the United States crop, the net effect of the two crops was on the whole to ease, rather than to tighten, the international position.

CHART 16.—CORN PRODUCTION IN THE UNITED STATES AND IN ARGENTINA, 1920-30*

(Million bushels; logarithmic vertical scale)



* Data from Appendix Table V.

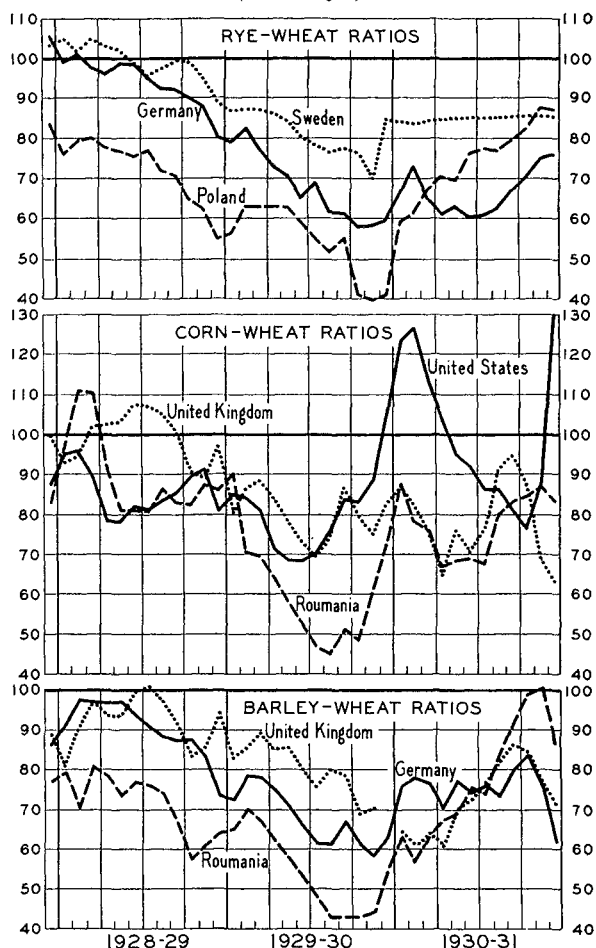
As regards oats and potatoes,¹ crops harvested outside of Europe presumably have less influence upon European prices than in the case of barley and corn. Oats production in Europe (ex-Russia) was smaller in absolute quantity than any of the crops of the preceding four years, and relative to feed requirements was perhaps also smaller than in 1923 and 1925. The European potato crop was relatively much larger; it had been exceeded in absolute terms only in 1929, though relative to current requirements the crops of 1922 and 1925 may also have been larger. In Germany, the potato output was of record size, being some 258 million bushels above the relatively large crop of 1929; but in other European countries potato crops were considerably smaller in 1930 than in preceding years.

Although we find no satisfactory basis for evaluating what may be called roughly the international statistical position of wheat substitutes, it seems possible at least to draw contrasts as between the past three crop years. With the animal population growing, 1928-29 is to be described as the year when supplies of wheat substitutes were least ample in relation to require-

ments, 1929-30 as the year of greatest abundance, and 1930-31 as standing in an intermediate position. Of these years 1928-29 was the one of somewhat the greatest abundance of wheat supplies, and 1929-30 of the least, with 1930-31 ranking fairly close to 1928-29. The incentives to use wheat as feed (or not to use wheat substitutes as food) under these circumstances

CHART 17.—PRICE RATIOS OF RYE, CORN, AND BARLEY TO WHEAT IN IMPORTANT MARKETS, FROM JULY 1928*

(Percentages)



* German (Berlin) and Roumanian (Constanza) prices of domestic grain, and the prices of domestic wheat and of Argentine corn in the United Kingdom (London), are from *Bulletin mensuel de l'Office permanent, Institut International de Statistique*. Barley prices in the United Kingdom (London or Liverpool) are averages of c.i.f. prices of Canadian No. 3 barley published in *Corn Trade News*. Polish prices of domestic wheat and rye at Warsaw are from *Wiadomosci Statystyczne*. Swedish prices of domestic grain (weighted averages for different markets) are from *Ekonomisk översikt*. For the United States, weighted averages of corn and wheat prices (5-6 markets) are from U.S. Department of Agriculture, *Yearbooks and Crops and Markets*.

¹ See Appendix Tables V and VI.

must have been strongest in 1928-29 and weakest in 1929-30, with 1930-31 again occupying an intermediate position; this may be said of Europe (ex-Russia) as a whole, though not of particular countries.

Price relationships confirm this analysis, at least so far as concerns the cereal markets of Europe where changes in tariffs and milling regulations have not served to invalidate comparisons over the three-year period. Chart 17 (p. 83) shows ratios of rye, barley, and corn prices to wheat prices in some of the principal European markets, and the corn-wheat price ratio in the United States. In general these price ratios appear highest in 1928-29 and lowest in 1929-30; the ratios for 1930-31 are intermediate, though perhaps generally closer to those of 1929-30. The relationships shown in the chart are not necessarily typical of the price relationships in other countries, for

milling, tariff, and price regulations differed in the various countries. Of the countries for which price ratios appear in Chart 17, Germany, Sweden, and the United States enforced measures in 1930-31 which tended to keep the price of wheat at a higher level than would otherwise have prevailed; the rye and feed grain ratios were presumably somewhat higher in 1930-31 in countries where restrictions were less severe. In a significant degree, milling and tariff regulations in 1930-31 seem to have led, notably in Germany, to more extensive use of wheat substitutes (and smaller use of wheat) than would otherwise have occurred. The occurrence of distinctly heavy utilization of wheat for feed in North America in 1930-31 is hardly to be taken as a reflection of the international statistical position of wheat substitutes, but rather as the result of a domestic situation.

II. WHEAT PRICE MOVEMENTS AND LEVELS

The crop year 1930-31 was noteworthy for an unexpected and catastrophic decline of world wheat prices, from low levels at the beginning to levels almost unprecedentedly low at the end, and for unusually wide diversities in wheat price movements and levels in different countries. It therefore seems worth while to set forth significant price data with greater fullness and larger perspective than usual, and to suggest reasoned though necessarily incomplete explanations of the striking facts presented.

MAJOR MOVEMENTS IN 1930-31

The broad movements of world wheat prices in 1930-31, as reflected in markets reasonably free from the influence of governmental policies, are easily summarized: (1) from low levels in July 1930, there was a severe decline in August-January; (2) in January-June 1931, on this extremely low level, prices fluctuated within a comparatively narrow range; (3) in June-July 1931 a fresh decline occurred which was to carry prices to new bottoms in later months.

These broad movements are plainly revealed by Chart 18, in the curves which show weekly average prices of British par-

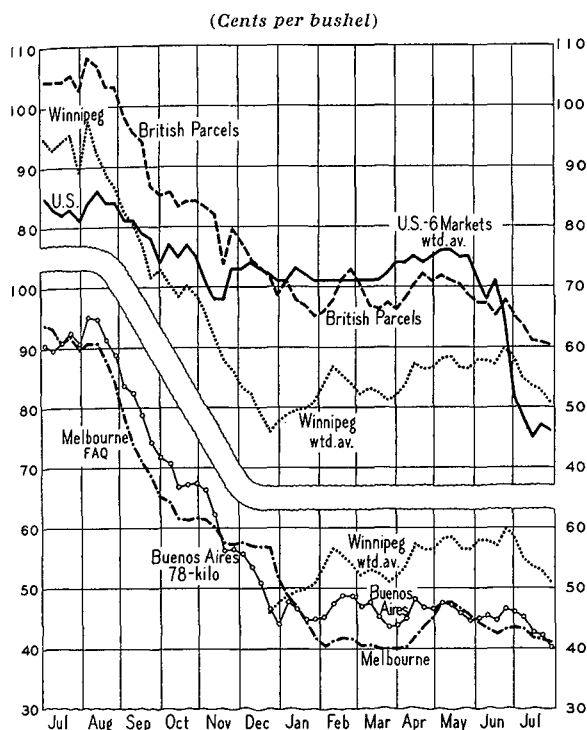
cels of imported wheats, Canadian wheats in Winnipeg, Argentine 78-kilo wheat at Buenos Aires, and Australian F.A.Q. wheat at Melbourne. Though the broad movements are made up of more numerous lesser ones (some of which are discussed below), and the several curves do not move exactly parallel, the major movements stand out clearly in these four curves.

Australian prices weakened earliest and declined most until mid-October. Liberal stocks of wheat remained in Australia in the middle of 1930.¹ A greatly increased acreage had been planted, and in consequence a large crop could be expected to be available in December-January. Financial pressure, in all its aspects, was peculiarly acute in Australia. This provided a special stimulus to exports because, although exchange rates were nominally controlled, only limited amounts of exchange could be obtained from the banks for making payments abroad.

After export sales of old wheat had been largely completed (though not all shipped out), prices of Australian wheat held more firmly for several weeks, the longer because of two factors: unusually wet weather in-

¹ See Chart 55, p. 141.

CHART 18.—WHEAT PRICE MOVEMENTS IN 1930–31
AS SHOWN BY REPRESENTATIVE WEEKLY
SERIES*



* See Appendix Table XXXIX for sources and descriptions of these series.

terfered with harvesting, and farmers sold slowly until it became clear that the guaranteed price, which was above the market, would be inoperative for lack of financing.¹ The especially severe decline in Australian

¹ Near the close of its session early in December 1930, the Commonwealth Parliament passed a Wheat Advances Act, which called for guaranteeing farmers a price based upon three shillings a bushel (about 73 cents) f.o.b. ports. Since current prices were already below this level, farmers had no inducement to sell. For four or five weeks export and domestic business were at a standstill, pending arrangements for making this law effective. On January 19, however, it became clear that neither the Commonwealth Bank nor the government could see its way clear to bear the burden of the guarantee; and open marketing was resumed.

² In January–February 1931 the premium on Australian wheats over Argentine declined from 12–14 cents to practically nil. Presumably because of extreme ease in ocean shipping, there occurred no significant advance in ocean freight rates, such as might have increased the Liverpool–Australian spread. See Appendix Table XXX.

³ See further below, p. 93.

⁴ See also Chicago futures prices shown in Charts 20, 21, and 22 (pp. 92 and 94).

prices from late December to early February represented in part a normal seasonal adjustment, but the decline was unusually abrupt, not alone for the reasons just mentioned. The new price level was rendered specially low by the size of the crop, its deterioration to a low average quality, and financial conditions that made holding impossible and heavy exports imperative. As exports rose to high figures (see Chart 35, p. 112), the premium on Australian wheat at Liverpool declined substantially, and the full Liverpool decline was naturally reflected in Australia.²

The persistent decline in Canada began later than in Australia, largely because of temporarily bullish news of the 1930 Canadian crop. In October–December, however, the decline was greatest in Winnipeg, not only because new wheat came earlier to market from a crop larger than expected and as Russian competition reached its peak, but because almost all events conspired to depress prices in Winnipeg.³ The January–February recovery in Winnipeg was in part a reaction from this extreme decline, but it was supported by bullish speculation and eventually aided by prospects for a very short Canadian crop in 1931.

Buenos Aires prices on the whole followed a course intermediate between Australian and Canadian prices, being almost equally subject to the common influences but less subject to the influences peculiar to the others, except in so far as the Argentine crop year is most nearly like the Australian.

British parcels prices declined, on the whole, more slowly in August–December but continued to decline through January. In the main, their course fairly reflects their composite nature, the elements in the composition changing.

United States wheat prices followed a strikingly different course. The contrast is clearly shown by the curve for the 6-market weighted average price of all classes and grades on Chart 18.⁴ In July 1930, wheat prices were lower in various United States markets than in other exporting countries; this was natural in view of the heavy carry-over and the seasonal pressure from new-crop winter wheat. In subsequent months,

after the sharp rise early in August, prices here declined much less than prices abroad. Resistance to the general market pressure was clearly in evidence here from August through October.

Effective support to United States wheat markets was contributed mainly by three factors. First, the impending disaster to the corn crop (eventually realized) raised corn prices sharply beginning late in July; and accumulating evidence of extensive feeding of wheat helped to strengthen the speculative influence of the corn market on the wheat market.¹ In the second place, it is now known that considerable purchases of wheat were made, under authority of the Federal Farm Board, apparently under the influence of serious interpretations of the prospective corn shortage. Between August 15 and November 1 the Grain Stabilization Corporation quietly accumulated something like 40 million bushels of wheat, including 28.3 million bushels of futures, and apparently the Drought-relief Department of the Farmers' National Grain Corporation purchased some additional quantities.² In the third place, past experience has shown that, as a general rule, market resistance to a downward drift of wheat prices under pressure of accumulated supplies tends to be strongest in the United States; presumably in this instance, as notably in 1928-29, American farmers, traders, and many speculators tended to be strong holders.³

In spite of these supporting forces the price decline early in November was especially precipitous in United States markets. This was definitely checked here in mid-November by the inauguration of ex-

tensive purchasing operations by the Grain Stabilization Corporation, as formally acknowledged on November 16 by the Federal Farm Board. The Corporation took up the burden of stabilizing prices for practically the remainder of the crop year; and it carried out this program, despite heavy financial strain, on a level that proved to be above British import prices.

The Federal Farm Board announced on March 23, 1931, that stabilization purchases would not be made in the 1931 crop. Purchases of old-crop wheat, in certain markets at least, were continued into June, but were discontinued after new winter wheat began to move in volume. Since world wheat prices remained at low levels, cash wheat prices in the United States therefore declined sharply, in June and early July, from the high supported level.⁴ Even at low levels registered late in July, however, United States wheats did not sell on a basis low enough to permit liberal commercial exports, as they usually do at that season of the year.

In the principal importing countries of continental Europe, and indeed in many other countries, wheat price movements in 1930-31 differed considerably from those in the markets mentioned above, mainly because of the varied influence of tariff duties and other governmental measures affecting the price of wheat. Seldom if ever, even in recent years, have wheat price movements in different countries been so complex and divergent. This is suggested, and in part revealed, by Table 1.

The average price of British imports declined by 39 cents between July 1930 and January 1931, by 8 cents between January and July 1931, and by 47 cents between July 1930 and July 1931. No such large declines as in July-January or July-July 1930-31 have occurred before in a half year or a full year, except in 1920-21. Declines in British parcels prices were somewhat less, because of differences in the timing of price registration and the somewhat different composition of wheats entering into the two series.⁵

Prices of Canadian, Australian, and Argentine wheats in Liverpool declined by 38 to 42 cents between July and January, by 4 to 7 cents between January and July,

¹ See Chart 17, p. 83.

² *Second Annual Report of the Federal Farm Board*, pp. 38-39, 45. This information appears not to have been publicly available prior to the recent release of this report.

³ See *WHEAT STUDIES*, September 1930, Vol. VI, especially p. 455; also the *Farm Board's Report*, p. 44. The Chief of the Grain Futures Administration significantly observes in his latest report (p. 5) that "the larger, or professional speculative traders . . . operated primarily on the short side of the market," while the smaller traders were predominantly on the long side.

⁴ See further below, p. 101.

⁵ The parcels series does not include full cargoes; hence at least the weighting of prices is different in the parcels series.

TABLE 1.—DECLINES IN WHEAT PRICES JULY 1930—
JANUARY 1931—JULY 1931*
(Cents per bushel)

Series	July	Jan.	July	Net change		
				July- Jan.	Jan.- July	July- Jan.
<i>United Kingdom imports:</i>						
Total	113	74	66	-39	- 8	-47
British parcels	103	68	62	-35	- 6	-41
Liverpool:						
No. 1 Manitoba.....	112	74	70	-38	- 4	-42
No. 3 Manitoba.....	108	70	63	-38	- 7	-45
Australian	111	70	64	-41	- 6	-47
Argentine Rosafé ..	103	61	7	-42	- 4	-46
<i>Canada, Australia, Ar- gentina:</i>						
Winnipeg, weighted av- erage	93	49	54	-44	+ 5	-39
Winnipeg, No. 3 Mani- toba	91	47	50	-44	+ 3	-41
Melbourne, F.A.Q.	92	46	42	-45	- 4	-50
Buenos Aires, 78-kilo.	91	46	43	-45	- 3	-48
<i>United States:</i>						
Six markets, weighted average	83	71	47	-12	-24	-36
No. 2 Hard Winter, Kansas City	80	69	44	-11	-25	-36
No. 1 Northern Spring, Minneapolis	92	76	61	-16	-15	-31
No. 2 Amber Durum, Minneapolis	87	72	61	-15	-11	-26
No. 2 Red Winter, St. Louis	85	78	48	- 7	-30	-37
No. 1 Western White, Seattle	91	66	57	-25	- 9	-34
Farm price, weighted average	70	59	36	-11	-23	-34
<i>European domestic wheats:</i>						
United Kingdom	108	73	82	-35	+ 9	-26
Belgium (Antwerp) ..	115	63	80	-52	+17	-35
France (Paris).....	171	179	186	+ 8	+ 7	+15
Germany (Berlin)....	187	168	156	-19	-13	-32
Italy (Milan).....	177	149	131	-28	-18	-46
Austria (Vienna)....	114	84	114	-30	+30	0
Czecho-Slovakia						
(Prague)	134	110	118	-24	+ 8	-16
Poland	153	76	87	-77	+11	-66
Hungary (Budapest) ..	92	66	54	-26	-12	-38
Roumania (Constanza)	78	51	49	-27	- 2	-29

* Data in part from Appendix Tables XXXVIII, XXXIX, XL; other United States data from *Crops and Markets and Foreign Crops and Markets*; other European data from *Bulletin mensuel* of the Institut International de Statistique, converted to United States currency at monthly average exchange rates.

In a few cases the usual rounding of figures has been modified to give the net change correct to the nearest cent.

and by 42 to 47 cents between July 1930 and July 1931, the greatest declines occurring in the Southern Hemisphere wheats. Win-

nipeg prices of Canadian wheats dropped nearly as much as Melbourne and Buenos Aires prices in July-January, but rose slightly in January-July while Melbourne and Buenos Aires prices declined slightly. Notably heavy declines in prices of Australian wheats are attributable chiefly to the bumper crop of 1930, its low average quality, and lower premiums that Australian wheats could command in import markets when available in large quantities.¹ Melbourne prices declined by 50 cents between July 1930 and July 1931; in July 1931, some seven months after the Australian harvest, they averaged only 42 cents a bushel.

By contrast, United States cash prices dropped far less in July-January, partly because the July 1930 level was seasonally low and partly because, by January, the Grain Stabilization Corporation had pegged prices.² The more severe drop in January-July actually took place almost wholly in June and early July, after stabilization purchasing ended. The net decline over the year, however, was smaller in United States markets than in other exporting countries and Great Britain. This was due mainly to restrictions upon sales of stabilization supplies and restrained marketings by farmers in June-July 1931,³ though speculative forces may also have lent additional support. The net decline in July-January was largest for spring wheats, because July 1930 preceded the spring-wheat harvest; but in January-July and July-July the decline was by far the smallest in spring wheats, chiefly in consequence of prospects for an exceedingly short crop in 1931.

Table 1 brings into bold relief the strik-

¹ If China had not absorbed large amounts of Australian wheat, it would presumably have gone to a discount in Europe.

² Even in the absence of stabilization operations, the July-January decline would have presumably been less in the United States markets than in competing export countries and in Liverpool, not only because, as is not the case in Canada, Australia, and Argentina, cash prices tend to be seasonally higher in January than in July (see WHEAT STUDIES, November 1931, VIII, 7), but also because of the holding tendency mentioned above, p. 86.

³ See Appendix Table XIX. In view of the fact that the winter-wheat crop was of record size, receipts at primary markets in July were not notably heavy. See also preceding note.

ing divergence, in respect to levels and net movements of domestic prices of wheat, among various European countries and of these compared with the major exporting countries, Russia excepted. Some discussion of this intricate subject is given below (pp. 103-7).

THE LOW LEVEL OF JULY 1930 IN PERSPECTIVE

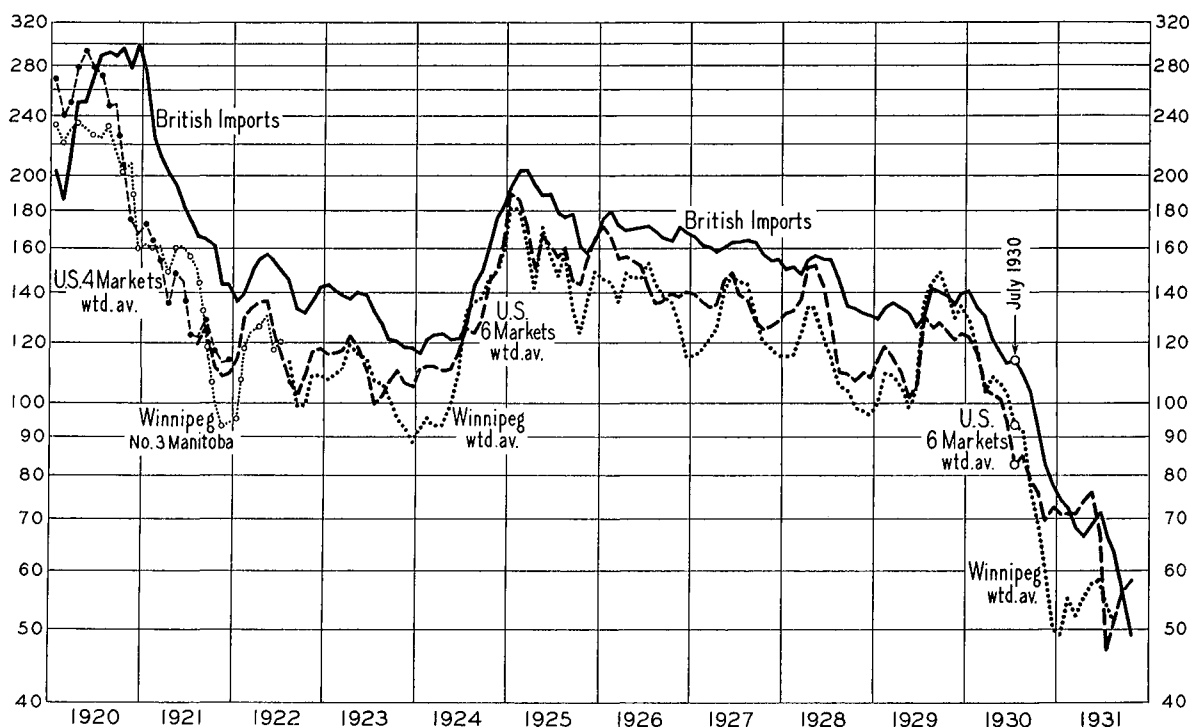
The price movements of 1930-31 are shown against the background of the post-war price movement in Chart 19, by

1923-24. A striking advance occurred between May 1924 and January 1925, in response to a short world crop, short crops of most cereals in Europe, and improved European purchasing power. From the high level reached early in 1925, wheat prices moved irregularly downward, year after year, as world production expanded and stocks rose even while consumption increased. In 1928-29, prices fluctuated on a level almost as low as that of 1923-24.

In retrospect at least, it is surprising that, following the record world crop of 1928,

CHART 19.—POST-WAR MOVEMENTS OF WHEAT PRICES, 1920-31, AS INDICATED BY REPRESENTATIVE MONTHLY SERIES*

(Cents per bushel; logarithmic vertical scale)



monthly series representing British import prices and prices in the United States and Canada. Various charts and Appendix Tables in this issue illustrate many of the points mentioned below.

The big post-war decline, accompanying general deflation in commodity prices, ended late in 1921. As production expanded faster than consumption demand, wheat prices sagged further in 1922-23 and

wheat prices fell no lower in 1928-29. The reasons were chiefly three. Because wheat was generally abundant and cheap and feed grains not abundant, wheat was consumed more liberally than usual. The crop of 1928 had been so exceptional that the next crop was generally expected to be smaller, making prices higher; hence farmers, dealers, and millers, the world over, were willing to carry big stocks into the

next crop year. Finally, business was good, prices in general were fairly stable, confidence was widespread, and speculators were willing and able to accumulate wheat futures (as well as corporation shares) on a liberal scale. An unorganized, unrealized, but effective co-operation of all wheat interests achieved a remarkable stabilization of wheat prices, much as it had in 1923-24. In consequence, when the crop year ended, world wheat stocks were unprecedentedly huge. In fact, the magnitude of these stocks was not fully realized. The unorganized price stabilization of 1928-29 rested partly on the belief that outward carryovers were much smaller than they proved to be.

The world wheat crop of 1929 turned out to be notably smaller than that of 1928. The reduction now appears to have been about 500 million bushels, though early in the season a still greater reduction was expected. For a time it appeared that the expectations of holders of wheat and wheat futures would be fully justified, as those of some undoubtedly were. Wheat prices advanced sharply in the summer of 1929, particularly in the United States and Canada. The advance, however, was soon checked; prices weakened as European markets failed readily to absorb heavy shipments from Argentina and the Danube countries plus restricted amounts from other countries. Yet even the crisis precipitated by the stock market crash in the autumn did not bring sustained declines in the wheat market, among other reasons because of reluctant selling by Canadian holders and the loan policy established by the Federal Farm Board here. In the first half of 1930, however, prices slumped badly, until by July 1930 almost every series of cash and futures prices had broken through the previous post-war low records,¹ and world wheat prices were close to or below the lowest levels of the post-war period or, indeed, since July 1914.

The reasons for this severe decline to low levels in July 1930 are now fairly clear. As mentioned above, world wheat stocks carried into 1929-30 were not only large, but

much larger than had been realized. Export supplies in Argentina and the lower Danube basin, and stocks of domestic and imported wheat in importing countries of Europe, proved far larger than had been realized. European importing countries harvested unusually good crops in 1929. In Europe ex-Russia as a whole, the crops of wheat, corn, barley, oats, and potatoes were the largest since the war and rye the second largest. France, instead of importing wheat as usual, had a surplus for export; Germany's rye supplies were very burdensome. In the face of this situation, several wheat-importing countries of Continental Europe took steps to protect their own wheat growers, raising their tariffs and otherwise restricting the use of imported wheat.² Germany sought to increase the domestic use of rye at the expense of wheat, and France gave a bounty on wheat exports. In consequence, European countries imported in 1929-30 about 150 million bushels less than in any of the three years preceding, and ex-European countries imported only moderate quantities.

As the large export surpluses of North America moved abroad only in restricted volume, the visible supply increased much faster than usual, to a high record peak on January 1, 1930.³ It was astounding that, after a short crop in 1929, world wheat visibles every month established new high monthly records. In July 1930, world wheat stocks remained abnormally high, not much below the record levels of the year preceding; carryovers in exporting countries as a whole were higher than they were in July 1929; European import restrictions persisted; and a larger harvest was in prospect for 1930. Finally, the economic crisis had been followed by depression, commodity prices in general had fallen, and speculative confidence had given way to pessimism, so that ability and willingness to hold wheat or wheat futures for better prices was materially weakened.

Chiefly for these reasons, world wheat prices in July 1930 were at practically the lowest levels since the war. It was from such low levels, with these market factors already taken into account, that the unexpected and severe decline of August-January 1930-31 occurred.

¹ In Canada, wheat prices had been a little lower between October 1923 and April 1924.

² See Chart 28, p. 104, and Appendix A.

³ See Chart 53, p. 139.

THE DECLINE OF AUGUST-JANUARY 1930-31

In terms of cash prices in Great Britain (import wheats), Canada, Argentina, and Australia, the net decline in wheat prices from July to the bottom in late December, January, or early February, was 40 to 50 cents a bushel—equivalent in some cases to 50 per cent or even more. From the August peak to the trough in late December the decline in December closing futures was 57 cents in Liverpool and 54 cents in Winnipeg; and Liverpool March and May futures fell a little lower in January than in December.

So radical a decline in wheat prices between July and January following has few precedents. In the United States the only comparable decline occurred in 1920-21, in a period of much more extreme deflation in commodity prices in general. Declines greater in absolute amount have occurred before, from levels temporarily high, as in 1925; but these declines have been smaller relatively, and the larger ones have not occurred in the second half of the calendar year.

It is now possible to summarize the factors that were responsible for this extreme decline, from levels already very low, which was quite unexpected in the summer of 1930.

In the first place, the world wheat crop of 1930, and more particularly the supplies available for export, were not only unusually large; in reality they were significantly larger than was realized at the beginning of the crop year, e.g., in July or early August, before the decline began.

In January 1931, the wheat crops of exporting countries outside of Russia, in the aggregate, appeared at least 75 and probably over 100 million bushels larger than they had six months earlier, and subsequent revisions of estimates have been, on the whole, upward.¹ This increase was only partially offset by prospects for increased use of wheat for feed in the United States, in view of the short corn crop here. The

Russian crop, for which no satisfactory evidence was available in July 1930, turned out to be very much larger than competent wheat students or traders expected. Broomhall's first estimate of Russia's export surplus, published on September 3, was 56 million bushels, of which he expected 48 million to be shipped out. At the time, these estimates were regarded as surprisingly liberal; yet Russia's exports, in July-June 1930-31, are officially given as 111 million bushels, and the figure for August-July would presumably be still larger. In July 1930 export carryovers and new crops had appeared abundantly ample to provide for import requirements of around 800 million bushels and to leave liberal carryovers at the end of the crop year. Under such circumstances, the addition of some 100 to 150 million bushels to export surpluses was of far greater weight than the relation of this figure to the total world crop would suggest. The actual pressure of Russian exports on world markets, by reason both of volume and method of shipment and sale, contributed notably to the price decline.

Broomhall's summarized estimates of exporters' surpluses and importers' requirements, as first published on September 3, 1930, yielded an excess of 392 million bushels.² This figure was considerably larger than in any earlier post-war year except for a few weeks in January-February 1929, when the corresponding figure was 400 million bushels. Revisions of North American surpluses on September 17 brought the figure up to 440 million bushels. On November 12, Broomhall raised his estimate of Russia's export surplus from 56 to 112 million bushels. At the same time, however, he reduced his figures for Argentina on account of lower expectations of the crop, and from India and the United States for other reasons. These brought the calculated surplus over import requirements down to 408 million bushels. It was only after heavy shipments to ex-European destinations, in consequence of extremely low prices, that upward revisions in these figures, on February 4 and March 25, caused the excess to drop to 376 and 364 million bushels, which were only a little higher than the corresponding figures of

¹ Complete detailed comparisons are hardly feasible, but this statement appears amply warranted by reference to crop summaries in *World Wheat Prospects* and our own *WHEAT STUDIES*.

² See Appendix Table XVI, and corresponding tables in our earlier crop year reviews.

February–July 1929. Broomhall's estimates of export surplus ran over 100 million bushels higher in 1930–31 than in 1923–24.

As it turned out, early forecasts of European import requirements, which had been materially too high in 1929–30, were not put too low early in 1930–31. Wheat crops in European importing countries are now estimated at almost precisely the figure that we employed in August 1930. Broomhall left unchanged throughout the year his September 3 forecast of European import purchases. Our own early forecasts were too high, not too low. Moreover, higher tariffs and milling regulations, adopted in several European importing countries, tended to reduce somewhat the proportions of the year's purchases that were bought in the first half of the crop year, thus weakening somewhat the current market demand when the pressure of Russian wheats was most extreme.

Ex-European import purchases indeed eventually ran materially in excess of forecasts early in the crop year; but it was only as wheat prices sank to extremely low levels that the Orient and some other ex-European purchasers absorbed much larger quantities of wheat and flour than had been anticipated in the summer of 1930. Had world wheat prices remained at or above the level of July 1930, it is probable that no such increase in ex-European takings would have taken place.

The very declines in wheat prices under the influence of these factors led, in turn, to further declines. This was because the Canadian Wheat Pool and other holders found it financially impossible to continue holding, and were forced either to sell cash wheat freely or to hedge unhedged supplies. Increasingly severe restrictions on imports into Germany were imposed late in October, and a few countries put up special barriers against Russian wheats. Moreover, speculative support through the futures markets was severely reduced under the influence of the Russian outpouring and the financial weakness of other holders.

Not all of the weakness in wheat prices in this period of great decline is to be attributed to factors of wheat supply and demand as such. Undoubtedly the factors,

numerous and complex as they are, that brought about continued sharp recessions in prices of almost all raw materials, agricultural and industrial, exerted a depressing influence on wheat prices as on other prices. It is remarkable that corn prices here, in spite of the very short domestic crop and an effective tariff of 25 cents a bushel, were lower in 1930–31, on the whole, than in any recent year except 1921–22.¹ Moreover, the pessimism that accompanied and in part intensified renewed declines in business activity and in security prices, in the last six months of 1930, was a supplementary factor tending to reduce speculative purchases of wheat. Holders of commodity stocks were everywhere bearish. The persistence of these forces through the first half of 1931 and their fresh intensification in the summer of 1931 contributed heavily to the continuance of extremely low wheat prices.

Great complaints were made against "bears" in the wheat market, when it seemed that short selling, or bearish talk influencing buyers of actual wheat, was causing price declines that were unwarranted by the real facts of supply and demand. Unquestionably instances of this occurred, as often before. Apparently also, the larger, professional speculators operated mainly on the short side of the market.² Short sales made on Russian account in Chicago, in September 1930, led the Board of Trade to resolve "that the selling of futures upon our exchanges by any foreign government is a new development of commerce of seriously objectionable character and it must be brought to an end." Our own analysis, however, points to the probability that these particular Russian sales were hedging transactions rather than sinister moves to force wheat prices lower;³ and on the evidence of the year as a whole it appears that it was the "bears" who were broadly correct in their appraisal of the wheat situation as it developed.

¹ *Agriculture Yearbook, 1931*, pp. 625–26. The 1921 crop was large, and followed a still larger crop; whereas the 1930 crop was very short, and followed one of moderate size.

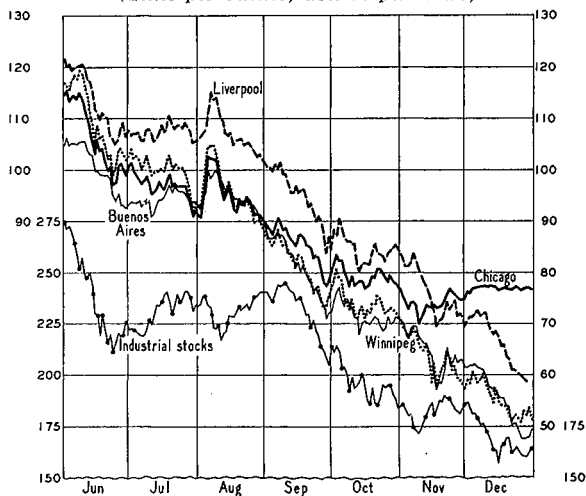
² See Report of the Chief of the Grain Futures Administration, September 1, 1931, pp. 5–7.

³ See WHEAT STUDIES, February 1931, VII, 262–65.

SHORT-TIME MOVEMENTS DURING THE DECLINE

Daily prices of December futures in June-December 1930, shown in Chart 20, reveal details of the great decline more clearly than the weekly and monthly series shown in the two preceding charts. For comparison here, the Dow-Jones index of daily closing prices of 30 industrial stocks in New York is also plotted on this chart. A few points deserve comment.¹

CHART 20.—PRICES OF DECEMBER WHEAT FUTURES IN FOUR LEADING MARKETS, JUNE-DECEMBER 1930, AND PRICES OF INDUSTRIAL STOCKS*
(Cents per bushel; dollars per share)



* Daily closing prices from *Daily Trade Bulletin*, Chicago. For Buenos Aires, July, September, October, and February futures are used. Dow-Jones index of closing prices of thirty industrial stocks, from *Bradstreet's* and *The Chicago Journal of Commerce*.

The sharp drop in wheat prices in June 1930 is not easily explained by bearish news applying peculiarly to wheat. It was significantly preceded and/or accompanied by an even more severe decline in the stock market, acute weakness in the silver market, and declines in prices of many raw materials, agricultural and industrial. Moderate firmness in the stock market in July was accompanied by comparative stability in wheat prices, extending until near the end of the month. In August, wheat prices and prices of industrial stocks moved broadly in opposite directions; but from

¹ See also *WHEAT STUDIES*, August 1930, VI, 387-90, January 1931, VII, 202-05.

September to December the parallelism shown in June, and in lesser degree in July, reappeared. For a short time in November, as stabilization purchases supported the Chicago wheat market while Liverpool and Winnipeg broke with special severity, stock prices more nearly paralleled the Chicago movement; but thereafter the correspondence was closer between Winnipeg wheat and industrial stocks.

The break in wheat prices late in July was sharpest in Winnipeg and slightest in Liverpool. It was associated with bearish private forecasts of the Canadian crop, rumors of pressing offers of Russian wheat, heavy marketings of American winter wheat, a sharp increase in the United States visible, and official confirmation of a record carryover in the United States.

The sharp upturn of August 4-6, which was greatest in North American markets, was partly a technical reaction, supported chiefly by two factors: concentrated recognition of the really disastrous effects of the drought on the corn crop of the United States, which was causing sharp advances in corn prices and giving rise to expectations of heavy demands for wheat for feed use; and reports of damage to the Canadian crop, especially because of black rust in parts of the Northwest.

The reaction of August 9-13 was greatest in Winnipeg. It was associated with some improvement in weather conditions, particularly in Canada; bearish constructions of official crop reports, especially the Canadian; rumors that the Canadian Wheat Pool was encountering difficulties in getting bank credit for financing the 1930 crop; indications that Russian shipments, for which heavy chartering had been reported, were getting under way; and renewed weakness in the stock market, which had not shared in the preceding advance in wheat.

The dominant factor in the prolonged decline of ensuing weeks was unquestionably the Russian shipments, which were pressed upon the world markets in increasing volume, to an extent and in a manner that no one appears publicly to have correctly forecast. Important additional depressing factors from early in September, at least, were weakness in commodity and

security markets generally, declines in business activity and industrial output, and increasing pessimism concerning the date of sustained upturns. The temporary resistance in October was associated with a fairly even balance of bullish and bearish crop news, and was presumably furnished in part by unannounced supporting purchases under Farm Board authority.

Chart 20 shows how Winnipeg futures broke through the relatively firmer Chicago futures late in August, and how in September and October Chicago prices resisted the decline abroad, so that the spread between Chicago and Winnipeg gradually widened and that between Liverpool and Chicago gradually narrowed. In late October and early November, however, Chicago prices broke farthest. If major stabilization operations had not been undertaken, Chicago futures might soon have settled, at least for a time, at a lower level in relation to Liverpool and Winnipeg futures. This tendency was quickly reversed, as support in Chicago was accompanied by extreme weakness in Liverpool and Winnipeg. Late in December, Chicago December futures sold around 77 cents, while Liverpool December was about 18 cents lower and Winnipeg December, representing a more valuable milling wheat (No. 1 Manitoba Northern), some 25 cents lower.

Extreme weakness in world wheat prices in the first half of November was associated with several factors: extreme pressure of Russian shipments (then reaching their peak for the season) upon a restricted European market; an upward revision of the Canadian crop estimate, and persistent rumors that the Canadian Pool would be forced to liquidate; reports that India was reducing railroad rates to facilitate exportation of a substantial amount of surplus wheat there; back-spreading operations between Winnipeg and Chicago;¹ and renewed weakness in security markets. The temporary recovery in wheat prices after mid-November was associated, not only with some firmness in the stock market but with accredited reports that Russian ship-

ments would be small in the remainder of the season, that the Canadian Pool would not be forced into liquidation, and that the Argentine crop had suffered permanent damage from rust.

The fresh decline in December 1930 was probably attributable mainly to competitive pressure of export wheat on a restricted European market. European buyers had lost heavily on purchases in August-October, and were not eager to buy until better assured regarding the future of prices. Large stocks of Russian and North American wheat had piled up in European ports. A large Southern Hemisphere crop was nearly ready to move in volume. Argentine exporters, favored by a rapid depreciation in Argentine exchange and an improved outlook for the Argentine crop, appear to have pressed their offers. Pressure on the Canadian market from hedging sales by the Canadian Pool was also presumably a factor in December. So also were weakness in security prices and fresh low levels in business activity.

MOVEMENTS IN JANUARY-JULY 1931

In sharp contrast with the declines of August-December 1930, world wheat prices were comparatively stable in January-June 1931. In the United States, until some time in June, stabilization operations held cash prices and May futures fairly constant. Where price control measures were not in force, wheat futures prices moved within narrow limits,² as shown by Charts 21 and 22 (p. 94). Liverpool May futures fluctuated for five months within a range of about 8 cents. The range in Buenos Aires futures was about the same. The range in Winnipeg futures was but little wider, if one excepts the lower prices early in January and a brief peak early in February. Almost equal stability characterized July futures in Liverpool, Winnipeg, and Buenos Aires, from January through June.

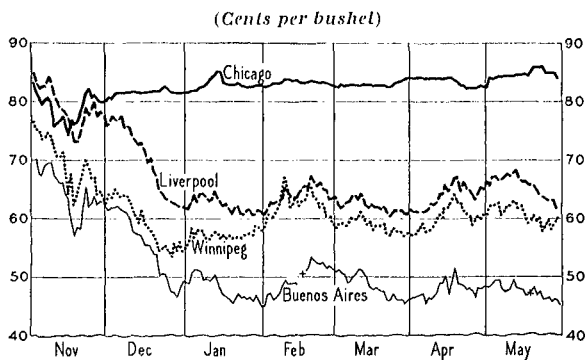
World wheat prices held up well in the face of continued recessions in commodity prices in general. Some improvement in business activity occurred between December and April or May, but fresh declines followed. The severe decline in prices of industrial stocks, from late in March until

¹ See WHEAT STUDIES, January 1931, VII, 204.

² British import prices, however, continued to decline until April, presumably because of the heavier proportions of cheap Australian and Argentine wheats.

June 3, was not at all closely paralleled in wheat markets, and the sharp recovery in security markets late in June was accompanied by only a slight firming of wheat prices.

CHART 21.—PRICES OF MAY WHEAT FUTURES IN FOUR LEADING MARKETS, NOVEMBER–MAY 1930–31*



* Daily closing prices from *Daily Trade Bulletin*, Chicago. For Buenos Aires, February, May, and June futures are used.

The comparative stability in wheat prices presumably reflects mainly the fact that the undoubted bearish factors in the situation were well discounted by the end of December, and that subsequent bullish and bearish influences were more or less counterbalancing.¹ Striking increases in Southern Hemisphere shipments were partly offset by reduced shipments from Russia. Exports from India failed to materialize. Ex-European takings increased notably. Even Europe bought larger quantities as port stocks were absorbed, and still more toward the end of the year as domestic supplies ran short. The persisting superabundance of wheat, partially reflected in record levels of visible supplies and the continuance of severe world-wide depression, was sufficient to hold bullish forces in check; but the actual pressure on world markets was not increased, and at such low levels of prices the risks of bearish operations were unusually great.

It seems doubtful whether, in the absence

¹ See WHEAT STUDIES, May 1931, VII, 314–15, and September 1931, VII, 497–99.

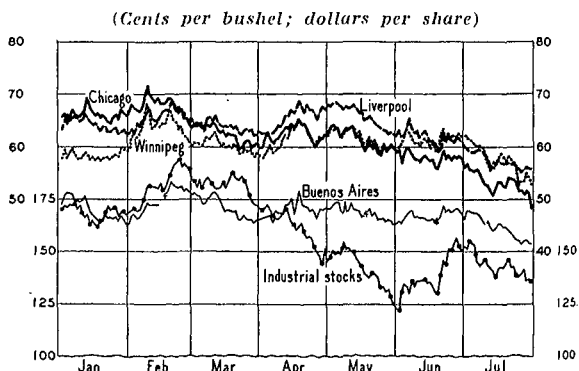
² This is not inconsistent with the discussion of the "Transfer-of-Speculators-to-Winnipeg Myth," in the recent report of the Chief of the Grain Futures Administration.

of stabilization operations in the United States, world wheat prices would have fluctuated so narrowly; but it is open to question whether the general level in January–June would have been materially different.

Detailed consideration of minor movements of prices in January–June seems hardly called for; but the relative firmness of Winnipeg prices, the gradual weakening in the relative position of July futures in Chicago, and the declines in June–July 1931, deserve comment.

Winnipeg futures rose from low levels in mid-December to a peak 13 cents higher on February 10. The spread between Liverpool and Winnipeg futures narrowed from about 12 cents in the first half of December until for a few days in February Winnipeg was above Liverpool. The Liverpool–Winnipeg spread remained unusually narrow, considering the large Canadian stocks, for the rest of the year. The early firmness in Winnipeg was probably a reaction from

CHART 22.—PRICES OF JULY WHEAT FUTURES IN FOUR LEADING MARKETS, JANUARY–JULY 1930, AND PRICES OF INDUSTRIAL STOCKS*



* Daily closing prices from *Daily Trade Bulletin*, Chicago. For Buenos Aires, February, May, June, July, and August futures are used. Dow-Jones index of closing prices of thirty industrial stocks, from *Bradstreet's* and *The Chicago Journal of Commerce*.

the preceding decline, which had been notably severe in Winnipeg. Probably another factor was that some American speculators with relatively bullish views concentrated their operations in the Winnipeg market.² The sharper decline in Winnipeg futures in the second half of February was in turn a reaction from an overbought position, which was associated, among other things,

with rumors, confirmed on February 26, that the Grain Stabilization Corporation would undertake to sell some 35 million bushels for export before July 1. Later, increasingly poor prospects for the new Canadian crop lent additional strength to the Winnipeg market.

The Chicago July future advanced relative to Liverpool July in December and January, and sold above Liverpool July through most of January and February. After the middle of February it gradually lost ground. Declines in relation to Liverpool occurred especially (1) in February, when the decision to sell for export some 35 million bushels of stabilization wheat was first rumored, and then confirmed; (2) after March 23, when the Federal Farm Board announced that stabilization purchases would not be made from the 1931 crop; and (3) after the middle of April, partly under the influence of indications of a big new crop of winter wheat.

Even after this relative weakening, however, Chicago July futures remained, practically throughout May-July, at a much smaller discount under Liverpool July than would be expected when a large United States carryover is assured and prospects develop for a large crop of winter wheat. The spread varied mostly within 5 or 6 cents a bushel, as compared with 10 cents or more in May-July 1930.

The moderate decline in world prices from early May to early July was probably attributable to definitive slackening of European purchases and to a favorable development of the United States winter-wheat crop offsetting the influence of deterioration in the North American spring-wheat belt. In July the sagging of world wheat prices became more pronounced. By the end of July, before the decline was completed, prices generally had broken through previous low levels.

¹ See Appendix A, which gives changes in tariffs and in milling quotas.

² Comparisons of wheat prices over periods of centuries are both inexact and misleading, chiefly because genuinely homogeneous price series are not usually available (except perhaps in very limited areas that cannot be taken as representative), and because the value of the money unit has changed so greatly that the significance of prices expressed in money units of changing purchasing power varies widely in the course of many years.

The July decline, in the face of several bullish factors mentioned above, may be attributed to the greater aggregate weight of numerous bearish influences. European demand slackened considerably as fresh restrictions were imposed in more and more countries,¹ and as new-crop domestic wheat became available. There was a heavy early movement of new winter wheat in the United States, from a crop of extraordinary size. The Federal Farm Board made it clear that, instead of complete withholding of stabilization wheat, limited amounts would be sold regularly, and additional amounts might be sold to foreign governments or their agencies; and European fears of considerable liquidation of these stocks were not allayed. Canada's crop prospects registered some improvement. The Argentine exchanges again weakened, and Argentine exporters lowered their export offers. Russian offers for forward shipment and liberal Russian charterings not only had a direct current influence, but intensified fears of extensive competition from Russian wheat. Finally, the critical financial situation in Europe was brought clearly into view; and in spite of hopes aroused by President Hoover's proposal of a year's moratorium on inter-governmental debts, which was agreed to after some delay, the whole basis for confidence in early recovery from the depression was weakened.

RECENT LOW PRICES IN PERSPECTIVE

Commodity price declines in 1930 carried many prices, including that of wheat, below their previous low records since the war. Since late in 1930, furthermore, low-price records that had stood in wheat and other commodities since the middle 'nineties have been broken through. In terms of purchasing power over commodities in general (that is, when allowance is made for the change in the general price level), wheat generally has been worth distinctly less in 1931 than probably ever before over any considerable area.

For wheat, 1894-95 had previously held the low-price record for many decades, probably ever since international trading had created the modern world wheat market.² In 1894 British domestic wheat aver-

aged 69 cents a bushel, apparently the lowest annual average price since 1745.¹ In October 1894 the average price per bushel of all wheat imported into Great Britain set a low record of 64 cents a bushel. This record was not broken until August 1931, but ever since November 1930 (except in May 1931) this series had been running lower than in corresponding months of 1894-95. As early as December 30, 1930, Liverpool near futures had temporarily dropped slightly under the lowest point reached in 1894.² Still lower levels were reached by the end of July 1931.

In December-January 1930-31, when No. 1 Northern Manitoba sold in Winnipeg around 51-52 cents, the lowest levels in the history of Winnipeg wheat prices were broken through.³ Late in July 1931, certain wheat futures prices in Chicago fell below the lowest levels that had been touched in the crop year 1894-95.⁴ No. 3 Spring wheat (then the most representative grade) sold in Chicago as low as 49 cents in January 1895—a lower figure than any since before the Civil War and the development of cheap transport from the West.⁵ Contract grade wheat in Chicago broke through this low price late in July 1931, though spring wheat, because of prospects for a very short crop in 1931, has not yet sold as low.

¹ *Agricultural Yearbook, 1922*, pp. 605-06. The data prior to 1772 are not official like the later ones, and the two series are probably not fairly comparable.

² *Corn Trade News*, January 7, 1931.

³ Monthly Winnipeg prices of No. 1 Northern Manitoba from 1890 to 1925 are shown in Charts 5-7 in *WHEAT STUDIES*, July 1925, I, 242-45. The series in the 'nineties is for the first of each month.

⁴ A chart of Chicago futures prices in 1894-95 will appear in the next issue of *WHEAT STUDIES*. See James E. Boyle, *Chicago Wheat Prices for Eighty-one Years, 1922*. Holbrook Working's recent study (*WHEAT STUDIES*, November 1931, VIII, No. 1, Plate 1, Chart A-1) shows that "deflated" prices of May futures reached low levels of 76 to 77 cents on the 1913 price level in May 1894 and February 1895, and that similarly deflated May futures first sold below this level in September 1930.

⁵ Boyle, *op. cit.*

⁶ From relationships between futures prices and the United States average farm price on December 1, 1893-95, it may be inferred that monthly farm prices, at their lowest points in July, August, and October 1894, and February 1895, did not fall much if any below 40 cents a bushel.

⁷ The peak of this series in December 1920 (\$2.994) was higher than any reached during the war or in 1919.

The average farm price in the United States on December 1, 1894, was 48.9 cents a bushel, the lowest of any year in the period since 1866 for which these data have been available (see Chart 30, p. 107). In the absence of stabilization operations in 1930, the average farm price on December 1, 1930 (which actually was 60.0 cents), might have fallen nearly to this pre-war low, or conceivably below it. It is reasonably safe to infer, in the absence of monthly data prior to 1908, that monthly average farm prices as reported for the summer months of 1931-35 to 36 cents a bushel—were lower than the lowest that actually obtained in 1894 or 1895.⁶

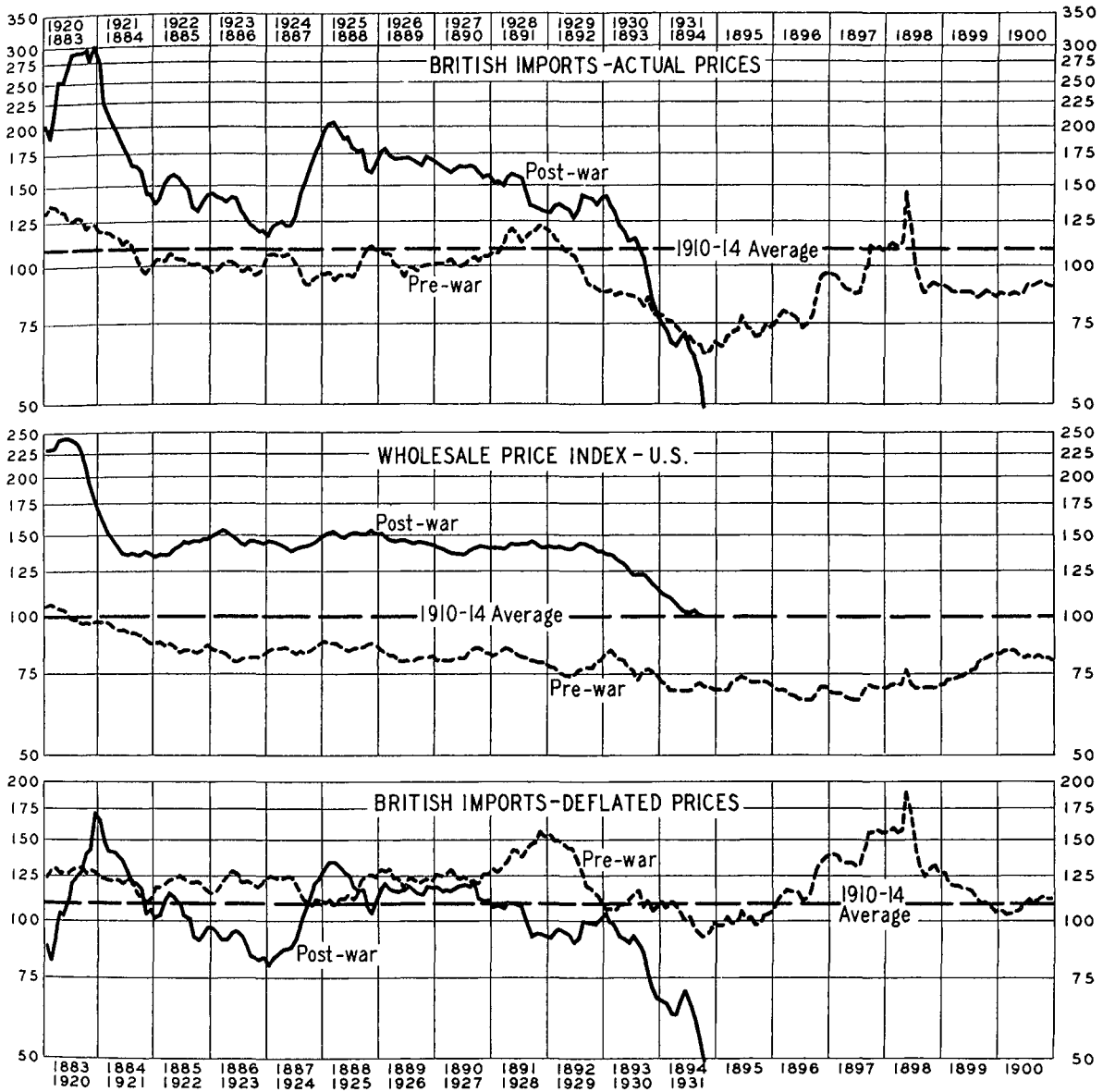
Chart 23 is inserted here to show, in broader perspective, the recent low levels of wheat prices and the preceding decline. It presents the most representative single series of world wheat prices that is available over a long period of years—monthly average prices, here expressed in United States currency, of wheat imported into Great Britain.

The upper section of the chart shows this price series monthly from 1920⁷ to date, in comparison with the same series monthly from 1883 through 1900, and with the average price in 1910-14, which was 108.8 cents. The scales are superimposed so that the curve for 1931 may be directly compared with the curve for the low-price year 1894. The curves are plotted on a logarithmic or ratio vertical scale, since this facilitates comparison of relative changes, a drop from \$1.20 to 60 cents appearing as great as a drop from \$2.40 to \$1.20.

Comparison of actual average prices, as shown in the upper section of this chart, brings out significant facts in addition to the recent drop below the low points of 1894. In the post-war period, prices fluctuated above the 1910-14 average until August 1930, whereas through most of the pre-war period covered the monthly average price was below the 1910-14 average. Changes in wheat price levels have been more pronounced in the post-war period than in the pre-war period shown: the advance of 1924-25 and the declines of 1921, 1930, and 1931 were sharper and greater than any comparable advances and declines in the pre-war period. The decline

CHART 23.—WORLD WHEAT PRICE MOVEMENTS IN 1883-1900 AND 1920-31, AS REFLECTED IN BRITISH MONTHLY IMPORT PRICES, ACTUAL AND DEFLATED; AND INDEX NUMBERS OF WHOLESALE PRICES*

(Cents per bushel; index numbers; logarithmic vertical scale)



* Sources and description of British import prices as given in Appendix Table XXXVIII. Index number of wholesale prices of all commodities, compiled by Professors Warren and Pearson, as given in *Farm Economics*, published by the New York State College of Agriculture, Ithaca, New York, September 1931. The latest month plotted is October 1931. The September 1931 price, 56.8 cents, is obtained by converting the pound at \$4.86, approximately the average for the period within the month ending September 19. Severe depreciation of sterling began on September 21, but it is reasonable to assume that wheat imports covered by customs returns for September were entered at c.i.f. prices that were ruling before the suspension of the gold standard occurred. Conversion at the monthly average exchange brings the figure to 52.9 cents.

between August 1929 and August 1931 (from \$1.415 to 63 cents, or 54½ per cent) was relatively larger than the decline between August 1920 and August 1922 (from \$2.912 to \$1.454, or 50 per cent). The drop

from the peak in January 1930 to the low of October 1931 (from \$1.404 to 48.8 cents, or about 65 per cent) was relatively greater than the drop, in a period one month longer, from the peak in December

1920 to the succeeding low of October 1922 (from \$2.994 to \$1.309, or 56 per cent). It is of interest to observe that wheat prices tended upward from the low point of October 1894 until the spring of 1898, but settled back in the summer of 1898, after the effects of world crop shortage had worn off, to a level about 40 per cent above the low.

Over a period of a decade or two, changes in the general price level, which reflect (more or less imperfectly) changes in the purchasing power of the money unit, are often so marked that the money prices of a commodity such as wheat obscure very significant changes in its value in terms of other commodities in general. This has been true in both periods here compared. More important, the changes in general price levels between the pre-war and post-war periods, separated by 37 years, were so great that prices expressed in identical money units are far from comparable in significance.

The middle section of Chart 23 illustrates this point, using a United States wholesale price index on a 1910-14 base that has been recently extended back to 1797 by Professors Warren and Pearson. During practically all of the pre-war period shown here, this index fluctuated below the 1910-14 average. During most of the post-war period the same index has been some 60 per cent or more above the pre-war index for the years with which comparisons are made. Only recently, after a decline seldom equaled except shortly after the close of the Civil War and the Great War, has this index declined to the 1910-14 average, whereas in 1894 it was some 32 per cent below that average. The index for October 1931 is 100; that for October 1894 was 70.

A rough adjustment, to help overcome the obstacle to comparability occasioned by changes in the purchasing power of the money unit over periods of years, can be made by "deflating" the money prices of a commodity by index numbers of wholesale prices, e.g., dividing each monthly price of wheat by the wholesale price index number for the same month.¹ The resulting series can be regarded (with certain reservations) as expressed in cents of the purchasing power that they had in the index

base period. This has been done here, using the index numbers on the base 1910-14 that are charted in the middle section of Chart 23.² The resulting two deflated series of British import prices of wheat are plotted in the lowest section of the chart.

The comparison provided by the two lowest curves is quite in contrast with the comparison shown by the actual price series above. In all but two or three years since the war, wheat has been cheaper, *in terms of 1909-14 cents*, than in the parallel years of 1883-94. In 1923-24 world wheat "values," in this sense, appear to have been lower than at their lowest in 1894. At their peak early in 1925, they were only about 25 per cent above the 1910-14 average. In 1928-29 they were below the levels that prevailed in 1894-95, though not as low as in 1923-24. In the second half of 1930 the post-war low-record values of 1923-24 were broken, and recent deflated prices appear strikingly below the pre-war lows of 1894. The October 1931 deflated price of 48.8 cents is only 53 per cent of the deflated price of 91.6 cents in October 1894.

Between 1894 and 1898, there was little change in the general level of commodity prices. Recovery in wheat prices occurred in spite of this, but the trend of the wholesale index number was clearly upward from 1898 to 1913. Wheat prices have declined so much more radically than prices in general, in 1930 and 1931, that there appears a historical basis for hopes of recovery in wheat prices even though the general index should remain low. Moreover, the general index has declined so far that somewhat greater recovery in this index than took place in 1894-96 may not unreasonably be expected; yet most economic analysts do not expect the broad trend of

¹ This procedure is not entirely satisfactory, as is frequently assumed, and the results of any particular deflating procedure cannot be freely used without various reservations; yet for the broad purpose here employed the procedure appears defensible.

² It would appear more logical to deflate the original British series by a British wholesale price index number, and then express the results in United States currency. This would yield moderately different results. For the present purpose the procedure here followed has been more convenient, and it has some advantages that tend to offset a theoretical preference for the other.

prices in the decade 1930-40 to be upward as it was from 1894 to 1913.¹

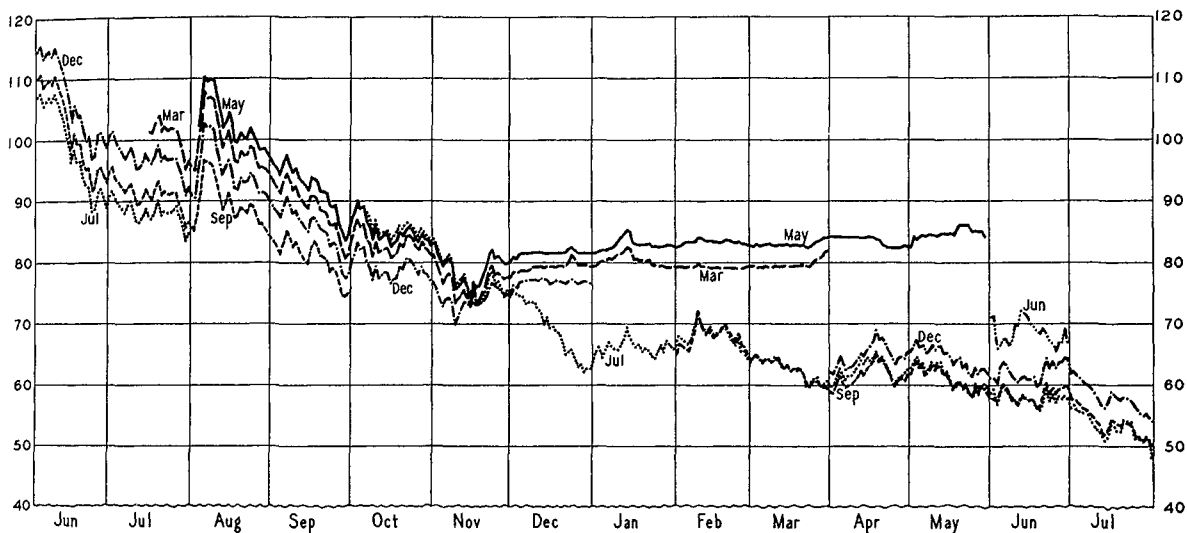
PRICES IN THE UNITED STATES

Wheat price movements in the United States in 1930-31 are shown in most detail by daily closing futures prices in Chicago, as in Chart 24; the May future is the "new-

neer and more distant futures were again unusually wide. This reflected the heavy carryover, liberal early marketings, relatively limited current absorption of marketed supplies, and big visible supplies. Though not as wide as in 1929, the spreads in the summer of 1930 were again wide enough to provide liberal carrying charges to holders who hedged their wheat, but in-

CHART 24.—DAILY CLOSING PRICES OF CHICAGO FUTURES, JUNE 1930 TO JULY 1931*

(Cents per bushel)



* Data from *Daily Trade Bulletin*, Chicago.

basis" May, which commanded more or less premium over old-basis May.² Without considering further the course of prices in July-November, it is here pertinent to observe that, in the summer of 1930 as in the summer of 1929,³ the spreads between

¹ Holbrook Working's recent study (*WHEAT STUDIES*, November 1931, VIII, 44-55) emphasizes the association between wheat price movements and movements of the general price level. This is in harmony with the picture revealed in Chart 23. Forecasts of wheat price trends over the next decade must therefore depend in considerable measure upon forecasts of the course of prices in general. This is not to say that the general price movement is a major factor determining movements of wheat. It seems much more probable that the influence on wheat prices is exerted by factors that operate similarly and simultaneously on the prices of large numbers of commodities entering into the general index.

² This was because of more rigid terms for deliverable wheats. See U.S. Grain Futures Administration, *Grades of Grain Deliverable on Contracts for Future Delivery* (revised to November 5, 1930), pp. 7-8.

³ See James E. Boyle, *Chicago Wheat Prices for Eighty-one Years*, 1922.

creased storage space and the shifting of stabilization supplies contributed to prevent such congestion and heavy discounts on cash wheats as had occurred in the summer of 1929.

The spread between December and May gradually narrowed from around 8 cents early in August to around 6 cents early in November. It narrowed still further, to 3 cents and even less, in the week of November 17, when stabilization purchases were made in large volume. One may infer that the Grain Stabilization Corporation first made relatively heaviest purchases of December futures. Shortly, however, the December-May spread widened to about 4½ cents.

Through most of December the December future sold close to 77 cents. The March future sold a little above 79 cents from early December into late in March, except for a few days late in December and most

of January. The May future, which had closed at 74.1 cents (new basis) on November 15, rose sharply to 82, and after recovery from a brief decline it rose by degrees from 81½ cents in December to a high point of 86 cents late in May. The fluctuations of futures prices above the pegged prices (taking into account the differences between old- and new-basis May) are presumably to be attributed to the demands of shorts (hedgers or speculators) upon the limited supply of contracts outside the hands of the Grain Stabilization Corporation.

July wheat sold at a very slight premium over May in the few weeks before stabilization operations were announced. Such a relationship, though unusual, was appropriate in view of confident expectations of a heavy carryover in 1931. Since stabilization purchases of futures were confined to old-crop futures, henceforward the July future fluctuated in general sympathy with world market prices. Late in December, July was at a discount of some 19 cents under May. After a period of narrowing, the spread widened in February and March to around 24 cents early in April. Another period of narrowing was followed by a widening to 26 to 28 cents late in May. Reasons for these changes have been suggested above (pp. 92-95).

July and September futures were not purchased in the course of stabilization operations, and the Farm Board stated on March 23 that stabilization purchases would not be made from the 1931 crop. Yet as the new harvest season approached, the fact that the bulk of the wheat stocks was in the hands of the Grain Stabilization Corporation and the manner of handling those stocks influenced strongly the relationships between new-crop futures and those between cash wheat prices and prices of futures.

In times when stocks are heavy, spreads between futures of different delivery months are normally large and prices of cash wheat are at correspondingly large discounts under futures, especially under the more distant futures. In 1929, with heavy stocks of wheat in private hands, the Chicago July future sold at discounts under the September, ranging mostly, in

June and July, from 4 to 5½ cents. In June and July 1930, with larger stocks of wheat in the United States, but some 65 million bushels of the stocks under the control of the Stabilization Corporation, the discount of July wheat under September ranged mostly between 3 and 4 cents. In June and July 1931, with stocks further augmented but chiefly in the hands of the Grain Stabilization Corporation, July wheat sold mostly at no discount under September, or at a discount of only about one cent.

A similar influence may be traced in spreads between September and December futures and in spreads between cash wheat and new-crop futures. As reflected in the spread between No. 2 Hard Winter wheat at Chicago and the Chicago December future, as of the last few days of July, the result was a decrease in the discount of cash wheat from nearly 16 cents in 1929, to about 7½ cents in 1930, and less than 5 cents in 1931.

In short, it appears that as regards relations between new-crop futures and between cash wheat and futures, though not in most other respects, the concentration of stocks in the Stabilization Corporation created a condition approaching that to be expected in the absence of its stocks.

The course of cash prices of representative wheats in United States markets, over the past three crop years, is shown in Chart 25. All the curves show the influence of stabilization purchases in holding up wheat prices and minimizing their fluctuations between mid-November 1930 and June 1931, on a level not much below that of October 1930, whereas in unsupported markets prices fell materially below the October level.

The three series of cash prices moved relatively close together in 1930-31 as in 1929-30, but even more closely in 1930-31. Chart 25 shows the contrast, in this respect, between these two years and 1928-29, when soft red winter wheat sold at high but declining premiums, and hard red spring sold for three months very little above hard winter. Chart 26 (p. 102) illustrates this point more clearly, and makes possible comparisons on the basis of monthly spreads over No. 2 Hard Winter from 1920 to 1931. This chart incidentally brings out

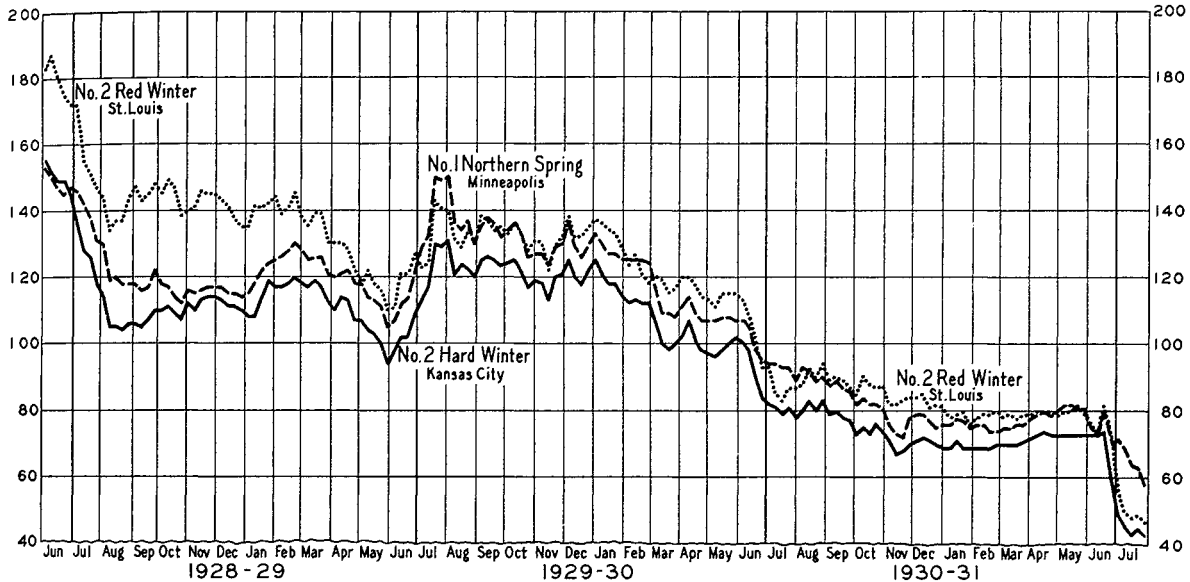
the striking lack of parallelism in the price movement of different types of wheat in the Mississippi Valley of the United States.

The comparative simplicity of the price relations in 1929-30 and 1930-31 is attributable in part to the heavy carryovers and relatively abundant supplies of all three types of wheat.

not low enough to permit commercial export sales to reach significant dimensions.

Hard red spring wheat, well represented by quotations for No. 1 Northern Spring at Minneapolis, as usual commanded a moderate premium over hard red winter in 1930-31, seasonally largest in July and smallest in October-January. As Chart 26

CHART 25.—PRICES OF REPRESENTATIVE WHEATS IN UNITED STATES MARKETS, WEEKLY, JUNE 1928 TO JULY 1931*
(Cents per bushel)



* Weekly weighted averages computed by U.S. Department of Agriculture, from *Crops and Markets*.

Hard red winter wheat sold lower than soft red winter or hard red spring in 1930-31, as it has almost every year since the war. Considering the price movements in world markets, its price moved within surprisingly narrow limits. Unquestionably responsible for this were the Grain Stabilization Corporation's policies of withholding from the market its stocks acquired in the first six months of 1930 and of purchasing wheat in large quantities in the autumn, winter, and spring of 1930-31. Only as new wheat came to market and stabilization purchases ceased, did prices of hard red winter fall severely from the supported level, in late June and early July. The new low level, however, was not as low as if the Corporation had marketed its supplies freely in competition with new wheat, or as if growers had sold freely from this bumper crop; indeed, prices were

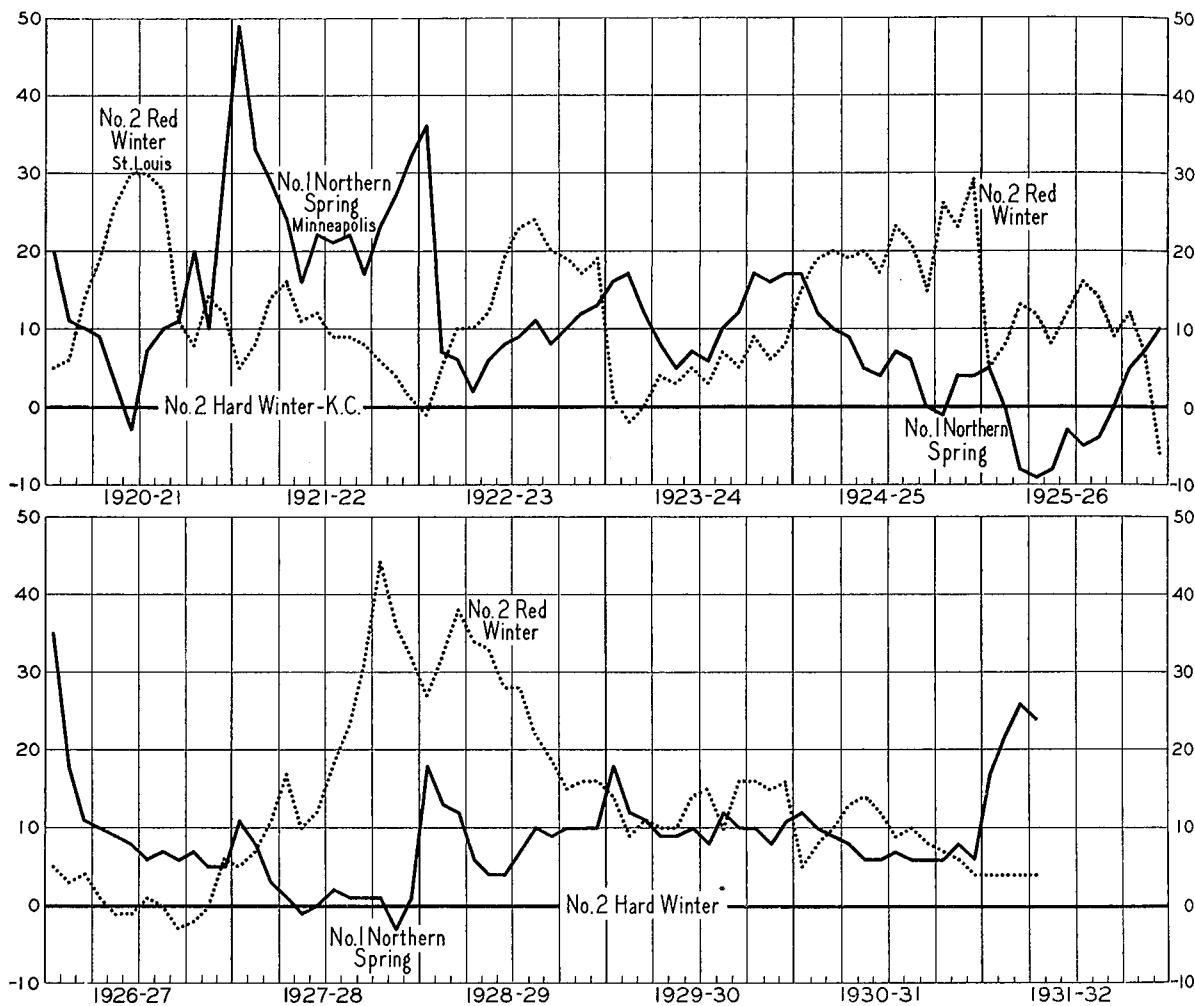
(p. 102) shows, spring wheat sold lower in relation to hard winter in several earlier post-war years, notably in 1925-26, after a very short crop of winter wheats and a moderate crop of hard spring wheat.¹ Spring wheat sold at levels relatively very high in 1921-22, when crop relationships were almost the reverse of those in 1925-26, and at relatively high levels in parts of other years.

The relative stability of the premiums on hard spring in 1929-30 and 1930-31 is in striking contrast with their variations in every other season since the war except 1927-28, following one of the biggest crops of hard spring. In spite of moderately small crops of hard red spring wheat in 1929 and 1930, the ready substitutability of hard winter for hard spring in flour-making prevented the price spread from becoming

¹ See Appendix Table IX.

CHART 26.—PREMIUMS OF SOFT WINTER AND HARD SPRING WHEATS OVER HARD WINTER, MONTHLY, 1920-31*

(Cents per bushel)



* Computed from monthly weighted average prices as given in *Yearbook of Agriculture, 1931*, p. 601, and *Crops and Markets*.

ing very wide, and stabilization operations in 1930-31 doubtless prevented fluctuations in the spread that might otherwise have occurred.

Anticipations of a very short crop of hard red spring in 1931, coupled with restricted sales of stabilization stocks in the Northwest, permitted premiums on hard spring wheat to rise to unusual heights in the summer of 1931.

Soft red winter, as usual, commanded the best prices in 1930-31.¹ The premiums over hard red winter were naturally much smaller than the exceptionally high ones that prevailed in most of 1928, when the

crop of soft red winter was unusually small.² The rise in the premium, early in the season, probably reflects the relatively heavier influence of the expected corn short-

¹ Since 1923-24, soft red winter has sold above hard red winter in every year except 1926-27, when the crop of soft red winter wheat was large enough, as it had been in the first few years after the war, to permit substantial exports. See Appendix Tables IX and XVIII. Part of the difference, however, is due to the fact that St. Louis is, so to speak, several cents nearer the consumer than Kansas City. In identical markets, the premiums on soft red winter were less than those shown in Chart 26.

² The high premium characteristic of most of 1928-29 appeared in the winter and spring of 1928, as heavy winterkilling gave the basis for expecting a short crop in 1928.

age on prices of soft red winter. The subsequent narrowing of the premium, in November-January, probably reflects the weakening of this influence, though it also suggests that stabilization support of the wheat market may have been less effective on soft red winter than on hard wheats. The later narrowing of the premium, from February 1931 onward, probably reflects chiefly expectations of a large crop of this wheat in 1931, as the more spectacular narrowing in the winter and spring of 1929 had done in that year.

Further consideration of wheat prices in the United States is deferred for discussion in connection with stabilization operations.

DIVERGENT LEVELS AND COURSE OF PRICES IN EUROPE

Divergences between countries in respect to the level and course of wheat prices are always present. The convenient phrase "world price of wheat" does not mean, of course, that a bushel of wheat brings the same price the world over, or even in important wheat markets. Nor does it imply that wheat prices in different countries move parallel from year to year or within a season. Price data, when reduced to the same currency unit, reveal wide diversities in levels and course of wheat prices in different countries.¹ This is true in major exporting countries such as the United States, Canada, Argentina, and Australia, and of neighboring importing countries such as Great Britain, France, Italy, and Germany.

In practice, the expression "world price of wheat" is best used to mean a range of c.i.f. prices (before tariff and port charges) of imported wheats, or some condensation of this range, in the principal import markets of Europe in which the world wheat price-making forces are well focused.

Convenient condensed expressions of the

¹ This is also true of different regions within the same country, and of different classes or grades of wheats in the same general region, as this and other issues of *WHEAT STUDIES* have repeatedly indicated.

² See Charts 18, 19, and 23, Appendix Tables XXXVIII and XXXIX, and *WHEAT STUDIES*, July 1928, IV, No. 8.

³ Changes in shipment costs have been much less important factors in the past two years than in several earlier periods.

world price of wheat, in this sense, are given in the monthly average prices of all wheat grain imported into Great Britain, and in the less comprehensive weekly series of British "parcels" prices which the Food Research Institute.²

This import wheat is composed of various types, in varying proportions. It comes, also in varying proportions, from a large number of exporting countries, including sometimes Germany, France, and other net-importing countries. The series is, therefore, not "homogeneous." Yet, since British imports of wheat grain constitute something like one-fourth of the international wheat movement, British import prices give a fair approximation to the course of c.i.f. prices of import wheats in Europe or available to it, subject to tariff charges. Such a series is both convenient and significant for comparisons with prices in exporting countries and with prices of domestic wheats in importing countries.

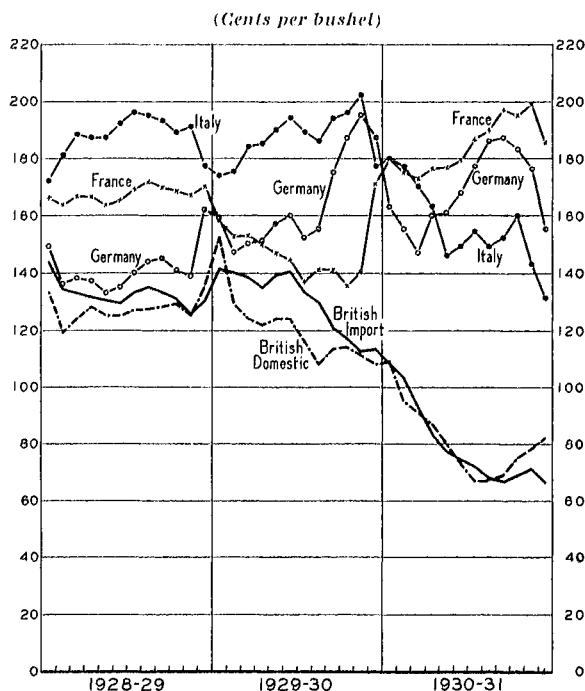
Divergences in level and course of prices, such as were summarized in Table 1 (see p. 87), have been unusually pronounced in the past two years. On the whole, they were probably more extreme in 1930-31 than in any corresponding period of peace in the past fifty years. As usual these differences were due in part to divergent changes in the size and quality of domestic crops; to changes of a particular country from a surplus to a deficit basis, or vice versa; to differences in harvest periods and variations in domestic marketing pressure; and to changes in costs of shipment.³ Always contributing factors and latterly the most potent causes of divergence have been governmental measures, variously applied in different countries — notably tariff duties and milling regulations, but in some cases export bounties and government-financed purchases.

The two companion charts here presented illustrate these points with reference to the four largest wheat-consuming countries of Europe outside of Russia, whose combined net imports of wheat and flour ordinarily make up over half of the international trade in these products. Chart 27 shows, for the past three crop years, the course of domestic (soft) wheat prices in these countries and the course of prices of

wheat grain imported into Great Britain. To facilitate the interpretation of this chart, the tariff duties in force during the same period in the three continental countries are graphically presented in Chart 28. A glance at the two charts shows how strikingly tariff duties have been advanced as world wheat prices have declined. It should also be borne in mind that, during the past two years, tariff duties in Germany and France have been reinforced by milling regulations and other devices.¹

Reference must also be made to variations in the size of the domestic crops, in

CHART 27.—WHEAT PRICES IN ITALY, FRANCE, GERMANY, AND GREAT BRITAIN, AUGUST 1928 TO JULY 1931*



* See Appendix Tables XXXVIII (British imports) and XL (domestic soft wheats).

the light of the production range in each of the several countries. Using the letters A to E to indicate the general size of the domestic crop, from big (A) through moderate (C) to short (E), we have the following, in million bushels:

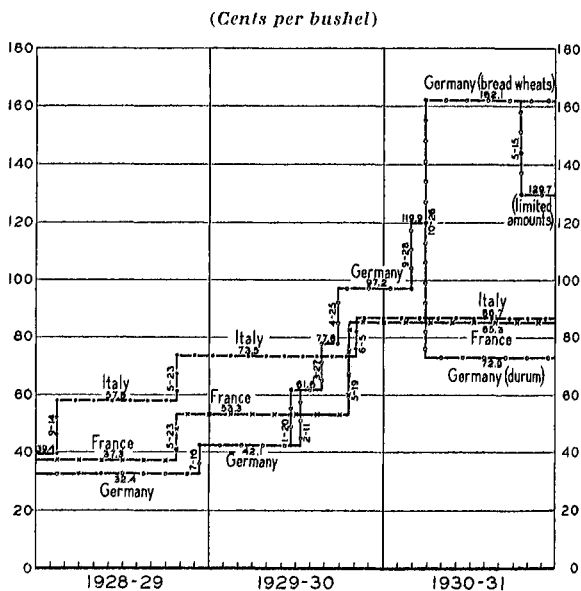
¹ See Appendix A.

² The crop was, indeed, the smallest in many years, but in the light of the downward trend it seems hardly to be called a very short crop.

Year	Italy	France	Germany	British Isles
1928	C-229	C-281	B-142	C-51
1929	A-260	A-337	C-123	C-51
1930	D-211	E-239	B-139	D-43

First it will be observed (Chart 27) that prices of domestic wheat have been regularly lowest in Great Britain. Of these four countries she alone has admitted foreign wheats free of duty, and has had no restrictions on the milling of imported wheats. For the same reason, the course of British domestic wheat prices most nearly parallels the course of prices of import wheats. Chiefly because of its inferior quality for milling as compared with imported grain, British wheat usually sells for

CHART 28.—TARIFF RATES ON WHEAT IN ITALY, FRANCE, AND GERMANY, AUGUST 1928 TO JULY 1931*



* Data from official sources and U.S. Department of Commerce; conversions at par of exchange.

less than import wheats; but the discount tends to diminish as the season progresses and domestic supplies become scarce, and late in the crop year domestic wheat may sell above import wheats, as in 1928-29 and 1930-31. The greater relative firmness of British domestic wheat prices in 1930-31 may be attributed to the shortness of the British crop in 1930.²

In the major portion of the crop year

1928-29, the levels of wheat prices were strikingly different in the four countries: in Italy around \$1.90; in France around \$1.67; in Germany around \$1.40; in Great Britain around \$1.26—as compared with British import values of around \$1.33. Three of these countries harvested fair crops in 1928, Germany's alone being large. The differences in level were due in large part to differences in tariff duties, which were 58 cents in Italy, 37 cents in France, and 32 cents in Germany. In spite of the tariff, however, prices of domestic wheat in Germany were not far above British import prices, because the domestic crop was so big that it exceeded the limits at which German wheats could be advantageously blended with imported wheats to make satisfactory flours.

Consider next the first six or seven months of 1929-30. Italian prices were slightly lower than in 1928-29—the effect of a big crop having been largely offset by firmer world prices and a 16-cent increase in the tariff. German prices were somewhat higher than in 1928-29, because of the joint influence of firmer world prices, a smaller German crop, and a 10-cent increase in the tariff duty. French prices, on the other hand, were sharply lower, in consequence of a fine crop which proved to be in excess of domestic requirements for the year. For this reason, indeed, prices of French wheat in 1929-30 were not far above British import prices, in spite of a tariff increase to 53 cents, eventually supplemented by an export bounty and milling regulations designed to strengthen domestic prices.

The big decline in British import prices in January-May 1930 was not paralleled in these continental European markets. Italian prices declined for a time, and then recovered as domestic supplies became scarce. French prices recovered from a sharp brief drop, but then showed only a moderate downward drift, as the tariff was reinforced by an export bounty and milling regulations which gave some effective support to domestic prices. German prices, however, rose sharply from February to June, in striking contrast to the decline in "world prices." Increasing scarcity of domestic wheat was a factor in this advance,

but chiefly responsible were successive increases in the German tariff effective January 20, March 27, and April 25, reinforced by milling regulations restricting the use of imported wheats.

In 1930-31, Italian prices declined almost parallel with British import prices. The level reached after the decline was around \$1.50, much lower than in either of the two preceding years, though the crop was the smallest and the tariff was the highest.

By contrast, French prices advanced sharply in 1930-31, and stood at the highest level of the three years. Three factors more than offset the great decline in world prices: the French crop of 1930 was very small and inferior in milling quality; the tariff rate was increased by 22 cents; and stringent milling regulations were put in force.

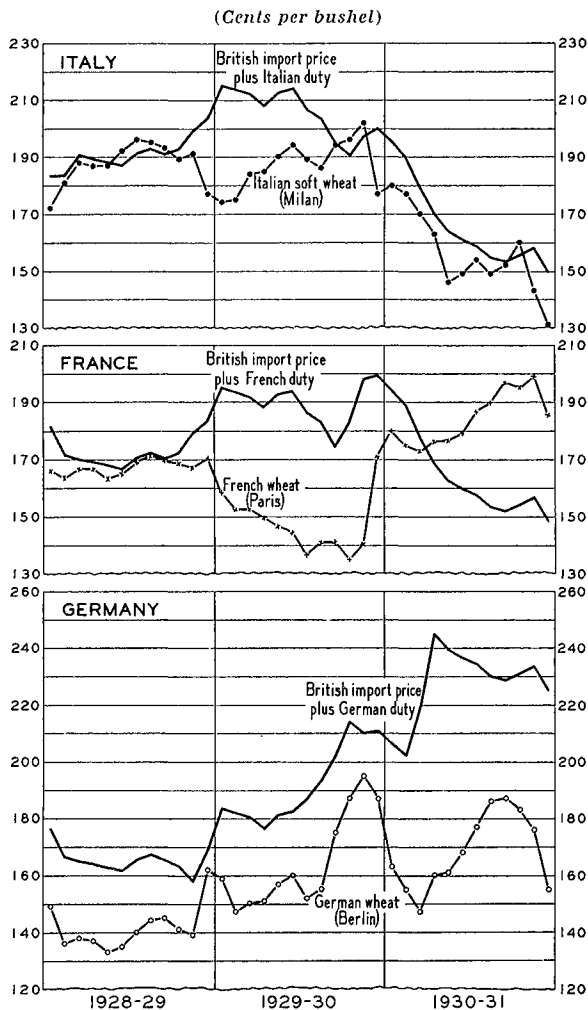
German prices declined sharply in the early months of 1930-31; decline in world prices and the harvesting of a big German crop temporarily offset the influence of continued high duties and milling regulations. From October to April, however, German prices rose sharply while world prices declined; this was due to the raising of the German tariff to the almost prohibitive level of \$1.62 and the concurrent enforcement of stringent milling restrictions, reinforced in the later months by increasing scarcity of domestic wheats. On the whole, the level of domestic wheat prices in Germany was higher in 1930-31 than in either of the two preceding years, although the crop of 1930 was little below that of 1928 and world prices were sharply lower; unquestionably the governmental measures were responsible for this.

In April 1931, domestic wheat in all three of these continental importing countries, though inferior in milling value to imported wheats, was selling between two and three times as high as wheat imported into Great Britain — about \$1.30 higher in France, about \$1.20 higher in Germany, and about 85 cents higher in Italy. All three countries had in force through 1930-31 tariff duties higher than the c.i.f. price of British wheat imports from November 1930 onward.

Chart 29 shows, for the three continental

countries,¹ comparisons between representative prices of domestic wheats and the "world price" plus the duty in force in each of those countries.² This chart reveals notable variations in the spreads between do-

CHART 29.—EUROPEAN DOMESTIC WHEAT PRICES AND WORLD PRICE PLUS DUTY, AUGUST 1928 TO JULY 1931*



* Data as in Charts 27 and 28.

mestic wheat prices in the importing country and British import prices plus the prevailing tariff duty. Obviously this implies great variation in the effectiveness of tariff duties, even when supplemented by other measures, in supporting prices of domestic wheat.³

In 1928-29, both in Italy and France, the two curves moved fairly closely together.

Both countries had harvested moderate domestic crops; they needed to import, and did import, liberal quantities of foreign wheats. Under these conditions, without any supplementary measures, the tariffs were broadly effective in supporting domestic prices. In 1929-30, on the other hand, a large crop in Italy and a bumper crop in France led to heavy discounts on domestic wheats. In Italy the discount diminished as domestic supplies became scarcer. In France, however, the heavy discount persisted until very late in the crop year because, in spite of export bounties reinforcing the import duty, France had a surplus over domestic requirements.⁴ The increased tariff duties (and the French export bounty) undoubtedly helped to support domestic prices, but their price-effectiveness was materially reduced by the large size of the domestic crops.

Germany, unlike Italy and France, had a relatively large crop of wheat in 1928. Domestic wheat therefore sold in 1928-29 at considerable discounts under British import prices plus the German tariff duty because, in the quantities in which domestic wheat was available, it was much less valuable to millers than imported wheat.⁵ In 1929-30, with a smaller German wheat crop but a huge rye surplus, liberal discounts on domestic wheat persisted, though they were smaller at the beginning and end of the crop year. Although thus limited in its price-effectiveness, the tariff, as successively increased, was largely responsible for most of the sharp advance in German

¹ Since Great Britain has had no import duty, the two lowest curves on Chart 27 show essentially the same facts for Great Britain.

² The British import price series seems preferable, for this use, to a series made up of average prices of wheat imports into the countries concerned; sometimes the actual imports are very small, and composed largely of special types or qualities, so that they constitute less representative series than British import prices.

The import price curves should be somewhat higher, because shipment costs to the continental markets used (from North and South America) are greater than to the British ports.

³ Data for earlier years, not here presented, reveal the same broad facts.

⁴ The same situation prevailed in 1925-26.

⁵ Data for earlier years show that, with rare exceptions, Berlin prices of German wheats always run below British import prices plus the German duty.

domestic prices between January and June 1930 when world prices were declining.

In 1930-31, with reduced domestic consumption in Germany and another large domestic crop, wheat sold at unusually heavy discounts under duty-paid import wheats, in spite of milling regulations and other restrictions reinforcing the tariff. These measures gave support to domestic prices and were responsible, with the tariff increase late in October, for the marked advance from October to April; but the extent of price enhancement was much smaller than the increased severity of restrictions might suggest. The general level of German domestic wheat prices in 1930-31 was much the same as in 1929-30.

In France, in contrast to Germany, domestic wheat prices rose in 1930-31, while not only world prices but world prices plus the French duty declined. The very poor French crop of 1930 was responsible for greatly increased price-effectiveness of the tariff as compared with 1929-30. The increasing premiums on domestic wheat as the year progressed, however, were attributable to milling regulations reinforcing the tariff rather than to the tariff itself.

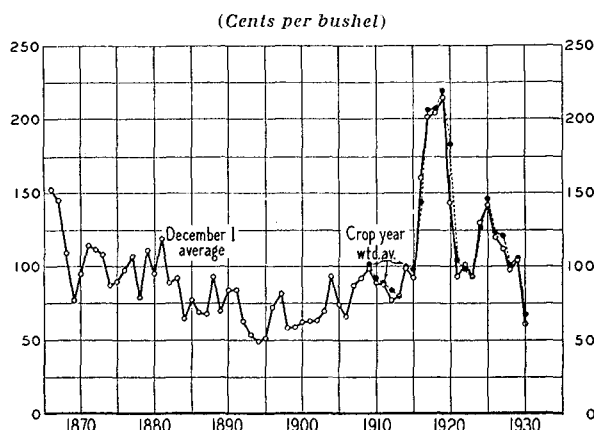
In Italy in 1930-31, domestic wheat sold at moderate discounts under British imports plus the Italian duty throughout most of the year, and at lower levels than in 1929-30. In respect to domestic crop and import requirements, the situation was broadly comparable to that in 1928-29; the heavier average discount on Italian wheats was probably due to the fact that the import wheats competing with Italian wheats were cheaper than the average of British imports.

RETURNS TO WHEAT GROWERS

Wheat growers in the United States were naturally distressed at the unsatisfactory returns they received for the wheat that they sold in 1930-31. The weighted average farm price for the year is provisionally estimated at 66.7 cents a bushel. This was by far the lowest annual average since monthly farm prices have been collected (1908); the lowest previous figure available is 79.3 in 1913-14. The December 1 average farm price, 60.0 cents per bushel, was lower than

in any year since comparable annual figures have been calculated (1866), except in 1893, 1894, 1895, 1898, and 1899; the minimum of these was 48.9 cents in 1894 (see Chart 30).

CHART 30.—UNITED STATES FARM PRICES OF WHEAT, 1866-67 TO 1930-31*



* *Yearbook of Agriculture, 1931*, pp. 582-83, 600; *ibid.*, 1923, p. 624.

Nevertheless, American wheat growers were fortunate in comparison with wheat growers in other major exporting countries. Their wheat moved to market in largest volume during the early part of the crop year, when wheat prices were much higher than in subsequent months; and, largely in consequence of stabilization operations undertaken on a scale without precedent, they were enabled to sell during the greater part of the year at prices far above those obtaining in other exporting countries, and to carry only moderate stocks into a new crop year that opened with world prices lower still.

Farm price data for other countries, comparable with those in the United States, are not compiled. One may hazard the rough opinion, however, that as compared with the United States average farm price of 67 cents a bushel, Canadian farmers probably averaged around 40 cents, Argentine farmers around 30 cents, and Australian farmers around 35 cents, for their 1930 crops. It is safe to say that very few wheat growers in any of these four countries made a profit on their 1930 crop. By and large, however, wheat growers in the United States doubtless received a larger

return above (or toward) their out-of-pocket expenses in wheat growing than farmers in Canada, Australia, or Argentina.

If overhead costs and unpaid labor of the farmer and his family, as well as direct outlays, are considered, wheat growing was generally unprofitable at prices that prevailed in 1930-31, even at the supported levels maintained in the United States. The outstanding exceptions were in Germany and France, where wheat prices were maintained in 1930-31 at higher levels than in most other post-war years, and particularly in Germany, where wheat growers had good yields for sale at these high prices. But in Italy and a number of lesser wheat-

growing countries, similar measures kept wheat-growing on a fairly profitable level in 1930-31. Despite substantial reductions in costs of wheat production in recent years, few farmers anywhere can afford to raise wheat for sale at the prices prevailing in the summer of 1931, outside of the countries which have extreme protective measures in effective force. Except in such countries, reductions in wheat acreage are being forced by financial pressure. Yet low levels of prices of other farm crops, and various obstacles to shifting to suitable alternative enterprises, serve to restrain the elimination of much unprofitable wheat culture.

III. INTERNATIONAL TRADE IN WHEAT AND FLOUR

OUTSTANDING FEATURES IN 1930-31

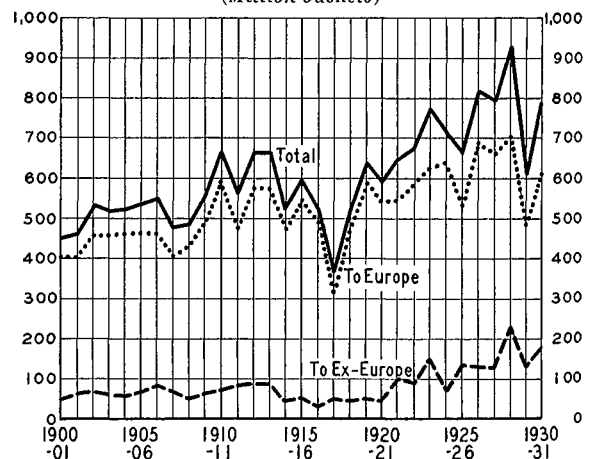
International trade in wheat and flour in 1930-31 was sharply higher than the extremely small movement in the preceding year, but not nearly as large as the record movement in 1928-29. Both total shipments and shipments to Europe were roughly midway between the post-war high and low records set in the two preceding years (see Chart 31). Measured by statistics of shipments or by net exports of net-exporting countries (see also Chart 33, p. 110), the aggregate was of the same general order of magnitude as in three earlier post-war years.

Shipments to Europe were moderately small in 1930-31. They were larger than in 1929-30 because both carryovers and new crops in European importing countries, which had been unusually large in 1929, were of more moderate size in 1930. European takings in 1930-31, however, were held down by various influences, most notably by milling regulations and other governmental measures that restricted importation for consumption and stocks, and by factors arising out of the general economic depression. A strikingly large proportion of the wheat exported to Europe in 1930-31 was shipped unsold. Total orders shipments of 194 million bushels were over 25 million bushels larger than in any preceding post-war year. They represented largely Russian wheat, and later in the

season some wheat from the Southern Hemisphere.

Shipments to ex-European countries were unusually high, both relatively and in absolute amount. Like European shipments, however, they ranked in size about halfway between the record level of 1928-29 and the lower one of 1929-30. The large

CHART 31.—SHIPMENTS OF WHEAT AND FLOUR IN TOTAL AND BY DESTINATIONS, FROM 1900-01*
(Million bushels)



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

ex-European movement was due mainly to extremely low prices. For this reason, China imported exceptionally large quantities, and India, though having a big surplus that normally would have moved more

or less into export, was actually a small net importer.

Limitations of import demand alone prevented the international movement from approaching if not exceeding the high record of 1928-29; for supplies available for export in exporting countries, from carryovers and new crops, were unprecedentedly large. Russia, after a bumper crop, rejoined the ranks of major exporters for the first time since 1913-14. Australia, out of liberal stocks in the middle of 1930 and a crop of record size, made larger exports than in any year since the war. French dependencies in northern Africa, favored by French restrictions on foreign wheats, exported more than in any preceding year. Because of severe competition from these areas, exports from Canada and the Danube basin, though by no means small, were moderate in relation to the supplies available for export.

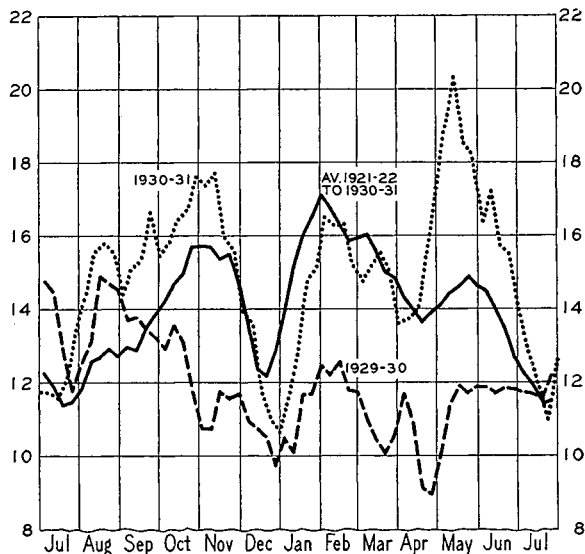
Overseas net exports from the United States (after allowance for stocks of United States grain in Canada) were the smallest of any year since 1911-12, and remarkably small in relation to the exportable surplus. This occurred because United States wheat prices were held out of line with world prices, under the influence of market factors reinforced by stabilization purchases authorized by the Federal Farm Board.

The seasonal course of trade was unusual, as broadly reflected in Chart 32. From around early August to the middle of November, shipments were unusually heavy, especially to Europe, in the main because declining shipments from North America were more than offset by heavy Russian shipments, part of which piled up in European ports. Shipments dropped off with unusual sharpness to extremely low levels at the end of 1930, as world wheat prices sank to new bottoms. The seasonal increase in January was especially pronounced, chiefly because of heavy Australian shipments; but aggregate shipments during the winter months were below average, in the main because of restricted European demand and light shipments from North America. Shipments rose to an extraordinary peak in the spring, as North American shipments rose in response to a marked but temporary increase in Euro-

pean demand coupled with continued heavy takings by the Orient. Relaxation in European milling regulations, as domestic wheats became scarce, were broadly re-

CHART 32.—TOTAL SHIPMENTS OF WHEAT AND FLOUR, WEEKLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1930-31*

(Million bushels; 3-week moving average)



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

sponsible for the unusually heavy shipments to Europe in the spring.

VOLUME OF TRADE

The total volume of international trade in wheat and flour in 1930-31 was around 800 million bushels. This is true whether one measures trade by summations of net exports of exporting countries, or by international shipments as reported by Broomhall. Charts 31 and 33 (p. 110) show comparative figures, on each of these bases, over a period of years. Figures for the past decade are shown on the next page, in millions of bushels.

The adjusted figures for net exports are the better for comparisons; the sum of net exports of Canada and the United States sometimes overstates (as in 1930-31) and sometimes understates the net outflow from North America. The difference between shipments, on the one hand, and on the other, net exports, even as adjusted for

	August July	Net exports		Shipments (Broomhall)
		Reported	Adjusted ^a	
1921-22	701	700	647
1922-23	714	713	676
1923-24	826	825	775 ^b
1924-25	771	770	715
1925-26	695	696	668
1926-27	848	846	818
1927-28	825	815	793
1928-29	943	934	928 ^b
1929-30	628	633	613
1930-31	828 ^c	820 ^c	787

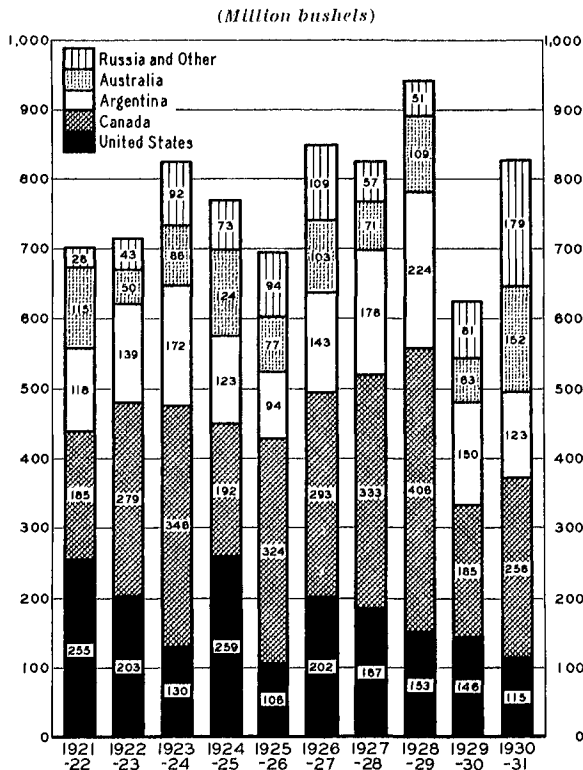
^a Adjusted for changes in stocks of United States grain in Canada and Canadian grain in the United States.

^b Fifty-three weeks.

^c Partly estimated, since net export data are not yet completely available for all countries.

changes in stocks of Canadian and United States grain in the other country, varies from year to year. Broomhall's data are

CHART 33.—SOURCES OF NET EXPORTS OF WHEAT AND FLOUR, 1921-22 TO 1930-31*



* Data from Appendix Table XXI. Countries included in the group with Russia are India, the Danubian exporting countries, Morocco, Algeria, Tunis, Chile, Spain, and Poland for years in which these countries were net exporters.

usually incomplete for North America, Russia, and the Danube basin; and since Russia and the Danube countries together

shipped much more wheat in 1930-31 than in other years, there was in Broomhall's figures more than the usual understatement of the total volume of international trade.

As shown by Charts 31 and 33, the volume of international trade turned out to be fairly large in 1930-31, though it had been more or less exceeded in two or three previous post-war years. The striking increase over 1929-30 reflects mainly the exceptionally small volume in the earlier year.

Broomhall's early forecasts were remarkably accurate for aggregate shipments to Europe, but the expansion of shipments to ex-Europe, under the stimulus of low prices, led him, beginning on February 4, to make substantial increases in his forecasts of these and of the total.¹ Our own early forecast, and that of the International Institute of Agriculture, were closer to the truth as to the total, but we overestimated Europe's takings and underestimated ex-Europe's.² It was heavy shipments to ex-European countries, made possible mainly by very low prices, that caused the total trade to be fairly heavy in the face of continued and intensified restrictions upon imports in several European importing countries.

In the absence of such restrictions, even with world wheat supplies as large as they proved to be, world wheat prices would probably not have fallen quite so far; ex-Europe presumably would have taken less, Europe considerably more; and probably the total trade would have approached more closely the record volume of 1928-29. However, three of the major factors that caused the volume of trade to be exceptionally large in 1928-29 were different in 1930-31. In the first place, expectations that the next crop would be smaller and prices higher were more confidently held in the earlier year. In the second place, the general economic situation in 1928-29, in contrast to that of 1930-31, was such as to favor liberal consumption of wheat and building up of stocks of imported wheat. Third, the rye and feed grain supplies available to European countries were no-

¹ See Appendix Table XVI.

² WHEAT STUDIES, August 1930, VI, 410-11.

tably smaller in 1928-29 and grain price relationships tended to encourage a more extensive substitution of wheat for other cereals in that year. Thus, even if wheat and flour had been as free to flow in 1930-31 as in 1928-29, the expansion of trade would have been held somewhat in check by limitations of purchasing power, and by desires of importers to hold down inventories in the face of assured continuance of liberal wheat supplies.

SOURCES OF EXPORTS

The distribution of net exports, according to sources, as shown in Chart 33, reveals several striking features of the trade in 1930-31.

Most notable was the large volume shipped by the group of countries that had hitherto ranked as minor exporters. Largely because of Russia's heavy contribution, now officially reported as 111 million bushels in July-June (and presumably somewhat larger in August-July), the total for this group was by far the largest of any year since the war. Russia alone exported in 1930-31 more than all of these countries combined had exported in any previous post-war year. As discussed elsewhere, this was the result of big Russian crops, particularly of wheat.

Roumania and Bulgaria also exported post-war record quantities out of big crops. The four Danubian exporting countries, in the aggregate, exported about as much as in 1925-26 and 1926-27, when world prices were far more attractive; but the 1930-31 total did not reach the high level of 1929-30. As in 1928-29, an unusually large proportion of the potential exportable surplus was kept at home, and consumed or carried forward.

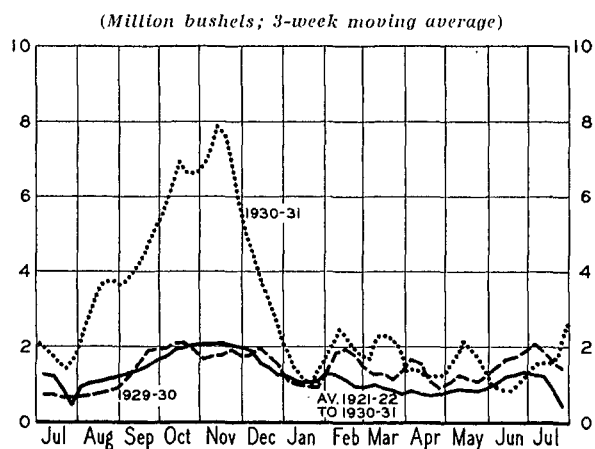
Poland, usually a net importer of wheat, was a net exporter in 1930-31. Her net exports, 4.4 million bushels, appear small in the light of her big crop, the trend of her home requirements, and the export bounty that she maintained.

Net exports of Algeria, Tunis, and Morocco, shipped almost wholly to France, aggregated 18 million bushels. Exports from these countries were undoubtedly stimulated by the special privilege of free

entry into France, where wheat prices were kept high by tariff duties and milling restrictions upon the use of foreign wheats. It is probable that part of the wheat exported from northern Africa in 1930-31 was drawn from stocks of old wheat carried over from 1929-30, when available supplies were larger and exports smaller, and that part was drawn from the strikingly large crops harvested in the spring of 1931.

The great bulk of the shipments by Russia and the minor exporting countries was made, as reflected imperfectly in shipments data shown in Chart 34, in August-December

CHART 34.—SHIPMENTS OF WHEAT AND FLOUR FROM MINOR EXPORTING COUNTRIES, WEEKLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1930-31*



* Data from Broomhall's *Corn Trade Year Books* and *Corn Trade News*. "Minor Exporting Countries" include all countries other than Argentina, Australia, and North America.

ber 1930. Roumania, Hungary, and Algeria all shipped relatively large quantities during these months, but the big Russian movement dominates the picture. As usual in pre-war years, the peak of the Russian movement was reached in mid-November; but the decline in the winter was greater, and the rise in the spring was less, in 1930-31 than was common before the war. The unexpectedly huge outpouring of Russian wheat, much of it shipped on consignment to await buyers in western European ports, was naturally an outstanding factor in determining the course of international trade and world wheat prices in 1930-31.

It is striking that India, after harvesting

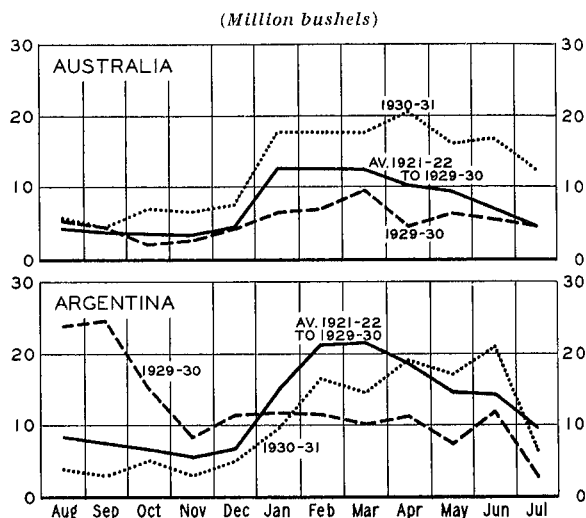
in 1930 a crop of record size, far in excess of her usual domestic use, actually imported in 1930-31 about 5 million bushels net. It is the more surprising because railway rates on wheat were reduced during the winter to stimulate exports and domestic consumption, a high import duty was imposed in March 1931, and another big crop was harvested in the spring of 1931. The extremely low prices prevailing in world markets effectually discouraged exports, and led to such holding in the wheat-growing sections of India that cheap Australian wheat was able to compete in large cities readily reached by import wheats.

Net exports of the four countries that have been major exporters ever since the war were smaller, in the aggregate, than in any other post-war year except 1925-26 and 1929-30 (see Chart 33, p. 110). In spite of abundant supplies, the competition in the export market was so severe that Canada, and the United States in greater degree, let stocks accumulate rather than meet the competition abroad. Consequently North America's contribution to the export trade was not much larger than in 1929-30, and was a smaller fraction of the total than in any previous post-war year.

Argentina's share in the world wheat trade of 1930-31 was moderately small. Moreover, in relation to the supplies available in Argentina during the course of the year, Argentine exports were smaller than in any post-war year except 1925-26, when the quality of the Argentine crop was notably poor. During August-January Argentina was not in a position to export much wheat; her stocks of old-crop wheat were not large, and heavy rains in December and January somewhat delayed the harvesting and the marketing of the new crop. The effect of these and other factors upon the Argentine export movement in 1930-31 is apparent in Chart 35 (lower section). During February-March exports continued below average: in these months Argentine exchange, though low, steadily appreciated, and wheat traders in that country showed little inclination to press their wheat upon the international market as they had done in some earlier periods, notably 1929. Exports in April-June were, contrary to the usual seasonal movement, considerably

higher than in February-March; and for the first time in at least a decade the peak of the Argentine export movement came in June. The spring increase in shipments was in response to the increase in European demand, a depreciation in the Argentine exchange tending somewhat to facilitate exports.

CHART 35.—AUSTRALIAN AND ARGENTINE NET EXPORTS OF WHEAT AND FLOUR, MONTHLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1929-30*



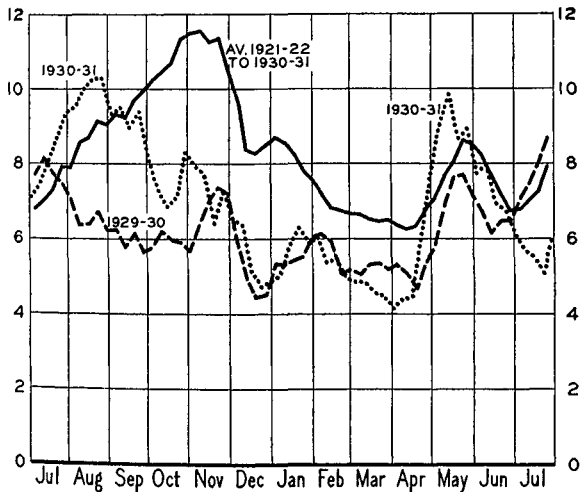
* Data from *Monthly Bulletins* of the International Institute of Agriculture.

Australia's net exports of 152 million bushels were larger than in any previous post-war year. Large stocks remained on August 1, 1930, and in December-January a record crop was harvested. In view of the supplies thus made available the export movement was not surprisingly large; indeed, there are some indications that the stocks on hand at the end of the international crop year were larger than at the beginning. Nevertheless, the great bulk of the Australian surplus was pressed into export, and an unusually large amount, of the lower grades particularly, found a market in China. Australia's flour exports were also larger than usual, but did not constitute a high percentage of the total exports. The export movement from Australia may have been somewhat facilitated by the relatively low value of Australian exchange; but on the basis of historical evidence it seems

reasonable to believe that the Australian surplus would have been pushed into international trade at a rapid rate in 1930-31 even if the exchange had remained stable. Chart 35 (upper section) shows the seasonal course of Australian exports. The export movement was heavier than usual throughout the entire year: in August-December, because stocks of old-crop wheat were abundant; in January-July, because the new crop was of record size, and the ex-European demand for wheat unusually large. The April peak in exports (the first one in at least ten years) and the unusually high level of exports during May-July reflected not, as in the case of Argentina, a notable increase and maintenance of European demand, but mainly an increase and maintenance of ex-European demand.

United States exports are given separate consideration below. Canada's net exports of 258 million, small in absolute amount as compared with most other years of the decade, were also small in proportion to world net exports, and to total supplies

CHART 36.—NORTH AMERICAN SHIPMENTS OF WHEAT AND FLOUR, WEEKLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1930-31*
(Million bushels; 3-week moving average)



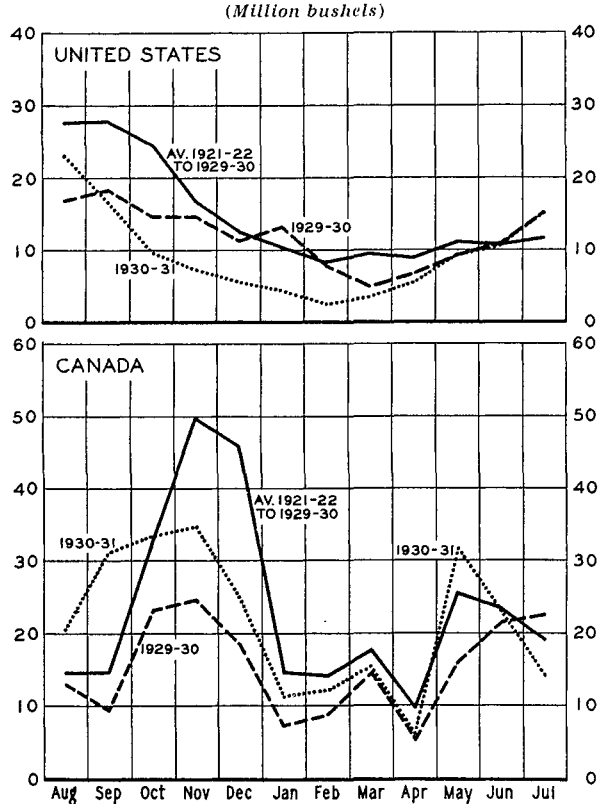
* Data from Broomhall's *Corn Trade Year Books* and *Corn Trade News*.

available in Canada in 1930-31. Although this evidence suggests that large quantities of Canadian wheat were apparently held for higher prices, the holding has been generally ascribed to private individuals rather

than to the Canadian Pool; this is in marked contrast to the situation in 1929-30. Canadian exports of flour, equivalent to some 30 million bushels of wheat in 1930-31, were the smallest within a decade.

Chart 36, showing the course of North American shipments in 1930-31, with com-

CHART 37.—UNITED STATES AND CANADIAN NET EXPORTS OF WHEAT AND FLOUR, MONTHLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1929-30*
(Million bushels)



* Data from *Monthly Summary of Foreign Commerce of the United States* and *Summary of the Trade of Canada*.

parisons, reflects chiefly the heavy movement of old-crop Canadian wheat, and a liberal movement of United States wheat, in July-August 1930. The onset of the Russian movement and the damage to the corn crop in the United States led to notable shifts in price relationships between North American and foreign markets. This led in turn to a sharp decline in United States exports and, after September, to a marked reduction in Canadian exports below their usual course, as broadly shown by net export data in Chart 37. As Russian ship-

ments rose, North American shipments declined. The usual October–November peak, caused mainly by heavy shipments of new-crop Canadian wheat, failed to appear; Canada's net exports were only slightly higher in November than in September and October.

Quite strikingly, the August–December decline in world wheat prices (see Chart 18, p. 85) was broadly paralleled by a decline in North American shipments, and during January–April the export movement was maintained at an unusually low level while prices fluctuated within narrow limits. From November onward, under the influence of stabilization operations, United States exports were very light, though toward the end of the year the net export figures were swelled by shifts of wheat into Canada for storage. Partly supported by relative bullishness of North American speculators, but also by increasingly adverse prospects for the Canadian crop of 1931, Liverpool–Winnipeg price spreads were unusually narrow in January–July; at times Winnipeg futures, representing No. 1 Manitoba, even sold above Liverpool futures. A striking increase in Canadian and North American shipments occurred late in April, extending through May: this was due to the opening of navigation and to the temporary increase in European demand. In July, North American as well as Canadian shipments declined to levels well below average.

UNITED STATES EXPORTS

United States net exports (in August–July, including shipments to possessions) were only 116 million bushels. Since before the war, the total had been smaller only in 1925–26.¹ With adjustment for changes in stocks of United States wheat in Canada, the figure for 1930–31 becomes 97 million bushels, even smaller than a corresponding figure for 1925–26. July–June net exports (again including shipments to possessions) were 115 million bushels as compared with 95 million in 1925–26;² adjusted for changes in stocks of United States wheat in Canada, the figures were 104 and 97 million bushels respectively. In 1925–26, however, the carryover plus a very short crop made total

available supplies exceptionally low. In 1930–31, on the other hand, United States wheat supplies were the largest in history.³ Under conditions favorable for exporting, net exports would certainly have been high.

In fact, exports were greatly restricted, and imports for milling in bond stimulated,⁴ in consequence of the high level of prices in the United States in relation to c.i.f. prices in importing countries. During the period from mid-November till early June prices were maintained on such a level that ordinary commercial exports, except of flour milled in bond from Canadian wheat, were almost impossible. The Chicago market was above Liverpool. Even before stabilization operations were undertaken in large volume, except in July 1930, United States wheat prices were relatively too high to permit liberal exports. This must be attributed not only to some (unannounced) purchases authorized by the Farm Board, but also to holding by farmers and traders, and bullishness among American speculators, particularly after serious drought damage to the corn crop was widely realized in August. In June–July 1931, after stabilization purchases were ended, heavy price declines in the United States did not go far enough, as prices abroad also fell, to permit liberal commercial exports.

Of the gross exports from the United States in the period December–June, a large fraction represented wheat grain exported by the Grain Stabilization Corporation or sold by it to exporters or to export millers at prices that would permit exportation as grain or as flour.⁵ Of the total for this period, 50 million bushels, 10.6 million represented not true exports, but increase

¹ See Appendix Tables XXIV and XXI.

² See Appendix Table XX.

³ See Appendix Table XLI.

⁴ Around the end of the year the decline of prices in Canada went so far as to threaten imports to this country over the duty of 42 cents a bushel. Chairman Legge of the Federal Farm Board suggested that an embargo might be necessary to prevent such importations and to support stabilization operations. Hearings were held in January on the Burtness bill, which provided for such an embargo on several agricultural products. The danger vanished as Canadian prices recovered, and Congress took no action on the bill. See Appendix Table XV.

⁵ See below, p. 157.

in stocks of United States grain in Canada. Probably around an equal amount represented exports of flour milled in bond from Canadian wheat. Ordinary commercial exports in this period must have been very limited, and confined chiefly to out-of-position wheat, low-grade flour, and deliveries on older contracts.

Exports of all classes of wheat grain were unusually low in 1930-31; but exports of durum wheat were relatively lower as compared with other years than were exports of the other classes, particularly hard red winter.¹ The United States crop of durum wheat was moderately small in 1930; but the low exports are probably to be attributed mainly to a restricted import demand for durum wheat.

DISTRIBUTION OF IMPORTS

European wheat imports were moderately low in 1930-31, as compared with most of the recent post-war years; but shipments of wheat to ex-European countries were larger than ever before except in 1928-29 and perhaps in 1923-24.² This is clearly indicated by Chart 31 (p. 108) and the tabulation below, representing shipments as reported by Broomhall, expressed in million bushels:

August-July	To Europe	To ex-Europe
1921-22	547	100
1922-23	586	90
1923-24	626 ^a	149 ^a
1924-25	640	76
1925-26	532	135
1926-27	683	132
1927-28	662	131
1928-29	703 ^a	225 ^a
1929-30	483	130
1930-31	608	179

^a Fifty-three weeks.

The seasonal course of shipments to Europe in 1930-31, with comparisons, is shown in the upper section of Chart 38.

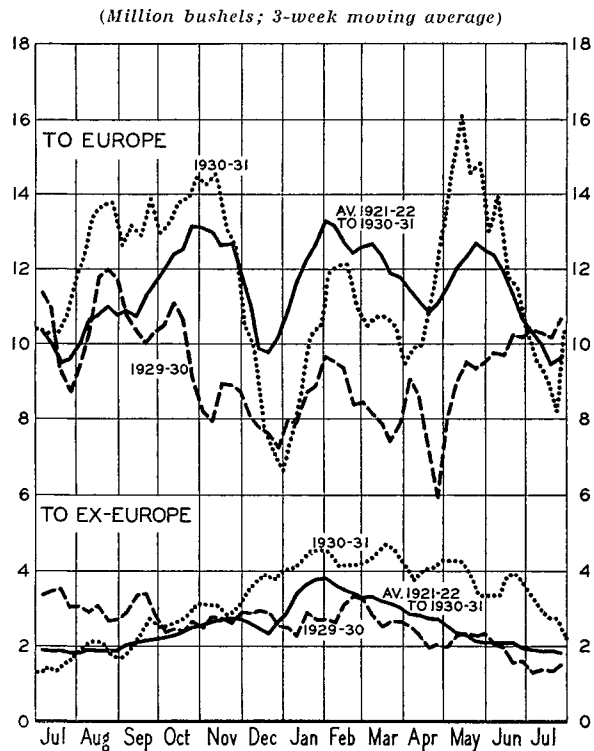
¹ See Appendix Table XVIII.

² Broomhall's figures indicate considerably larger shipments to ex-Europe in 1930-31 than in 1923-24; but net export data (see Appendix Tables XXVII and XXVIII) suggest that his reports of ex-European shipments were probably less complete in the earlier years, and that ex-European takings may have been larger in 1923-24 than in 1930-31.

³ See Chart 57, p. 143.

Shipments were well above average from mid-July to mid-November. In the first few weeks, this presumably reflected liberal European demand (before new-crop domestic wheat was freely available) for cheap wheat offered freely by Canada, the United States, and Australia. In September-November, however, the high level reflected mainly the forcing of export wheats

CHART 38.—SHIPMENTS OF WHEAT AND FLOUR TO EUROPE AND TO EX-EUROPE, WEEKLY, 1929-30 AND 1930-31, AND AVERAGE, 1921-22 TO 1930-31*



* Data from *Corn Trade Year Books* and *Corn Trade News*.

into the European market, notably by Russia. The result was to pile up stocks, some unsold, in European ports.³ Partly for this reason the seasonal decline of shipments in November-December began earlier than usual and was uncommonly precipitous, but other important factors contributed: a marked reduction in Russian shipments, continued declines in North American shipments as lake navigation closed in Canada and stabilization operations checked exports from the United States, and the end

of the crop year in the Southern Hemisphere, all coincided.

The rise early in 1931 was unusually marked, mainly because shipments had declined to such a strikingly low point in December, and because the record Australian crop began to move in large volume in January. Nevertheless, European takings continued below average throughout January-March. The high peak in May reflects a substantial increase in European demand, as stocks of domestic and import wheat became scarce and as milling regulations, and to some extent tariff restrictions, were relaxed. But in July shipments were again below average.

The curve of shipments to ex-Europe, also shown on Chart 38, is likewise striking. From low levels in July, shipments rose somewhat more rapidly than usual as world wheat prices declined in August-November; and in December-January, with the decline of wheat prices to new low levels and with the appearance of the new Australian crop, shipments increased even more markedly. They fluctuated on a fairly high level through the rest of the year, as world prices fluctuated on an extremely low level; and the downward drift was noticeably less marked than is the rule. The curve lends support to the theory that the demand for wheat in ex-European countries, more particularly in the Orient, is responsive to price.

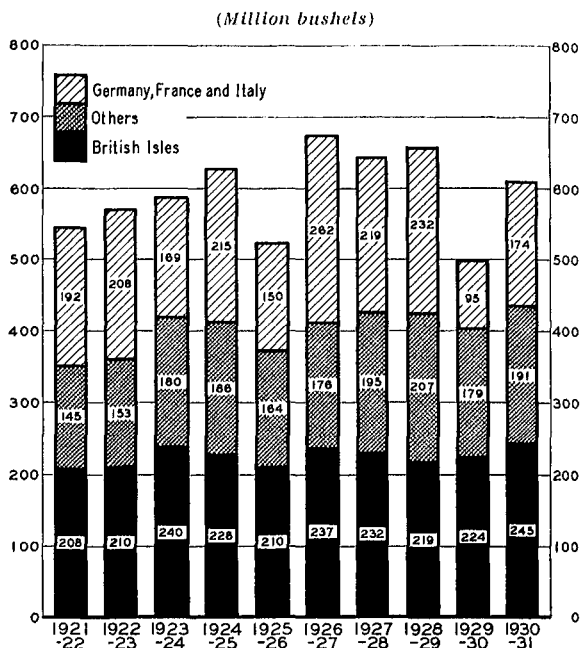
EUROPEAN IMPORTS

Shipments of wheat and flour to Europe, as indicated by Broomhall's figures cited above (p. 115, and Chart 31, p. 108), were a little over 600 million bushels, considerably smaller than four of the preceding six years, but considerably larger than in the other years of the past decade, including 1929-30. Net import data, summarized by groups of countries in Chart 39, broadly tell the same story. Further details are presented in Table 2.

Net imports of the British Isles were above average; indeed, larger than in any other year since the war. Since the wheat crop of the British Isles was the smallest in a decade, it may not appear surprising that British imports were larger than usual;

however, a study of past years suggests that British imports do not consistently vary with variations in domestic crops. The sum of crop and net imports in 1930-31 had been roughly equaled or exceeded in three of the preceding ten years.¹ As in those

CHART 39.—EUROPEAN NET IMPORTS OF WHEAT AND FLOUR, 1921-22 TO 1930-31*



* Data from Appendix Table XXIV. Net imports of Portugal excluded.

years, there may have been some increase in consumption and some increase in stocks, but not much, either absolutely or relatively.

Germany, France, and Italy, which constitute a group of countries whose imports average large but vary greatly from year to year, had net imports much larger than in 1929-30 but much smaller than in any of the three years preceding. It is worthy of note that whereas the aggregate wheat crop of Germany, France, and Italy was 17 million bushels smaller in 1930 than the average of the three years 1926 to 1928, net imports of these countries in 1930-31 totaled 64 million bushels less than the average in 1926-27 to 1928-29. Low imports by these three countries—particularly Ger-

¹ See Appendix Table XXXVI.

many and France—appear the chief explanation for the failure of Europe's net imports and total international imports to reach higher levels in 1930-31. Large carry-overs of old-crop wheat (notably in France), unfavorable economic conditions, high tariffs, milling regulations, and other governmental measures were primarily responsible.

TABLE 2.—EUROPEAN NET IMPORTS ANNUALLY
FROM AUGUST-JULY 1926-27*
(Million bushels)

Country	1926-27	1927-28	1928-29	1929-30	1930-31
British Isles	237.2	232.2	219.3	223.8	245.4
Italy	86.6	87.7	87.4	42.0	81.2
France	83.6	42.5	66.6	5.5	62.1
Germany	91.8	88.5	77.6	47.5	31.2
Belgium	39.5	41.8	41.9	42.4	46.7
Netherlands	28.5	31.0	30.0	30.6	35.4
Denmark	7.2	11.0	16.7	8.0	11.8
Norway	6.2	6.8	9.2	7.0	8.5
Switzerland	16.3	18.4	16.6	16.0	18.5
Greece	19.4	19.5	22.2	21.7	24.1
Poland	8.1	8.6	2.5	(.2)	(4.4)
Spain	(1.0)	2.9	17.2	3.4	(.2)
Austria	16.9	16.5	14.6	19.6	16.1
Sweden	6.0	8.4	8.0	7.3	4.9
Czecho-Slovakia	20.1	21.4	17.4	13.7	17.6
Finland	5.1	6.0	6.9	5.9	5.1
Latvia	1.7	1.5	3.0	2.5	1.5
Estonia . . . . .	.9	1.1	1.2	1.2	.8
Total ^a	675.1	645.8	658.3	498.1	610.9

* Data summarized from Appendix Table XXIV, p. 184. Parentheses indicate net exports.

^a Net imports into net importing countries.

The rest of importing Europe had net imports larger in 1930-31 than in any post-war year except 1927-28 and 1928-29. The factors at work varied greatly from country to country, and detailed consideration of each seems hardly feasible or indeed warranted at this point. A few comments, however, may be significant.

Six small countries of Continental Europe had liberal or large net imports and total supplies in 1930-31. These are Belgium, the Netherlands, Denmark, Norway, Switzerland, and Greece. The first five of these admit wheat duty-free, or practically so, and the Greek duty is not large. Each

of them except Denmark imports net considerably more wheat than it produces. Net imports of the six countries averaged about 120 million bushels a year in 1925-30, while their aggregate wheat crops averaged about 50 million.¹ Norway and Switzerland control imports, and Norway controls flour production, in order to maintain favorable prices to domestic wheat growers; Belgium and the Netherlands have just recently adopted milling regulations with the same object.² Greece imposed a quota law, requiring 10 per cent native wheat, in December; but this was suspended in April. With these exceptions, milling has been free from control. In Belgium, Holland, and Denmark, at least, flour and bread are cheap and good. Wheat consumption has been tending upward in all of the countries, most notably in Norway, Denmark, the Netherlands, and Greece; and net imports have risen too.

Under these circumstances, liberal or large net imports and total supplies in 1930-31 are not surprising. Belgium's net imports may overstate the fact, for it is reported that bread has been "bootlegged" over the border into France. Feed use of cheap wheat was perhaps liberal in Denmark, and in the Netherlands. Several of these countries, notably Greece, probably carried over larger stocks than usual.

Poland and Spain, usually small net importers of wheat, each had a net export balance in 1930-31. Large crops, following large crops, were primarily responsible for this, for domestic consumption was probably maintained or increased. Net imports of the other minor importing countries—Czecho-Slovakia, Austria, Sweden, and the small Baltic states—were of moderate size in 1930-31 as compared with other recent post-war years. Since these countries all harvested large wheat crops in 1930, their total available supplies were therefore larger than in most earlier years. Yet, in view of the upward trend of wheat use in these countries, and in spite of tariffs, milling regulations, and the like in several, neither total supplies nor net imports appear sufficiently unusual to call for special comment.

¹ See Appendix Tables XXIV, I.

² See Appendix A.

In Italy in some degree, in France to a greater extent, and most notably in Germany, governmental policies were important in restricting the volume of supplies and net imports, and in influencing the course of imports.

Despite notably low international wheat prices, and the smallest French crop in a decade, French imports were only moderately large in 1930-31 as compared with other post-war years. Under the prevailing conditions of supply and price France would undoubtedly have imported more wheat in 1930-31 if stocks of old-crop wheat had been small, rather than large, on August 1, 1930; if the import duty on wheat had been low, rather than high; and if milling restrictions had been less severe. In 1929 France harvested a record wheat crop; and though imports were small, the carry-over at the end of the season was presumably the largest in a decade. During the course of 1930-31 stocks were steadily reduced under governmental pressure in the form of a quota law. From August to mid-April French millers were required to grind at least 90 per cent domestic wheat; as domestic wheat (including wheat from the French dependencies of northern Africa) became increasingly scarce during April-June, the legal quota was gradually reduced to 85, 80, 75, and finally 70 per cent. These regulations, reinforced by a wheat tariff of approximately 85 cents per bushel, undoubtedly restricted the importation of wheat, and total domestic utilization (crop plus net imports) was lower in 1930-31 than in any other post-war year. The low domestic utilization, however, presumably reflected mainly a marked reduction in year-end stocks rather than a striking decline in wheat consumption.¹

German imports were notably small in 1930-31, the smallest in post-war years with the exception of 1923-24. Moderately low imports were to be expected, if for no other reason than that Germany produced a large wheat crop in 1930; but actual net imports appear surprisingly small even if the size of the crop be taken into account. In 1928

a larger and an appreciably better wheat crop was harvested, yet net imports in 1928-29 were 46 million bushels higher than in 1930-31. The smaller imports in the latter year are to be attributed mainly to governmental restrictions on milling, consumption, and trade, and to unfavorable economic conditions. With wheat prices maintained at a high level in Germany (in the face of low international prices) by means of a high tariff, and of a strict quota law requiring the use of 50 to 80 per cent domestic wheat, and with business greatly depressed and unemployment widespread, there was considerable incentive for many German families to substitute lower-priced foods, especially rye bread and potatoes, for bread and pastries made wholly of wheat.² Moreover, substitution of rye and potatoes for wheat was encouraged by direct legislation affecting the baking and sale of wheat and rye breads.³ As a result, consumption of wheat was presumably lower in 1930-31 than in any of the preceding four or perhaps five years.

Italian net imports may be described as moderately low in 1930-31; they had been lower in only three other post-war years. To a large extent the small imports of the past year are attributable to fairly abundant supplies of domestic wheat. The wheat crop of 1930 was moderately large and the inward carryover probably ranked as one of the largest of post-war years. Yet with net imports as low as reported, total wheat supplies were probably not large enough to allow per capita consumption to be maintained at as high a level as in the preceding few years. Since there is some basis for supposing that per capita consumption has been tending slightly downward since 1927-28,⁴ the decline in 1930-31 may represent merely a continuation of this general tendency. Italy did not enforce a quota law until July 1931; but imports were probably restricted throughout the season by a tariff of 87 cents per bushel on wheat, and a relatively higher tariff on wheat flour.

Chart 40 shows the seasonal course of net imports into each of the four principal European importing countries in 1930-31 as compared with 1929-30 and with the average for the preceding seven years. In the

¹ See p. 130.

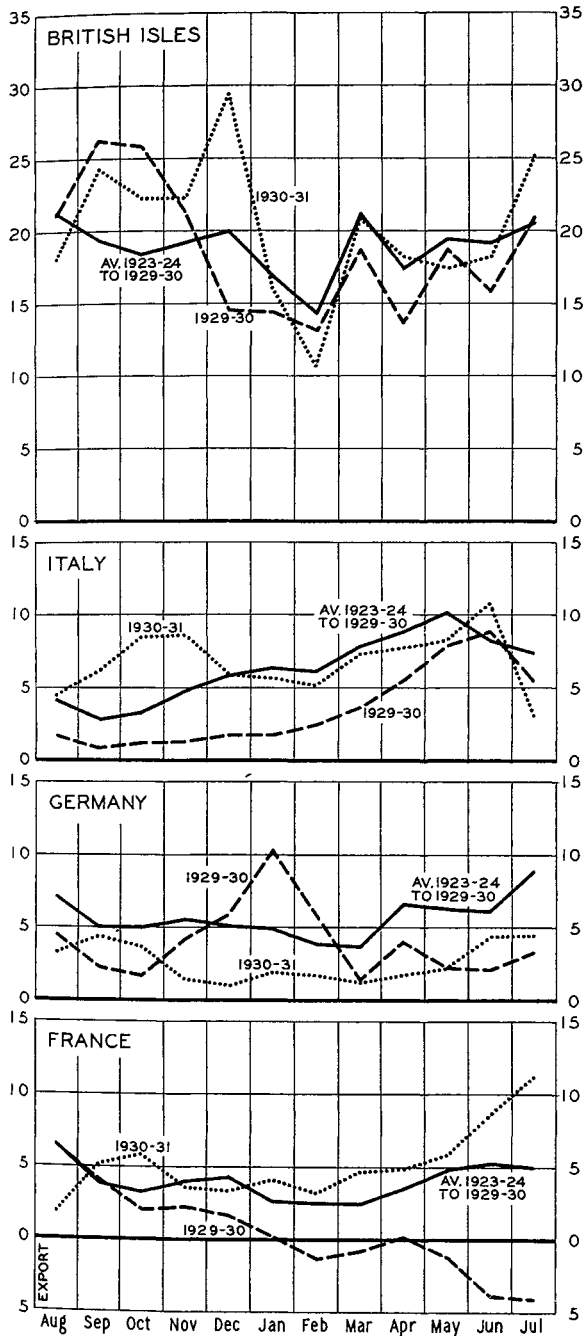
² See p. 132.

³ See Appendix A, p. 169.

⁴ See p. 131.

CHART 40.—NET IMPORTS OF WHEAT AND FLOUR INTO PRINCIPAL EUROPEAN IMPORTING COUNTRIES, MONTHLY, 1929-30 AND 1930-31, AND AVERAGE, 1923-24 TO 1929-30*

(Million bushels)



* Data of net imports into the United Kingdom from *Accounts Relating to Trade and Navigation of the United Kingdom*; data for the Irish Free State, Italy, and Germany from *Monthly Bulletins* of the International Institute of Agriculture; data for France ("commerce général") from *Statistique mensuelle du commerce extérieur de la France*.

fall and winter of 1930 British and Italian markets absorbed the major part of the Russian surplus: imports into the British Isles were notably high in September-December; imports into Italy notably high in September-November. French and German imports were less affected. France imposed, in October, a license system designed to restrict Russian imports; and in the same month Germany raised her tariff on wheat to an almost prohibitive figure (\$1.62 per bushel). From January to May French and Italian imports followed a fairly normal course; but British imports were strikingly low in January-February while the large stocks built up in the preceding months were being reduced, and German imports did not show their usual seasonal increase in April-May despite a considerable relaxation in the German quota law at the beginning of April. In June a marked increase in imports occurred in all of the countries except the British Isles; this presumably reflected a depletion of wheat stocks and some relaxation in milling and tariff regulations.¹ In July French and British imports rose to strikingly high levels, while German imports remained below average, and Italian imports declined from an unusually high figure in June to a notably low figure (the lowest in at least eight years) in July. French imports were large partly because of relaxed milling regulations, partly because of large shipments of wheat from northern Africa. In the British Isles the large July takings reflected on the one hand an inclination of importers to take advantage of the prevailing low prices to build up stocks, and on the other hand a diversion to English markets of some of the large "orders" shipments made by exporting countries in May-June. The decline in Italian imports between June and July 1931 was larger than in any of the preceding seven years; this presumably was the result of the stringent quota law which became effective July 2.

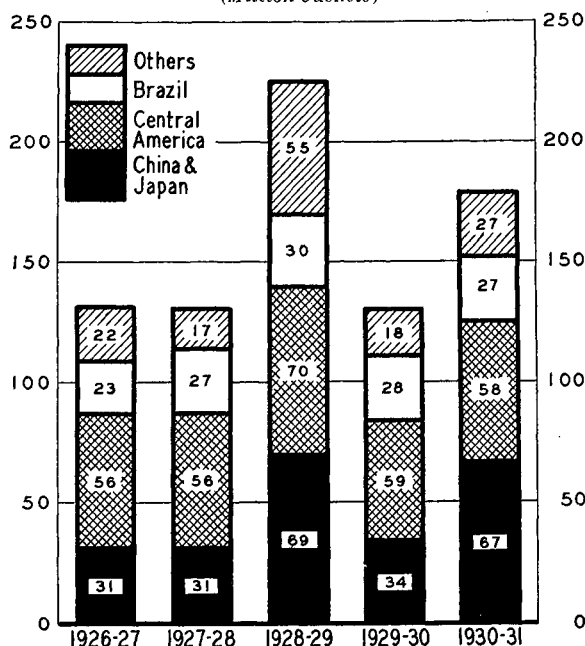
SHIPMENTS TO EX-EUROPEAN COUNTRIES

Comparative statistics of shipments to countries outside of Europe, available for

¹ See Appendix A, pp. 171-73.

the past five years, are shown by broad subdivisions in Chart 41. It will be noted that in totals and sub-totals, three of the five years were broadly similar in this respect, while 1930-31 stands midway between these years of smaller trade volume, and

CHART 41.—DISTRIBUTION OF SHIPMENTS OF WHEAT AND FLOUR TO EX-EUROPE, 1926-27 TO 1930-31*
(Million bushels)



* Data from Appendix Table XXIII. "Other countries" include Egypt, North and South Africa, Chile, India, Syria, Peru, Palestine, and New Zealand.

1928-29, the year of maximum trade. The most striking difference between 1928-29 and 1930-31 lies in shipments to the group labeled "Others," which includes occasional net importers such as India. The difference is due chiefly to the fact that shipments to India were about 17 million bushels smaller in 1930-31, and shipments to Egypt about 7 million smaller. Shipments to Brazil and to a group of countries here labeled "Central America" (though including also Venezuela, the West Indies, and the Dutch East Indies), were about as usual in 1930-31, and about 15 million bushels less than in 1928-29. Shipments to China and Japan, by contrast, were about as large in 1930-31 as in 1928-29, and much larger than in the other three years. Japan's net imports, of 18 mil-

lion bushels, were about like those of 1928-29, but they had been considerably larger in three of the five years preceding 1926-27.¹ China's net imports (chiefly wheat and flour from North America and Australia, and flour from Japan) amounted to some 54 million bushels²—presumably larger than in 1928-29, and certainly larger than in any other recent year except 1923-24. It was China's large takings that were chiefly responsible, in 1930-31, for the high world shipments to ex-Europe.

China's large imports are not to be explained on grounds of small crops of wheat in China. While comparable crop statistics are not available, there is strong reason to believe that China's wheat crop in 1930 was a fairly large one, certainly larger than in 1929. Rice and other food crops, too, appear to have been relatively abundant. Domestic wheat prices, in terms of gold, were low in China, not high, in 1930-31. Nor can the movement be explained by reference to silver prices. In the early part of the crop year, Chinese exchange (on a silver basis) was relatively firm; but late in 1930 it began to decline and fell (with silver) to new low levels early in 1931; after a slight recovery it remained low for the rest of the season.³ Yet shipments to the Orient, as broadly reflected in total shipments to ex-Europe (see Chart 38, p. 115), rose as silver fell, and remained on fairly high levels while the exchange fluctuated on a low level.

The primary reason for China's heavy imports was the extreme cheapness of import wheats, and especially of the poorer qualities of Australian wheats, that prevailed especially in December-June 1930-31. Because of this fact, in spite of contrary factors, import wheats (notably from Australia) were freely ground in Chinese mills,

¹ See Appendix Table XXIV.

² Net import data are not available for China on a crop year basis. The statement given is based largely on export statistics given in Appendix Table XXVII.

³ During 1930-31 monthly average exchange rates in New York on Shanghai were as follows in American cents per tael:

August	38.5	February	29.0
September	39.7	March	31.6
October	39.1	April	31.1
November	38.8	May	30.3
December	35.7	June	29.6
January	31.8	July	31.0

and imported flours competed effectively with flour produced from Chinese wheat. Somewhat the same situation obtained in 1923-24, when large quantities of low-grade wheat were exported to China from the United States, and in 1928-29, when Canada

supplied low-grade wheat and flour at very low prices. The inference is clear that China can and will serve to relieve a wheat surplus situation in a material degree, but only at prices hitherto regarded as unsatisfactory to exporting countries.

IV. WHEAT CONSUMPTION IN 1930-31

World wheat consumption almost certainly attained a record high level in 1930-31. Reliable evidence so indicates for the world exclusive of Russia and China. Including Russia, consumption for food, feed, and seed was presumably even more strikingly high by comparison with earlier years. Such limited information as is available for China's crop and imports suggests that consumption there was also large, though no one can say how it compared with other years of large consumption. Yet consumption in the importing countries of Europe was probably no higher than in 1928-29, if as high.

In comparison with 1929-30, aggregate consumption in 1930-31 presumably expanded most notably in the United States, Canada, India, and Russia. In the United States and Canada, it was the feed use of wheat that was strikingly large; in India and Russia, presumably the use of wheat for food. Expansion of consumption in these four countries and in some others where it was less striking must substantially have exceeded reductions that occurred in Germany and to a lesser degree in France. In Europe ex-Russia as a whole, it is altogether probable that consumption of wheat has increased but little since 1928-29. The incentives to use wheat for feed were stronger in 1928-29 than in 1929-30 or 1930-31, and in both 1928-29 and 1929-30 governmental measures tending to restrict consumption were much less in evidence than they were in 1930-31.

The record world wheat crop (excluding China) of 1930 was probably used to a greater degree for consumption than the big crop of 1928, from which such burdensome stocks were accumulated. In part this result sprang from the geographical distribution of world production, much more wheat being produced in 1930 in India and Russia, where consumption is presumably

rather elastic. In part it was traceable to the accident of a short corn crop in the United States in 1930, which provided a major incentive for heavier feeding of wheat to animals in this country. In part it was due to very low wheat prices, both absolutely and relatively. Trade statistics indicate that consumption of imported wheat must have been heavy in ex-European wheat importing countries in the aggregate, and most strikingly so in China. Growth of population also played a part, but not a major one. Despite heavy consumption in 1930-31, however, stocks in the aggregate were built up to record levels in the course of the year, though the increase was by no means so large as in 1928-29. Stocks had been somewhat reduced in 1929-30, a year of shorter crops and smaller consumption.

The whole subject of wheat consumption is greatly in need of clarification. In retrospect there is no doubt that erroneous assumptions as to consumption in 1928-29 contributed heavily to misjudgments that were in part responsible for declines in wheat prices during the past two years. Efforts to work out solutions of the world wheat problem call for better understanding of consumption facts and factors. For these reasons, though the path of the investigation is beset with many obstacles in this field, we have undertaken to set forth, at some length and with some perspective, a tentative appraisal of the regional consumption of wheat in 1930-31. We do not possess what is needed, a consumption index for wheat.

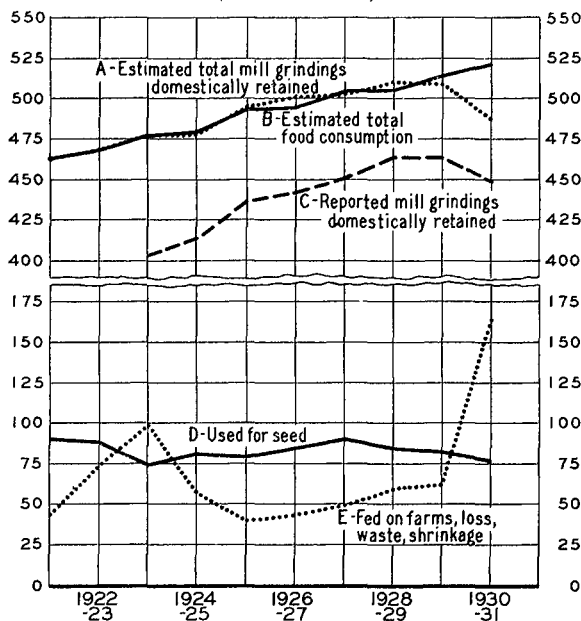
UNITED STATES

Domestic disappearance of wheat in the United States was exceptionally large in 1930-31, undoubtedly reaching a record level. A remarkable increase in the amount

of wheat fed to livestock, on farms of wheat growers and elsewhere, more than offset reductions in seed use and in mill grindings retained for domestic use. Flour consumption may not have been reduced much, if indeed at all, but part of what was consumed was obtained by drafts on flour stocks, and there was a notable expansion in the use of self-rising and low-grade flours.

Really satisfactory comparative statistics on domestic disposition of wheat for food, and more especially for feed, as well as for the minor items of waste and industrial use, are not available. The curves in Chart 42,

CHART 42.—UNITED STATES WHEAT CONSUMPTION IN ITS PRINCIPAL CATEGORIES, FROM JULY-JUNE 1921-22*
(Million bushels)



* Data plotted in curves A, D, and E as described in Appendix Table XII. Figures of curve B represent our estimates of total consumption of wheat for food, computed from population estimates, with per capita consumption constant at .9 of a barrel of flour, and adjusted official ratios of extraction. Figures of curve C are total mill grindings as reported in the monthly reports of the Bureau of the Census, minus net exports and shipments to possessions of flour, converted to wheat at 4.7 bushels per barrel.

however, provide some background for discussion of the principal categories of domestic disappearance.

Seed requirements for the crop of 1931 were rather small, some 77.2 million bushels according to a preliminary official esti-

mate. Variations in seed use (curve D) are usually of comparatively small magnitude. They depend chiefly, of course, upon changes in acreage sown. The area sown for the crop of 1931, and the seed use in 1930-31, were slightly the smallest since the war except in 1923-24. This was chiefly the result of a favorable autumn and winter, which made unnecessary the reseeding of much winter-killed wheat, and a material reduction of wheat acreage in the spring-wheat belt.

The three curves in the upper part of Chart 42 bear upon the problem of measuring the quantities of wheat consumed annually for food. Curve C shows, by crop years from 1923-24, the total quantity of wheat milled, as reported with varying degrees of completeness from month to month in the monthly reports of the Bureau of the Census, minus the quantity of flour (expressed in terms of wheat) exported net and shipped to possessions from the United States. Curve A represents our best (but tentative) estimates of total mill grindings minus net exports and shipments of flour expressed as wheat; this series may be called total mill grindings domestically retained. The extent to which the figures plotted in curve A exceed the corresponding figures plotted in curve C in general represents the extent to which the monthly census reports of mill grindings appear incomplete.

Both the reported and the estimated mill grindings domestically retained were substantially smaller in 1930-31 than in 1929-30; the estimated mill grindings retained domestically, indeed, were smaller than in any of the five preceding crop years. This was not the result of exceptionally heavy net exports and shipments of flour; these were, in fact, unusually small. It was rather the result of relatively small mill grindings of wheat, to make flour both for domestic use and for export. The tabulation opposite, in million bushels, illustrates these relationships as between the two crop years 1929-30 and 1930-31.

The net reduction in flour retained—which we have estimated at 22 million bushels—is not large in relation to the total; but it is an unusually large reduction, especially in view of the fact that do-

mestic consumption of flour appears to show an upward trend at the rate of around 7 million bushels of wheat a year.

	Wheat ground for flour	Flour exports ^a (as wheat)	Flour retained (as wheat)
<i>Estimated</i>			
1929-30	573	64	509
1930-31	545	58	487
Change	-28	-6	-22
<i>Reported</i>			
1929-30	527	64	463
1930-31	507	58	449
Change	-20	-6	-14

^a Net exports plus shipments to Alaska, Hawaii, Porto Rico.

The reduction in the estimated quantity of flour milled and retained for domestic use may be accounted for, wholly or in part, on two grounds. In the first place, stocks of flour were substantially reduced in the course of 1930-31. If we combine data on flour stocks in certain cities published monthly in the *Daily Trade Bulletin* (Chicago) with the census reports on flour stocks held by city mills, it appears that between July 1, 1930, and July 1, 1931, flour stocks in these positions alone may have declined, in wheat equivalent, nearly 18 million bushels.¹ There may well have been reduction in the stocks of flour held by bakers, and perhaps by retailers and consumers, as seems to have been the case in 1929-30.²

In the second place, the milling journals report relatively heavy grindings of long patent and straight flours, and relatively small grindings of short patent flour; this meant smaller mill grindings to obtain a given quantity of flour. There was also heavy production of self-rising flours,

which are on the whole of relatively long extraction.

In addition, there is reason to suppose that rather more wheat was ground into flour at custom mills in 1930-31 than in other recent years, if only because many farmers probably could in this way obtain offals for feed use at a reduction of cash outlay much to be desired in a year of such low wheat prices.³ Our estimates of wheat grindings domestically retained, as shown in curve C of Chart 42, are made on the assumption that the grindings in custom mills remained constant, and are not adjusted for changes in flour stocks.

Thus it seems probable that the quantity of flour (as wheat) actually consumed in the United States in 1930-31 must have been substantially in excess of the estimated quantity of flour (as wheat) milled and domestically retained. Estimated domestic retention would be larger if account could be taken of the grindings of custom mills; consumption was satisfied somewhat by drafts upon flour stocks. In short, it seems reasonable, though satisfactory measurement cannot be made of the change in flour stocks or of the output of custom mills, to suppose that per capita consumption of flour was maintained on the level of about .9 of a barrel as in earlier years. If so, aggregate consumption of wheat flour in terms of wheat in 1930-31 may have been the largest in post-war years on account of growth of population (see curve B on Chart 42). There is no reliable basis for inferring that economic depression and widespread unemployment in 1930-31 led to appreciable change in per capita flour consumption.

Even in the absence of satisfactory statistical measurement, there is no doubt that feed use of wheat was extraordinarily heavy. Official estimates are now available of the quantities of wheat fed on farms, and the quantities involved in farm loss, wastage, and shrinkage (see curve E, Chart 42). According to these estimates, the combined total was some 164 million bushels in 1930-31, much the largest figure in a decade. Although to include these estimates on an equal footing with estimates of other items of domestic wheat disappearance in a disposition table is to throw some

¹ The combined figures, with city mill flour stocks raised roughly to 100 per cent to account for mills not reporting, and with all flour stocks converted to wheat equivalent at 4.7 bushels of wheat per barrel of flour, are as follows, as of July 1 for the last seven years, in million bushels:

1925	26.5	1929	32.8
1926	26.5	1930	38.6
1927	27.7	1931	20.7
1928	27.9		

² See WHEAT STUDIES, December 1930, VII, 107-8.

³ Millfeed prices were relatively high, at some country points higher than local wheat prices, pound for pound.

doubt upon the accuracy of official wheat crop estimates in post-war years,¹ the main fact that an extraordinarily large quantity of wheat was used for feed in the United States in 1930-31 is hardly to be doubted. The corn crop of 1930 was a conspicuously short one; wheat was cheap in relation to corn, in several wheat-producing areas actually cheaper than corn for several months; farmers were advised by various agencies to feed wheat in place of corn, and methods of feeding were explained; the extremely low price of wheat itself may well have induced many farmers to reduce cash outlays for commercial feeds by substituting wheat ground or cracked at home. Whether or not the figure of 164 million bushels closely measures the extent of wheat feeding, loss, wastage, and shrinkage in 1930-31, its relationship to estimates of

utilization for identical purposes in earlier years seems reasonable in view of the circumstances. One may reasonably conclude that something like two to four times the usual amount of wheat was used up in these ways in 1930-31. One may suppose that wheat was fed heavily elsewhere than on farms where grown, though there are no estimates covering this item of disposition.²

Because of the extremely heavy feed use of wheat in 1930-31, total domestic disappearance was probably larger than ever before. The aggregate probably exceeded 750 million bushels.³ Actual consumption of wheat, including that drawn from flour stocks, was probably 25 to 30 million bushels more. The total was probably 100 million bushels larger than in 1929-30, or in the earlier year 1923-24, when feed use was unusually large but human consumption requirements smaller.

Heavy feed use and prospects for its continuance were a major factor in retarding declines in United States wheat prices in September-October 1930. They were among the factors that influenced the Farm Board's decision to authorize stabilization operations in November 1930.⁴ The extraordinary feed use of wheat certainly facilitated the maintenance of stabilized prices and the operations of the Grain Stabilization Corporation. Yet it proved insufficient to prevent an increase in the carryover, or to offset other factors making for declines in world wheat prices, or to permit an easy transition from stabilized prices at the end of the crop year. How far price stabilization itself may have kept wheat feeding down is matter for conjecture; such influence as it had was presumably in this direction, but the open winter was probably also an important factor in keeping feed use somewhat below the expectations that some entertained in the fall of 1930.

CANADA

Domestic disappearance of wheat in Canada was moderately above average in 1930-31. Heavy feed use of merchantable wheat more than offset considerable reductions in unmerchantable wheat and dockage, and smaller (actual) reductions in seed use. Available statistical evidence, by

¹ See Appendix Table XLI. There it appears that the sum of net exports, seed requirements, mill grindings domestically retained, utilization on farms for feed and waste, and outward carryovers of wheat exceeds the available supplies (estimated crops plus inward carryovers) in 6 of the past 10 years, yielding an average excess of about 6 million bushels per year. There would also have been some wheat used as feed elsewhere than on farms where grown. Unless over the decade stocks have been built up to a degree altogether inconceivable and at variance with the official estimates of stocks, it follows either that the crops have on the average (but not in every year) been officially underestimated, or that other items of disposition, in the aggregate, were overstated. Substantial inaccuracy of estimation on the whole seems more likely to be present in the estimates of crops, mill grindings domestically retained, or quantities fed and wasted, than in the estimates of net exports, seed requirements, or stocks; and in estimates of crops and quantities fed and wasted than in the estimates of mill grindings domestically retained.

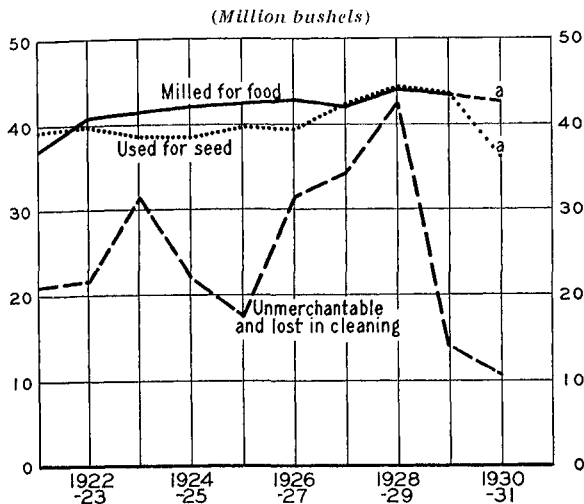
² As of November 15, 1930, the U.S. Department of Agriculture estimated, on the basis of reports from farmers, feed manufacturers, and commercial poultrymen, that 236 million bushels of wheat would be fed to livestock in 1930-31. Of this, wheat growers stated intentions of feeding 182.4 million bushels; other farmers, manufacturers, and poultrymen, 53.6 million. We have not seen a later estimate of the quantity actually fed by this second group. It will be observed that the quantity of 164 million bushels later estimated as fed on farms (also farm loss, waste, and shrinkage) is below the preliminary estimate.

³ Including an allowance for wheat fed elsewhere than on farms where grown. The sum of net mill grindings, seed requirements, and disappearance on farms as feed, loss, waste, and shrinkage was 728 million bushels in 1930-31. Corresponding figures for 1923-24 and 1929-30 were 649 and 653 million bushels. See Appendix Table XLI.

⁴ See Mr. C. C. Teague's address of December 8, 1930, before the American Farm Bureau Federation, Boston, Massachusetts.

no means satisfactory for comparisons, is summarized in Chart 43.

CHART 43.—CANADIAN WHEAT MILLED FOR DOMESTIC FOOD USE, USED FOR SEED, AND UNMERCHANTABLE AND LOST IN CLEANING, FROM AUGUST—JULY 1921-22*



* Official data; see Appendix Table XLII.

^a Data for 1930-31 preliminary.

The official estimates of wheat milled for food are based upon calendar year census reports of milling that are complete, and upon less complete monthly reports. These suggest that aggregate consumption of wheat for food in Canada has tended slightly upward, a little irregularly, in the past decade, per capita consumption remaining fairly constant around 4.5 bushels.¹ The official estimate for 1930-31 suggests a slight decline of consumption as compared with 1929-30; but since the estimate is preliminary and may be revised upward, it is not safe to infer that a decline actually occurred. Statistics of flour produced minus flour exported show a slight increase in 1930-31 as compared with 1929-30; and there was only a small increase (from 851 to 911 thousand barrels) in such flour stocks as are reported, those held by

mills that report monthly. The total quantities of wheat ground and of flour produced in Canada, according to the monthly reports, were a trifle larger in 1930-31 than in 1929-30, but were much smaller in both of these years than in the preceding seven. Grindings in custom mills, which are not fully accounted for in the monthly reports, were probably relatively large in 1930-31 for much the same reasons as in the United States.² If so, 1930-31 would compare a little more favorably with 1929-30 in respect to both total mill grindings and flour retained domestically in Canada.

The actual reduction in seed use in 1930-31, as compared with 1929-30, was probably not over 1 or 2 million bushels. The standing official estimate of the quantity of seed used for sowing the 1931 crop is only 36.5 million bushels, as compared with over 44 million in the two preceding years. The 1931 estimate, however, is preliminary, and may be revised upward. If one applies the factor for seed use per acre employed in earlier years (1.75 bushels) to the latest estimate of wheat acreage sown for the crop of 1931, the resulting figure is 43.6 million bushels. Application of this factor to the decennial enumeration of acreage sown (preliminary data) in 1931 brings the figure for seed use in 1930-31 to 45.7 million bushels.³ The present estimate may be near the truth, but if so, the earlier figures call for revision downward.

As is suggested by the lower line on Chart 43, the quantity of wheat of unmerchantable quality and the quantity lost in cleaning (dockage) were both strikingly small in 1930-31; this was presumably because of the generally favorable harvest conditions and the relatively good quality of the crop.⁴ These estimates also are preliminary.

For the first time, an official inquiry was directed in 1930-31 toward ascertaining the quantity of wheat fed to livestock and poultry on farms in the course of the year. This yielded the very high figure of 40.7 million bushels.

It is reasonable to suppose that more wheat than usual was fed on Canadian farms in 1930-31, for price relations of wheat (especially the lower grades) and feedstuffs at the farms permitted farmers

¹ See *Monthly Bulletin of Agricultural Statistics*, April 1931, p. 5.

² See above, p. 123.

³ The preliminary decennial census enumeration of the wheat area sown in 1931 is 26,115,726 acres, as against the Dominion Bureau's August estimate of 24,897,900.

⁴ See above, p. 75.

to save by feeding wheat instead of selling it and buying feedstuffs, much as in the United States. Presumably the small volume of unmerchantable wheat favored increased feed use of merchantable wheat. In the absence of comparable data on feed use in previous years, however, there is danger of exaggerating the increase in feed use of wheat in 1930-31. The official comment upon the estimate of wheat fed on farms was that "this factor in disposition has been greatly underestimated in the past." If so, several Canadian wheat crops since the war must have been underestimated to an extent not suggested by disposition data hitherto available.¹ The appearance of the decennial census enumeration of acreage sown for the crop of 1931 suggests in turn that such underestimation of wheat crops as has occurred must have been due largely to underestimation of wheat acreage.²

In short, important revisions in estimates for 1930-31 and several previous years seem necessary before a reliable appraisal of domestic utilization of wheat in Canada can be made. Data now available presumably suggest too great a reduction in seed use, and too great an increase in feed use, in 1930-31.

ARGENTINA AND AUSTRALIA

Domestic utilization of wheat in Argentina and Australia in 1930-31, for food, seed, and feed, may be provisionally estimated at about the same as in the preceding three or four years. Smaller use for seed was probably roughly offset by in-

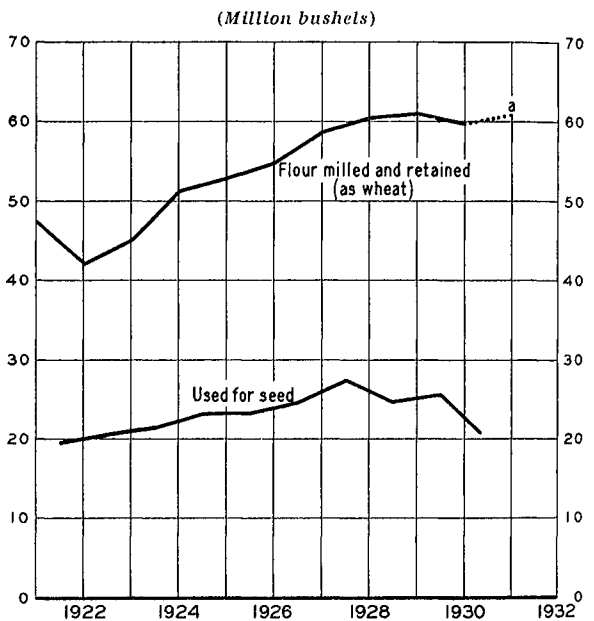
¹ See Appendix Table XLII.

² In the *Monthly Bulletin of Agricultural Statistics*, August 1931, p. 252, the Dominion Bureau suggested probable underestimation of the wheat crop of 1930 by 12.5 to 16.5 million bushels, the difference arising from the use of different statistics. If, as we have suggested above, the official estimates of seed use and human consumption are later revised upward, underestimation of the crop may then appear to have been perhaps 5-7 million bushels greater. But an underestimate of not far from 20 million bushels could perhaps be accounted for solely by underestimate of acreage, if the discrepancy between the estimated and the enumerated areas of 1931 would likewise have appeared in 1930. The new estimate of the quantity fed to livestock and poultry is the more readily to be regarded as accurate if underestimation of the crop is accounted for by underestimation of acreage.

creased feeding of wheat, and food use probably changed but little.

Statistical evidence regarding the domestic utilization of wheat in Argentina and Australia is limited, for the past decade, to official data on flour milled and to official estimates, or estimates that one may set up with some assurance of reliability, of the quantities of wheat used for seed. Official data specifically applicable to the crop year 1930-31 are in no instance available. Chart 44 shows for Argentina

CHART 44.—ARGENTINE WHEAT FLOUR (AS WHEAT) MILLED AND DOMESTICALLY RETAINED BY CALENDAR YEARS 1921-31, AND WHEAT USED FOR SEED BY CROP YEARS FROM 1921-22*



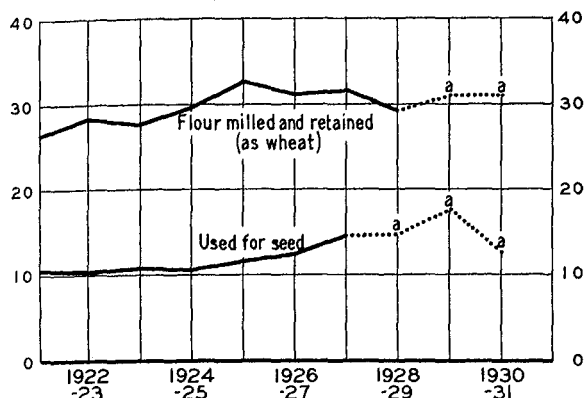
* Statistics of wheat milled and retained domestically based on official data as given in *Northwestern Miller Almanack*, 1931, p. 37, and in *Foodstuffs 'Round the World*, September 11, 1931. For estimates of seed use see Appendix Table XLIII.

^a Tentative estimate.

the official estimates of flour milled (minus flour exported), in terms of wheat, by calendar years 1921-30, with our tentative estimate for 1931; and our own estimates of wheat used for seed (based on official estimates of areas sown multiplied by the constant factor of 1.2 bushels per acre) by crop years from 1921-22. Chart 45 gives Australian official statistics of the wheat equivalent of flour milled minus flour and biscuits exported for July-June years 1921-

22 to 1928-29, and our estimates for 1929-30 and 1930-31; and also official estimates of wheat used for seed in the years 1921-22 to 1927-28, with our estimates for later years.

CHART 45.—AUSTRALIAN WHEAT FLOUR (AS WHEAT) MILLED AND RETAINED AND WHEAT USED FOR SEED, 1921-22*
(Million bushels)



* Official data (see Appendix Table XLIV) except as noted.

^a Tentative estimates.

Because of substantial reductions in acreage sown for the crops of 1931,¹ the seed use in 1930-31, in Argentina and Australia combined, was some 10 million bushels smaller than in 1929-30, when it had been unusually large.² In Argentina it was probably smaller than in any of the seven years preceding, and in Australia smaller than since 1926-27.

Wheat consumption for food in Argentina was probably about as large in 1930-31 as in the three preceding years. The upper curve on Chart 44, showing flour milled minus flour exported (in terms of wheat), suggests that aggregate domestic human consumption of wheat in Argentina tended to rise rather rapidly for about 5 years after 1922, but that after 1927 the aggregate remained nearly stationary at about 60 million bushels per year. If so, per capita hu-

man consumption probably rose for a time, and may now be tending to decline slightly. Such an inference, however, rests upon an assumption, which we cannot yet verify, that the statistics of wheat milled are substantially complete and comparable in each year of the period. The quantity of wheat actually consumed for human food in Argentina in the years 1927-28 to 1929-30 was apparently around 60 or 61 million bushels. It may have been slightly larger in 1930-31, for an official report permits one to infer that use of wheat for food was larger in the calendar year 1931 than in 1930.³

Feed use of wheat in Argentina was probably somewhat larger than usual in 1930-31. The official report mentioned above states that wheat was used more liberally in 1931 than in 1930, for feeding poultry and other animals, owing to the poor quality of some rust-infected wheat. No data on wheat feeding in Argentina are available, but the amount is probably never large, and there is no indication that the amount so used in 1930-31 was extraordinarily large either in absolute amount or in relation to the average.

Food consumption of wheat in Australia was probably about the same as in 1929-30, perhaps around 31 million bushels. Chart 45 shows that the quantity of wheat grain annually milled into flour in Australia and retained domestically tended to increase between 1921-22 and 1925-26, and to decline thereafter up to 1928-29, beyond which data are not available. A decrease in flour stocks may account for the relatively low figure of 1928-29; and since we know of no evidence that suggests a recent rapid decline in per capita flour consumption in Australia, we have assumed that aggregate utilization of wheat for food in both 1930-31 and 1929-30 may have approximated 31 million bushels, much the same as in 1926-27 and 1927-28.

"Chick-wheat" is regularly quoted in Australia, and while no statistics of wheat fed to chickens and other livestock are published, the amount so used probably runs to 3 or 4 million bushels a year, perhaps more. It is reasonable to infer that in 1930-31 somewhat larger amounts were so used, since the big wheat crop of 1930 was

¹ See Appendix Tables II and XII.

² On the assumption that the quantity sown per acre is practically constant from year to year. For Australia, official statistics bear out this assumption. See *Official Yearbook of the Commonwealth of Australia, 1930*, p. 482.

³ This report, which is directed toward an evaluation of exportable surpluses as of September 28, 1931, is printed in *Revista Semanal*, September 29, 1931.

of relatively low average quality as well as exceedingly cheap. We have no basis for estimating the amount of the increase, but it can hardly have exceeded a few million bushels.

ANALYSIS OF CONSUMPTION IN OTHER COUNTRIES

For most countries other than the four just considered, analysis of variations in wheat consumption from year to year must rest heavily upon the only data commonly available—official crop and trade statistics. These yield figures for gross domestic utilization or retention (wheat crops minus net exports or plus net imports). Statistics bearing on flour production or on the quantities fed and wasted are scarce, and if available are often incomplete or apply to early rather than recent years. A slight refinement is usually feasible. Seed requirements may be calculated with more or less accuracy by the use of annual statistics of wheat acreage and data (in most cases from official inquiries) as to average sowings per acre.

In the following five charts, each covering the past 11 crop years, curves are given showing for different countries or groups of countries (1) what is called "gross retention" of wheat—wheat crops minus net exports or plus net imports, depending on the status of the country; (2) what is called "net retention"—that is, gross retention minus quantities estimated to have been used for seed; and (3) what is called "estimated consumption," or the quantities that seem likely actually to have been consumed domestically each year for purposes other than seed.

The limitations of evidence are such that it is always difficult, and often impossible, to be certain whether a relatively high annual figure for net domestic retention in a given country reflects (a) relatively heavy actual consumption for food, feed, or both; (b) accumulation of stocks; or (c) merely an overestimate of the crop. Conversely, it is difficult or impossible to ascertain whether low actual consumption, reduction of stocks, or underestimation of crop is reflected in a relatively low figure for net domestic retention.

If, however, we assume that final estimates of crops are substantially accurate, we can bring to bear upon the problem of estimating actual consumption, for food and feed, pertinent information and comments in official and trade journals as to wheat quality, available supplies of other cereals, price relationships of wheat and other cereals, governmental measures that must tend to affect wheat consumption, and increase or reduction in stocks. One may also reasonably rely upon certain general principles. For example, wheat consumption for food, as between successive years, may be expected to expand sharply with increase in available supplies in a country where the per capita wheat intake and the general level of subsistence are low, but to change slightly in a country where per capita wheat consumption and the general level of subsistence are high. We have utilized such general principles and specific information in arriving at the quantitative estimates of annual consumption for food and feed that are shown in the following charts. Yet pure guess-work necessarily plays a rôle in the process of estimation, and we present the figures merely as the best that we can now formulate under the circumstances.

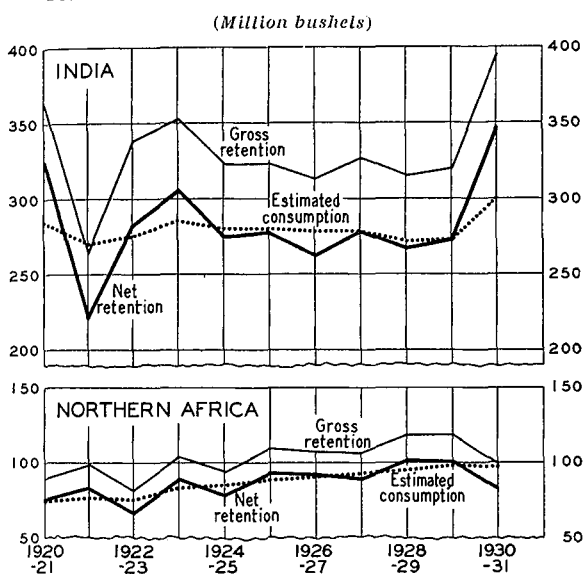
The same process has yielded our rough estimates of year-end stocks in the importing countries of Europe and in India and the Danube basin, as set forth in Section V below (pp. 137-48). These are therefore consistent with our estimates of actual consumption for food and feed in the same regions. Estimates of stocks in these regions cannot be reached except by reference to estimates of consumption; estimates of consumption cannot be reached without reference to estimates of stocks.

INDIA AND NORTHERN AFRICA

Wheat consumption in India must have been relatively large in 1930-31. The 1930 wheat crop was the largest on record. Since India was a small net importer in August-July 1930-31, the total supply of wheat from crop and net imports was by far the largest in the 11 post-war years for which data are shown in Chart 46. The use of wheat for seed presumably remains fairly constant

from year to year, since the wheat acreage remains rather stable. Since per capita food supplies even in the wheat-producing regions of India are small, it seems reasonable to suppose that consumption of wheat for food tends to rise in years of large crops and to fall in years of small ones. There is general agreement, however, that wheat stocks in India are accumulated in years of abundance, and drawn upon in years of relative scarcity.

CHART 46.—GROSS RETENTION, NET RETENTION, AND ESTIMATED CONSUMPTION OF WHEAT IN INDIA AND NORTHERN AFRICA, AUGUST-JULY 1920-21*



* Gross retention based upon official statistics of wheat crops plus net imports or minus net exports (see Appendix Table XXXVI). Net retention represents gross retention minus estimated seed use; seed use estimated from official statistics of areas harvested multiplied by approximate seed use per acre (India, Algeria, Morocco, Tunis, 1.5 bushels; Egypt, 2.8 bushels). Consumption estimates as described in accompanying text.

The wheat crops of 1924-29 were so small, on account of low yields per acre, that this period as a whole was presumably characterized by reduction of stocks and also by progressive reduction in per capita wheat consumption. The latter presumably reflected, not a voluntary shift toward a more ample and diversified diet, but abstinence enforced by low yields in conjunction with purchasing power too small to permit heavy wheat imports. The abundance of wheat supplies in 1930-31 presum-

ably served both to expand consumption and to permit replenishment of stocks.

If per capita wheat consumption had been progressively but involuntarily reduced in preceding years, a rather sharp expansion in consumption may well have occurred when wheat supplies became so abundant in 1930-31. Under the circumstances, an expansion of as much as 10 per cent from the levels of 1928-29 and 1929-30 does not seem improbable. On this basis about 300 million bushels of wheat, the largest quantity in post-war years, would have been consumed for food in India in 1930-31.¹ Since the population of India seems to have grown by more than 10 per cent in a decade, an aggregate wheat consumption of 300 million bushels in 1930-31 would not have yielded more wheat per capita than appears to have been consumed, on the average, in the years 1920-21 to 1922-23. From this point of view, even the high figure of 300 million bushels appears conservative for 1930-31.

In the four countries of northern Africa (Algeria, Morocco, Tunis, and Egypt) as a group, the net retention of wheat in 1930-31 fell to a rather low level. A very slender basis exists for adjudging whether actual consumption in these countries varies considerably from year to year, or whether there are fairly wide fluctuations in stocks carried over from one year to another. Tentatively we assume that stocks are the more variable, that there was accumulation in 1928-29 and 1929-30 but reduction in 1930-31, and that consumption in 1930-31 was fairly high in accordance with an upward post-war trend suggested by the statistics of net retention.

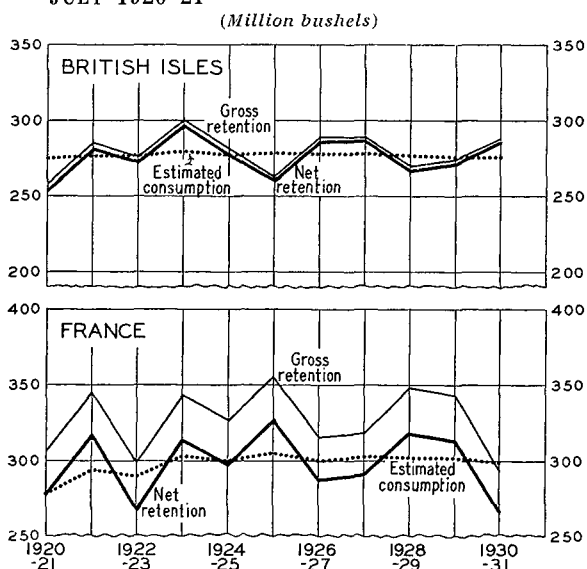
BRITISH ISLES AND FRANCE

Among the European importing countries, the British Isles may reasonably be classified among those countries where both the standard of living and per capita wheat consumption are relatively high, where not a great deal of wheat is fed to animals, and where, accordingly, year-to-year variations in wheat consumption are probably rather small. The data on net domestic retention

¹ Feed use of wheat in India may be regarded as negligible.

(see the upper section of Chart 47) suggest that aggregate consumption has remained approximately on the same level for a decade. With the growth of population, per capita wheat consumption has probably tended downward in recent years.

CHART 47.—GROSS RETENTION, NET RETENTION, AND ESTIMATED CONSUMPTION OF WHEAT IN THE BRITISH ISLES AND FRANCE, FROM AUGUST-JULY 1920-21*



* See footnote to Chart 46, p. 129. Seed use in British Isles, 2.0 bushels per acre; in France, 2.2 bushels.

Net retention of wheat in the British Isles stood at a rather high figure in 1930-31; exceptionally large imports more than offset the small crop. If wheat consumption remains fairly constant, there must have been some accumulation of stocks, though probably not as much as in 1924-25.¹

A small wheat crop coupled with small net imports brought net domestic retention of wheat in France in 1930-31 (see the lower section of Chart 47) to the lowest point in 11 years, even slightly below the low figure of 1922-23. In view of the many and changing governmental regulations of wheat milling in post-war years, it is very difficult to form an opinion regarding the causes of the rather wide year-to-year fluctuations in net retention of wheat. In absolute amount, and in terms of percentage variations from the average, these fluctua-

¹ See Appendix Table XXXIII.

tions have been a good deal larger than in the British Isles. With good bread as highly esteemed and as widely consumed as it is in France, where per capita consumption of wheat is perhaps higher than in any other country of western Europe, we think it improbable that aggregate consumption can vary from year to year by as much as 10 per cent. Yet one would be forced to believe this if one assumed that statistics of crops and trade were accurate and that stocks changed but little. It seems more reasonable to suppose that fluctuations in net retention are to be explained chiefly by changes in stocks. Other cereals probably are not substituted freely for wheat; nor are substantial and variable quantities of wheat fed to animals. Our estimates of actual consumption accordingly allow only for small variations after the first few years following 1920-21, when recovery of consumption from the war level appears to have been in progress. Since the population has grown, though slowly, it seems probable that per capita wheat consumption has tended to decline in recent years.

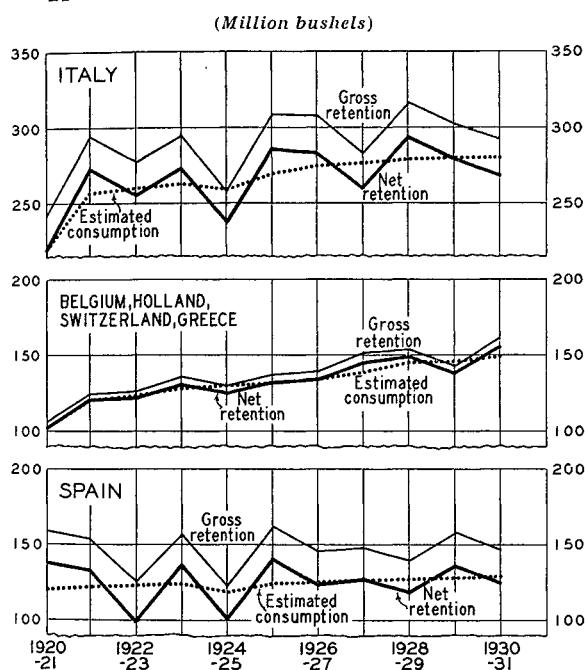
If per capita consumption is tending downward, this in itself would cause aggregate consumption to have been relatively low in 1930-31. Poor quality of flour and bread, ascribed to governmental regulations calling for heavy utilization of domestic soft wheat as against imported hard wheat, has frequently been mentioned as occasioning reduced consumption; and, other things equal, the poor quality may be supposed to have had this general effect. Nevertheless, complaints regarding bread quality have been common for several years; and the poor quality of the domestic crop of 1930 may have led to more liberal milling of low-quality wheat than in most other years. All told, we are disposed to believe that actual consumption in 1930-31 may have fallen below the levels of recent years, partly because bread prices were relatively high, but by perhaps not more than 1 or 2 per cent. The extremely low figure of net domestic retention of wheat presumably reflects mainly a reduction of stocks from a distinctly high level to a distinctly low one. A good deal of bread is said to have been smuggled into France from Belgium; if so, and since this would

not appear in the statistics, conclusions must be the more tentative.

SPAIN, ITALY, THE LOW COUNTRIES,
SWITZERLAND, GREECE

In Spain, the trend of total domestic net retention of wheat (see the lower section of Chart 48) seems to have been upward

CHART 48.—GROSS RETENTION, NET RETENTION, AND ESTIMATED CONSUMPTION OF WHEAT IN ITALY, BELGIUM, HOLLAND, SWITZERLAND, GREECE, AND SPAIN, FROM AUGUST-JULY 1920-21*



* See footnote to Chart 46, p. 129. Seed use per acre as follows, in bushels: Italy, 1.9; Belgium and Holland, 2.3; Switzerland, 3.0; Greece, 2.5; Spain, 2.0.

over the past 11 years, though so slightly that per capita wheat consumption can hardly have increased and may have declined a little. A fair-sized wheat crop in 1930, and negligible net exports, resulted in a figure for net retention of wheat in 1930-31 of moderate size. If aggregate consumption tends (possibly with interruptions in such a year as 1924-25, when the domestic crop was short and import wheat prices notably high) to expand a little from year to year, the crop year 1930-31 probably witnessed on the one hand the maintenance of consumption at a level to be expected

in view of the trend, and on the other a small reduction of stocks.

Much the same probably happened in Italy. Here (see the upper section of Chart 48) the aggregate consumption appears to have tended upward somewhat more rapidly than in Spain, though perhaps at a diminishing rate after recovery from the war level. Italy, like the British Isles and France, may reasonably be classified as a country where the variations in per capita wheat consumption from year to year are now probably small, and where changes in stocks account for most of the variations in net domestic retention. If so, the crop year 1930-31 probably witnessed maintenance of aggregate consumption about on the line of trend, partly through drafts upon stocks accumulated mostly in 1928-29. Corn is known to be widely consumed as human food in parts of Italy, available supplies of corn were relatively large in 1930-31, and corn was rather cheap in relation to wheat. Unemployment was heavier than in preceding years. There is reason, accordingly, to suppose that the circumstances would have tended to induce more or less substitution of corn for wheat. At the same time wheat was cheaper than in earlier years, and it may be that unemployment tended to increase wheat consumption at the expense of more costly foods.

In a group of countries including Belgium, Holland, Switzerland, and Greece (countries which import far more wheat than they produce domestically) the net retention of wheat has tended to increase with a few interruptions from year to year, and over the past decade at a more rapid rate than in Italy or Spain (see the middle section of Chart 48). In Holland and Belgium, the rapid increase probably represents in part a tendency for wheat to displace rye, so that per capita wheat consumption tends to increase. But in Switzerland and Greece, where rye is little used, the growth of aggregate and probably of per capita wheat consumption calls for a different explanation. Net domestic retention in these four countries taken together was larger in 1930-31 than in any of the preceding ten years. Since import wheat prices were low and since imports were little affected by governmental regulations,

it seems reasonable to infer that wheat consumption there attained a new post-war peak in line with the historical tendency toward expansion, and that at the same time stocks were built up somewhat as in the British Isles.

THE CASE OF GERMANY

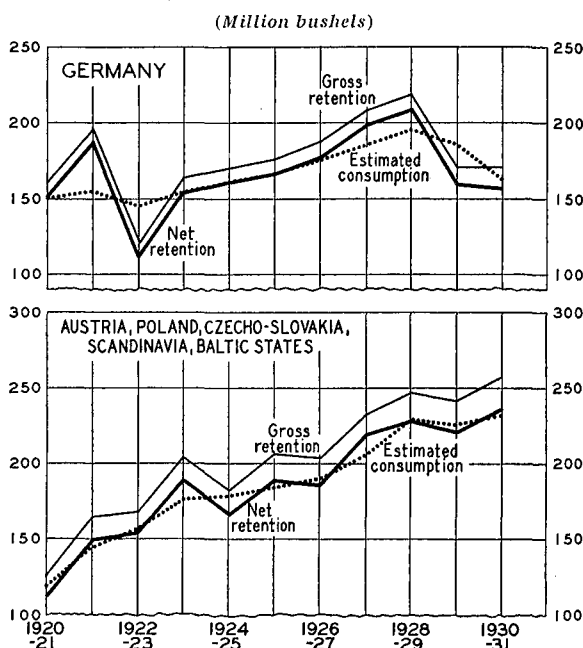
In contrast with the European importing countries thus far considered, Germany is to be classified as a country where, in post-war years at least, both aggregate and per capita wheat consumption have probably varied rather widely from year to year. Rye is consumed heavily as a bread grain, and bread made from wheat and rye flour mixed in varying proportions is widely used. This situation alone would presumably give rise to substitution of one grain for the other under appropriate circumstances of supply and price. Economic activity in general in Germany has proceeded at a less even pace than in most other countries; perhaps in no other country have such drastic governmental measures been applied to the grain trade and flour milling; and in no other country have governmental measures been so extensively directed toward influencing bread consumption.¹ These factors alone would tend to cause rather wide fluctuations in wheat consumption from year to year. Moreover, the statistics of bread-grain supplies and imports are regarded by careful students as understating available supplies in at least the first five years, perhaps the first eight, of the 11-year period ending with 1930-31. Consequently estimates of actual wheat consumption involve the more guess-work because one cannot accept official statistics as strictly comparable for the several years of this period.

The curves for gross retention and net retention of wheat in Germany, as shown in the upper section of Chart 49, include rough adjustments of official statistics of crops and net imports from 1920-21 to 1924-25. Even if one ignores these earlier years, there is no reason to doubt that wheat consumption was increasing in Germany be-

tween 1925-26 and 1928-29, and that per capita consumption also was increasing. Observers are generally agreed that stocks were built up both in 1927-28 and 1928-29, and reduced both in 1929-30 and 1930-31.

In these two latter years, however, actual consumption seems to have fallen from the high level attained in 1928-29. Governmental measures were put into effect in 1929-30 and made even more stringent in 1930-31.² In general rye flour, and to some

CHART 49.—GROSS RETENTION, NET RETENTION, AND ESTIMATED CONSUMPTION OF WHEAT IN GERMANY, AUSTRIA, CZECHO-SLOVAKIA, POLAND, THE SCANDINAVIAN COUNTRIES, AND THE BALTIC COUNTRIES, FROM AUGUST-JULY 1920-21*



* See footnote to Chart 46, p. 129. Seed use per acre as follows, in bushels: Germany, Austria, Czechoslovakia, Poland, and the Baltic countries, 2.5; Denmark, 2.7; Norway and Sweden, 3.3.

extent potato flour, was used in place of some wheat flour; the governmental measures were in part permissive, in part called for compulsory admixtures, and in part tended to make profitable the use of rye in place of wheat through their effect upon price relationships. That aggregate wheat consumption has declined in Germany for two successive crop years is hardly to be questioned, though the precise extent of the successive declines is not measurable with

¹ See Appendix A, p. 168.

² See Appendix A; also WHEAT STUDIES, December 1930, VII, 119.

the precision suggested in Chart 49.¹ Since regulations were longer in effect, more numerous, and more stringent in 1930-31 than in 1929-30, it seems reasonable to assume that the decline in German wheat consumption was larger between 1929-30 and 1930-31 than between 1928-29 and 1929-30. It is possible that in 1930-31 less wheat was consumed in Germany even than in 1924-25, before the recent expansion.

This reduction in consumption, amounting perhaps to more than 20 million bushels, in a country where wheat consumption has been tending to expand, was a significant factor in reducing European demand for import wheat in 1930-31. Behind it, of course, lay the complex set of circumstances that gave rise to the imposition of increasingly high tariffs on wheat and to the adoption and strengthening of governmental measures that resulted in substitution of rye and potato flour for wheat flour.

It is of interest to inquire whether or not consumption of bread in all its major forms, including straight rye and mixed rye-wheat-and-potato bread, was reduced in 1930-31 in comparison with earlier years. This seems improbable, though the evidence is not convincing. Almost every branch of the grain trade was affected by governmental measures in 1930-31. Increased tariffs had the general effect of reducing net imports of corn, barley, oats, and rye (as well as of wheat) practically to a minimum. By comparison with the two preceding years, the domestic crops of rye, oats, and barley in 1930 were small, though the rye carryover and the potato crop were large. Domestic utilization (crops plus net imports) not only of wheat, but also of rye, barley, oats, and corn was therefore presumably reduced. Doubtless the big potato crop helped to fill the deficiency in the three feed grains; probably also stocks of the feed grains were generally reduced. But the main effect was upon the consumption of rye, which had been so abundant in 1928-29 and 1929-30 that heavy stocks had accumulated. The measures taken in 1930-31 tended, as we have seen, to cause rye to be

used in place of wheat as human food. But high tariffs on the feed grains, propaganda, and an arrangement whereby a governmental organization bought rye at the market price, dyed it so as to make it unfit for human consumption, and sold it at feed-grain prices, tended also to cause rye to be used extensively as feed. As a result, stocks of rye were greatly reduced in the course of the year.

With rye so abundant that it could be used heavily as feed, it was of course abundant for use as food. Consumption of bread in all forms may easily have been maintained in Germany in 1930-31, an increase in the proportion of rye and potato flour counterbalancing decrease in the proportion of wheat flour. Since bread ranks as a cheap food in Germany in contrast with some other foods, there seems to be no reason to suppose that widespread unemployment in 1930-31 must necessarily have resulted in a decrease in aggregate or in per capita bread consumption: if there was incentive to turn from wheat and rye to potatoes and some coarse grains, there must also have been incentive to turn from sugar, milk, meat, and some other articles to bread made of wheat and rye.

OTHER COUNTRIES OF CENTRAL AND NORTHERN EUROPE

Net domestic retention of wheat in 1930-31 stood at a record high figure, some 235 million bushels, in a group of countries of central and northern Europe including Austria, Czecho-Slovakia, Poland, the Scandinavian countries, and the Baltic states. The general trend of net domestic retention over the past 11 years has been strikingly upward (see the lower section of Chart 49). To a large extent this trend represents expansion of domestic wheat production, a good deal of which in turn represents recovery from the disorganization of agriculture and general economic activity during and shortly after the war; but population growth and contraction or limited expansion of rye consumption have contributed to the upward tendency. The statistics of net retention taken alone suggest that after 1927-28 the rate of growth in wheat consumption may have become considerably

¹ Our estimates of consumption in the years 1928-29 to 1930-31, however, are closely in line with estimates recently published in *Blätter für landwirtschaftliche Marktforschung*, October 1931, p. 200.

less rapid than in the preceding years; and if recovery of agriculture was the major cause of the earlier rapid growth, it would be reasonable to expect that consumption should in fact grow less rapidly after agriculture had recovered its lost ground. The curve in Chart 49 showing our estimates of actual consumption, however, does not reflect this change, largely because we have placed our estimate of consumption in 1928-29 at a high figure to allow for heavy utilization of wheat for feed in the Scandinavian countries in that year.

All told, it seems probable that actual consumption of wheat in this group of central and northern European countries reached a new high post-war peak in 1930-31. The growth of population, the comparative freedom from such stringent regulations as prevailed in France and Germany,¹ and the evidence of a persistent tendency toward increase of per capita wheat consumption might warrant the inference that actual consumption increased as compared with 1929-30 by as much as the average annual increase over the 11-year period from 1920-21. But since recovery in agricultural production may now have been about completed, making the average annual increase smaller, and since there is evidence of upbuilding of stocks (largely in Poland) in the course of the year, aggregate consumption probably exceeded that of 1929-30 by only a rather small amount. The estimate of actual consumption in 1928-29 stands above that of 1929-30 on account of allowance for distinctly heavy feed use of wheat in Scandinavia. Price relationships were on the whole less likely to have promoted heavy utilization of wheat for feed in 1930-31 than in 1928-29.

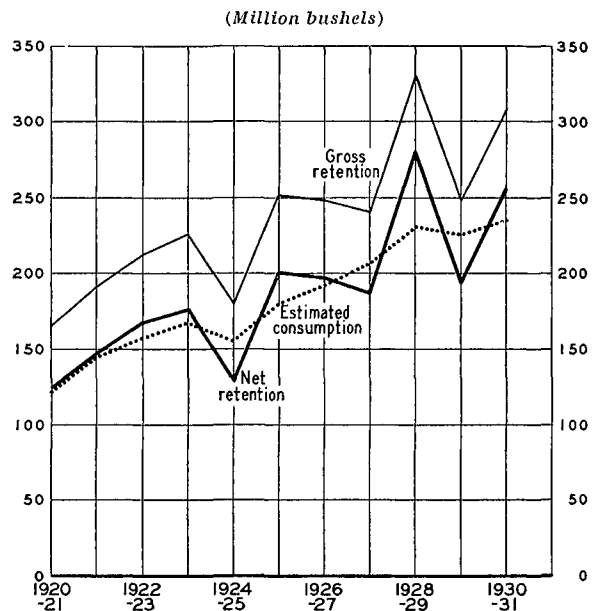
THE DANUBE BASIN

The four countries of the Danube basin (Hungary, Jugo-Slavia, Roumania, and Bulgaria) as a group harvested the second largest wheat crop of post-war years in 1930. Since neither net exports nor seed requirements were strikingly large, aggre-

¹ Such regulations were in force in Sweden and Czecho-Slovakia, but these were less stringent than those in Germany and France.

gate net retention of wheat also was smaller only than in 1928-29 (see Chart 50). In this group of countries, as in the group of eastern and northern European countries just considered, the statistics of net retention of wheat suggest notably rapid advance in wheat consumption over the past decade. In the Danube countries, however, rye is a much less important crop, and the large progressive increase in wheat retention is

CHART 50.—GROSS RETENTION, NET RETENTION, AND ESTIMATED CONSUMPTION OF WHEAT IN THE DANUBE BASIN, FROM AUGUST-JULY 1920-21*



* See footnote to Chart 46, p. 129. Seed use per acre as follows, in bushels: Jugo-Slavia, 2.4; Hungary, 2.6; Roumania, 2.8; Bulgaria, 3.3.

not to be explained as representing replacement of rye by wheat to a significant degree. Recovery of agricultural production, advance of the standard of living, and growth of population are probably the main factors leading to increase of aggregate wheat consumption; per capita consumption has presumably expanded also.

Corn is widely used as human food in Roumania and parts of Jugo-Slavia, and a year of small corn supplies and abundant wheat supplies, like 1928-29, probably gives rise through price adjustments to substitution of wheat for corn in these regions. Particularly in 1928-29, but also in 1930-31,

wheat was relatively cheap and therefore probably used in place of corn to a considerable extent.

It is also probable that nowadays, after a good deal of recovery in agricultural production, wheat stocks tend to accumulate in a year of abundant crops and low export prices. In 1928-29 there must have been a heavy accumulation of stocks; and some increase of stocks probably occurred in 1930-31. Changes in stocks probably account for variations in net retention of wheat to a larger extent than do changes in wheat consumption. Otherwise it would be necessary to assume that per capita human consumption of wheat (for there cannot be much feeding of wheat in the Danube basin) varies widely from year to year; and this is not the case, except under extraordinary circumstances, in any country for which statistics serviceable for judgment are available.

The estimates of consumption shown in Chart 50 were reached with reference to these considerations. All told, it seems probable that wheat consumption in the Danube basin attained a new high post-war peak in 1930-31, though perhaps not much higher than in 1928-29. As in 1928-29, accumulation of stocks in the course of the year must have been of considerable magnitude; and some evidence of the existence of liberal stocks is afforded by governmental efforts to enlarge exports, and also by heavy exports in the early months of 1931-32 from a crop no larger than those of 1928 and 1930.

RUSSIA

Wheat consumption in Russia needs to be considered together with consumption of rye. Both before and after the war the Russian rye crop must have contributed to the domestic bread-grain supply quite as much as wheat, or somewhat more. A tendency long existed, and is still in evidence, for wheat production and consumption to expand more than rye production and consumption; moreover, it does not always happen that a year with a large wheat crop is also one with a large rye crop. Obviously there is reason to suppose that aggregate wheat consumption may vary rather widely

from year to year, if only on account of variation in rye crops.

On the assumption that the rye crop of 1930, for which an official estimate has not yet appeared, approximated the high figure of 950 million bushels, the total supply of the two bread grains in Russia in 1930-31 must have been much the largest in recent years. The following figures show net domestic retention of wheat and rye separately and in combination, by crop years beginning with 1925-26; "net retention" means estimated crops minus net exports and seed requirements,¹ and both wheat and rye are here expressed in terms of million bushels of 60 pounds each.

Crop year	Wheat	Rye	Total
1925-26	622	707	1,329
1926-27	723	733	1,456
1927-28	648	763	1,411
1928-29	659	580	1,239
1929-30	533	621	1,154
1930-31	807	735	1,542

There can be little doubt that the bread-grain supply domestically retained in 1930-31 was strikingly large, even after allowance for sizable net exports and after deduction of seed requirements, which for the large area sown in 1930-31 for the 1931 crop perhaps totaled about 300 million bushels. The main question is whether this large supply, around 1,500 million bushels, was consumed practically in its entirety, or whether large stocks were accumulated.

There can be no doubt that consumption both in the aggregate and per capita was larger in 1930-31 than in 1929-30. The official ration was increased in the course of the year, and the population doubtless increased also. But these two factors together probably would not have led, other things equal, to an increase in consumption of more than 5 per cent, or 60 million bushels, whereas the increase in available supplies was perhaps not far from 400 million bushels; and these relationships at first glance suggest a huge accumulation of stocks. But accumulation of the magnitude of 300 mil-

¹ Seed requirements were estimated by using 2.0 bushels of 56 pounds per acre for rye, and 1.8 bushels of 60 pounds per acre for wheat—figures a little lower than pre-war official data; these factors were applied to official statistics of areas sown.

lion bushels seems inconceivable in the light of the strenuous official efforts employed in collecting grain and the admitted necessity to export in order to pay for imports. Consequently one may suppose that actual consumption increased by much more than 5 per cent, and perhaps by an amount not much smaller than the increase in available bread-grain supplies.

An increase of consumption as large as this would be almost inconceivable in a country where the supplies in the earlier year were adequate to the needs and desires of the population. But the year 1929-30 was presumably not such a year in Russia. Official statistics state that stocks of wheat and rye were increased by around 135 million bushels in the course of three years of relative abundance, 1925-26 to 1927-28—an average of about 45 million bushels a year. There was reduction in 1928-29. The year 1929-30 must have been a year of relative shortage of bread grain as compared with earlier years, even if existing stocks had been drawn upon to the full extent, as seems improbable because the previous upbuilding was from very low levels to something like a normal one, and not from a normal level to a high one. On these grounds a strikingly heavy increase of aggregate bread-grain consumption between 1929-30 and 1930-31 may well have occurred, though how heavy is impossible to say.

Another comparison suggests that a distinctly large fraction of the increase between 1929-30 and 1930-31 in bread-grain supplies domestically retained may have gone into consumption. On the average in the three-year period of relative abundance, 1925-26 to 1927-28, net retention of bread grain was close to 1,400 million bushels; about 1,350 million with allowance for increase of stocks. In 1930-31 net retention may have been about 1,540 million. The increase was therefore only a little over 11 per cent. But from the middle of the earlier period, say January 1927, to the middle of 1930-31, again January, the population of Russia increased, so far as one can judge from the census of December 1926 and official estimates carrying to April 1930, by about 9.5 per cent. Consequently the huge bread-grain supply of 1930-31 could have

yielded only a little more grain per capita than was available in the earlier period. This calculation seems to us to suggest the probability that the heavy net retention of 1930-31 went in considerably the greater part to actual consumption for food, and that in consequence stocks were not greatly built up.

Yet it is also probable that there was something of an upbuilding of stocks. Enough bread grain seems to have remained toward the close of the crop year 1930-31 to permit a transition from one crop year to the next without difficulty in supplying the cities with food, and this was not the case in the two earlier years. Now that evidence has accumulated pointing to only moderate crops in 1931, the heavy Russian exports of wheat in August-September 1931 are more readily explained if one assumes that stocks were built up to some extent in 1930-31. Finally, it should be recalled that bread-grain producers and consumers in Russia were in a better position to follow their own inclinations in 1925-26 to 1927-28 than they were in 1930-31—in short, that the per capita intake of cereals may have been more restrained by governmental measures in the past year.

To the extent that expansion of per capita consumption of bread grain in 1930-31 was in fact restrained by governmental measures, such as rationing and collection of grain from farms where it would otherwise have been consumed, it is reasonable to infer that in part the heavy Russian wheat exports of 1930-31 were in a sense forced exports, which would not have occurred under circumstances identical except for governmental organization. But the question is not of particular significance except as it bears on a future in which Soviet plans may call for relaxation of controls. Of major significance is the fact that in 1930-31, thanks to big crops, the Russian people had available per capita at least as much grain as in other comparatively favorable post-war years, and seem likely to have consumed most of it.

The views expressed above of course depend in no small degree upon the assumption that the Russian rye crop of 1930 was a big one, approximating 950 million bush-

els. If in fact it substantially exceeded this figure, calculations would suggest greater upbuilding of stocks than we have inferred, and at the same time would tend to charac-

terize the heavy net exports of 1930-31 less as forced than as representing a true surplus over potential requirements for consumption.

V. STOCKS AND CARRYOVERS

ACCUMULATION OF STOCKS IN 1930-31

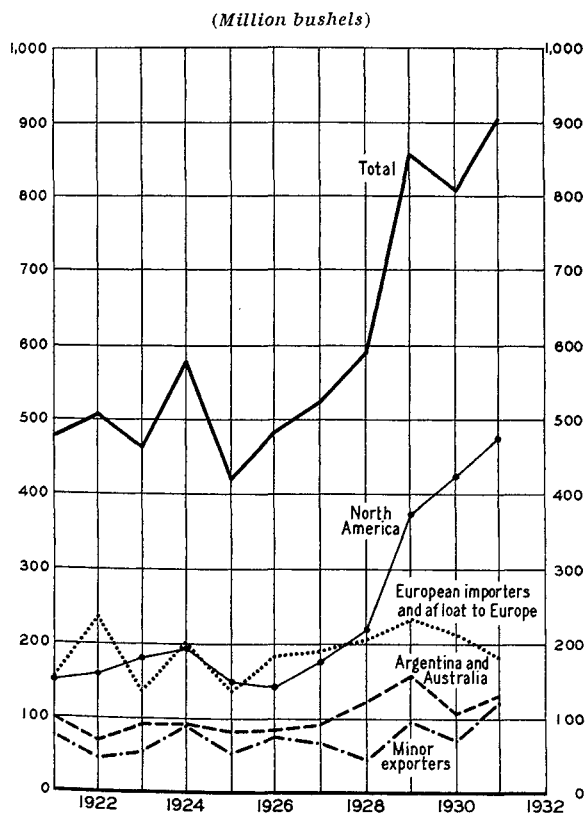
In spite of heavy consumption of wheat in 1930-31, world wheat stocks increased to what were probably new high record levels. Chart 51 provides a generalized picture of changes in world stocks (excluding particularly Russia and China) in the past decade. The picture is inaccurate in many

be employed; but it may be taken as indicating the direction of change of stocks from year to year, and in an imperfect way as measuring the levels.

From a distinctly low level at the end of 1924-25, after the notably short wheat crop of 1924, aggregate stocks rose successively for four years, to a strikingly high level in July 1929. The increase may have approximated 400 million bushels. Most of it occurred in 1928-29, following the huge wheat crop of 1928. After that harvest, and principally because of its magnitude and distribution,¹ stocks of wheat became distinctly burdensome, and were a significant factor in the decline of wheat prices. Stocks were moderately reduced in 1929-30, but by much less than the reduction in the crop of 1929. In 1930-31, after another crop that was even larger than that of 1928 but distributed more favorably for large consumption, stocks rose to new high levels, but by a smaller amount than in 1928-29. If one could include Russian stocks in the world picture, the level and the increase in 1930-31 would presumably appear somewhat higher than is suggested by the curve of Chart 51, which shows roughly the position in the world ex-Russia and China.

The increase in wheat stocks in 1930-31 cannot be adequately explained by reference to a single significant influence. It is easy, and not altogether untrue, to say that accumulation must always occur in a year when the wheat crop falls above its line of trend. But this implies greater stability in aggregate consumption than the evidence seems to warrant. Per capita wheat consumption is rising in some countries and falling in others; and in some countries, more than in others, consumption of wheat for food and feed is modified in accordance

CHART 51.—WHEAT STOCKS (PARTIALLY ESTIMATED) IN NORTH AMERICA, EUROPE EX-RUSSIA AND AFLOAT TO EUROPE, ARGENTINA AND AUSTRALIA, INDIA AND NORTHERN AFRICA, AND TOTAL, ABOUT AUGUST 1, 1921-31*



* See Appendix Table XXXII.

details, since year-end stocks are not directly estimated in most countries and estimates lacking secure bases have had to

¹ In Russia and India, where domestic consumption is particularly responsive to supplies, the 1928 crops were small; and in the four major exporting countries, where domestic consumption tends to vary little with the crop, the 1928 crops were large.

with supplies and prices of wheat and wheat substitutes. Under these circumstances the geographical distribution of grain crops is important. If in 1930 Russia and India together had harvested 400 million bushels less wheat and the rest of the world (ex-China) 400 million bushels more, stocks in the world ex-Russia and China would almost certainly have increased far more than they did in 1930-31. As between 1928-29 and 1929-30, the substantially smaller upbuilding of stocks in the later year in the world ex-Russia and China (and probably in the world including Russia) is to be explained less by the size of the two wheat crops than by their different geographical distribution, by growth of population and hence of consumption for food over the interval, and by the accident of a shorter United States corn crop in 1930, which led to heavy consumption of wheat for feed. The general accumulation of stocks in 1930-31 would unquestionably have been somewhat smaller in the absence of the governmental measures that tended to reduce wheat consumption in several European countries.

It seldom happens that in a particular year the change in wheat stocks is in the same direction, to say nothing of similar magnitudes, in different countries or regions. Among the four groups of countries for which data appear in Chart 51, there was only one year—1928-29—in which stocks were increased in each group; and only one year—1924-25—in which stocks were reduced in each group. Needless to say, changes in stocks are seldom in the same direction in all of the countries included in a particular group.

The outstanding features of the direction of change in 1930-31 were the decline of stocks in and afloat to European countries and the contrasting increases of stocks in the three groups of exporting countries. Stocks available to European importing countries fell in the course of the year to a level that was one of the lowest in six years. This low level is to be explained principally by the situation in France and Germany, where governmental regulations led not only to sharp restriction of imports but to reduction of stocks of both domestic and import wheat practically to a minimum.

European importing countries did not as a group (though they did in some individual instances) build up wheat stocks in 1930-31, though upbuilding or at least maintenance would seem to have been a rational procedure in a year of unprecedentedly low wheat prices. Exporting countries, as a group, were thus forced to let their stocks pile up to an extent hardly conceivable in the absence of restrictive governmental regulations in Europe; and to an extent not measurable the overseas movement of wheat in 1930-31 was thereby restricted. In less striking degree this general situation had prevailed in 1929-30.

Whether or not reduction of stocks in European importing countries had gone about as far as possible by midsummer 1931, is a question of considerable importance that cannot be answered with assurance. The presumption is, however, that by August 1931 stocks of bread grain (wheat and rye together) in European importing countries stood so low that relatively minor reductions, as compared with 1929-30 and 1930-31, are in prospect for 1931-32 despite the strengthening of governmental regulations. By contrast with earlier years, the wheat stocks in European importing countries excluding Poland were probably even lower in August 1931 than Chart 51 suggests, for Poland, a country that in some years is a net exporter of wheat, seems to have held unusually heavy stocks at the end of 1930-31.

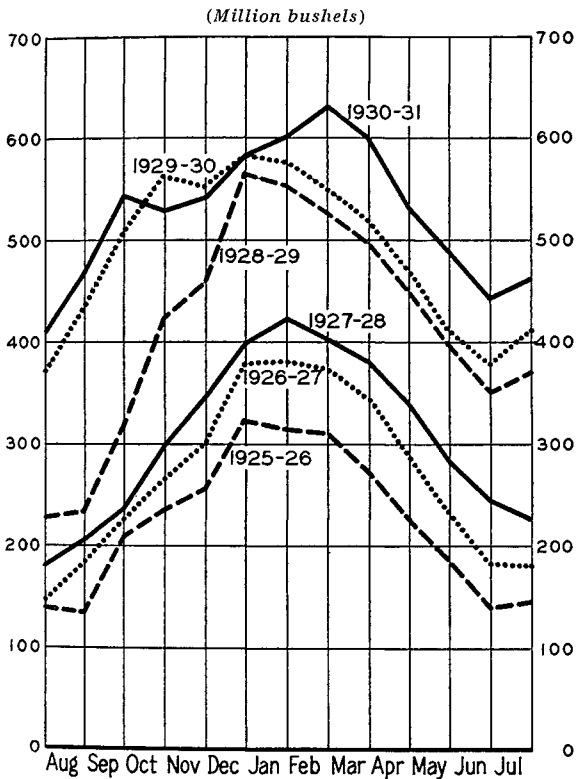
In Argentina and Australia together stocks were high in August 1931, but not as high as two years earlier. The increase during 1930-31 was not large, and occurred mostly in Argentina. In the minor exporting countries (India, the Danube basin, and the four countries of northern Africa) as a group the level was probably the highest in post-war years, and the increase in the course of the year was very heavy. India accounts principally both for the high level and the increase, and in a lesser degree Roumania and Bulgaria; stocks probably increased only slightly in Hungary, and decreased in the northern African countries and Jugo-Slavia. The North American level of year-end stocks represents accumulations both in the United States and Canada, where the carryovers rose to new record

levels; but most of the increase during 1930-31 is accounted for by increase of United States wheat.

THE COURSE OF VISIBLE SUPPLIES

It is impossible to show in detail, from month to month, how and where aggregate world wheat stocks were built up in the course of 1930-31. The most comprehensive data available by months apply to so-called world "commercial stocks" or "visible supplies." These data, summarized in Chart 52,

CHART 52.—WORLD VISIBLE WHEAT SUPPLIES, MONTHLY FROM AUGUST 1, 1925*



* See Appendix Table XXXIII.

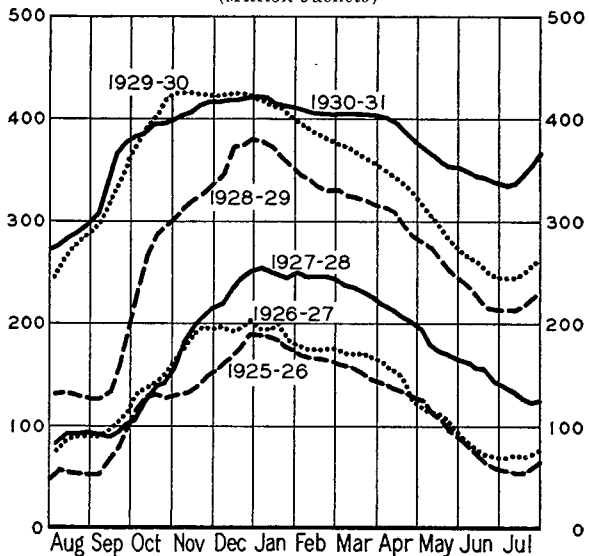
cover roughly the stocks in terminal elevators in the United States, in country elevators and terminal elevators in Canada, in railway stations and in ports of Australia, in ports of Argentina, afloat to Europe, and in ports of the United Kingdom. They do not cover farm stocks in any country, stocks in positions equivalent to country elevators in any countries but Canada and Australia, or any stocks whatever in Europe, Asia, Africa, and South America, aside from rela-

tively small quantities in the ports of the United Kingdom and Argentina. Despite their incompleteness, these figures and their several components carry a good deal of significance, and throw a good deal of light upon important developments in the world wheat situation.

As the chart shows, these world visible supplies stood at their highest post-war level practically throughout the crop year 1930-31, and were (like combined total stocks in the United States, Canada, and Australia) higher at the end than at the beginning.

Certain unusual features of the curve for 1930-31 were a decline in October, an increase smaller than usual in November and December, and an increase rather than a decline in January and February to an unusually late peak on March 1. These are naturally to be explained by reference to the several components of the total. Data for North America (weekly statistics not strictly comparable with the figures for North America that enter into the total visible supply shown in Chart 52) are given in Chart 53. Chart 54 shows the course of

CHART 53.—COMMERCIAL STOCKS OF WHEAT IN NORTH AMERICA, WEEKLY FROM AUGUST 1925* (Million bushels)



* Summation of commercial stocks in the United States and Canada, as described in footnotes to Chart 56, p. 141.

visibles afloat to Europe; Chart 55 the Australian visibles; Chart 56 visibles in the United States and Canada separately; and

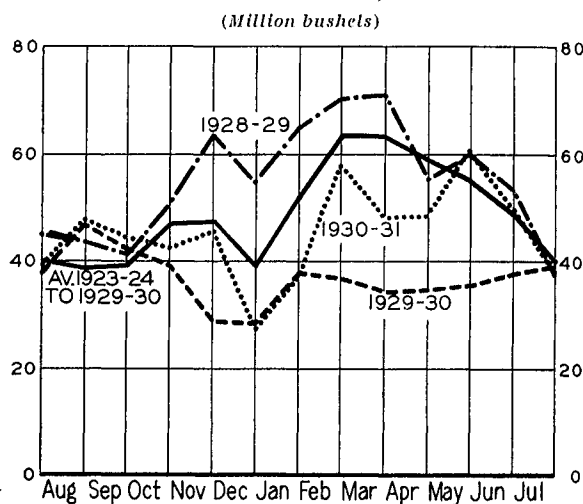
Chart 57 the visibles in ports of the United Kingdom (see pp. 141 and 143).

The unusual decline in the world visible supply in October 1930 occurred partly because visibles in North America showed less than their usual seasonal rise; because visibles afloat to Europe declined instead of rising as they usually do; and because Australian visibles showed more than their usual decline. The unusually small increase in total visibles in November and December 1930 resulted from an unusually small seasonal increase in North America and a strikingly large seasonal decline in visibles afloat to Europe; these developments were not counterbalanced by unusually large increases in visibles in Australia and in ports of the United Kingdom. The unusual increase of the total in January-February was due largely to the failure of North American visibles to decline as much as usual, and to an extraordinary increase in Australian visible supplies; a striking decline of visibles in ports of the United Kingdom was not of sufficient magnitude to offset the increase in Australia alone. The change in total visibles was about of the usual magnitude between March 1 and August 1, 1931; but distinctly less than the seasonal decline occurred in North America, and somewhat less in visibles afloat to Europe, while on the other hand Australian visibles declined much more than usual and visibles in ports of the United Kingdom a little more.

Of the several categories of the total visible supply, the stocks afloat to Europe (see Chart 54) warrant only brief comment. The movement in a given year naturally depends heavily upon variations in the quantities of wheat shipped to Europe from exporting countries, and upon the way these shipments are distributed between exporting countries close to and far from Europe. Thus the generally high level of 1928-29 and the generally low level of 1929-30 reflect the relatively large shipments to Europe in 1928-29, and the relatively small shipments in 1929-30. The position of the curve of visibles afloat in 1930-31 in relation to the average more or less resembles the relation of shipments to Europe to their average (see Chart 38, p. 115); in both series the figures for 1930-31 stood high in

relation to the averages in the early months of the year, low in the middle months, and again high in the later months. That visibles afloat were nearly as large on March 1 as on June 1, 1931, despite much heavier shipments to Europe in May than in February, reflects a higher ratio of Southern Hemisphere shipments to total shipments in February than in May.

CHART 54.—VISIBLE WHEAT SUPPLIES AFLOAT TO EUROPE, MONTHLY, AVERAGE 1923-24 TO 1929-30 AND FROM AUGUST 1, 1928*



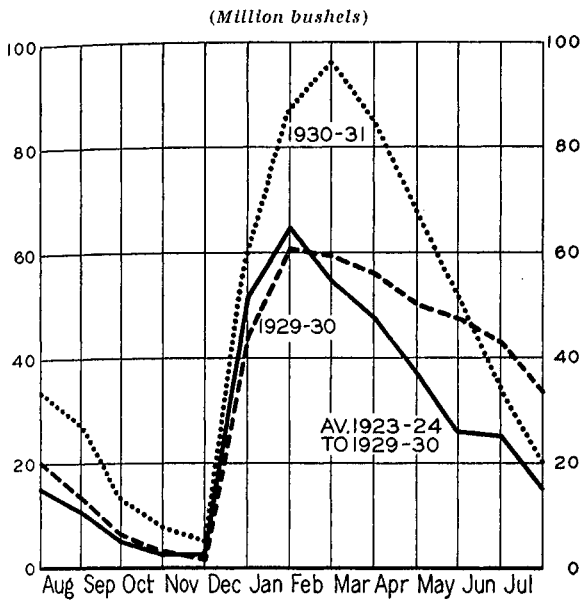
* See Appendix Table XXXIII.

The Australian wheat crop harvested late in 1930 and early in 1931 was much the largest in recent years; hence the Australian visible supply rose to an extraordinarily high level after harvest (see Chart 55). The peak came later than usual, perhaps in part merely because the crop was so large, but probably also because rainy weather retarded harvesting operations and the movement of wheat to market.¹ After March 1, 1931, the visible fell much more rapidly than usual, reflecting the rapid tempo of the export movement.² By August 1 the visible was scarcely above average, and substantially below the figure of August 1, 1930. Despite the bumper crop of 1930 and extremely low export prices, Australia disposed of a distinctly large fraction

¹ Prospects for a bounty on exports, which was authorized but for financial reasons could not be paid, were probably also a retarding factor.

² See above, p. 113.

CHART 55.—VISIBLE WHEAT SUPPLIES IN AUSTRALIA, MONTHLY, AVERAGE 1923-24 TO 1929-30 AND FROM AUGUST 1, 1929*



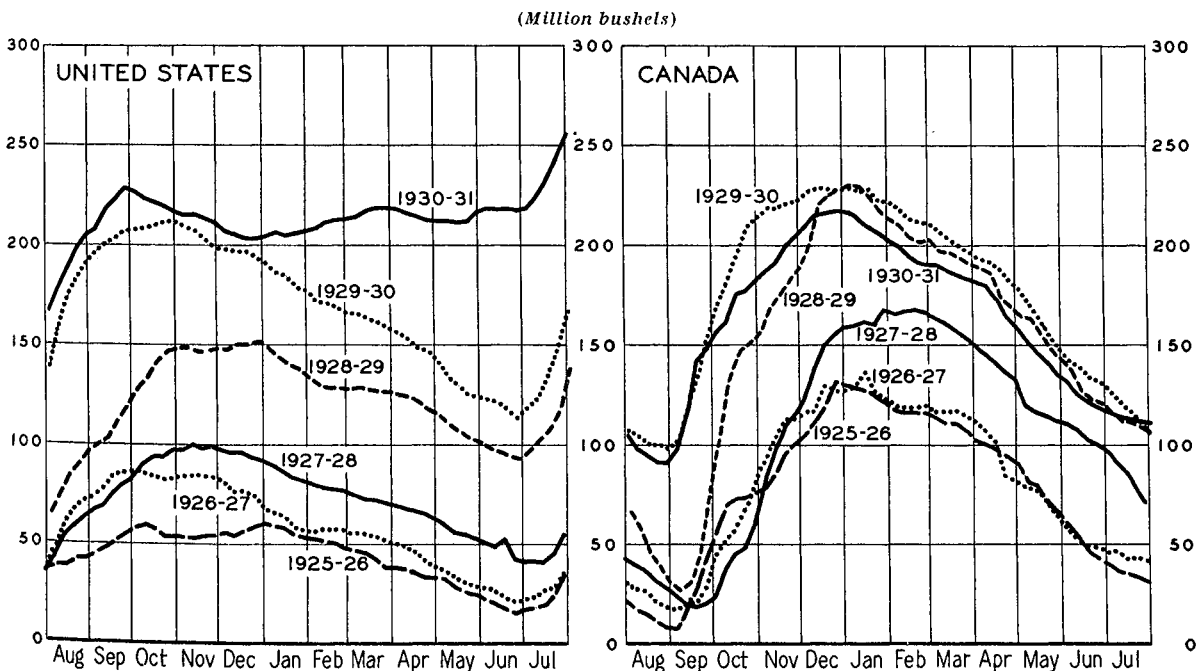
* See Appendix Table XXXIII.

of her wheat supplies; financial pressure compelled.

The movement was different in North America. Chart 56 shows weekly visible supplies of Canadian wheat both in Canada and in the United States, and of United States wheat both in the United States and in Canada.

The course of Canadian visible supplies was not, on the whole, strikingly different from what it has been in other years. To judge solely from the course of exports (see Chart 37, p. 113), one would expect rather more than the usual seasonal decline of visibles in August 1930, rather less than the seasonal rise in September, an unusual rise in November and December, an unusual decline in May 1931, and less than the usual decline in July. These features are in fact apparent so far as concerns the second half of the crop year; the decline was sharp in May, with heavy exports, and small in July with small exports. But in the early part of the year, one finds that the visible declined

CHART 56.—COMMERCIAL STOCKS OF CANADIAN AND UNITED STATES WHEAT IN NORTH AMERICA, WEEKLY FROM AUGUST 1925*



* Stocks of United States wheat represent the sum of commercial stocks of United States wheat (a) in the United States, as reported by the U.S. Department of Agriculture (Bradstreet's visible before January 1927); in Canada, as reported by the U.S. Department of Agriculture (*Canadian Grain Statistics* prior to January 1927). Stocks of Canadian wheat represent the sum, as reported in *Canadian Grain Statistics*, of (a) Canadian wheat in Canada; and (b) Canadian wheat in the United States.

rather less than usual in July, rose sharply in September, and rose less than usual in November and December. In general these developments reflect the facts that the crop of 1930 matured early and was harvested under favorable weather conditions until October, permitting a free movement to market, and that the weather in parts of October and November tended to retard marketings. It is impossible to say precisely what differences in the course of Canadian visibles in 1930-31 would have appeared if farmers had not held on farms an unusually large quantity of wheat at the end of the year, or if they had not fed unusually large quantities of merchantable wheat to animals. In the absence of these developments, other things equal, the visible supply would have increased more than it did.

The course of visible supplies of United States wheat (commercial stocks as reported by the United States Department of Agriculture) was most unusual. The fall peak came early, largely because the winter-wheat harvest was early, marketings liberal, export movement slow, and the spring-wheat harvest small.¹ But the most striking development was that visibles failed to show their usual substantial decline between early January and the end of June, and stood in late June 1931, before the new crop began to move, around 10 million bushels higher than in early January. The operations of the Grain Stabilization Corporation were clearly the major cause of this unusual development.

It is probable that, even in the absence of stabilization operations, wheat prices in the United States would have ruled too high in relation to prices elsewhere to have permitted a notably large export movement from this country, as they did in 1928-29. The maintenance of visible supplies, so far as it was due to the relatively small exports in relation to the export surplus, cannot be wholly ascribed to stabilization operations. These operations had, however, a more direct effect upon the course of visible supplies. In the second half of 1930-31, millers,

merchants, and bakers sought to operate on minimum stocks in view of a prospective price precipice, and farmers had little incentive to carry heavy stocks. The stabilizing operations caused the visible supply (wheat in terminal elevators where it could be kept in good condition) to act as a magnet drawing stocks from all other positions.

The data on visible supplies given in Chart 56 include stocks of United States wheat stored in Canada and of Canadian wheat stored in the United States. In the course of the crop year, August-July, the stocks of United States wheat in Canada increased from 4 to 23 million bushels, by far the largest figure in a decade. This increase, most of which occurred in the three months May-July 1931, presumably reflected the storage in Canadian elevators of part of the Stabilization Corporation's holdings. The shifting was doubtless made to reduce the danger of congestion of domestic storage space when the crop of 1931 came to market, and perhaps to take advantage of lower storage charges, particularly in view of prospects for a short crop in Canada. Canadian stocks in the United States, on the other hand, were reduced about 10 million bushels in the course of 1930-31, and at the end stood at the lowest July point since 1927.

The course of visible supplies in ports of the United Kingdom was also unusual in 1930-31 (see Chart 57). Much as in 1929-30, the early months of 1930-31 witnessed a striking accumulation of stocks in this position, and the later months an equally striking decline. In 1929-30 the accumulation consisted largely of Argentine wheat; in 1930-31 of Russian. The piling up of British port stocks in 1929-30 was accompanied by a decline in wheat prices, interrupted by an advance in November; and it was followed by a very steep decline in prices. In 1930-31, however, the piling up of British stocks was accompanied by a price decline but not followed by one.

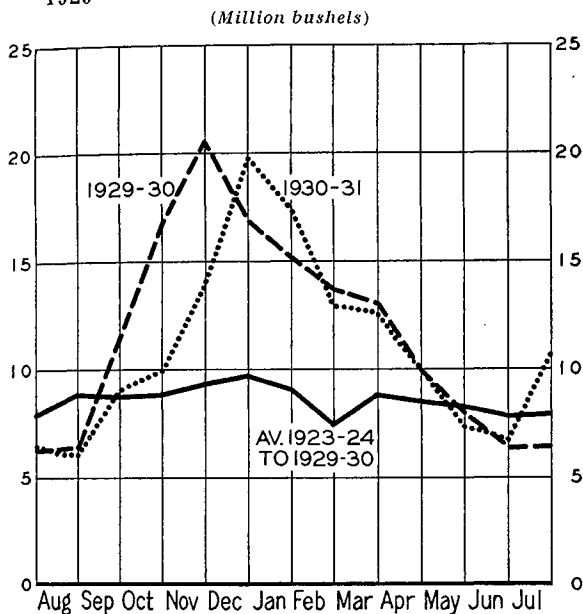
Obviously a heavy accumulation of these stocks may represent at times accumulation induced by fear of rising prices, and hence may reflect for a time active bidding for import wheat at successively higher prices. At other times it may represent the efforts of exporting countries to push wheat into

¹ In years of large spring-wheat crops, a secondary peak in receipts at primary markets often occurs in October, tending (other things equal) to keep total visible supplies at a high level, or causing them to reach a peak, in October or November.

the hands of importers even at progressively lower prices, the United Kingdom being the importing country best fitted by location and equipment to receive and hold for a time such wheat as exporting countries push out in excess of what other European importing countries will take. In any

for some time after) piled up because other importing countries chose not to take as much wheat as the exporting countries, notably Russia, chose to ship. The accumulation of stocks under these circumstances was a symptom of an unfavorable price situation.

CHART 57.—VISIBLE WHEAT SUPPLIES IN PORTS OF THE UNITED KINGDOM, MONTHLY, AVERAGE 1923-24 TO 1929-30 AND FROM AUGUST 1, 1929*



* See Appendix Table XXXIII.

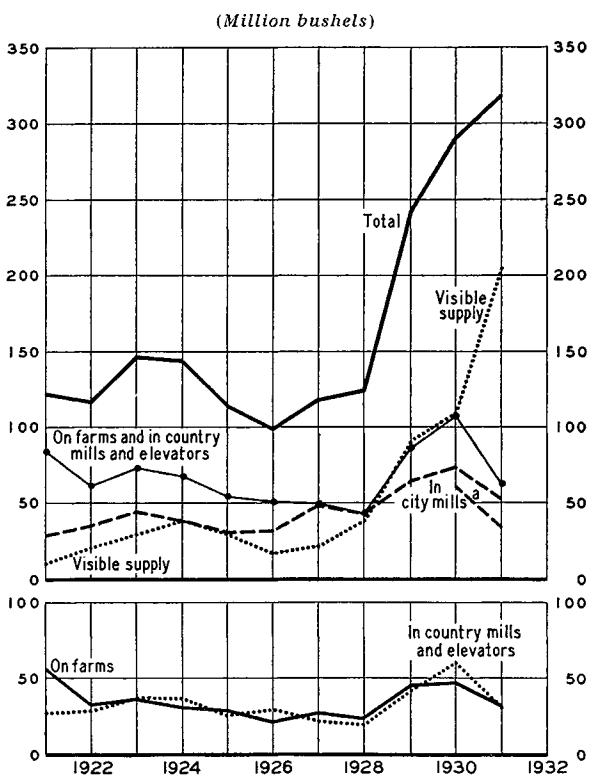
event a distinctly high level of British port stocks must be regarded as unpropitious for an advance in world wheat prices.

When these stocks are high, British importers are in a position permitting them safely to withdraw from the market for a time, as seems to have been the case in the early months of 1930,¹ or to lower their bids. In the early months of 1931 a similar withdrawal occurred, though with the effect not of depressing prices further (as in 1930) but of tending to restrain or limit an advance. It is clear that the large accumulation of British stocks in September-December 1930 could hardly have resulted from British expectations of an advance in prices in later months. The stocks (some of which were not sold before arrival or

UNITED STATES CARRYOVER, JUNE 30, 1931

As we have seen, the total of such wheat stocks as are estimated in the United States was built up in 1930-31 for the fifth successive year, and stood higher than ever before on June 30, 1931. Chart 58 shows for

CHART 58.—WHEAT CARRYOVER IN THE UNITED STATES, JULY 1, 1921-31*



* See Appendix Table XXXI.

° The lower line covers stocks owned by mills; the upper includes also stocks "stored for others."

a decade the level of and changes in year-end stocks in the several major positions. The chart lends emphasis to the facts, discussed above, that it was the supply of wheat in terminal markets (the visible) which reached a record height at the end of 1930-31, and that it was the visible that

¹ See WHEAT STUDIES, December 1930, VII, 138.

was built up in the course of the crop year. Stocks in all other positions declined, though not to really low levels.

The figures of the several series summarized in Chart 58 are not strictly comparable as between successive years. For example, the rise of 9.4 million bushels in city mill stocks in 1929-30 is due wholly to the fact that as of June 30, 1930, we include an official approximation to the quantity of wheat "stored for others" in city mills.¹ It may well be that even before the advent of the Grain Stabilization Corporation, more or less wheat was "stored for others" by mills; to the extent that such storage occurred, the figures for years prior to 1930 are understated for proper comparison with the figure of 1930 and 1931. For the first time in June 1931, the Census Bureau requested city mills to report the quantity of wheat "stored for others," and the returns (raised to 100 per cent to account for non-reporting mills) yield a figure of 18.4 million bushels. It is not yet possible to ascertain how much of (or possibly how much more than) this quantity was owned by the Grain Stabilization Corporation. The inclusion of it in a statement of the total United States carryover, however, may exaggerate both the size of city mill stocks and of the total carryover at the end of June 1931, in contrast especially with the figures for June 1929. In some degree, though probably not a significant one, the increase of stocks in the United States in the past five years, as measured by the data of Chart 58, is due to the increased inclusiveness of the statistics.²

The ownership of the outward carryover is discussed below (p. 156).

CANADIAN CARRYOVER, JULY 31, 1931³

Total year-end stocks of Canadian wheat in Canada were officially estimated at 133 million bushels, about 22 million larger than the huge stocks carried into 1930-31. On account of a reduction of stocks of Canadian wheat in the United States, however, the increase in stocks of Canadian wheat in North America was only about 12

million bushels. Among the several components of the total, stocks on farms increased about 14 million bushels, and stocks in country, private, and mill elevators about 17 million, both standing at much the highest level in post-war years. In similar positions in the United States, stocks were reduced; and the sharp contrast between developments in the two countries must be regarded as largely an effect of stabilization operations in the United States. The increase of Canadian stocks in country mills and elevators, however, was partly statistical, arising from a shift of classification; some wheat formerly reported as "in flour mills" was shifted to the category of "country, private, and mill elevators in the Western Division." The increase would appear to be not 17, but about 10 million bushels except for the shift of classification. This shift accounts also for an apparent decline of the stocks "in flour mills" from 6.9 to 1.4 million bushels. There was actually an increase of about a million bushels in stocks held by mills included in the monthly reports of mill grindings and flour output. Canadian stocks in terminal elevators were only a little higher at the end of the year than at the beginning, and stocks in transit were smaller.

The small net exports from Canada in 1930-31, the upbuilding of stocks, and the relationship of Winnipeg to Liverpool futures prices especially in the latter part of the year combine to suggest that Canadian wheat tended to be held rather strongly. If this was the reaction in Canada to unprecedentedly low wheat prices, it seems fairly certain that a similar reaction would have been observable in the United States, even in the absence of stabilization operations. In passing, it is worthy of notice that in 1930-31, with the reorganization in November 1930 of the central selling agency of the Canadian Wheat Pools, the private grain trade could not continue to attribute accumulation of Canadian wheat stocks to the operations of this organization.

SOUTHERN HEMISPHERE STOCKS, AUGUST 1, 1931

Neither official nor unofficial estimates of stocks as comprehensive or as detailed

¹ This estimated quantity was 12.5 million bushels.

² For details, see Appendix Table XXXI.

³ See Appendix Tables XXXI and XLII.

as those of the United States and Canada are available for Argentina and Australia. It is possible, however, to reach rough estimates of aggregate stocks in each country as of August 1.

As of September 12, 1931, a direct official estimate accounted for 39 million bushels in railway stations, in ports, and in flour mills of Argentina; no estimate was made of stocks on farms, but it is to be inferred from the official report¹ that an allowance of about 2 million bushels was thought sufficient to cover stocks in this and some minor positions. This official estimate seems too low, for by the middle of November about 13 million bushels had been exported, about 5 million remained in the visible in ports, about 10 million must have been used for food, and it is hardly conceivable that in mid-November only 13 million bushels remained to cover export and domestic use before the new crop was marketed. If we add to the official estimate as of September 12 the exports between August 1 and September 12 (about 9 million bushels), and allow for a reduction of something like 10 million bushels in mill stocks² between those dates, the calculation suggests stocks of about 60 million bushels as of August 1. But if the official estimate was too low, the calculation based on it probably yields too low a figure for stocks on August 1, 1931.

An unofficial direct estimate of Argentine wheat stocks in ports, in railway stations, and on farms as of about June 15-20, 1931, was published by the *Times of Argentina*.³ The estimated figure was about 82 million bushels; this does not include mill stocks. If we assume that as much wheat was held by mills on June 15-20 as on September 12 (some 19 million bushels), we may infer that total stocks in June were about 101 million bushels. Allowance for exports and domestic consumption between mid-June and August 1 (exports of about 16 million

bushels and domestic consumption of about 8 million), would point to stocks on August 1 of about 77 million bushels. If, however, we assume that mill stocks were higher on August 1 than on September 12, August 1 stocks may have been as high as 85 million bushels. We employ this figure for lack of a better; later estimates of stocks and the export statistics may warrant the use of a different one.

If stocks on August 1, 1931, approximated 85 million bushels, the level as compared with other years was moderately high, though somewhat lower than in 1928 and much lower than in 1929 after the huge crop harvested late in 1928. Stocks must also have been built up in the course of 1930-31, perhaps as much as 20 million bushels. In Argentina, however, the increase was from an average level, not a high one as in the United States and Canada. A sizable fraction of the year-end stocks not destined for domestic use was presumably of poor quality. Holding back from export wheat of poor quality in the hope that it could be sold for better prices when mixed with new-crop wheat probably constitutes the chief reason for the increase of stocks in 1930-31.

Our estimates of year-end stocks, taken in conjunction with statistics of crops and net exports and fairly reliable estimates of utilization for food and seed, at first suggest that the crop of 1930 either was used rather extensively for feed or was officially overestimated.⁴ But neither the available information nor the margin of error in the figures warrants a definite conclusion. It is possible that in Argentina some poorer stands of wheat were not thought worth cutting in view of the low price, and were used as pasture. If the grain on such fields is included in the official crop estimate, it may be that feed use of wheat would have to be described as notably heavy. If such grain was not included in the crop estimate, it may be that our estimate of August 1 stocks is too low, possibly because a fair amount was held on farms.

Not much more can be said of the size of Australian wheat stocks on August 1, 1931, than that they must approximately have equaled the exports during August-November following, plus the visible supply on

¹ See *Revista Semanal*, September 29, 1931.

² One may reasonably assume that in Argentina as in the United States, mill stocks are reduced in the second half of the country's crop year.

³ These estimates have appeared two or three times a year, in the second half of the calendar year, since June 1928.

⁴ See Appendix Table XLIII.

December 1, plus requirements for domestic consumption during August–November. The final figures necessary for this calculation are not yet available; but incomplete data suggest that stocks on August 1 were at least 40 million bushels, and perhaps somewhat larger if we assume that more remained on farms than usual. At say 45 million bushels stocks would be relatively high. Perhaps only the stocks in 1921, before war-time accumulations had been cleaned out, were larger. The relatively high stocks may be regarded mainly as a natural consequence of the record wheat crop of 1930.

Stocks of 45 million bushels on August 1, 1931, would represent a comparatively small fraction of the preceding crop. The financial stringency of farmers and the general financial weakness of Australia in 1930–31 must have militated against holding, which was more or less in evidence in the latter part of 1929–30. There was no great accumulation of stocks in the course of the Northern Hemisphere crop year 1930–31. As in Argentina, the stocks probably contained a good deal of low-quality wheat, and of course prices were very low. The relatively poor quality of the crop of 1930 suggests that utilization of wheat for feed may have been unusually heavy. Unless feeding was heavy, the statistics and estimates of disposition¹ suggest either that the official crop estimate is too high, or that our estimate of year-end stocks is too low.²

STOCKS IN RUSSIA

The Russian wheat crop of 1930 (and presumably the bread-grain crop) was huge, and likewise the supplies left available for domestic use even after deduction for heavy exports and heavy utilization for seed. The inference is immediately suggested that opportunity existed for a large accumulation of wheat stocks, perhaps to such an extent that year-end stocks could

have been the largest in a decade. At the London Wheat Conference held in May 1931 the official Russian delegate, Mr. Lubimoff, spoke of a wheat crop in 1930 of 1,084 million bushels; "consumption within the country" of 860 million bushels, and a "surplus of last year's harvest" of 224 million. It would be possible to interpret these statements to mean that since exports have approximated 110 million bushels, year-end stocks on August 1, 1931, were larger (by about 114 million bushels) than were the stocks on August 1, 1930. We take it, however, that Mr. Lubimoff was speaking of a theoretical or statistical surplus, obtained by subtracting what must be an exceedingly rough estimate of consumption from a more precise estimate of the crop. For reasons set forth above, we are disposed to believe that wheat stocks were to some extent accumulated in 1930–31;³ yet we find difficulty in supposing that the accumulation could have amounted to as much as 114 million bushels—that is, about as much as the exports. The evidence which suggests that stocks were built up does not seem to us to imply an accumulation amounting to over 10 per cent of the harvested wheat crop. Nevertheless it would not be unreasonable to suppose that the level of Russian wheat stocks at the end of 1930–31 was quite as high as in any other post-war year, perhaps higher; and it was almost certainly higher than in August of the two preceding years.

STOCKS IN MINOR EXPORTING COUNTRIES

Specific evidence both as to the absolute levels and the changes during 1930–31 in year-end stocks of countries other than the four major non-European exporters is decidedly scanty. As was pointed out above,⁴ the most tangible evidence is provided by statistics of apparent domestic utilization⁵ (crops plus net imports or minus net exports) and of net retention (apparent domestic utilization minus estimated seed requirements). In so far as it is possible to estimate for any country the quantities utilized for food, feed, industry, and waste, it is also possible to adjudge roughly what must have been the changes in stocks, or at least the direction of change; and im-

¹ See Appendix Table XLIV.

² In Australia as in Argentina, some stands of wheat may not have been harvested, and it is difficult to say how this affects the statistics of disposition.

³ See above, pp. 135–36.

⁴ See p. 128.

⁵ See Appendix Table XXXVI.

pressions obtained from statistical analysis of this sort may be confirmed or called into question by reference to the comments of traders and to statistical evidence that has at least an indirect bearing. A series of charts presented in the preceding section gives our rough estimates of wheat consumption;¹ the accompanying text contains comments upon the stocks position; and we have already considered the probable size and direction of change of year-end stocks in the minor exporting countries as a group and in the European importing countries as a group. Here we need only consider certain details.

Table 3 is inserted in order to provide a clearer idea of the procedure involved in estimating stocks in the minor exporters as a group and severally, and to illustrate how the stocks position differed as between countries. For all countries we employ statistics of net retention and estimates of consumption in August–July crop years. This is of course an arbitrary procedure, followed only because it seems desirable to try to secure as generalized a notion as possible of the world stocks position at the end of what is called the Northern Hemisphere crop year, August–July. The Indian wheat crop year is not August–July, but April–March; the crop year in northern Africa is June–May; the Danubian crop year is July–June. To employ the net wheat retention statistics and estimates of consumption as of these crop years would doubtless be the preferable procedure if one sought specifically to estimate the quantities of old-crop wheat retained by each country at the end of its proper crop year, but not to evaluate the world stocks position at the end of the Northern Hemisphere crop year. The use of the Northern Hemisphere crop year obviously introduces an element of artificiality into the picture of the stocks position in every country whose proper crop year is not August–July; but this artificiality seems unavoidable if a generalized evaluation of the world stocks position is to be attempted at any given date whatever.

For what they may be worth, our estimates of year-end stocks in several minor exporting countries are shown in Table 3.

The method of estimation essentially involves an attempt to measure deviations of stocks from a minimum; it is for this reason that for some countries the table shows stocks to have been zero in some years. Since the estimates must be taken as attempts to represent stocks of wheat in all forms and positions, stocks could not fall to zero in any country, and we have therefore allowed roughly for minimum stocks. The allowances, needless to say, are arbitrary; and for this reason less confidence can be placed in the absolute levels of stocks as estimated than in changes in level or in comparative levels as between different years.

TABLE 3.—ESTIMATED WHEAT STOCKS IN THE MINOR EXPORTING COUNTRIES, AUGUST 1, 1927–31*

(Million bushels)

Country	1927	1928	1929	1930	1931
India	4	4	0	0	47
Hungary	1	0	18	5	11
Jugo-Slavia	14	4	19	13	8
Bulgaria	2	2	9	0	8
Roumania	9	0	10	7	16
Northern Africa ^a ..	7	3	11	14	0
Allowance for minimum stocks ^b ...	30	30	30	30	30
Total	67	43	97	69	120

* Based mainly upon the differences between net domestic retention (crops minus net exports or plus net imports minus estimated seed requirements) and estimated consumption.

^a Algeria, Morocco, Tunis, Egypt. Trade statistics of Morocco partially estimated.

^b Roughly 5 per cent of average annual domestic net retention of wheat over the period 1920–21 to 1930–31.

If the figures are at all well founded, the main conclusion is that aggregate stocks in the minor exporting countries stood at a very high level at the end of 1930–31, and increased greatly in the course of the crop year. The increase may possibly have been as large as the increase of stocks in North America—probably larger if we have overestimated consumption in the minor exporting countries, but probably smaller if we have underestimated consumption. By countries, the level of stocks at the end of 1930–31 in contrast with earlier years appears especially high in India and Rouma-

¹ See Charts 46–50, pp. 129–34.

nia, and low in northern Africa. Jugoslavia and the northern African countries alone seem to have reduced their stocks in the course of the year. The relatively high level in the Danubian countries as a group seems to be confirmed by the exceptionally heavy shipments from that area in August-November 1931. India, however, has shown no evidence of disposing of accumulated stocks, and it may be that subsequent developments will warrant the inference that the huge crop of 1930 passed more largely into current consumption and less into stock-building than our present estimates suggest.

STOCKS IN EUROPEAN IMPORTING COUNTRIES

We have already noted (see above, p. 138) that combined wheat stocks afloat to Europe and in Europe excluding the Danube basin and Russia appear to have stood at the lowest level in about six years at the end of 1930-31. In contrast, stocks in North America, Argentina, Australia, India, the Danube countries as a group, and probably Russia stood at either their highest post-war level or at levels not far below the highest. European governmental regulations were of outstanding importance in causing the generally low level of stocks available to European importing countries, and hence in causing further accumulation of stocks in exporting countries.

The stocks position was very different, however, as between the several European importing countries. Table 4, the figures of which are subject to all of the qualifications applicable to our estimates of stocks in the minor exporting countries, gives a more detailed picture of the European position. Stocks were increased from a moderate level to a high one in the British Isles, Poland, and the group including Belgium, Holland, and Switzerland. Direct estimates of British port stocks also indicate both a high level of British stocks at the end of the year and an increase within the year.¹ As of the middle of July, reported stocks in

Antwerp, Rotterdam, and Amsterdam stood appreciably higher in 1931 than in 1930,² so that our evaluation of the position in Belgium, Holland, and Switzerland is partially confirmed. In France big initial stocks, built up from the huge crop of 1930, were reduced to distinctly small ones as a result of the tariff and the governmental regulations of milling; although no direct estimates of stocks are available, the main

TABLE 4.—ESTIMATED WHEAT STOCKS IN EUROPEAN IMPORTING COUNTRIES, AUGUST 1, 1927-31*

(Million bushels)

Country	1927	1928	1929	1930	1931
British Isles	8	19	10	6	18
France	16	3	20	32	0
Germany	1	16	30	5	0
Italy	25	8	23	24	12
Belgium, Holland, Switzerland	0	7	9	5	10
Austria, Czecho-Slovakia	0	5	7	6	3
Spain	15	15	7	14	10
Poland	0	7	3	1	10
Others ^a	4	6	10	5	5
Allowance for minimum stocks ^b	75	75	75	75	75
Total	144	161	194	173	143

* Based mainly upon the differences between net domestic retention (crops plus net imports minus estimated seed requirements) and estimated consumption.

^a Denmark, Norway, Sweden, Finland, Estonia, Latvia, Lithuania, Greece.

^b Roughly 5 per cent of annual average domestic net retention of wheat over the period 1920-21 to 1930-31.

facts are recognized by all observers. It was probably in France that the largest reduction of stocks occurred in 1930-31. In Italy, Spain, and Austria and Czecho-Slovakia together, reduction of stocks probably occurred in 1930-31, but perhaps from a high level to a moderate one; the facts are somewhat obscure. In Germany reduction occurred from a rather low level to a distinctly low one, as is attested by estimates of wheat stocks on German farms and of wheat and flour stocks in Berlin,³ as well as by the opinions of observers. In other countries as a group, stocks were probably neither strikingly low nor strikingly high at the end of 1930-31, and there was probably not much change in the course of the year.

¹ See Appendix Table XXXIII.

² See *World Wheat Prospects*, September 3, 1931, p. 29. The figures were 2.06 million bushels in 1930 and 3.15 million in 1931.

³ *Ibid.*, p. 29. Estimated year-end stocks in Hamburg, however, were larger in 1931 than in 1930.

VI. STABILIZATION OPERATIONS IN THE UNITED STATES

In 1929-30 the loan policies of the Federal Farm Board, and subsequent supporting purchases of wheat by the Farmers National Grain Corporation and the Grain Stabilization Corporation under the Board's auspices, were significant factors in the wheat situation in this country and, to some extent, in the world at large.¹ In 1930-31 stabilization operations under the Board's control were of far greater importance.

The price-pegging policy pursued in 1930-31 was quite in contrast with the stabilization policy pursued in 1929-30. It is true that the policy of lending to co-operatives on a fixed basis, and subsequent purchases on that basis by the Farmers National Grain Corporation, suggested price pegging. But the Grain Stabilization Corporation, when it entered upon the policy of supporting the market in February and March 1930, bought at the market, and undertook to cushion price declines instead of to stand under the entire market. The operations in 1929-30 were less extensive geographically as well. The 1930-31 operations represent a major economic experiment, different in principle and practice from previous examples in this country and most examples abroad, at least in time of peace. The distinction is made clear by the chart of grain stabilization holdings reproduced on page 164 below.

In view of the importance of the innovation of a pegged price in times of peace, the announcements of the Farm Board were meager. The objectives of the operation were not fully set forth until months after it was instituted. The duration of the stabilization was not initially announced. The operative steps were not announced in detail. The policy on export sales was not formulated early. The action was evidently undertaken to meet circumstances regarded

as an emergency. All of the problems to be encountered could not possibly be foreseen. As conditions developed unfavorably in world markets the difficulties multiplied. In the matter of publicity, the policy was distinctly one of reserve.² Only recently, with the publication of the *Second Annual Report of the Federal Farm Board*, and with hearings before the Senate Committee on Agriculture and Forestry, have certain important details been made public.

The Board's *Report*, released on November 24, 1931, is by no means an exhaustive document. Nevertheless, the section devoted to the stabilization of the wheat price enables the commentator to go more deeply into the subject than was previously possible on the basis of official pronouncements and the observations of the trade. Some additional information was disclosed in testimony before the Senate Committee on November 24, 25, and 27. Certain important statistical data, in particular, are now publicly available. The future historian will desire considerably more official information; and it is explicitly recognized in the *Report* that only a limited appraisal is possible until the lapse of another crop year.

SUMMARY OF OPERATIONS

The stabilization operations of 1930-31 may be summarized briefly as follows:

1. The Grain Stabilization Corporation held off the market over 65 million bushels of wheat and futures, which remained on June 30 as a net balance from its operations in 1929-30. The Corporation sought to arrange the position of these holdings in such manner as to minimize congestion during the period of heavy movement of the oncoming crop.

2. In the summer of 1930 the Federal Farm Board resisted much pressure to have it authorize extensive purchases of new wheat to support the market.

3. In September and October the trade observers occasionally ascribed firmness in the market to purchases by the Farm Board or its "subsidiaries." According to the *Report*, price-supporting purchases of futures were begun by the Grain Stabilization Cor-

¹ See WHEAT STUDIES, December 1930, VII, No. 2, especially pp. 145-64.

² The reasons which led the Board to authorize stabilization operations in mid-November 1930 had to be gleaned, in advance of the issuance of the *Second Annual Report*, from four principal sources: Chairman Legge's brief announcement of November 16, 1930; Member Teague's Boston address of December 8, 1930; Chairman Stone's address in Hutchinson, Kansas, on March 25, 1931; and President Milnor's statement of May 29, 1931.

poration in mid-August, and continued through September and October, apparently to the extent of approximately 40 million bushels.

4. In mid-November, however, in the midst of severe price declines to new low levels which the Board regarded as creating a grave emergency, it embarked upon formal stabilization purchases on a large scale. Though the character of the stabilization policy was not announced at the outset, in December it was made clear that the intention was to maintain a stabilized level of prices until the new crop year opened.

5. The procedure shortly developed was to buy sufficient futures to maintain minimum prices in the various futures markets, to take deliveries on these futures, and to make supplementary purchases of cash wheat so as to make such support of futures markets effective on cash markets.

6. Sales of futures and of cash wheat were made, to an extent not publicly known, in such a way that no severe "squeezes" occurred, but not so as to prevent occasional significant advances in futures prices above the pegged levels.

7. On February 26, 1931, the Stabilization Corporation announced that it would endeavor to sell for export, for the best prices obtainable, by July 1, 1931, some 35 million bushels of wheat that were "out of position" at the seaboard. Apparently some of this wheat was sold direct, some to or through private exporters; the amount thus sold was a little over 21 million bushels.

8. The Stabilization Corporation set up a plan for sale of wheat to millers for export of flour, under which some 9 million bushels of wheat were exported in the state of flour.

9. On March 23, 1931, the Board announced that the policy of stabilizing prices would continue to the end of the old-crop movement, but that stabilization purchases would not be made from the 1931 crop.

10. Extensive deliveries on May futures, preceded by smaller deliveries on December and March futures, were accepted with avoidance of congestion of physical facilities in terminal markets. Purchases of cash wheat were continued after the end of May in certain markets at least, but such purchases ceased as the new-crop wheat moved

to market in considerable volume toward the end of June.

11. Stabilization supplies were again, as in 1930, shifted to avoid congestion as new wheat moved to market, and it is to be inferred that increased stocks of United States grain in Canada largely represented stabilization wheat.

12. In its statement of March 23 the Board announced that, in the new crop year, "stabilization supplies of wheat will be handled in such a way as [the Board thought] to impose the minimum of burden upon domestic and world prices." In practice, domestic sales were limited, and were not made in the Southwest in competition with wheat of the new crop in June and July.

13. On June 30, 1931, in response to insistent demands for a more definite statement of policy, and after great pressure had been exerted to have the Board announce complete withholding of stabilization stocks, either until July 1, 1932, or at least until a certain price might be reached, the Board announced that sales of stabilization wheat during 1931-32 would be limited to 5 million bushels a month, exclusive of sales to foreign governments or their agencies which were under consideration on that date, except in the case of radical change in the wheat situation.

14. Total purchases, apparently including those of 1929-30, were 330 million bushels, taken at an average price of 81.97 cents per bushel. Sales over the whole period ending June 30, 1931, were 73 million bushels. At that time the Grain Stabilization Corporation owned 257 million bushels of wheat. The total carryover within the United States was 319 million bushels; an additional 15 million bushels of United States wheat was stored in Canada; hence some 77 per cent of the total carryover of United States wheat in this country and Canada was in official hands. The wheat on farms and in official hands may have been around 90 per cent of the outward carryover.

REASONS FOR STABILIZATION

Chairman Legge of the Federal Farm Board issued on November 16, 1930, the

following brief statement on the inauguration of major stabilization operations:

Demoralization in world grain markets has made it necessary for the Grain Stabilization Corporation to again enter the wheat market in order to stop panicky selling and to prevent further unwarranted declines in domestic prices. Comparatively wheat is lower in price than other agricultural commodities. The price of flour fully reflects the price of wheat which no doubt is increasing the per capita consumption. While the visible supply of wheat is large, there is no congestion in any of the terminal markets. Receipts at primary markets are unusually light, which suggests the extent to which farm stocks are being used for feeding purposes. Further price declines would be in sympathy with foreign markets and not justified by domestic conditions.

In the *Report* are given a number of factors bearing on the policy. The early prices of the crop were disappointing, wheat was evidently accumulating abroad, and importing countries were restricting imports. The disaster to the corn crop was regarded by the Board as threatening an acute feed shortage which could be met only by heavy feeding of wheat. Support was first given on account of the heavy decline in wheat prices despite the short corn crop. The exports of other countries, especially Russia, were heavy. Importers declined to accumulate stocks and congestion of wheat appeared on the water and in European ports. These various influences led to pronounced weakness of the world price, reacting on the domestic price. Financial weakness supervened, credit became scarce, loans were imperiled, co-operatives and banks were endangered, banking and mercantile stability were involved. Drastic action was regarded as imperative if our markets were to be saved from collapse with the world market. Formal stabilization was thereupon instituted.

The reasons for the pegging of the wheat price were evidently several. A major one (and, we believe, the compelling reason) was the desire to stabilize credit and check panic in the wheat belts. A second was the desire to protect the American market from foreign influences. A third was the feeling that stabilization of price of wheat would yield to wheat growers a substantial increase from an otherwise low and unremunerative price. A fourth was the hope

that pegging the wheat price would have a favorable influence on the prices of other grains. Lastly, it was felt that industry as well as agriculture stood to gain from a stabilization of credit and a checking of demoralization in the marketing of so prominent a crop as wheat. Here is obviously a mixture of price stabilization and credit stabilization. We have previously expressed the view that the stabilized wheat price was primarily a credit measure and is to be judged by what it accomplished in the field of credit more than by what it accomplished in net gain in the farm price of wheat.

EFFECT OF STABILIZATION ON COURSE AND RELATIONSHIPS OF DOMESTIC PRICES

In retrospect, it is clear that operations for drought relief carried on with the cooperation of the Farmers' National Grain Corporation and purchases of futures during August-October had some effect in supporting prices in the United States.¹ The *Report*, however, does not stress this influence.

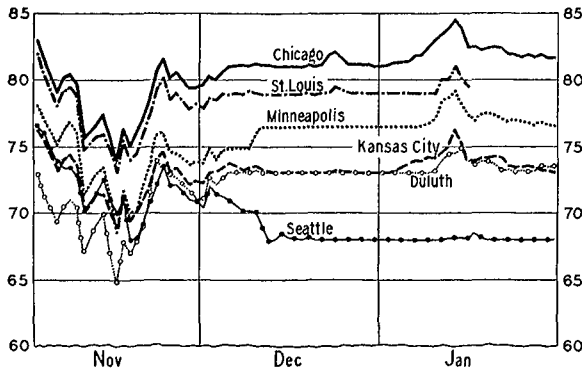
Chart 24 (p. 99) shows how the descent of futures prices was abruptly checked in mid-November. Prices of all futures fell to low levels on November 10. Supporting purchases, of December futures at least, were probably quietly made during that week. The December future closed relatively firm when, on November 15, March and May futures dropped to new low levels in all markets. On November 16 the Chairman of the Federal Farm Board acknowledged the inauguration of formal stabilization operations.

In the following week futures prices advanced sharply, not merely because of purchases by the Grain Stabilization Corporation, but because shorts hastened to cover. Prices of May futures, which had closed at 73.9 cents on November 15, closed at 80.6 cents on November 22, and higher still on November 24. A somewhat corresponding advance in May futures occurred in other markets, as shown by Chart 59. In the following week there was a moderate decline, but most or all of this was recovered in the

¹ See above, p. 86.

first week of December. The only exception was the markets of the Pacific Northwest, where stabilization was not made effective until December 12 or 13, and then at a level about equal to the low point of November 18.

CHART 59.—CLOSING PRICES OF MAY FUTURES IN SIX UNITED STATES MARKETS, NOVEMBER—JANUARY 1930-31*
(Cents per bushel)



* Prices in Chicago (old style contract) are from the *Daily Trade Bulletin*; Minneapolis prices from the *Daily Market Record*; Kansas City prices from the *Grain Market Review*; Duluth prices from the *Daily Trade Bulletin*, Chicago, and the *Chicago Journal of Commerce*; Seattle prices from the *Commercial Review*, Portland.

President Milnor of the Grain Stabilization Corporation, in a statement issued May 29, 1931, described the level at which prices were pegged as follows:¹

... Since that time [November 24, 1930] such purchases as were necessary have been made in order to maintain the minimum price of 81 cents in Chicago, and corresponding prices in other principal markets; for example, 73 cents in Kansas City, 76½ cents in Minneapolis, etc.

The price of cash wheat has been maintained on a comparative level with the futures

In effect, futures prices were "pegged," by the process of taking all futures offered at certain minimum levels. These evidently were, for May futures, as follows in cents per bushel:

Chicago	81	(old basis)
Minneapolis	76½	
Kansas City	73	
Duluth	73	
St. Louis	79	
Seattle }	68	(bulk basis)
Portland }	71	(sacked basis)

¹ Here quoted from *Wheat Growers' Journal*, Kansas City, Missouri, June 5, 1931.

Cash purchases were also made, in order to supplement the support of the futures markets in holding up prices in the country; but to what extent, and on precisely what basis, public information does not yet disclose.

In short, the Grain Stabilization Corporation maintained the pegged price in three ways. First, by purchase of futures, largely in Chicago, in the December and March, but especially in the May contract. Second, the Grain Stabilization Corporation made heavy purchases of cash wheat, especially in the Southwest. Whenever, for one reason or another, the cash price lagged behind the futures prices, cash wheat had to be purchased to make good the pegged price to the grower. Wheat was purchased both from growers and from grain dealers. Third, the Grain Stabilization Corporation (it is to be inferred) took over wheat from the Farmers National Grain Corporation to an extent which, again, is not a matter of public record.

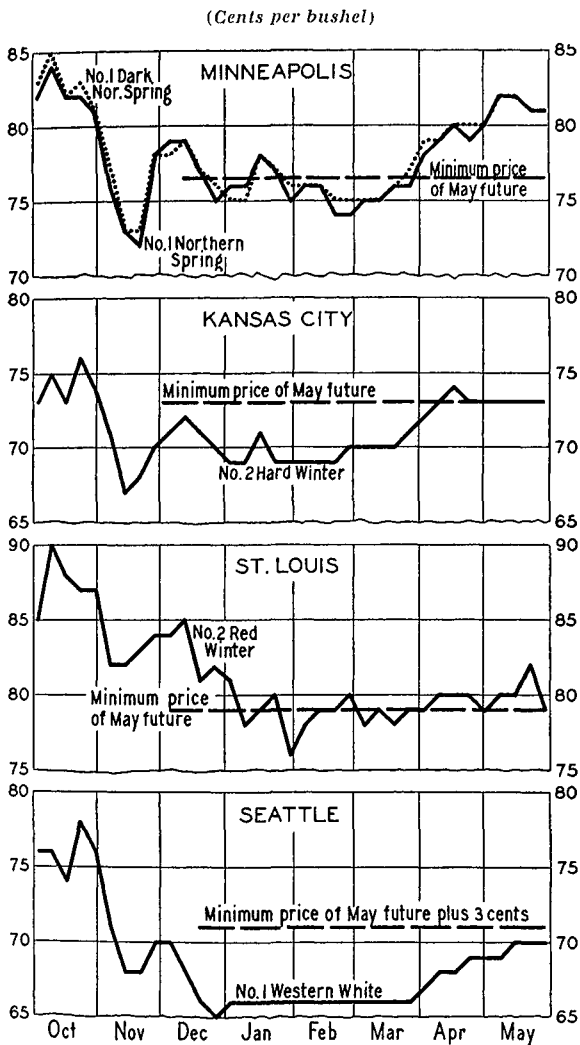
Sales of futures and of cash wheat were presumably made during the period of support of the market, and in such amounts as to prevent the occurrence of severe squeezes as more and more of the available supplies of contracts and actual wheat came into possession of the Stabilization Corporation. Yet sales were not made with sufficient freedom to prevent occasional temporary advances in the futures, as for example, in January 1931. The new basis contracts in May futures, on which more limited grades were deliverable without discount, commanded higher prices than old May contracts.

Some idea of the extent to which the support of the futures market, supplemented by cash purchases, was effective in prices of cash grain, is afforded by Chart 60. This chart shows that prices of No. 2 Hard Winter in Kansas City stood 4 cents below the pegged price of the May future through most of January and February and 3 cents below in most of March. Beginning late in March, however, the price rose until from early in April until after the middle of June the price was practically the same as the minimum price of the May future, and in two individual weeks slightly above it.

Prices of hard spring wheats were simi-

larly maintained, and strengthened well in advance of the end of May, but prices of No. 1 Northern and No. 1 Dark Northern dropped appreciably in the first two weeks of June, while hard winters were held up.

CHART 60.—WEIGHTED AVERAGE PRICES OF REPRESENTATIVE WHEATS, WEEKLY, SEPTEMBER 1930 TO JULY 1931, IN COMPARISON WITH MINIMUM (STABILIZATION) PRICES OF MAY FUTURES*



* Weekly average data from *Crops and Markets* and *Foreign Crops and Markets*.

No. 2 Red Winter at St. Louis held closer to the minimum prices of the May future and was even above it part of the time; but the stabilized prices were lower in relation to those of October and the lows of Novem-

ber than was true in the cases of hard winter and hard spring wheats.

The cash prices of No. 1 Western White, Seattle, ruled for several months 5 cents below the minimum prices of the Seattle May future, expressed on a sacked wheat basis, and like soft red winter wheat considerably below the October level or the lows of mid-November. Beginning in April, however, prices of Western White advanced until through most of May it was selling within 1 cent of the stabilized futures price.

Abandonment of market support seems to have occurred at different times in the case of different markets. The course of cash and futures prices makes it appear that the Seattle market was not supported after the end of May; that the support of the Minneapolis and St. Louis markets was interrupted after the end of May but temporarily resumed, in some form at least, late in June; and that the support of hard winters in Kansas City was continued until about June 19. (See Chart 25, p. 101.)

The stabilization of wheat markets all over the country necessarily required somewhat arbitrary decisions as to the relative levels at which prices would be stabilized. Apparently no explanation has been given of the reasons for the choice of the various levels. It would require extensive investigation to show to what extent premiums and discounts on premium and discount wheats were maintained or modified in the course of stabilization operations. There is some reason for believing that in effect, though possibly not in intention, relatively less support was given, in some cases at least, to premium wheats than to contract and discount wheats.

Monthly average prices¹ of representative wheats in certain months of 1930-31, before and during the stabilization period, are shown below, in cents per bushel. The tabulation suggests that the price support given by stabilization operations was somewhat more substantial on hard winter, hard spring, and durum wheats than on soft red winter and western white wheats,

¹ From *Crops and Markets*, except figures for No. 1 Western White, which are averages of weekly data in *Foreign Crops and Markets*.

and was least substantial in the Pacific Northwest.

Month	No. 1 North- ern Spring Minn- neapolis	No. 2 Amber Durum Minn- neapolis	No. 2 Hard Winter Kansas City	No. 2 Red Winter St. Louis	No. 1 West- ern White Seattle
September ..	87	79	78	88	79
October	82	78	74	87	76
January	76	72	69	78	66
March	76	72	70	78	66
May	81	77	73	79	70

INFLUENCE OF STABILIZED PRICE ON FARM MARKETINGS AND STOCKS

The influence of stabilized prices on farm marketing and stocks may be adjudged only roughly by reference to the available statistics. The most precise data—percentages of the crop marketed monthly, as reported by about 3,500 mills and elevators—are not yet available. Statistics of monthly wheat receipts at primary markets¹ (themselves not inclusive of all areas and reflecting the facts best for the spring-wheat belt) suggest that in August and September, 1930, marketing was heavy. In October, again before price-pegging occurred, receipts at primary markets were strikingly small. November and December may be classified as months of moderately small receipts. But during January–June, primary receipts were rather heavy. It does not appear likely that the more precise figures on marketing from farms will show, when they appear, that a very much larger percentage of the crop was marketed in November–June 1930–31 than in other years, though the contrast was in this direction. In any event, the usual marketing statistics will throw little light upon the course that farmers chose to follow in different regions and different states.

Different farmers would doubtless react differently to the pegged price of wheat. Some would be influenced to market rapidly, expecting no higher price later and having use for the money. Others might be influenced to the contrary—since a lower price was not to be feared, marketing might be deferred until most convenient. But farmers reasoning in each direction would probably agree that maximum marketing

of wheat should be carried out before the end of the crop year, since there was no promise of a pegged price for the new crop year and the world price seemed sure to be low.

Farm stocks of wheat are reported for March 1 and July 1. On March 1, 1931, the wheat on farms was reported as over 160 million bushels, nearly 19 per cent of the crop. This was 40 million bushels higher than the year before. Over the past ten years the wheat on farms on March 1 averaged 17 per cent of the crop. Since receipts at primary markets were relatively large in January–March, there is evidence of some stimulus to the movement from farms.

On July 1, wheat on farms was reported as only 32 million bushels. The ten-year average was 47 million bushels; but in three of these ten years the amount of wheat on farms was lower than on July 1, 1931, the lowest being 21 million bushels on July 1, 1926. It may therefore be inferred that the stabilized price stimulated farm marketing especially during the last three months of the crop year, and the statistics of primary receipts support the inference. But the reported carryover on farms does not indicate that farmers made an unprecedented cleaning of the bins to avoid the effect of an expected lower price in the new crop year. In our view, a large meaning is not to be attached to a variation of 10 or 20 million bushels of wheat, more or less, remaining on farms on July 1, for a larger or lesser retention of wheat by growers may be influenced by considerations of quality as well as of price. Under the circumstances, however, it is reasonable to conclude that farm stocks at the end of the year were a good deal smaller, and marketings within the year larger, than would have occurred in the absence of a pegged wheat price.

INFLUENCE OF STABILIZED PRICE ON INDEPENDENT MERCHANTS

On the day when the wheat price was pegged the independent merchants possessed certain stocks of wheat, presumably largely hedged. With the promise of a stabilized price only on the 1930 crop and

¹ See Appendix Table XIX.

the prospect of a sharp decline to the world price directly after that date, the task of independent dealers was to merchandise their wheat as profitably as possible until the close of the crop year, without being caught with any wheat on their hands when the new crop with lower price arrived. Since the customary protection by hedging was not available (having been suspended by the pegged price), the cash wheat merchants had to face their risks with a different technique. This implied the gradual transfer of operations of buying and selling to something resembling a hand-to-mouth basis. The Grain Stabilization Corporation, which was supporting the price largely through purchase of futures, would accept delivery at the close of the May option, and the millers had to grind throughout the year. Therefore, the independent dealers expected to dispose of their wheat to the Stabilization Corporation and to the mills and to be practically out of the market during June, except for new-crop wheat.

If the Stabilization Corporation's holdings of 257 million bushels (around 247, perhaps, within the United States) were solely of physical wheat and not of futures, it would follow that the private trade divested itself of ownership in wheat to an unprecedented extent. Of the total carry-over of 319 million bushels, there would be left, aside from wheat owned by the Corporation and wheat on farms, only 40 million bushels. But since city mills reported about 36 million bushels owned, and some wheat reported in country mills and elevators and even in the visible may have been owned by farmers and/or dealers, it is possible that a part of the Corporation's holdings were futures. The differentiation is not made in the Board's *Annual Report*. In any event the private trade must have held very little.

In consequence of the attraction of wheat into visible positions and its concentration in storage facilities, stabilization operations proved, for the time being, distinctly advantageous to owners of storage space. Not only were the usual facilities well filled, and presumably at profitable rates, but facilities not ordinarily used for wheat were in some cases made available for this purpose. Owners of storage space enjoyed ad-

vantages which more than offset the decrease in stocks of corn following the short corn crop of 1930.

EFFECT ON SPECULATORS AND BROKERS

The stabilization of prices in November 1930 undoubtedly caught short a good many speculators whom events later proved to be right in the bearish position which they had taken. At the same time, it saved a body of long speculators from considerable losses that they would have incurred if the price descent had continued.

During the period of stabilized prices there was little incentive for speculation in old crop positions. While futures prices were not absolutely fixed, they were permitted to fluctuate only within comparatively narrow limits, and speculators could not operate with their usual freedom. Even speculation in the July futures was rendered more risky than usual by reason of the uncertainty as to the freedom with which wheat would be available for delivery on those futures. Indeed, speculation in September and December futures was not altogether without dangers, since it could not be confidently assumed, after the Board's reversal of its position in November 1930, that it would adhere to the announced decision not to authorize stabilization purchases from the crop of 1931.

The business of commission houses was undoubtedly injured by these factors which effectually limited the volume of speculation in wheat. Their wheat business was by no means completely annihilated, for a considerable number of trades were necessitated by stabilization operations themselves. Comparative statistics, given in Appendix Table XXXVII, show how the volume of trading shrank after November 1930. Yet on the whole wheat trading in United States futures markets was heavier in December-May 1930-31 than in the corresponding period of 1923-24, when market prices were unusually stable.

EFFECT ON VISIBLE SUPPLIES AND CARRYOVERS

The effect of stabilization operations was to maintain and even increase the visible supply of wheat, preventing the decline

which ordinarily sets in after January 1 or even earlier (see Chart 56, p. 141). The stabilized price level, in the face of the price outlook, proved attractive to sellers and not to buyers. Stocks of wheat piled up in terminal markets for delivery on futures contracts and were taken over by the Stabilization Corporation; and it also purchased cash wheat which it had no opportunity to sell for the time being. Had larger terminal facilities been available, visible supplies would probably have been still larger, for it is to be inferred that stabilization wheat was in part stored with mills and in country elevators because sufficient terminal elevator space was either not available or could not be used without interfering with the movement of the new crop.

The volume of total wheat grain carryover was unquestionably increased in consequence of stabilization operations. Exports of wheat and flour, mill grinding into flour for domestic consumption, and to some extent feeding of wheat to livestock were reduced. There was a corresponding increase in the stocks of wheat grain carried over into the new crop year. No one can make a safe estimate of the extent of the increase that was due solely to stabilization operations. In the absence of stabilization operations it is probable that the United States carryover on June 30, 1931, would have been smaller than on June 30, 1930, instead of larger; but by how much we do not venture to estimate.

The distribution of the carryover was also greatly modified by stabilization operations. Visible supplies were materially increased, farm stocks were reduced, and stocks owned by mills in mill storage were materially reduced.¹ How much the physical stocks in country mills and elevators and in city mills were actually different from what they would otherwise have been cannot be stated.

It is a striking fact, to which attention has already been called (see above, p. 144), that in Canada farm stocks were at record high levels at the end of the year, whereas

in the United States they were at moderately low levels; that city mill stocks were high in Canada while stocks owned by city mills were unusually low in the United States; and that visibles decreased in Canada, whereas they increased greatly in the United States.² It seems probable that something like what happened in Canada would have happened in the United States had no stabilization operations been undertaken, though the visible supply might have been higher than at the beginning of the crop year.

EFFECT ON EXPORTS AND EXPORTERS

Stabilization operations were important in curtailing our exports of wheat grain and flour milled from domestic wheat. For the year as a whole, in spite of a moderately heavy movement in July-August 1930, both exports of wheat grain and net exports of wheat and flour were the smallest of any year since the war except 1925-26.³ In the light of conditions as they appeared in July 1930, with heavy supplies available here from carryover and new crop, it had been reasonable to anticipate that United States exports would be relatively large throughout the year. In fact, however, a heavy shrinkage in United States exports occurred in September and October 1930, as the spread narrowed between world prices and United States prices, following the realization that the United States corn crop would be short, the outpouring of Russia shipments, and increased barriers to European imports (see Chart 28, p. 104). In retrospect, the world market conditions did not favor large exports from this country in the absence of stabilization. After stabilization purchases were inaugurated on a large scale in mid-November, as prices rose here and fell sharply abroad, our price level was completely above export parity, and so it remained for the rest of the crop year. Ordinary commercial exports of wheat, and of almost all flour ground from domestic wheat, soon became unprofitable and therefore impracticable. It is reasonable to infer that most of the exports of wheat and flour from December through June, except those of flour milled from Canadian wheat in bond, were made by the Grain Stabilization

¹ See Appendix Table XXXV.

² See Appendix Table XXXV.

³ See Appendix Table XX.

Corporation or of grain purchased from it for export.

Gross exports of wheat grain and net exports of wheat and flour are shown in Table 5, for the periods December–February, March–June, and December–June

TABLE 5.—UNITED STATES WHEAT EXPORTS, AND NET EXPORTS OF WHEAT AND FLOUR, DECEMBER–JUNE, FROM 1923–24*
(Million bushels)

Crop year	Exports of wheat grain			Net exports, wheat and flour		
	Dec.–Feb.	Mar.–June	Dec.–June	Dec.–Feb.	Mar.–June	Dec.–June
1923–24.....	12.5	14.5	27.0	27.5	29.0	56.5
1924–25.....	33.7	35.3	69.0	47.0	52.2	99.2
1925–26.....	7.8	23.7	31.5	14.8	34.5	49.3
1926–27.....	22.6	32.9	55.5	33.3	48.8	82.1
1927–28.....	15.1	15.3	30.4	26.3	26.5	52.8
1928–29.....	14.3	23.7	38.0	24.9	37.8	62.7
1929–30.....	20.6	18.9	39.5	32.2	31.4	63.6
1930–31.....	4.2	19.4	23.6	12.4	28.6	41.0
adjusted ^a	4.0	9.0	13.0	12.3	18.2	30.5

* Data of U.S. Department of Commerce.

^a See accompanying text and footnote.

ruary, March–June, and December–June 1930–31, in comparison with similar figures for earlier years. The actual export statistics for 1930–31 are misleading for comparisons because part of the exports, this year, notably in May and June 1931, represented wheat put in storage in Canada, in very unusual amounts. Accordingly the “adjusted” figures shown are the amount after deduction of increases in stocks of United States wheat in store in Canada between November 29, 1930, February 28, 1931, and July 4, 1931.¹ For the pe-

¹ The figures were, in thousand bushels, +161, +10,396, and +10,557, as derived from weekly data published by the Bureau of Agricultural Economics. Corresponding adjustments for previous years would be small, and often in the opposite direction. Compare Appendix Table XXXII.

² The contrast would be less striking if the comparison excluded June, for exports in June 1926 were very heavy.

³ On page 41 of the *Report of the Farm Board* is the statement that under the milling plan “9,056,490 bushels of wheat were ground and exported which otherwise would have remained as an addition to the stabilization stocks.” On pages 47 and 48 of the *Report* it is stated that “exports of flour milled from domestic wheat totaled only 7,300,000 barrels during the year . . .” From this it would follow that of the flour ground from domestic wheat during the crop year, about a third was provided by the milling plan of the Corporation.

riod of market support, the adjusted figures show up much smaller than corresponding figures for any year since the war, even including 1925–26.² The adjusted figures for December–June were, for wheat grain exports, 13 million bushels, and for net exports of wheat and flour, 30.5 million. (Of this, over 2 million barrels of flour came from Canadian wheat.) No one, of course, is in position to say how large exports would have been in the absence of stabilization operations, and it is certain that other factors would have restrained our exports as they did in 1923–24 and 1928–29; but there is little doubt that stabilization operations exerted an additional influence restricting exports of domestic wheat.

When stabilization operations were begun, private exporters and the Grain Stabilization Corporation held some wheat in export positions. The wheat of private exporters was presumably hedged. After the stabilization support of the market was under way, most of such wheat could not be sold without loss, for the hedges could not be bought in at prices that would yield a profit equal to the loss on going export prices, and the wheat could not be moved to interior markets except at additional cost for transportation and handling.

On February 26 the Grain Stabilization Corporation announced that it would endeavor to sell for export before July 1, at the best prices obtainable—therefore presumably at a loss, but not below the comparable prices in other exporting countries—some 35 million bushels of wheat that it held “out of position” at Atlantic, Gulf, and Pacific ports. Such sales are stated in the *Annual Report of the Farm Board* to have aggregated 21,458,809 bushels.

The Stabilization Corporation also made arrangements with millers, at their request, whereby wheat could be obtained for milling into flour for export. Details³ as to these arrangements are not available, but it has been announced that 9 million bushels of wheat were thus exported in the state of flour.

The net effect of such sales of wheat and flour during the period of stabilized prices, whether by the Stabilization Corporation itself, or by private exporters and millers, was that sales were made for export at

prices below the levels maintained in this country. In the technical economic sense, such sales constituted "dumping." There seems to have been no public overt reaction abroad against such dumping sales, presumably in large part because the volume involved was limited; in practice it has usually required extensive flooding of markets with export goods to arouse defensive or retaliatory action in importing countries.

Commercial exporters had naturally a bad year. In recent years the American exporters have been gradually replaced by American representatives of European importing houses. Whether the injury to American exporters, already in retreat, will have the effect of further strengthening the European import houses when the export trade again becomes free and the Grain Stabilization Corporation has disposed of its supply, remains to be seen.

EFFECT ON MILLING AND MILLERS

Mill grindings of wheat were materially reduced in consequence of stabilization operations. Foreign markets for flour produced from United States wheat were to a large extent lost to American millers, for the time, by reason of the relatively high stabilized price, and not all of this loss was made up by liberal milling of Canadian wheat in bond. Because of the prospect that wheat and flour prices would be lower when stabilized support of the market was withdrawn, millers, bakers, and flour dealers let their flour stocks run down to a notable degree. Finally, there is evidence that lower-grade flours were more widely used than usual,¹ made by long extraction, whereby a unit of wheat yielded a larger proportion of flour. The precise extent of the reduction in grindings attributable to the stabilization operations cannot be stated, but that it was substantial cannot be doubted in the light of evidence clearly available. It may have been 20 to 30 million bushels.²

Millers were adversely affected by the stabilization operations, not merely through reductions in their volume of export and domestic business, but particularly through

the difficulty in handling their operations during the period of transition from the stabilized level of prices to an unsupported level. Because of the abnormal relationship maintained between May futures and new-crop futures, it was impossible for millers to hedge their operations in their customary fashion. Their maximum safety lay in carrying minimum stocks of either wheat or flour into the new crop year. Moreover, the influence of stabilization holdings upon new-crop futures, even in the absence of stabilization purchases of those futures, made more risky than usual the use of new-crop futures for hedging operations. Such risks eventuated in losses.

Hedging, though common among millers, is not universal, and is apparently uncommon west of the Rocky Mountains and in the intermountain territory. Undoubtedly millers in these areas who were long on wheat when stabilization operations were undertaken were saved from some losses on their inventories which would presumably have occurred if the price decline had not been checked. But the windfalls of millers who happened to be long on unhedged wheat are not to be balanced against the losses of hedging millers who were deprived of this customary insurance.

On January 20, 1931, the Grain Stabilization Corporation offered to millers a so-called "Mill Export Plan." Wheat was offered to millers for cash at full domestic market value, with the understanding that after flour milled from said wheat had been exported, the Grain Stabilization Corporation would permit the miller after July 1 to return new-crop wheat in quantity, grade, and quality, the miller receiving a refund in adjustment of the amount paid in the original purchase. In effect, the miller was offered wheat at prices reflecting world price levels. In addition to the price adjustment, it was assumed that millers could hedge in new-crop futures. The advantage of the proposed arrangement to millers lay in maintenance of their brands in foreign markets; the advantage to the Corporation lay in a saving of storage and carrying charges.

The amount of wheat sold under this plan was slightly over 9 million bushels, of which less than 3 million were purchased

¹ This was due not to stabilization but to the business depression.

² See above, p. 123, and Appendix Table XLI.

by mills east of the Rocky Mountains. The plan turned out to be essentially adapted to Pacific Coast milling conditions. Pacific millers were first permitted to return the wheat in eastern terminals; later, they were permitted to buy the wheat directly at export value, adjusted on the day of export of flour, this applying only to flour to the Orient. Over half of the total volume handled under the plan was exported to the Orient.

In the final liquidation of the plan less than 2 million bushels were repaid by the mills in kind, and the remainder was settled by an adjustment between old-crop and new-crop prices. The Grain Stabilization Corporation has reported that the plan netted to it a saving of \$195,000; the advantage to millers was probably larger on operative grounds than in terms of net profit. Growers received an advantage directly in the sale of the wheat and indirectly in the lowering of the carryover.

EFFECT ON WHEAT ACREAGE

It has been argued that the Federal Farm Board, by its stabilization policy in 1930-31, was effectually defeating its own policy of encouraging reduction in wheat acreage in the United States. There may have been some slight tendency in this direction, chiefly through the prevention of as great declines in growers' returns as would presumably have occurred in the absence of stabilization operations. On the whole, however, it is probable that stabilization operations had almost negligible effect upon the wheat acreage planted in the United States for the crops of 1931 or 1932.

These operations were not undertaken until after winter-wheat planting for the crop of 1931 had been practically completed. While prices were supported during the period in which spring-wheat plantings were planned and made, even the supported level can hardly have been attractive to growers, and the Board gave warning (on March 23) that it would not authorize stabilization purchases from the crop of 1931. A substantial reduction in spring-wheat acreage occurred, chiefly under the influence of five major factors: low current prices even at the stabilized

levels, the poor outlook for wheat prices in 1931-32, adverse climatic conditions, and shortage of feedstuffs that may have tended to expand feed-grain areas and to contract wheat areas; plus the additional facts that in the Pacific Northwest fall planting had been large and that there and elsewhere abandonment of fall-sown acreage was so light that little reseeding in the spring was called for.

In so far as price support in 1930-31 may have had an influence in the direction of lower prices in the summer of 1931, it may be assumed that winter-wheat plantings for the crop of 1932 have at least not been increased in consequence of stabilization operations.

EFFECTS ON WORLD WHEAT PRICES

An analysis of the effects of stabilization operations upon world wheat prices cannot be made with confidence. No one can reconstruct the course that prices would have followed if stabilization operations had not been undertaken. Estimates of the gains to United States wheat producers through stabilization operations depend somewhat upon opinions as to what the level and course of world wheat prices would have been in the absence of stabilization.

So far as concerns the course of prices, there is reason to believe that the drop in Winnipeg, Liverpool, and Buenos Aires in the second half of November 1930 was intensified by the inauguration of stabilization operations in the United States. It is reported, probably with truth, that heavy purchases of futures in the Winnipeg market had been made against sales of futures in Chicago, on the assumption that stabilization operations would not be undertaken and that the Chicago market was out of line upward. When stabilization operations were begun the shorts in the Chicago market had to cover, and simultaneously sold their long contracts in Winnipeg and other foreign markets, thus furthering declines abroad. Moreover, it seems probable that the Canadian Pool, beset by financial difficulties, was compelled to hedge its open position, and that its sales of futures helped to explain the declines in Winnipeg in the last few weeks of the calendar year. Had

no stabilization operations been undertaken, it is also reasonable to suppose that the decline of prices in world markets which took place in the last six weeks of 1930 would have been spread over a somewhat longer period. Conceivably it might not have occurred. More probably, if no stabilization operations had been undertaken, the low levels of world wheat prices would have been reached in the early spring of 1931 instead of in the autumn. If so, the course of world wheat prices in the summer of 1931 might have been upward from a level lower than prevailed, instead of downward after the readjustment to an unsupported market took place in the United States. In short, if one is to guess at the probable course of world wheat prices in November-July 1930-31 that might have occurred in the absence of stabilization in the United States, the guess includes somewhat lower prices at some time in the winter, perhaps equally high prices in the spring, perhaps higher ones during the summer or autumn. But all this is hardly more than guesswork.

With regard to the level of world wheat prices, three views are held in different circles bearing on the effect of the pegged wheat price in the United States upon the world price of wheat—namely, (a) that the world price of wheat was elevated, (b) that it was depressed, (c) that it was not significantly altered.

The view that the withdrawal of American wheat from the export market because of the pegged price had the effect of raising the world price is based directly upon the altered quantitative relations of supply and demand. With the American wheat withdrawn from export regarded as nonexistent for the time being, this would reduce correspondingly the figure for export surplus with the figure for import requirement unchanged. This implies that the import markets of the world regarded American wheat withdrawn from sale as not present in the supply. When we apply the argument of the demand curve, such a situation would result in increased price for the wheat purchased from the reduced supply.

In the view of those who hold to the contrary that the world price was reduced by the stabilization operations in the United

States, the orthodox application of the demand curve is held not to apply for exceptional reasons. When the adjustment between exporters' supplies and importers' requirements is very easy, a reduction of exporters' supplies makes no difference because importers are not put to competitive bids in order to cover their wants. Furthermore, the American wheats withdrawn were not of types especially desired by importing countries, but were largely filler wheats. The wheat withdrawn by the Grain Stabilization Corporation was not in the market sense equivalent to wheat absent from the market. An impounded wheat supply is not equivalent to a crop failure. Foreign countries did not trust the continuity of the holding policy. Wheat buyers in importing countries, already discouraged in their holding tendency, were further discouraged. In other exporting countries (possibly outside of Canada) the sellers of wheat made additional efforts to dispose of their supplies in order to get rid of them before the United States should return to the market. Other exporting countries sought to reduce their outbound carryovers. The suspension of speculation in the United States in current futures and the consequent disorganization of speculation abroad tended toward price decline. In short, according to this view, the average wheat price of the world following December was lower than it would have been in a free market, because all bullish influences were eliminated.

The third view runs to the effect that the influence in either direction was probably negligible. It regards the world price of wheat at that time as a composite of influences of the free supply and light demand of wheat, the supply and demand of other grains, tariffs and milling regulations, the decline of the general price level, the abnormal condition in international exchange, and the unpredictable behavior of Russian exports. Since there was so much wheat available in the world, the withdrawal of that amount of American wheat which would probably, or possibly, have been exported, made no practical difference in the adjustment of supply and demand. According to this view, the figure of importance was not the accumulated stocks in the

United States but the amount that experience under similar circumstances indicates might have been exported. Under the circumstances, there is no reason to believe that we would have exported more than we did in the previous year—rather less, on account of the activity of Russia. The season when American wheat is naturally most easily exported (July – September) had passed. It is believed that in a free market speculation in the United States would have continued to hold our wheat above export parity, as it tended to do for several years. During the period of stabilization, American speculation in new-crop futures tended to hold those prices above export parity. In short, it is felt that on a free market, under the abnormal circumstances, the world would have taken only a small additional amount of American wheat. Put in another way, it is felt that the adjustment of supply to demand without the United States was not significantly different from what it would have been with the United States included in the free market.

The *Second Annual Report* of the Farm Board does not contain a detailed examination of the effect of the American wheat price stabilization on the world price of wheat. Recognizing that in the absence of the stabilization, American futures might not have followed Liverpool futures, that the other major wheat-exporting countries would probably not have shipped much less than they did, that American exports would not have been much larger than they were, and that the carryover in the world would not have been materially smaller, it is suggested that even a small net increase in our exports would probably have exerted a significant effect on world price.

It seems to us that the several qualifications tend to remove the inductive basis of the modest final inference. It seems to us the gains of American farmers are for the present best appraised on the assumption that the world wheat price was not significantly modified by the American stabilization. The grounds for this view are briefly as follows.

Since historically the United States is more likely to resist wheat price decline than any other exporting country, and to accumulate stocks in the process, we infer

that the Chicago future could not have stood at a shipping differential below the Liverpool for a long enough time to have made exports significantly heavier than in fact they were, all other factors than stabilization remaining the same.¹

The United States does not export (net) more than 145 million bushels of wheat and flour together in years when the Chicago-Liverpool spread is narrow, whatever may be the cause of the narrow spread; something like 100 million bushels of wheat as flour and of low-grade or substandard wheat would be exported in a free market under almost any set of circumstances except a domestic crop failure. Hence it is hardly imaginable that the United States would have offered for export at competitive prices as much as 50 million bushels more than she did in 1930-31.

We doubt if a net addition of less than 50 million bushels to supplies offered competitively for export, scattered as the additional offers presumably would have been over several months in a year of notably abundant exportable surpluses, would significantly have tended to depress world wheat prices. As to the effect of stabilization operations upon import demand, there is little statistical evidence that importing countries would have made purchases of cash wheat in significantly more substantial volume than in fact they did in 1930-31. Some countries would not have imported more wheat whether or not the Stabilization Corporation existed. The governmental measures that led to small net imports into Germany and France in 1930-31 began to be applied even in 1929-30 under agrarian pressure; they are not reasonably to be described as measures that would not have been introduced in the absence of the Stabilization Corporation. The net imports

¹ A statement signed by Secretary of Agriculture Hyde, and accompanied by charts, was issued on March 28, 1931. Below one of the charts are the comments: "(1) If there were no stabilization operation, Chicago prices would have followed Liverpool, and [apparently at the end of February] wheat would be selling at around 62 cents in Chicago [with Liverpool about 63 cents]. (2) If there were neither stabilization nor Federal Farm Board, Chicago wheat would be selling . . . at about 53 cents." In our judgment it is doubtful if the Chicago price would have stood so near a shipping differential below Liverpool even in the absence both of stabilization operations and of the Federal Farm Board.

of another group of countries when viewed in connection with their crops, estimated inward carryovers, and the probable consumption of wheat, were large enough to have resulted in an accumulation of stocks. There were a few countries, however, that either drew upon stocks or failed to increase them.

We believe it reasonable to assume that the general situation, including domestic controls, in 1930-31 was such that the actual imports of European importing countries would have been close to what they actually were, at least if the average level of world wheat prices had been relatively low. Nevertheless the statistics suggest that, given a level of prices about as low as it was, stocks in several countries might have been built up more than they were, or reduced less, if traders had been convinced that "the bottom had been reached." This would have meant more active purchasing from exporting countries, and a larger volume of international trade. Although the statistical evidence is less clear with regard to ex-European importing countries, we believe that here too there was doubt that the bottom in wheat prices had been reached.

Furthermore, within a short time after the price was pegged it naturally became the concern of the trade both at home and abroad to decide how much wheat would be accumulated by the Corporation, and when and how it would be sold. So far as we are able to interpret the comments of traders abroad, the general view from January onward was that importers had to face squarely the possibility that competitive offers of more or less of the Corporation's wheat might appear at any time, the reasons being that the Corporation might not be financially able to hold as large a quantity as it seemed to be accumulating, and that it might choose, whether or not it was financially able to hold, to sell abroad at competitive prices. The holdings of the Corporation were so often spoken of as a "threat" or a "menace" to the then world wheat price level that we infer that they were in fact so regarded by the European trade, if not unanimously at least generally or widely. We do not believe that holdings of equivalent size in the hands of individuals would have been regarded as

equally menacing, for the simple reason that under ordinary conditions a possible flow of offers, not a possible flood, would have been envisaged. The peculiar course of the United States visible supply—the extraordinary accumulation of wheat in the terminal elevators—is to be remembered in this connection, and also the fact that stabilizing operations were largely responsible for the great accumulation in this position. Here, a foreign importer could say, is wheat close to the export outlets; it is an overwhelming quantity; much of it is out of position for domestic use; we do not know how strongly it is held; we do not know how much of it will be pressed upon us, or when.

Vague indications to awaken fears that heavy offers might be made abroad were not lacking. Steps were taken in January to facilitate export of United States flour; and even the best informed European could not be certain that further steps would not be taken. In February the announcement was made that not over 35 million bushels of the Corporation's wheat would be offered for export—in itself not a strikingly large quantity; but since not even 35 million bushels had before been mentioned as for sale even the best informed European trader could not feel altogether confident that in a month or two the quantity might not be increased substantially. In March it was stated officially that efforts to maintain domestic prices would be abandoned "as soon as last year's crop is delivered," and that the Board "cannot indefinitely buy more than it sells, nor indefinitely hold wheat it has bought."

Now it is true that as the weeks passed in the second half of the crop year the competitive export offers from the United States did not materialize; it is true that importers who gave thought to the question would have had good reason to doubt if an official governmental agency of the United States could countenance what would almost certainly be construed in many foreign countries as dumping; it is true that careful reading of the announcements regarding sales policy would not have warranted the view that an overwhelming efflux of Corporation-owned wheat was ever in prospect. Yet one can hardly escape the

conviction that a great many importers, whether properly and reasonably or not, held it to be possible, even probable, that the efflux would come.

We believe, then, that many traders abroad felt more or less unsafe in carrying wheat stocks unhedged or in purchasing wheat futures on the chance of an increase in prices. We infer that stabilizing operations in the United States contributed significantly to this attitude. But we doubt if actual cash purchases of importers were deliberately restricted by as much as 50 million bushels on account of the "menace" of Stabilization Corporation holdings; after all, stocks were built up in several important importing countries where this was feasible, under comparative freedom from governmental regulations or in their absence. Hence in its purely quantitative effects upon the world wheat statistical position, and thus its effect upon world prices in so far as they are governed by day-to-day quantities offered and demanded, we doubt if stabilization operations in the United States were of particular significance. If offers to the international market were reduced, so was demand, and perhaps by roughly equivalent amounts.

It is widely believed abroad that such fear as existed of a sudden efflux of American wheat was in itself something of a price-depressing influence. This fear may well have affected both buyers and sellers practically the world over, leading to lower price-offers and price-bids than otherwise would have prevailed. Yet there would have been distinctly large wheat supplies in sight and on offer even if less wheat had been drawn into the United States visible supply and more consumed domestically as feed; it seems probable that in the downward phase of the trade cycle, pessimism would have characterized the wheat markets somewhat as it did in fact; and we are unable to believe that the fear traceable to stabilization was a price-depressing factor of outstanding significance.

EFFECT ON RETURNS TO WHEAT GROWERS

If stabilization operations in the United States had only a small effect upon world wheat prices, it follows that the gross re-

turn to growers in the United States crop of 1930 was increased, since possibly 40 per cent was sold at a higher price than would otherwise have been received. The fact of gain to growers through stabilization can be brought into question only by supposing that the world price of wheat was greatly depressed through the operations.

Measurement of the gain to United States growers in terms of cents per bushel is quite as difficult and uncertain as evaluation of the effect of stabilization upon the world wheat price. Assuming that the world wheat price was but little affected, it remains to determine where, in the absence of stabilization, the Chicago futures would have stood in relation to the Liverpool futures. For reasons set forth above, we are unable to believe that Chicago futures would have stood at a full shipping differential (15-20 cents) below Liverpool for more than a few weeks, if at all. In view of the behavior of prices in earlier years, and their behavior in August-November 1931, there seems little reason to suppose that the Chicago futures could have stood above the Liverpool in the absence of stabilization; the more probable range would have been anywhere from 2 or 3 to 10 cents below. On assumptions such as these (taking Liverpool futures at the levels that actually prevailed), the gain per bushel to American farmers through stabilization could be measured as roughly 20-30 cents per bushel during January-May 1931. On the assumption that the Chicago futures would have stood 15-20 cents below the Liverpool (again taking Liverpool futures at their actual levels), the gain could be measured as 35-40 cents per bushel. Different measures would appear as one undertook comparisons of prices in different United States markets with Liverpool prices. In the Farm Board's *Report*, the gain per bushel, based on a comparison of Kansas City and Liverpool prices, is put at 25 to 35 cents a bushel on the average after mid-November. Chart 61 (p. 164), reproducing from the *Report* the comparison upon which the conclusion is based, is here inserted; it is of interest also in that it shows how holdings of the Corporation accumulated from month to month.

A full discussion of the effect upon re-

turns to growers would involve not only analysis of the relationship of United States regional prices to Liverpool prices, but also of regional marketings month by month. Such analysis is hardly profitable so long as uncertainty surrounds either the position of Liverpool prices in the absence of stabilization or the position of regional United

disposing of the accumulated supplies, remains to be completed." The loss, in other words, is still to come.

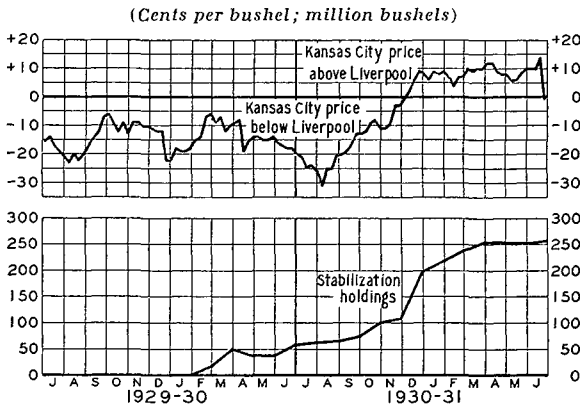
GENERAL APPRAISAL

The legal basis for the stabilization operations is provided in Section 1 (a) of the Agricultural Marketing Act, which declares it to be the policy of Congress "to protect, control, and stabilize the currents of interstate and foreign commerce in the marketing of agricultural commodities and their food products . . . (4) by aiding in preventing and controlling surpluses in any agricultural commodity, through orderly production and distribution, so as to maintain advantageous domestic markets and prevent such surpluses from causing undue and excessive fluctuations or depressions in prices for the commodity." In Section 9 of the Act, which relates specifically to stabilization corporations, reference is twice made to the "furtherance of the policy declared in Section 1." Irrespective of details of the operations, it would seem that the Board acted within its powers, and in harmony with the intent of Congress, in entering upon stabilization operations in the fall of 1930.

Within limits, the purpose was achieved. There is no doubt that the Grain Stabilization Corporation soon obtained effective control of the wheat surplus; that it maintained relatively advantageous domestic markets for wheat, for a period of several months; and that it prevented, for the time, the surplus from causing material fluctuations and further depressions in the domestic price of wheat. In this restricted sense stabilization operations were successful; and it is worthy of note that a breakdown of the policy, which was feared in some quarters and hoped for in others, did not occur.

On the other hand, really advantageous domestic markets were not and could not be maintained; the relative advantage could not, in the conditions, be maintained beyond a limited period; and on economic grounds somewhat further fluctuations and depressions in the domestic price of wheat were probably due and reasonable, though these might have become undue and ex-

CHART 61.—SPREADS BETWEEN KANSAS CITY AND LIVERPOOL WHEAT PRICES, AND GRAIN-STABILIZATION HOLDINGS, 1929-30 AND 1930-31*



* Adapted (practically reproduced) from *Second Annual Report of the Federal Farm Board*, p. 45.

States prices in relation to Liverpool prices in the absence of stabilization. We see no reason to doubt that in general United States wheat producers benefited substantially, not only from higher wheat prices than would otherwise have prevailed, but probably also from higher coarse-grain prices. On the other hand, all farmers paid higher prices for flour during the period of stabilization. The data do not serve for evaluation of the net position of farmers, either in the United States as a whole or in different regions. The indirect benefits which may have accrued to agriculture, through the influence of wheat price stabilization as a credit measure, can hardly be applied to the question of the commercial advantage of stabilization to wheat growers.

In any event, as is stated in the Board's *Report* (p. 43), the "full gain or loss to producers" through stabilization operations cannot be appraised. "The wheat stabilization operations were only half completed by June 30, 1931. Wheat had been withdrawn from the market, sustaining the price. The second half of the operation,

cessive in the absence of stabilization operations. In this sense, the operations appear not to have fulfilled the stated policy of Congress.

It is conceivable, although it will probably never be demonstrable, that, considering this crop year and the next, as well as the crop year 1930-31, the stabilization operations resulted in a net loss rather than a net gain to wheat growers so far as direct returns from wheat are concerned. Even if this might appear to be the case, it might still be possible to indicate that wheat growers had profited indirectly through the credit measure more than they had lost directly through the price measure. Whether this eventuates or not, it is worth bearing in mind that those who criticize "government in business" most, who object most to fixed prices of commodities, do not feel the same aversion when the government steps in to influence a monetary policy, to check a disorganization of credit, or to oppose a hoarding of currency. The world is much more accustomed to governmental interference and control in monetary matters than in commodity prices. It strikes us that it is from this viewpoint that the pegged wheat price will finally be judged; and if farmers complain that not much was attained by pegging the wheat price and that it should have been continued during the present crop year, the sufficient answer will lie in the rejoinder that the pegged wheat price was primarily a credit measure and not an operation created to improve the farm price of wheat, though the action included this objective.

Commercial gains and losses occurred which may perhaps be described as incidental. Owners of storage space found their services at a premium. Owners of unhedged wheat profited by the act. Some elevator companies and probably also large speculators were saved from heavy losses. On the other side, millers suffered losses and grain merchants and commission houses as a group found their business reduced. Exporters were injured, and probably some speculators were caught on the wrong side of the market. The extent of these gains and losses cannot be guessed, but in any event the gain by one does not balance the loss by another.

When the transaction is completed, the national Treasury will have sustained a loss. During the period of stabilization urban consumers paid a higher price for flour. Whether bakers gained or lost is uncertain. If it should be shown, with the close of the 1931-32 crop year, that the net result to wheat growers was a loss, then the cumulative losses will amount to a high figure.

As of June 30, 1930, the Board reported the net commitment on account of grain stabilization (mostly wheat) as 90 million dollars. On June 30, 1931, the corresponding net commitment was roughly 277 million dollars. Such figures do not indicate the full extent of the current financial burden of stabilization operations unless there were no loans from private banking interests. Whatever the strain may have been, the margin proved sufficient to permit carrying through the stabilization policy.

In retrospect it seems probable that if the Board had authorized heavy stabilization purchases in the summer of 1930, as it was urged to do, the burden of the operations would have been so great that the maintenance of prices through the crop year would have overtaxed the Board's financial resources, unless Congress had been persuaded to increase its appropriations to the Board's revolving fund beyond the 500 million dollars authorized in the Agricultural Marketing Act.

The extent of funds tied up in stabilization operations of course gives no measure of the eventual loss to the Treasury. That the operations will eventually prove to have entailed heavy loss seems beyond doubt. The average purchase price was approximately 82 cents per bushel, to which must be added the carrying charges, etc. The final cost may be well over 90 cents per bushel. Until full statements are published, covering costs of purchases, proceeds of sales, and expenses of operation for the Grain Stabilization Corporation, it will be impossible to determine the extent of the cost of wheat stabilization operations to the Treasury.

We are in no position to cast up the balance of gains and losses, to the country as a whole. Broadly stated, it appears that, however justified the stabilization experi-

ment may have been, the outcome of the experiment does not warrant ready resort to it in future. It has unmistakably demonstrated limitations upon major efforts to control a huge surplus in a staple commodity, and the disadvantageous effects of such efforts, even though it showed that such operations can be carried through when sufficient funds are available.

Finally, the value of the fixed price of wheat as a credit measure is to be recognized but cannot be evaluated. To what extent a local panic centering in Chicago was averted is not known (if at all) outside of the confidential record of the government. It is possible that the stabilization of the prices of wheat and cotton were of large benefit in cushioning the price declines. It is known that many business men who object to price fixing on commodity grounds are not hostile to it as a credit measure. In any event it is important to keep the two considerations distinct and separate, and to appreciate that price fixing need not be regarded as a public good on commodity grounds, even though it is properly resorted to in a panic.

We take it that the following statement represents the reasoned opinion of the Federal Farm Board:

Had the radical drop in wheat prices continued after November 1930, the shock to business and financial institutions, in cities as well as in the country, would have been intensified. Many co-operatives, and banks, dealers, and other concerns, might have been forced into bankruptcy. Grain farmers had large investments in their marketing organizations, which would have been severely crippled if not destroyed, had stabilization operations not stopped the decline in wheat prices in the fall of 1930. The six months of stable prices gave business institutions, co-operative and private, a breathing spell in which to readjust themselves.¹

From the standpoint of agricultural policy, the experiment in wheat price stabilization was unfortunate. It is a precedent in the wrong direction. The problem of surplus of agricultural products is not to be solved by holding or price pegging. To urge that this was a peculiar emergency and not to be counted, misses the point in farm psychology. If it is conceded that an emergency justifies price fixing and hold-

ing of surplus, then the question of measuring the existence and compelling nature of the emergency will be claimed by farmers as the right of agriculture. All the price controls of the past decade have been based upon the assumed demonstration of an exceptional emergency. Quite generally it is to be expected that those who are to be relieved will determine the nature of the relief. If growers of wheat and cotton are to claim direct action under a certain set of circumstances, then other farmers will later claim the same right to direct action when their crops are similarly involved. Also, the extent of the emergency held to justify direct action will tend to change in the direction of justification on lesser grounds. The precedent of the pegged price of a commodity in time of peace may long return to plague the government in Washington.

The recent testimony of Chairman Stone before the Senate Committee on Agriculture and Forestry made it clear that the Farm Board is fully alive to the dangers and defects of stabilization. The greater the claims made for the operation as an aid to farm income, the stronger the appeal to it as a precedent. At the same time, the difficulties and losses attending it make easier the re-appeal to the equalization fee and the export debenture. Refusal of the Farm Board to restabilize wheat when the price has fallen far below the level maintained by the Board last year provokes in farm circles reactions largely determined by the acceptance or rejection of shortage of Treasury funds as explanation of the decision. With the growing deficit in the national budget, farm opinion turns back from the stabilization plan to the equalization fee and export debenture. We take it the controversial atmosphere has been cleared to the extent that direct price stabilization has been eliminated, leaving future policy to rest upon Congressional action on the equalization fee and the export debenture.

It strikes us that the occurrence will prove to be peculiarly unfortunate in our international relations. For a decade our government has opposed price fixing and commodity control by governments directly or indirectly. Foreigners can hardly be blamed for saying that we have capitulated and joined the procession. We may reply

¹ *Second Annual Report*, p. 46.

that in other countries commodities were controlled and prices were fixed during prosperity, with a relatively high general price level, whereas in this country action was taken with wheat and cotton only in a profound business depression, with a heavily declining price level. There is merit in this rejoinder, but it will fail to impress foreigners. If price fixing and commodity control is to be judged from country to country and from case to case by the extent

of the emergency according to statistical measurements, the case against price fixing and commodity control is lost. The world has entered on a veritable orgy of governmental participation in price determinations, directly and indirectly. Heretofore, the example of the United States exercised a restraining influence. This may now be lost because it is impossible to prove to other countries that this country has been justified while other countries have not.

This issue was written by M. K. Bennett, Joseph S. Davis, Helen C. Farnsworth, Alonzo E. Taylor, and Ada F. Wyman, with suggestions from Holbrook Working. Tables by Robert F. Lundy; charts by P. Stanley King. The interpretation and appraisal of stabilization operations is primarily the work of Alonzo E. Taylor.

APPENDIXES

APPENDIX A

TARIFFS AND MILLING REGULATIONS

An interesting feature of the crop year 1930-31 was the tendency for legislative and administrative bodies in many countries to attempt to ameliorate the effects of exceedingly low world wheat prices by recourse to controls of various sorts. This tendency was clearly apparent in 1929-30; it was very much more general in 1930-31. Exporting countries have had recourse directly to governmental price support through purchases; to export bounties; to commercial treaties; to trade agreements that were in effect barter of one country's commodity for another country's commodity. Importing countries have resorted to monopolistic control of imports, to systems of licensing, and above all to increases in tariff duties and to control of the milling industry in such a manner as to enforce the use of home-grown wheat in preference to imported wheat.

The most striking effects of governmental interventions in 1930-31 upon international trade and prices and price relationships are traceable to what took place in the United States, Germany, France, and Italy. Developments in the United States have been considered in some detail in preceding pages; those in other countries have been treated more briefly. It seems desirable to present in summary form a record that will serve to illustrate, at least for the wheat-importing countries, how widespread was the movement to increase tariff duties on wheat and flour, and how widespread was the tendency to supplement tariff protection with so-called "quota laws" that in effect specified in what proportions domestic and imported wheats should be milled. Accordingly we present a brief summary of the situation in the most important European importers whose trade was affected by governmental interventions—Germany, France, and Italy.

The tables that follow this discussion help to fill in the picture. In general, this material shows what tariffs were and how they have changed, and also where and how the quota laws were changed. The tables do not, of course, cover the whole field of governmental regulation. There were alterations in tariffs on other commodities than wheat and flour, and there were regulations and procedures that fell outside the range of tariffs or of quota laws. The record of tariff changes itself is not a complete one: it does not cover all countries, and it does not show changes in terms of the original currency units. It is necessary also to observe that in most instances we have had to rely upon secondary rather than upon primary sources of information, so that inaccurate dates and amounts may have been inserted in some instances. With all these qualifications, however, the tables provide a useful

brief summary of significant developments in 1930-31.

DEVELOPMENTS IN GERMANY, FRANCE, AND ITALY

German tariff rates on wheat and flour were changed three times during the year, with the total result of increasing the wheat duty by 65 cents (from 97 cents to \$1.62) per bushel, and the flour duty by \$2.47 (from \$6.67 to \$9.14) per barrel. From May 15 to July 31, 1931, millers were permitted to import wheat in limited quantities at a reduced rate of duty, \$1.30 per bushel; the amount each mill might import at the reduced rate was fixed at 20 per cent of its total grindings during April-June 1930. The duty on semolina was raised to the same level as that of wheat flour, as of May 1, 1931, in order to curb the importation of large quantities for mixing with domestic flour. The duty on durum wheat for the manufacture of semolina was fixed at 73 cents on October 26, and on January 15 the duty on wheat for the manufacture of starch was reduced to the same rate.

Tariff policies for wheat were subject to the legislation of April 1930, which required the government to use as a basis of decision a yearly average price of 260 marks per metric ton (\$1.69 per bushel). A new tariff law, effective March 28, 1931, extended for a year the authority previously granted the government to regulate customs duties on cereals by special decrees; it stipulated, however, that in using this authority, the government must prevent an increase of bread prices above the average for the last six months. This law required the government to try to overcome the spread between prices of agricultural products and prices of other products; and to lower customs duties on food products for which the index number should exceed 133 for more than four months. The issuance of import certificates for wheat was discontinued in October 1930, to be re-introduced, with some modification, in the beginning of 1931-32.

The duty on rye was increased, on March 6, 1930, by 30 cents (from 91 cents to \$1.21) per bushel. Increases were also made during the year in the duties on oats, barley, millet, and bran. The importation of maize remained a government monopoly. Concessions of reduced duties on feeding barley to importers who purchased equal quantities of rye, potato flakes, or maize from the government trading organization were continued, and the rate was further reduced, on September 11, 1930, from 12 to 6 marks per 100 kilograms, and on June 26, 1931, from 6 to 5 marks per 100 kilos.

Milling quotas for domestic wheat were successively 40, 60, 80, 75, and 50 per cent (see Table A3). The required percentage was decreased toward the end of the crop year, but increased percentages have again been announced for the new crop year, 1931-32. There was no milling quota for rye; however, rates of extraction for rye were limited to a maximum of 60 per cent from August 15 to April 18, and thereafter to a maximum of 70 per cent.

From August 15, 1930, the use of 80 per cent rye flour in mixed rye and wheat bread was required. From December 8, restaurants, hotels, and other public eating-places were forbidden to serve bread other than that made with 97 per cent pure rye flour. A decree effective December 9 required the admixture of 30 per cent rye flour in all wheat bread weighing over .44 lb. per loaf, and permitted the admixture of 10 per cent potato flour; every bakery was required to sell rye bread, and this was to be made in specified weights.

The official trading organization continued to support the rye market during the early part of the crop year, and it was also reported to have carried on operations in the wheat market.

Trade agreements with Roumania and Hungary were considered, whereby Germany might concede reduced tariff rates on cereals to these countries in return for preferential treatment of German industrial products; the Roumanian treaty was reported to have been concluded. However, it has been impossible to make such agreements effective without the consent of the nations having most-favored-nation treaties with either party. Preliminary steps have been taken in an endeavor to secure this consent; meanwhile other measures have been discussed, such as a system of export bounties, whereby the desired result possibly could be achieved without contravening the letter of the most-favored-nation treaties. The proposed customs union with Austria was referred to the World Court and did not become effective.

The only change in wheat and flour duties in France during the year was the establishment on July 18, 1931, of a double schedule of rates, the one series being general, the other conventional. The conventional schedule maintained the previously existing rates, while the general schedule doubled them. Apparently the only exporting country affected by the change was Russia. On April 28, 1931, the duty on rye was raised by 14 cents (from 21 cents to 35 cents), and on rye flour by 62 cents (from 62 cents to \$1.24).

During the period August-March the French milling quota remained at 90 per cent for domestic wheat; during the period April-July it was decreased by 5-unit stages, as old-crop supplies

became more and more scarce, until it reached 70 per cent, after which, as new-crop supplies came into the market, it was increased by 5-unit stages until it again reached 90 per cent.

On August 27, 1930, the prohibition of exports of wheat, rye, and bread was formally withdrawn. In October a prohibition was placed on certain imports, including wheat and flour, from Soviet Russia, except on the authorization of the Minister of the Budget on the advice of interested departments. As a corollary of this action, a decree of October 23 required that imported goods be accompanied by certificates of origin.

Plans were completed, in the early part of 1930-31, for the holding of a permanent stock of wheat and flour by the French government.

There has been much agitation during the year for more strict enforcement of the temporary admission regulations. A decree of November 20 stated that importers must declare at the customs office the destination of foreign wheat and flour, and that such declarations should be verified. A decree of November 26 prescribed a form to be signed by millers importing wheat in temporary admission. Further measures of control were contemplated.

The Italian duty on wheat remained at 87 cents per bushel throughout the year. On July 8, 1931, the flour duty was increased from \$4.07 to \$4.34 per barrel. This rate was also applied to white maize flour. On July 9 the duty on rye was increased by 27 cents (from 22 cents to 49 cents) per bushel, and the duty on rye flour by 64 cents (from 57 cents to \$1.21) per 100 pounds. Further increases in duty on wheat and flour, and also on semolina, were announced soon after the close of the crop year.

The system of milling quotas for domestic wheat was introduced into Italy on July 2, 1931, on which date it became compulsory for millers to use 95 per cent domestic wheat both for flour and for semolina, with the exception of flour and meal destined for export and of those products for which temporary importation of wheat is permitted by current laws. Millers were obliged to keep a strict record of their incoming and outgoing shipments of wheat and flour.

The Permanent Grain Committee, in deciding upon the establishment of a milling quota, considered other measures for the aid of domestic agriculture. Banks were to be asked to extend credit on wheat; plans were laid for the purchase of wheat in July and August for army purposes; reduction of land taxes was discussed. Presumably the supervision of cultivation, the educational campaigns, and the exhibitions, prizes, etc., identified with the "Battle of Wheat" have remained in effect.

TABLE A 1.—TARIFF RATES ON WHEAT AND FLOUR IN EUROPEAN IMPORTING COUNTRIES AT HALF-YEAR INTERVALS, AUGUST 1, 1929 TO AUGUST 1, 1931*

(U.S. dollars per bushel and per barrel)

Country	Wheat					Flour				
	Aug. 1, 1929	Feb. 1, 1930	Aug. 1, 1930	Feb. 1, 1931	Aug. 1, 1931	Aug. 1, 1929	Feb. 1, 1930	Aug. 1, 1930	Feb. 1, 1931	Aug. 1, 1931
Austria	{ .11 ^a .22 ^b	.11 ^a .22 ^b	.11 ^a .33 ^b	.11 ^a .33 ^b	....55	.90 ^a 2.16 ^b	.90 ^a 2.16 ^b	.90 ^a 3.60 ^b	.90 ^a 3.60 ^b	... 4.23
Belgium	Free	Free	Free	Free	Free	.10	.10	.10	.10	.10
Czecho-Slovakia ^c ..	{ .24 ^a .48 ^b	.24 ^a .48 ^b	.24 ^a .60 ^b	.44 ^a .68 ^b	.44 ^a .68 ^b	1.84 ^a 3.16 ^b	1.84 ^a 3.16 ^b	1.84 ^a 4.45 ^b	3.82 ^a 5.13 ^b	2.92 ^a 4.24 ^b
Denmark	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Estonia	{53	....53	....53	....79	.80 ^d 1.60 ^e	2.40 ^d 3.60 ^e	2.40 ^d 3.60 ^e	2.40 ^d 3.60 ^e	4.29 ^d 5.49 ^e	4.29 ^d 6.69 ^e
Finland	{51	....51	....69	....69	....69	3.25 ^f 2.69 ^g	2.80 ^f 4.70 ^g	2.80 ^f 3.36 ^g	... 4.70	... 4.70
France	{53	....53	....85	....85	.85 ^a 1.71 ^b	... 4.46 ^b	... 4.46 ^b	... 4.46 ^b	... 4.46 ^b	4.46 ^{ah} 8.92 ^{bh}
Germany	{ .42 ^a .49 ^b	.42 ^a .62 ^b	....97	.73 ⁱ 1.62 ^j	.73 ⁱ 1.62 ^j	... 3.07	... 3.07	... 6.67	... 10.91	... 9.14
Greece .....	.24 ^k	.24 ^k	.32 ^k	.32 ^k	.32 ^k	1.53 ^k	1.53 ^k	1.86 ^k	1.86 ^k	1.86 ^k
Italy .....	.74	.74	.87	.87	.87	3.48	3.48	4.07	4.07	4.34
Irish Free State...	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Latvia	{37	... Free	....37	....37	....37	... 4.29	1.72 ^f 4.29 ^g	1.72 ^f 4.29 ^g	1.72 ^f 4.29 ^g	1.72 ^f 4.29 ^g
Norway	No duty: Government monopoly					Government monopoly				
Netherlands	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free ^t
Portugal	Rates fixed on special contingents when imports are allowed					Government				
Sweden .....	.27	.27	.27	.27	Government monopoly	1.55	1.55	1.55	1.55	Government monopoly
Switzerland	{ .03 ^m 1.08 ⁿ	.03 ^m 1.08 ⁿ	.03 ^m 1.08 ⁿ	.03 ^m 1.08 ⁿ	.03 ^m 1.08 ⁿ	.77 ^m 4.20 ⁿ	.77 ^m 4.20 ⁿ	.77 ^m 4.20 ⁿ	.77 ^m 4.20 ⁿ	.77 ^m 4.20 ⁿ
United Kingdom..	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free

* Data mostly from publications of the U.S. Department of Commerce. Conversions at par of exchange in every instance.

^a Conventional rate.

^b General rate.

^c Czecho-Slovakian imports are subject to a sales tax on wheat of 3 cents per bushel, and on flour of 13 cents per barrel, collected at the customs.

^d Rate for unsifted flour.

^e Rate for sifted flour.

^f Rate for graham flour.

^g Rate for white flour.

^h Rate for flour of 70 per cent extraction. Higher rates are quoted for flours of shorter extractions.

ⁱ Rate for durum wheat.

^j Rate for bread wheat.

^k There are additional taxes amounting to 75 per cent of the duty.

^l Imports allowed only in an amount fixed by a government commission.

^m Rate on controlled imports by registered dealers.

ⁿ Rate on uncontrolled imports by unregistered dealers.

TABLE A2.—CHANGES IN TARIFF DUTIES ON WHEAT IN SELECTED COUNTRIES, FROM AUGUST 1, 1930*
(U.S. dollars per bushel)

	Czecho-Slovakia	Germany	Estonia	Jugo-Slavia	Egypt	Poland	India	Union of South Africa	Austria	France
Rate Aug. 1, 1930	{.24 ^a .60 ^b }	.97	.53	.13 ^a	.20	.53	Free	.39 ^c	.11 ^a	.85
Date effective				.34 ^b	...	...	...	.36 ^{cd}	.33 ^b	...
1930 Aug. 26.....	.66 ^b	—	—	—	—	—	—	—	—	—
Sept. 20.....	.68 ^b	—	—	—	—	—	—	—	—	—
Sept. 28.....	...	1.20	—	—	—	—	—	—	—	—
Oct. 26.....	...	{1.62 ^e .73 ^f }	—	—	—	—	—	—	—	—
Oct. 31.....	...	...	.79	—	—	—	—	—	—	—
Nov. 6.....	...	...	...	.26 ^e	—	—	—	—	—	—
Dec. 15.....	.44 ^a	...	...	...	.40	—	—	—	—	—
1931 Feb. 9.....	...	...	...	...	{.24 ^e .65 ^e }	—	—	—	—	—
Feb. 10.....	...	...	...	{.53 ^e .79 ^b }	...	—	—	—	—	—
Mar. 6.....	...	...	...	...	...	.76	—	—	—	—
Mar. 21.....	...	...	...	...	...	...	.39	—	—	—
Apr. 25.....	...	...	...	...	...	...	...	—	—	—
May 4.....	...	...	...	...	...	...	...	...	—	—
May 15.....	...	...	...	...	...	...	...	...	—	—
July 1.....	...	...	...	...	...	...	...	...	.55	—
July 18.....	...	...	...	...	...	...	...	...	...	{.85 ^a 1.71 ^b }
July 20.....	...	...	{.80 ^e 1.60 ^b}}	...	...	...	...	...	...	...

* Data mostly from publications of the U.S. Department of Commerce. Conversions at par of exchange in all instances.

^a Conventional rate.

^b General rate.

^c Rate includes a suspended duty of 7 cents per bushel, which apparently was applied at some time before the new sliding scale went into effect on May 4.

^d Rate on Canadian wheat only.

^e Rate on bread wheat.

^f Rate on durum wheat.

^g These rates are the lower and upper limits of a sliding scale based upon c.i.f. quotations for Australian wheat at Egyptian ports, in terms of the London exchange.

^h Estonian mills given right to import free of duty 145 kilos of wheat for each quintal of sifted flour they export in the following year.

ⁱ Special duty imposed, equal to the difference between the landed cost of the wheat and 11s. 6d. per 100 pounds (\$1.64 per bushel).

^j Until July 31, each mill permitted to import wheat at reduced rate of \$1.30 per bushel in an amount proportionate to its output in April-June, 1930.

^k Imports became a government monopoly.

TABLE A3.—CHANGES IN TARIFF DUTIES ON WHEAT FLOUR IN SELECTED COUNTRIES,
FROM AUGUST 1, 1930*
(U.S. dollars per barrel)

	Czecho- Slovakia	Ger- many	Estonia	Jugo- Slavia	Fin- land	Egypt	India	Poland	Union of South Africa	Aus- tria	Italy	France
Rate Aug. 1, 1930	{1.84 ^a 4.45 ^b }	6.67	2.40 ^c 3.60 ^d	1.37 ^e 2.40 ^b	2.80 ^c 3.36 ^f	1.32	15% ad valorem	2.54	2.70 ^g 2.54 ^h	.90 ^c 3.60 ^b	4.07	4.46
Date effective												
1930 Aug. 26.....	4.82 ^b	—	—	—	—	—	—	—	—	—	—	—
Sept. 20.....	4.87 ^b	—	—	—	—	—	—	—	—	—	—	—
Sept. 28.....	....	8.15	—	—	—	—	—	—	—	—	—	—
Oct. 20.....	5.00 ^b	....	—	—	—	—	—	—	—	—	—	—
Oct. 26.....	....	10.91	—	—	—	—	—	—	—	—	—	—
Oct. 31.....	....	....	{4.29 ^c 5.49 ^d }	—	—	—	—	—	—	—	—	—
Nov. 6.....	....	....	....	{1.72 ^c 2.40 ^b }	—	—	—	—	—	—	—	—
Nov. 7.....	5.13 ^b	....	....	....	—	—	—	—	—	—	—	—
Nov. 15.....	....	....	....	....	4.70	—	—	—	—	—	—	—
Dec. 15.....	3.82 ^a	....	....	....	....	2.11	—	—	—	—	—	—
1931 Feb. 9.....	....	....	....	....	....	{1.41 ^f 2.94 ^f }	—	—	—	—	—	—
Feb. 10.....	....	....	....	{2.75 ^c 3.43 ^b}}	....	....	—	—	—	—	—	—
Mar. 2.....	....	....	....	....	....	....	(20% ad valorem)	—	—	—	—	—
Mar. 6.....	....	....	....	....	....	....	....	3.69	—	—	—	—
Mar. 12.....	....	....	6.69 ^d	....	....	....	....	....	—	—	—	—
Mar. 21.....	....	....	....	....	....	....	1.28	....	—	—	—	—
Apr. 1.....	{3.79 ^a 5.10 ^b}}	....	....	....	....	....	....	....	—	—	—	—
May 4.....	....	....	....	....	....	....	....	....	....^j	—	—	—
May 5.....	{3.55 ^a 4.87 ^b}}	....	....	....	....	....	....	....	....	—	—	—
June 3.....	{3.18 ^a 4.50 ^b}}	....	....	....	....	....	....	....	....	—	—	—
June 10.....	....	9.14	....	....	....	....	....	....	....	—	—	—
July 1.....	....	....	....	....	....	....	....	....	....	4.23	—	—
July 8.....	....	....	....	....	....	....	....	....	....	....	4.34	—
July 9.....	{2.92 ^a 4.24 ^b}}	....	....	....	....	....	....	....	....	....	....	—
July 18.....	....	....	....	....	....	....	....	....	....	....	....	{4.46 ^a 8.92 ^b }

* Data mostly from publications of the U.S. Department of Commerce. Conversions at par of exchange in all instances.

^a Conventional rate.

^b General rate.

^c Rate for unsifted flour.

^d Rate for sifted flour.

^e Rate for graham flour.

^f Rate for white flour.

^g Rate includes a suspended duty of 32 cents which apparently was applied from September 27, 1930.

^h Rate on Canadian flour only.

ⁱ Lower and upper limits of a sliding scale, based upon c.i.f. quotations for Australian flour at Egyptian ports, in terms of the London exchange.

^j Special duty imposed, equal to the difference between the landed cost of the flour and 18s. 6d. per 100 pounds (\$8.82 per barrel).

TABLE A4.—MINIMUM PERCENTAGES OF DOMESTIC WHEAT REQUIRED TO BE USED BY MILLERS IN SPECIFIED COUNTRIES, 1928-29 TO 1930-31*

Date effective	Spain	Germany	France	Sweden ^a	Czecho-Slovakia	Latvia	Peru	Greece	Tunls	Belgium	Luxembourg	Italy	Holland
1928 Sept. 25.....	70	—	—	—	—	—	—	—	—	—	—	—	—
Nov. 11.....	50	—	—	—	—	—	—	—	—	—	—	—	—
1929 July 15.....	75	—	—	—	—	—	—	—	—	—	—	—	—
1929 Aug. 1.....	..	40	—	—	—	—	—	—	—	—	—	—	—
Oct. 1.....	..	50	—	—	—	—	—	—	—	—	—	—	—
Dec. 1.....	..	..	97	—	—	—	—	—	—	—	—	—	—
1930 May 21.....	.. ^b	..	..	—	—	—	—	—	—	—	—	—	—
July 4.....	—	..	..	45	—	—	—	—	—	—	—	—	—
July 16.....	—	..	..	55	—	—	—	—	—	—	—	—	—
July 26.....	—	..	90	..	—	—	—	—	—	—	—	—	—
1930 Aug. 1.....	—	40	..	..	—	—	—	—	—	—	—	—	—
Aug. 15.....	—	60	..	..	—	—	—	—	—	—	—	—	—
Sept. 1.....	—	..	..	60	—	—	—	—	—	—	—	—	—
Oct. 1.....	—	80	..	..	—	—	—	—	—	—	—	—	—
Nov. 1.....	—	..	..	75	—	—	—	—	—	—	—	—	—
Nov. 11.....	—	..	..	..	75	—	—	—	—	—	—	—	—
Nov. 12.....	—	..	..	..	..	50	—	—	—	—	—	—	—
Nov. 28.....	—	..	..	..	..	..	30	—	—	—	—	—	—
Dec. 8.....	—	..	..	..	..	..	..	10 ^c	—	—	—	—	—
1931 Jan. 1.....	—	..	..	80	..	..	..	..	—	—	—	—	—
Feb. 1.....	—	75	..	..	..	..	..	..	—	—	—	—	—
Feb. ? ^d.....	—	..	..	..	..	..	..	..	{80 ^e } {90}	—	—	—	—
Mar. 1.....	—	..	..	85	..	..	..	..	—	—	—	—	—
Apr. 1.....	—	50	..	..	..	..	..	..	—	—	—	—	—
Apr. 14.....	—	..	85	..	..	..	..	..	—	—	—	—	—
Apr. 15.....	—	..	80	..	..	..	..	..	—	—	—	—	—
Apr. ? ^f.....	—	..	..	..	..	..	..	..	—	5 ^f	—	—	—
Apr. 27.....	—	..	75	..	..	..	..	..	—	..	—	—	—
May 19.....	—	..	..	..	50	..	..	..	—	..	—	—	—
June 16.....	—	..	70	..	..	..	..	..	—	..	—	—	—
July 1.....	—	..	75	..	..	..	..	..	—	..	10	—	—
July 2.....	—	..	..	..	..	..	..	..	—	..	..	95	—
July 4.....	—	..	80	..	..	..	..	..	—	..	..	..	20
July 10.....	—	..	85	..	..	..	..	..	—	..	..	..	..
July 25.....	—	..	90	..	..	..	..	..	—	..	..	..	..
1931 Aug. 1.....	—	60	..	80	..	..	..	..	—	..	..	..	..
Aug. 16.....	—	{97 ^g } {70}	..	..	..	..	..	..	—	..	..	..	..
Aug. ? ^h.....	—	..	..	..	..	..	..	..	—	15 ^h	..	..	..
Aug. 31.....	—	..	..	..	0 ⁱ	..	..	..	—	..	..	..	..
Sept. 7.....	—	..	..	70	—	..	..	..	—	..	..	..	22½
Oct. 1.....	—	..	..	60	—	..	..	..	—	..	..	..	..
Nov. 1.....	—	..	..	..	—	..	..	..	—	..	..	{75 ^j } {95}	..

* Data chiefly from *Commerce Reports* of the U.S. Bureau of Foreign and Domestic Commerce; *Commercial Intelligence Journal* of the Canadian Department of Trade and Commerce; *Foreign Crops and Markets* of the U.S. Department of Agriculture; and *Foodstuffs 'Round the World*, published by the U.S. Department of Commerce.

In addition to the countries mentioned, Estonia and Algeria appear to have had milling quotas, but specific dates and percentages are not available to date.

^a The Swedish quota was first established by a voluntary agreement between the government and the principal millers, but was made compulsory from September 1, 1930. However, it was provided that millers agreeing to pay specified minimum prices for domestic grain might use a quota ten units lower than the regular rate. Moreover, each quota was intended to apply to a given period, usually two months, and a lower limit was fixed as the minimum for short periods or special lots.

^b As of May 21, 1930, the Spanish government prohibited further importation of wheat until such time as the domestic price should exceed 53 pesetas per 100 kilos during a month. This has rendered the quota law practically obsolete.

^c Subject to temporary suspension when domestic supplies are exhausted. Such suspension occurred in April 1931, but in lieu of the domestic quota importers were obliged to pay 17.2 leptas (\$0.002) per kilogram of wheat and flour imported.

^d Reports indicate that the measure became effective at some time between February 1 and March 1.

^e Eighty per cent in flour for domestic consumption, 90 per cent in flour for export.

^f It was reported that in April the Belgian millers made an informal agreement with the government to use 5 per cent domestic wheat in their grindings. No formal law on the subject was passed.

^g Foreign wheat in excess of 3 per cent may be used up to a maximum of 30 per cent, if the extra quantities are imported on certificates showing that equal amounts of domestic wheat have been exported.

^h In August it was reported that the millers had agreed to use 15 per cent domestic wheat. Rumors were also received to the effect that the 15 per cent was to be made compulsory, but to date no confirmation has been received.

ⁱ The milling quota requirement was replaced by import licensing.

^j Hard wheat 75 per cent, soft wheat 95 per cent.

APPENDIX B

TABLE I.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING COUNTRIES, 1920-31*

(Million bushels)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugoslavia	Roumania	Soviet Russia ^a	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	676.8	395.5	331.0	114.5	191.1	26.7	10.0	71.7	41.4	78.6	104.7	782.3	9.2
1926	831.4	407.1	324.7	160.8	230.1	23.3	10.2	74.9	36.5	71.4	110.9	913.8	10.3
1927	878.4	479.7	335.0	118.2	282.3	30.6	15.4	76.9	42.1	56.6	96.7	784.6	11.9
1928	914.9	566.7	290.9	159.7	349.1	29.7	12.3	99.2	49.2	103.3	115.5	795.2	11.0
1929	809.2	304.5	320.7	126.9	162.6	37.1	13.2	75.0	33.2	95.0	99.8	702.9	11.3
1930	858.2	397.9	390.8	212.6	236.0	21.2	8.0	84.3	57.3	80.3	130.8	1,084.0	11.4
1931	892.3	298.0	347.3	170.0	218.6	....	...	65.7	61.2	98.8	127.9	.....	15.8
Average 1925-29	822.1	430.7	320.5	136.0	243.0	28.8	12.2	79.5	40.5	81.0	105.5	795.8	10.7

Year	Morocco	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Netherlands	Denmark	Norway	Sweden
1920	17.9	16.2	5.2	31.7	58.0	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	77.1	323.5	107.8	194.1	14.5	8.6	11.1	.97	12.3
1922	12.9	18.9	3.7	36.0	66.5	243.3	71.9	161.6	10.6	6.2	9.2	.64	9.5
1923	20.0	36.2	9.9	40.7	60.6	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	4.6	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	25.0	23.6	13.0	37.2	52.2	231.8	95.4	220.6	12.8	5.5	8.8	.59	12.2
1927	28.2	28.3	8.1	44.3	57.2	276.1	120.5	195.8	16.3	6.2	9.4	.60	15.3
1928	28.1	30.3	12.1	37.3	51.0	281.3	141.6	228.6	17.2	7.3	12.2	.80	18.3
1929	31.8	33.3	12.3	45.2	50.9	337.3	123.1	260.1	13.2	5.5	11.8	.75	19.0
1930	21.3	32.2	10.4	41.0	43.3	231.1	139.2	210.1	13.2	6.1	10.2	.78	21.5
1931	34.7	22.0	13.6	46.1	36.0 ^b	269.6	155.5	247.9	15.2	6.3	9.2	.75	19.6
Average 1925-29	27.4	29.6	11.5	40.0	53.0	291.4	119.8	229.2	14.8	6.0	10.4	.65	15.6

Year	Spain	Portugal	Switzerland	Austria	Czecho-Slovakia	Poland	Finland	Latvia	Estonia, Lithuania	Greece	Japan, Chosen	South Africa	New Zealand
1920	138.6	10.4	3.6	5.5	26.4	22.7	.27	.39	2.58	11.2	39.4	7.6	6.9
1921	145.1	9.3	3.8	6.5	38.7	40.5	.58	.78	3.34	10.3	38.0	8.7	10.6
1922	125.5	10.0	2.5	7.4	33.6	46.8	.71	.96	4.17	9.0	38.1	6.3	8.4
1923	157.1	13.2	3.8	8.9	36.2	54.9	.69	1.64	3.70	8.8	33.6	6.0	4.2
1924	121.8	10.6	3.3	8.5	32.2	37.5	.79	1.58	3.86	7.7	35.7	7.1	5.4
1925	162.6	12.5	3.8	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	39.9	52.5	.92	1.86	5.02	12.4	38.7	8.3	8.0
1927	144.8	11.4	4.3	12.0	47.2	61.1	1.06	2.64	6.33	13.0	38.3	6.0	9.5
1928	122.6	7.5	4.5	12.9	52.9	59.2	1.00	2.50	7.36	13.1	39.4	7.2	8.8
1929	154.2	10.8	4.4	11.6	52.9	65.9	1.10	2.34	10.59	8.5	38.8	11.1	7.2
1930	146.7	13.5	3.8	12.0	50.6	82.3	1.21	4.06	12.96	12.5	38.5	10.2	6.5
1931	130.8	12.1	4.4	9.4	38.3	80.8	1.18	3.75	10.36	12.2	39.8	....	...
Average 1925-29	146.2	10.2	4.2	11.3	46.4	60.5	1.00	2.30	7.08	11.6	39.0	8.4	7.6

* Data of U.S. Department of Agriculture and International Institute of Agriculture. Dots (...) indicate that data are not available.

^a Data reported by the U.S. Department of Agriculture. Figures for 1923 and 1924 presumably not strictly comparable with data for later years.

^b England and Wales only.

TABLE II.—WHEAT ACREAGE IN PRINCIPAL PRODUCING COUNTRIES, 1920-31*
(Million acres)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugo-Slavia	Roumania	Soviet Russia ^a	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	1.45	.96	3.52	2.55	4.31	8.16	63.12	1.13
1926	56.36	22.90	30.47	11.69	18.95	1.48	1.00	3.71	2.62	4.18	8.22	73.90	1.29
1927	58.78	22.46	31.30	12.28	20.20	1.84	1.15	4.02	2.67	4.52	7.66	77.67	1.31
1928	58.27	24.12	32.19	14.84	20.08	1.72	1.26	4.14	2.81	4.68	7.92	71.96	1.28
1929	61.46	25.26	31.97	14.98	13.59	1.76	1.10	3.80	2.66	5.21	6.76	81.00	1.29
1930	61.14	24.90	31.65	18.15	18.94	1.61	.86	4.19	3.00	5.36	7.55	83.80	1.22
1931	54.95	26.12	32.18	13.99	17.30 ^b	1.43	...	4.13	2.96	5.39	8.36	92.37	1.42
Average 1925-29	57.45	23.11	31.54	12.80	18.09	1.65	1.09	3.84	2.66	4.58	7.74	73.53	1.26

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	.306	.152	.180	.040	.358
1921	1.96	3.04	1.50	1.46	2.08	13.30	3.56	11.88	.343	.180	.220	.041	.358
1922	2.07	3.74	1.07	1.52	2.07	13.07	3.40	11.40	.300	.150	.237	.025	.356
1923	2.25	3.12	1.61	1.54	1.84	13.67	3.65	11.45	.345	.154	.205	.025	.362
1924	2.46	3.53	1.32	1.42	1.63	13.62	3.62	11.28	.340	.118	.149	.021	.322
1925	2.62	3.61	1.62	1.38	1.57	13.87	3.84	11.67	.365	.132	.199	.022	.363
1926	2.56	3.74	1.84	1.53	1.68	12.97	3.96	12.14	.354	.132	.252	.022	.381
1927	2.30	3.47	1.38	1.66	1.74	13.06	4.32	12.30	.391	.153	.274	.025	.561
1928	2.66	3.66	2.02	1.59	1.49	12.80	4.27	12.26	.408	.148	.252	.028	.561
1929	3.01	3.80	1.73	1.61	1.41	12.67	3.96	11.79	.356	.112	.257	.030	.574
1930	2.96	3.98	1.92	1.58	1.43	12.99	4.40	11.90	.411	.142	.249	.030	.647
1931	2.73	3.54	1.90	....	1.20 ^c	12.49	5.36	12.06	....	.191	....	....	.684
Average 1925-29	2.63	3.66	1.72	1.55	1.58	13.07	4.07	12.03	.375	.135	.247	.025	.488

Year	Spain	Portugal	Switzerland	Austria	Czechoslovakia	Poland	Finland	Latvia	Estonia, Lithuania	Greece	Japan, Chosen	South Africa	New Zealand
1920	10.25	1.10	.119	.371	1.57	1.79	.022	.039	.194	1.08	2.18	.875	.220
1921	10.39	1.09	.117	.378	1.56	2.42	.028	.046	.210	.95	2.14	.992	.353
1922	10.31	1.16	.110	.460	1.53	3.02	.038	.070	.253	1.06	2.12	.848	.276
1923	10.49	1.05	.112	.475	1.51	2.99	.038	.106	.257	1.06	2.07	.779	.174
1924	10.38	1.04	.111	.482	1.51	3.16	.037	.106	.254	1.15	2.03	.755	.167
1925	10.72	1.05	.112	.484	1.53	3.20	.038	.119	.328	1.15	2.04	.968	.152
1926	10.78	1.06	.134	.500	1.80	3.25	.039	.122	.362	1.30	2.04	.880	.220
1927	10.83	1.06	.134	.505	1.85	3.36	.044	.145	.364	1.23	2.06	.774	.261
1928	10.48	1.12	.134	.514	1.92	3.19	.046	.164	.463	1.33	2.10	.825	.255
1929	10.62	1.08	.134	.515	2.02	3.53	.047	.145	.570	1.25	2.09	.942	.237
1930	11.13	1.10	.129	.501	1.98	4.07	.051	.179	.616	1.19	2.05	1.137	.243
1931	10.87	....	.134	....	1.98	4.01	.047	....	.495 ^d	....	2.06	....	....
Average 1925-29	10.69	1.07	.130	.504	1.82	3.31	.043	.139	.417	1.25	2.07	.878	.225

* Data of U.S. Department of Agriculture and International Institute of Agriculture. Figures for 1931 are preliminary. Dots (...) indicate that data are not available. Estimates are presumably of areas harvested in most instances, Canada being an outstanding exception. Many countries, however, do not distinguish sharply between areas sown and harvested; the estimates above ordinarily represent the final official estimates of area, which are assumed to be harvested areas.

^a Data reported by U.S. Department of Agriculture. For somewhat different figures, see Appendix Table XII.

^c England and Wales only.

^b Estimate for area sown, not harvested. For estimates of areas sown in earlier years, see Appendix Table XII.

^d Lithuania only.

TABLE III.—WHEAT YIELD PER ACRE IN PRINCIPAL PRODUCING COUNTRIES, 1920-31*
 (Bushels per acre)

Year	United States	Canada	India	Australia	Argentina	Chile	Uruguay	Hungary	Bulgaria	Jugoslavia	Romania	Soviet Russia	Mexico
1920	13.6	14.4	12.6	16.1	11.8	18.4	11.1	14.2	13.7	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	18.3	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	18.4	10.5	20.3	16.2	18.3	12.8	12.4	8.2
1926	14.8	17.8	10.7	13.8	12.1	15.7	10.3	20.2	14.0	17.1	13.5	12.4	8.0
1927	14.9	21.4	10.7	9.6	14.0	16.6	13.4	19.1	15.8	12.5	12.6	10.1	9.1
1928	15.7	23.5	9.0	10.8	17.4	17.3	9.8	23.9	17.5	22.1	14.6	11.1	8.6
1929	13.2	12.1	10.0	8.5	12.0	21.1	12.0	19.8	12.5	18.2	14.7	8.7	8.8
1930	14.0	16.0	12.3	11.7	12.5	13.2	9.3	20.1	19.1	15.0	17.3	12.9	9.4
1931	16.2	11.4	10.8	12.2	....	....	....	15.9	20.6	18.3	15.3	....	11.6
Average 1920-30	14.2	17.1	11.1	12.2	13.0	17.4	11.0	18.8	14.4	15.5	13.5	10.9 ^a	7.1 ^b

Year	Morocco	Algeria	Tunis	Egypt	British Isles	France	Germany	Italy	Belgium	Netherlands	Denmark	Norway	Sweden
1920	9.0	4.7	4.0	26.6	29.3	18.8	24.3	12.5	33.6	39.4	41.1	25.0	23.8
1921	11.8	9.4	6.0	25.4	37.0	24.3	30.3	16.3	42.3	47.6	50.7	23.7	34.5
1922	6.2	5.1	3.4	23.7	32.1	18.6	21.2	14.2	35.4	41.1	39.0	25.7	26.7
1923	8.9	11.6	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	3.9	24.1	33.0	20.6	24.6	15.1	38.3	39.2	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	43.5	49.0	22.3	36.8
1926	9.8	6.3	7.1	24.3	31.0	17.9	24.1	18.2	36.2	41.6	34.8	26.6	31.9
1927	12.2	8.2	5.9	26.8	32.8	21.1	27.9	15.9	41.6	40.2	34.3	24.2	27.3
1928	10.5	8.3	6.0	23.5	34.2	22.0	33.2	18.6	42.2	49.6	48.5	28.5	32.7
1929	10.5	8.8	7.1	28.0	36.0	26.6	31.1	22.1	37.1	48.8	45.8	25.0	33.2
1930	7.2	8.1	5.4	26.0	30.3	18.4	31.6	17.7	32.2	42.6	41.0	25.9	33.2
1931	12.7	6.2	7.1	....	....	21.6	29.0	20.6	....	32.8	....	....	28.7
Average 1920-30	9.7	7.7	5.7	25.6	33.0	21.1	28.0	17.3	37.9	43.1	42.4	24.9	30.6

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	13.3	10.4	18.1	8.7	31.2
1921	14.0	8.5	32.5	17.3	24.9	16.7	20.7	17.0	15.9	10.9	17.8	8.7	29.9
1922	12.2	8.7	23.2	16.1	22.0	15.5	18.7	13.7	16.5	8.5	18.0	7.4	30.4
1923	15.0	12.5	34.3	18.7	24.0	18.4	18.1	15.5	14.4	8.3	16.3	7.7	24.0
1924	11.7	10.2	30.0	17.6	21.3	11.9	21.4	14.9	15.2	6.7	17.6	9.4	32.6
1925	15.2	11.9	33.6	22.0	25.7	19.9	24.4	18.2	18.5	9.8	19.7	9.5	30.4
1926	13.6	8.1	31.7	18.9	22.2	16.2	23.7	15.2	13.9	9.5	19.0	9.4	36.1
1927	13.4	10.8	32.4	23.7	25.5	18.2	24.2	18.2	17.4	10.5	18.6	7.7	36.6
1928	11.7	6.7	33.4	25.1	27.6	18.6	21.7	15.2	15.9	9.8	18.8	8.8	34.6
1929	14.5	10.1	32.6	22.4	26.2	18.7	23.3	16.1	18.6	6.8	18.6	11.8	30.6
1930	13.2	12.3	29.7	24.0	25.6	20.2	23.7	22.7	21.0	10.5	18.8	9.0	26.7
1931	12.0	....	32.5	....	19.4	20.1	25.0	....	....	....	19.4	...	....
Average 1920-30	13.5	9.9	31.2	20.0	23.8	17.0	21.1	16.1	16.4	9.2	18.3	8.9	31.2

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

^a Average 1923-30.

^b Average 1921-30.

TABLE IV.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS, 1920-31*

(Million bushels)

Year	United States	Canada	Soviet Russia	Lower Danube ^a	Other Europe	Northern Africa ^b	India	Other Northern Hemisphere ^c	Northern Hemisphere ex-Russia	Argentina	Australia	Other Southern Hemisphere ^d	Southern Hemisphere	World ex-Russia
1920.....	833	263	...	172	776	39	378	86	2,547	156	146	48	350	2,897
1921.....	815	301	...	212	1,009	61	250	80	2,728	191	129	56	376	3,104
1922.....	868	400	...	224	820	35	367	88	2,802	196	109	49	354	3,156
1923.....	797	474	419	260	997	66	372	88	3,054	248	125	54	427	3,481
1924.....	864	262	472	204	853	51	361	80	2,675	191	165	50	406	3,081
1925.....	677	395	782	296	1,100	68	331	85	2,952	191	115	54	360	3,312
1926.....	831	407	914	294	921	62	325	86	2,926	230	161	52	443	3,369
1927.....	878	480	785	272	1,001	65	335	95	3,126	282	118	65	465	3,591
1928.....	915	567	795	367	1,042	71	291	88	3,341	349	160	61	570	3,911
1929.....	809	305	703	303	1,144	77	321	95	3,054	163	127	73	363	3,417
1930.....	858	398	1,084	351	1,015	64	391	91	3,168	236	213	50	499	3,667
1931.....	892	298	...	354	1,067	70	347	102	3,130	219	170	..	...	.....
Average 1925-29..	822	431	796	306	1,042	69	321	90	3,080	243	136	61	440	3,520

* Data summarized from Appendix Table I.

^a Hungary, Bulgaria, Roumania, and Jugo-Slavia.^b Algeria, Morocco, and Tunis.^c Egypt, Mexico, Japan, and Chosen.^d Peru, Chile, Uruguay, Union of South Africa, and New Zealand.

TABLE V.—RYE, CORN, BARLEY, AND OATS PRODUCTION IN SOME IMPORTANT AREAS, 1920-30*

(Million bushels)

Year	Rye		Corn				Barley					Oats		
	Europe ex-Russia	Others ^a	Europe ex-Russia	United States	Argentina	Union of South Africa	Europe ex-Russia	Russia	United States	Canada	Argentina	Europe ex-Russia	Russia	United States
1920....	532	73	520	3,209	230	33	551	...	189	63	4	1,478	...	1,496
1921....	765	85	393	3,069	176	48	551	...	155	60	6	1,451	...	1,078
1922....	720	139	423	2,906	176	71	585	...	182	72	8	1,478	...	1,216
1923....	831	90	468	3,054	277	40	648	...	198	77	12	1,720	...	1,306
1924....	654	81	589	2,309	186	87	565	180	182	89	7	1,569	603	1,503
1925....	946	60	624	2,917	322	39	672	269	214	87	17	1,708	838	1,488
1926....	762	58	653	2,692	321	65	674	246	185	100	18	1,843	1,071	1,247
1927....	812	80	485	2,763	312	69	659	207	266	97	15	1,748	917	1,183
1928....	902	67	384	2,819	240	67	743	252	357	136	17	1,879	1,135	1,439
1929....	945	56	704	2,614	249	80	827	338	303	102	16	2,061	1,144	1,228
1930....	923	72	608	2,060	371	57	768	...	305	135	14	1,731	...	1,278
Average 1925-29..	873	64	570	2,761	289	64	715	262	265	104	17	1,848	1,021	1,317

* Official data as reported by the U.S. Department of Agriculture.

^a Canada, United States, Argentina.

TABLE VI.—CORN AND POTATO PRODUCTION IN PRINCIPAL EUROPEAN PRODUCING COUNTRIES, 1920-30*
(Million bushels)

Year	Corn (Maize)						Potatoes						
	Hungary	Bulgaria	Jugo-Slavia	Romania	Soviet Russia	Italy	British Isles	France	Germany	Belgium, Holland	Czecho-Slovakia	Poland	Soviet Russia
1920.....	50.2	20.9	101.1	182.0	....	89.3	238	428	1,024	204	184	665	.....
1921.....	31.7	16.4	73.8	110.6	....	92.3	245	305	961	179	159	527	.....
1922.....	48.7	16.4	89.8	119.8	....	76.8	322	465	1,494	307	333	948	.....
1923.....	49.2	21.8	84.8	153.0	....	89.2	223	364	1,197	211	229	825	.....
1924.....	74.1	24.8	149.4	155.5	90.9	105.7	219	564	1,338	208	239	831	1,332
1925.....	88.0	25.8	149.2	163.7	172.0	110.0	281	558	1,533	230	276	909	1,453
1926.....	76.5	27.3	134.2	229.9	131.5	118.1	249	409	1,103	220	185	786	1,609
1927.....	68.3	21.0	83.0	139.1	117.6	87.4	275	644	1,380	214	370	984	1,525
1928.....	49.6	20.3	71.6	108.5	126.8	65.0	297	414	1,516	271	326	1,016	1,675
1929.....	70.6	37.0	163.3	251.4	158.5	99.6	331	611	1,473	294	393	1,167	1,758
1930.....	55.4	30.5	136.4	177.9	....	118.0	254 ^a	493	1,731	221	300	1,135	.....
Average 1925-29..	70.6	26.3	120.3	178.5	141.3	96.0	287	527	1,401	246	310	972	1,604

* Data of U.S. Department of Agriculture and International Institute of Agriculture. Dots (...) indicate that data are not available.

^a Irish Free State and Northern Ireland estimated.

TABLE VII.—RYE PRODUCTION IN PRINCIPAL PRODUCING COUNTRIES, 1920-31*
(Million bushels)

Year	United States	Canada	Argentina	Hungary	Bulgaria	Jugo-Slavia	Romania	Soviet Russia	France	Germany	Italy	Belgium	Netherlands
1920.....	60.5	11.3	0.8	20.2	6.2	6.1	9.4	.....	34.5	194.2	4.5	18.2	14.8
1921.....	61.7	21.5	1.7	23.1	6.1	6.2	9.1	.....	44.4	267.6	5.6	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	906.2	43.7	317.4	6.7	21.7	16.4
1926.....	40.7	12.2	5.2	31.4	7.1	7.5	11.2	941.3	30.1	252.2	6.5	20.1	13.6
1927.....	58.2	15.6	6.6	22.4	7.0	5.9	9.3	950.3	34.0	269.0	5.9	21.9	13.5
1928.....	43.4	14.6	9.0	32.6	8.1	7.5	11.5	750.0	34.1	335.5	6.5	23.2	17.3
1929.....	41.9	9.8	4.4	31.4	7.3	8.3	13.3	818.5	39.4	321.0	6.9	22.2	18.3
1930.....	45.4	22.0	4.7	28.4	12.6	7.8	18.3	.....	29.3	302.3	6.1	18.6	14.9
1931.....	32.7	5.9	...	20.8	12.9	7.6	15.7	.....	31.0	275.1	6.4	21.1	12.7
Average 1925-29..	46.1	12.3	6.0	30.1	7.3	7.4	10.7	873.3	36.3	299.0	6.5	21.8	15.8

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	1.8	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	1.7	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	1.9	15.8	53.3	242.8	9.4	10.8	6.5	23.8	0.6
1924.....	11.1	10.9	26.3	5.2	1.4	16.2	44.7	147.9	11.3	7.8	5.5	18.3	0.9
1925.....	14.4	26.6	29.9	5.1	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	55.7	204.0	11.9	6.1	4.5	13.8	1.6
1927.....	11.0	15.2	26.5	4.7	1.8	20.1	60.0	231.8	12.9	10.2	6.7	21.2	1.5
1928.....	10.2	17.0	16.4	4.0	2.0	19.9	70.0	240.5	11.0	8.5	5.5	18.7	1.7
1929.....	10.9	16.3	22.9	4.7	1.9	20.1	70.4	276.0	13.1	9.5	5.7	22.0	1.3
1930.....	10.6	18.0	21.5	4.9	1.5	20.6	68.0	273.9	14.1	14.4	8.9	25.2	1.9
1931.....	....	12.2	18.5	...	1.4	18.3	50.5	224.4	13.1	6.4	5.8	15.2	...
Average 1925-29..	11.9	19.6	23.8	4.4	1.9	20.1	62.8	243.5	12.5	9.3	5.9	20.4	1.5

* Data of U.S. Department of Agriculture and International Institute of Agriculture. Dots (...) indicate that data are not available.

TABLE VIII.—UNITED STATES WHEAT ACREAGE, 1920-31*
(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.....	42.7	2.66	40.1	21.4	61.5
1930.....	42.5	3.00	39.5	21.6	61.1
1931.....	43.1	2.14	41.0	13.9	54.9
Average 1925-29..	42.7	6.18	36.5	21.0	57.5

* Official data of U.S. Department of Agriculture. See especially *Agriculture Yearbook, 1931*, p. 588, and crop reports.

^a Estimate of December 1, 1931.

TABLE IX.—UNITED STATES WHEAT PRODUCTION BY CLASSES, 1920-30*
(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.....	203	102	384	140	86	915
1929.....	143	57	344	186	78	809
1930.....	152	59	366	194	81	851
Average 1925-29..	165	71	322	181	82	822

* Classification by U.S. Department of Agriculture. These are estimates only, and are made on a basis which does not lead to highly reliable results. Figures for 1930 are subject to revision; total production by classes is smaller than the official estimate of total production as in Appendix Table I.

TABLE X.—UNITED STATES WHEAT CROP FORECASTS AND ESTIMATES, 1926-31*
(Million bushels)

Date	1926	1927	1928	1929	1930	1931
WINTER WHEAT						
May 1.....	548.9	593.9	486.5	595.3	525.1	652.9
June 1.....	543.3	537.0	512.3	622.1	532.5	649.1
July 1.....	567.8	579.4	543.8	582.5	557.7	712.6
Aug. 1.....	626.5	552.8	578.6	568.2	597.4	775.2
Sept. 1.....	626.5	532.8	578.6	568.2	597.4	775.2
Oct. 1.....	626.5	552.8	578.6	568.2	597.4	775.2
Dec. 1.....	626.9	552.4	579.0	578.3	604.3	787.5
Revised	627.4	552.8	578.7	576.2	601.9	.....
SPRING WHEAT						
July 1.....	199.6	274.2	256.2	251.4	249.5	156.4
Aug. 1.....	212.7	298.4	312.7	205.7	223.2	118.4
Sept. 1.....	212.1	308.1	322.5	217.5	240.4	110.5
Oct. 1.....	213.3	313.8	325.3	223.5	242.2	109.1
Dec. 1.....	205.4	319.3	323.8	228.2	246.2	104.8
Revised	203.9	325.6	336.2	233.0	256.3	.....
TOTAL WHEAT						
July 1.....	767.4	853.6	800.0	833.9	807.2	869.0
Aug. 1.....	839.2	851.2	891.3	773.9	820.6	893.6
Sept. 1.....	838.6	860.9	901.1	785.7	837.8	885.7
Oct. 1.....	839.8	866.6	903.9	791.7	839.6	884.3
Dec. 1.....	832.3	871.7	902.8	806.5	850.9	892.3
Revised	821.3	878.4	914.9	809.2	858.2	.....

* Data from *Agriculture Yearbooks* and crop reports of the U.S. Department of Agriculture. Revised figures are usually those published in December of the following year.

TABLE XI.—CANADIAN WHEAT PRODUCTION FORECASTS AND ESTIMATES, 1926-31*
(Million bushels)

Date	1926	1927	1928	1929	1930	1931
June 30.....	349	325	...	...	...	...
July 31.....	317	357	...	...	...	...
Aug. 31.....	399	459	550	294	385	271
Oct. 31.....	406	444	501	294	396	298
Dec. 31.....	410	440	534	300	398	...
Final .....	...	480	567	305	...	...

* Official Canadian data.

TABLE XII.—WHEAT ACREAGE IN UNITED STATES, ARGENTINA, AND RUSSIA, 1920-30*
(Million acres)

Year	United States		Argentina		Russia	
	Sown	Harvested	Sown	Harvested	Sown	Harvested
1920....	65.99	61.14	15.01	13.22	.....^a	.....^a
1921....	65.91	63.70	14.24	14.10	.....^a	.....^a
1922....	67.89	62.32	16.25	16.06	.....^a	.....^a
1923....	66.24	59.66	17.19	17.04	39.16	.....^a
1924....	65.80	52.54	17.79	15.98	52.73	.....^a
1925....	60.97	52.37	19.19	17.62	63.12	61.82
1926....	59.26	56.36	19.27	18.95	73.90	73.30
1927....	64.43	58.78	20.69	20.20	78.96 ^b	78.65
1928....	69.38	58.27	22.76	20.08	71.88	68.39
1929....	64.12	61.46	19.49	13.59	75.72 ^c	74.19
1930....	64.14	61.14	21.28	18.94	83.79	.....^a

* Data as reported by the U.S. Department of Agriculture for the United States and Argentina. Russian figures 1923-29 are data of the Gosplan, and agree with figures published by the International Institute of Agriculture; for 1930, as reported by the U.S. Department of Agriculture and the International Institute of Agriculture.

^a Not available. However, statistics of area 1920-22 may be found in various *Yearbooks* of the International Institute of Agriculture. The figures as they appear in the last *Yearbooks* to include them are as follows, in million acres: 1920-47.56; 1921-38.36; 1922-25.86. These figures were obtained before statistical methods were far advanced, and have not been revised to accord with the Gosplan data of 1925-29.

^b The U.S. Department of Agriculture carries a figure of 77.67 million acres.

^c The U.S. Department of Agriculture carries a figure of 81.00 million acres.

TABLE XIII.—UNITED STATES WINTER- AND SPRING-WHEAT ACREAGE, PRODUCTION, AND YIELD PER ACRE, 1920-31*

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	402.1	274.7	12.8	13.1
1926....	36.99	19.37	627.4	203.9	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....	40.06	21.41	576.2	233.0	14.4	10.9
1930....	39.51	21.63	601.8	256.3	15.2	11.8
1931....	41.01	13.94	787.5	104.8	19.2	7.5
Average 1925-29..	36.47	20.98	547.4	274.7	15.0	13.1

* Data of U.S. Department of Agriculture. See especially *Agriculture Yearbook, 1931*, p. 588, and press releases.

TABLE XIV.—PERCENTAGES OF VARIOUS GRADES OF CANADIAN HARD RED SPRING WHEAT TO TOTAL WHEAT INSPECTED IN THE WESTERN DIVISION, SEPTEMBER-AUGUST, 1924-31*

Grading	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31
No. 1 ^a	19.3	22.4	9.2	.9	1.5	40.0	39.6
No. 2....	18.3	27.1	17.5	7.7	12.3	35.9	20.8
No. 3....	18.5	13.9	7.8	22.3	19.7	11.8	5.1
No. 4....	16.3	3.1	3.2	12.3	19.8	2.0	1.8
No. 5....	8.1	.9	1.4	5.0	17.4	.6	.3
No. 6....	3.2	.2	.9	2.9	15.2	.2	....
Feed....	1.2	.1	.3	1.2	5.6	.1	.1
No grade ^b ..	11.7	28.6	51.2	43.0	1.4	1.4	25.3 ^c
Other ^d	3.4	3.7	8.5	4.7	7.1	8.0	7.0

* Data from *Canadian Grain Statistics*.

^a Includes No. 1 Hard and No. 1 Northern.

^b 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.

^c Tough and damp inspections. Owing to a change in the inspection laws, these classifications include wheats previously classified as "No grade."

^d Largely durum.

TABLE XV.—UNITED STATES IMPORTS OF WHEAT AND FLOUR FROM CANADA, 1920-21 TO 1930-31*
(Million bushels)

Crop year July-June	Withdrawn for consumption, duty-paid	Withdrawn for milling 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....	7.51	9.28	18.01	1.93	19.94
1923-24....	13.78	13.88	27.28	0.76	28.04
1924-25....	0.27	5.81	6.17	0.03	6.20
1925-26....	1.65	13.44	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
1929-30....	0.03	12.01	12.95	0.01	12.96
1930-31....	0.04	19.90	19.05	0.01	19.06

* Data of U.S. Department of Commerce 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 XVI.—BROOMHALL'S FORECASTS OF WHEAT EXPORT SUPPLIES AND REQUIREMENTS, 1930-31*

(Million bushels)

Date of report	Available for export	Importers' purchases			Margin over Importers' purchases
		Total	Europe	Ex-Europe	
Sept. 3.....	1,128	736	608	128	392
Sept. 17.....	1,176	736	608	128	440
Nov. 12.....	1,144	736	608	128	408
Feb. 4.....	1,144	768	608	160	376
Mar. 25.....	1,148	784	608	176	364
June 17.....	1,132	784	608	176	348
Actual .....	.....	787	608	179	...

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

TABLE XVII.—CANADIAN WHEAT AND FLOUR EXPORTS OVERSEAS, FROM 1920-21*

(Million bushels)

August-July	Total	Through U.S. ports	Through all Canadian 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
1929-30.....	179.0	77.2	101.8	54.9
1930-31.....	251.5	97.3	154.2	89.6

* 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 XVIII.—UNITED STATES WHEAT EXPORTS BY CLASSES, FROM 1923-24*

(Million bushels)

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
1929-30..	2	15	54	3	18	92
1930-31..	1	12	47	3	14	77

* Data from *Foreign News on Wheat*, October 21, 1929, page 11; and *World Wheat Prospects*, August 22, 1930, page 16. Data for 1930-31 received direct.

TABLE XIX.—MONTHLY WHEAT RECEIPTS AT PRIMARY MARKETS IN THE UNITED STATES AND CANADA*

(Million bushels)

Month	United States primary markets				Fort William and Port Arthur				Vancouver			
	1927-28	1928-29	1929-30	1930-31	1927-28	1928-29	1929-30	1930-31	1927-28	1928-29	1929-30	1930-31
Aug.	81.6	84.2	101.7	85.5	2.4	3.5	2.4	11.1	.09	1.07	.74	4.98
Sept.	79.7	73.3	47.0	62.6	8.6	39.1	27.7	49.0	.32	2.61	4.83	6.12
Oct.	73.3	84.4	36.3	28.9	51.4	81.4	28.9	29.7	6.17	12.69	7.32	6.94
Nov.	44.8	43.6	20.6	24.6	71.0	72.9	17.0	14.6	10.78	14.62	6.19	10.18
Aug.-Nov.	279.4	285.5	205.6	201.6	133.4	196.9	76.0	104.4	17.36	31.02	19.08	28.22
Dec.	26.5	33.0	22.9	21.5	41.0	51.6	6.2	12.4	11.81	13.53	4.73	7.76
Jan.	23.5	22.5	17.5	29.5	21.1	11.0	2.8	4.9	16.49	13.90	4.25	7.83
Feb.	22.5	28.7	19.9	30.7	9.5	2.9	1.8	4.5	12.54	9.25	6.23	8.36
Mar.	26.3	27.2	16.7	30.8	3.3	5.2	1.6	5.1	10.50	15.46	6.89	5.41
Dec.-Mar.	98.8	111.4	77.0	112.5	74.9	70.7	12.4	26.9	51.34	52.14	22.10	29.36
Apr.	18.0	17.5	13.4	21.2	.9	9.7	1.6	7.6	10.88	7.31	4.12	5.70
May	25.9	18.6	16.5	30.9	17.6	13.8	7.4	12.6	7.43	3.91	3.08	5.61
June	15.6	25.7	18.7	29.7	20.1	14.7	23.7	22.1	3.66	3.04	3.60	3.27
July	72.6	94.2	99.0	104.0	14.4	14.6	14.2	11.7	2.44	3.30	3.31	3.62
Apr.-July	132.1	156.0	147.6	185.8	53.0	52.8	46.9	54.0	24.41	17.56	14.11	18.20
Aug.-July	510.3	552.9	430.2	499.9	261.3	320.4	135.3	185.3	93.11	100.72	55.29	75.78

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

TABLE XX.—UNITED STATES TRADE IN WHEAT AND FLOUR WITH FOREIGN COUNTRIES AND ALASKA, HAWAII, PORTO RICO, FROM 1920-21*

(Thousand bushels)

July-June	Wheat				Flour as wheat		Wheat and flour as wheat				
	Exports	Imports	Re-exports	Net exports	Exports	Net exports	Exports	Imports less re-exports	Net exports	Shipments to possessions	Net exports plus shipments
1920-21.....	293,267	51,005	778	243,040	76,051	69,588	369,318	56,689	312,628	2,697	315,325
1921-22.....	208,320	14,466	4	193,858	74,246	71,731	282,566	16,976	265,589	2,687	268,276
1922-23.....	154,950	18,013	148	137,085	69,950	67,995	224,900	19,820	205,080	2,907	207,987
1923-24.....	78,793	27,284	36	51,545	81,094	80,360	159,887	27,980	131,905	2,973	134,878
1924-25.....	195,491	6,169	70	189,392	65,316	65,316	260,807	6,100	254,708	2,871	257,579
1925-26.....	63,188	15,597	251	47,842	44,847	44,819	108,035	15,376	92,661	2,741	95,402
1926-27.....	156,250	13,235	81	143,096	62,914	62,905	219,164	13,164	206,001	3,082	209,083
1927-28.....	145,998	15,705	39	130,332	60,259	60,245	206,257	15,679	190,577	2,692	193,269
1928-29.....	103,113	21,430	43	81,726	60,574	60,574	163,687	21,386	142,300	3,172	145,472
1929-30.....	92,174	12,948	60	79,286	61,142	61,147	153,316	12,883	140,433	2,983	143,416
1930-31.....	76,443	19,054	15	57,404	55,260	55,258	131,703	19,040	112,663	2,787	115,450

* Official data, chiefly from *Monthly Summaries of Foreign Commerce*.

TABLE XXI.—NET EXPORTS OF WHEAT AND FLOUR FROM PRINCIPAL EXPORTING COUNTRIES, FROM AUGUST-JULY, 1921-22*

(Million bushels)

Country	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31
United States ^a	255	203	130	259	106	202	187	153	146	116
Canada	185	279	346	192	324	292	332	406	185	258
Argentina	118	139	172	123	94	143	178	224	150	123
Australia	115	50	86	124	77	103	71	109	63	152
India .....	...^b	29	20	38	8	11	9	.. ^c	1	.. ^d
Danube basin ^e	21	12	34	26	45	45	32	37	56	45
Russia .....	...^f	... ^f	21 ^f	... ^f	27 ^f	49 ^f	7 ^f	... ^f	10	111 ^f
Other countries ^g	7	2	17	9	14	3	9	14	17	23
Total	701	714	826	771	695	848	825	943	628	828

* Summarized from data in Appendix Table XXIV.

^a Includes shipments to possessions of about 3 million bushels a year (see Appendix Table XX for July-June figures).^b Net imports of 14 million bushels.^c Net imports of 25 million bushels.^d Net imports of 5 million bushels.^e Hungary, Jugo-Slavia, Roumania, and Bulgaria. July-June.^f July-June.
^g Includes Morocco, Algeria, Tunis, Chile, Spain, and Poland for the years in which these countries were net exporters. The totals include some rough estimates.

TABLE XXII.—INTERNATIONAL SHIPMENTS OF WHEAT AND RYE (BROOMHALL), 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	....	....	37.4	0.0	1.4	38.8
1922-23.....	676.4	455.1	138.3	47.8	....	9.1 ^a	26.1	....	62.9	2.9	1.6	67.4
1923-24 ^b	775.3	454.4	174.4	77.9	23.2	27.9 ^a	17.5	....	28.7	44.3	...	73.0
1924-25.....	715.2	422.6	121.4	117.1	....	13.5	31.7	8.9	62.3	0.4	0.1	66.8
1925-26.....	667.6 ^c	413.2	94.0	74.0	23.6	28.8	4.8	14.8	16.1	4.2	20.6 ^d	40.9
1926-27.....	817.6	484.0	139.2	104.0	44.4	31.2	10.4	4.4	34.8	8.6	7.1	50.5
1927-28.....	792.8	489.6	177.6	74.4	4.8	29.2	7.2	10.0	45.9	3.1	4.8	53.8
1928-29 ^b	927.6	542.9	223.7	112.1	....	36.0	0.2	12.7	19.1	0.5	12.2	31.8
1929-30.....	612.9	318.7	152.2	64.9	6.4	46.6	4.2	19.8 ^c	2.3	4.8	25.1	32.2
1930-31.....	786.5	354.2	123.1	153.9	98.7	37.5	3.7	15.4	4.8	22.6	12.8	40.2

* 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. Wheat shipments are converted from quarters of 480 pounds on the basis of 60 pounds per bushel, and rye shipments are converted from quarters of 480 pounds on the basis of 56 pounds per bushel.

^a Includes also shipments from other areas.

^d Chiefly Germany.

^b For 53 weeks.

^c Includes shipments from France.

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

TABLE XXIII.—BROOMHALL'S SHIPMENTS OF WHEAT AND FLOUR BY DESTINATIONS, FROM 1921–22*
(Million bushels)

Crop year ending approximately August 1	To Europe				To Ex-Europe							
	Total	U.K.	Continent	Orders	Total	China and Japan	Central America	Brazil	Egypt	North and South Africa	India	Others
1921-22.....	546.7	155.1	253.3	138.3	100.4	....	....	....	....	...	...	...
1922-23.....	585.9	167.4	315.8	107.7	90.5	....	....	....	....	...	...	...
1923-24 ^a	626.5	228.3	305.7	132.3	148.8	....	....	....	....	...	...	...
1924-25.....	639.7	160.2	312.5	167.0	75.5	....	....	....	....	...	...	...
1925-26.....	532.3	162.8	260.1	109.4	135.3	....	....	....	....	...	...	...
1926-27.....	683.0	176.5	355.2	151.3	132.0	30.7	55.6	22.7	11.0	7.0	4.0	1.0
1927-28.....	661.8	164.7	352.1	145.0	131.0	31.4	55.6	26.7	9.2	5.9	1.5	0.7
1928-29 ^a	703.1	158.8	399.2	145.1	225.0	69.5	70.4	30.3	17.8	7.3	27.6	2.1
1929-30.....	483.0	137.4	225.3	120.3	129.8	33.6	50.1	28.2	7.6	2.7	6.3	1.3
1930-31.....	607.5	131.0	282.8	193.7	179.0	67.4	58.0	26.5	11.1	4.1	11.0	0.9

* Data from the *Corn Trade News*. Dots (...) indicate that data are not available.

^a Fifty-three weeks.

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

(Million bushels)

A.—NET EXPORTS

Crop year August-July	United States	Canada	India	Aus- tralia	Argen- tina	Hungary	Bulgaria	Jugo- Slavia	Rou- mania	Russia	Algeria
1920-21.....	307.9	165.8	15.1	88.9	64.0	(.01)	1.77	3.76	1.41	....	(5.6)
1921-22.....	251.8	185.4	(13.8)	114.6	118.1	9.40	4.52	3.90	3.51	....	4.2
1922-23.....	200.2	279.0	28.6	50.3	139.4	5.15	4.32	1.01	1.64	....	(2.3)
1923-24.....	127.4	346.1	20.1	85.6	172.2	16.79	2.45	5.84	8.98	21.4 ^c	7.2
1924-25.....	256.4	192.1	38.1	123.6	123.1	13.54	(1.70)	9.55	3.21	....^{ab}	(0.5)
1925-26.....	103.4	324.1	8.0	77.2	94.4	19.79	4.37	10.81	9.93	27.1 ^a	4.6
1926-27.....	198.6	292.5	11.5	102.7	143.0	21.88	2.25	9.70	11.18	49.2 ^a	(1.6)
1927-28.....	184.1	332.5	8.5	70.7	178.1	21.84	2.04	0.55	7.46	7.0 ^a	5.3
1928-29.....	149.8	406.2	(24.8)	108.6	224.0	26.00	0.28	8.81	1.59 ^c	....	3.7 ^d
1929-30.....	142.9	184.9	0.7	62.6	150.4	30.06	(1.42)	22.92	2.82	9.6	4.6
1930-31.....	113.3	258.5	(4.9)	152.3	122.9	18.29	5.91	5.62	15.46	110.8 ^c	...
Average 1925-30.....	155.8	308.0	0.8	84.4	158.0	23.91	1.50	10.56	6.60	....	3.3

B.—NET IMPORTS

Crop year August-July	Tunis	Egypt	United Kingdom	Irish Free State	France ^e	Germany	Italy	Belgium	Nether- lands	Denmark	Norway
1920-21.....	1.3	11.21	200.1		69.7	59.8 ^f	99.4	32.2	18.9	0.35	3.86
1921-22.....	(1.3)	6.84	208.2		21.8	69.5 ^f	100.5	40.5	19.8	4.01	5.16
1922-23.....	0.7	7.68	205.5 ^g	4.8 ^g	55.0	37.5 ^f	115.7	39.5	23.9	6.28	6.90
1923-24.....	(2.8)	8.52	219.4	20.3	68.1	30.7 ^f	69.9	40.0	26.7	9.28	6.11
1924-25.....	(0.2)	9.90	208.8	19.1	45.6	80.9 ^f	88.7	39.0	26.8	6.55	5.57
1925-26.....	(2.6)	12.79	191.1	18.8	24.6	57.4	67.9	39.2	27.2	6.00	6.70
1926-27.....	(0.3)	8.77	217.3	19.9	33.6	91.8	86.6	39.5	28.5	7.24	6.22
1927-28.....	(0.6)	6.60	213.6	18.6	42.5	88.5	87.7	41.8	31.0	10.96	6.78
1928-29.....	(5.3)	13.65	200.8	18.5	66.6	77.6	87.4	41.9	30.0	16.67	9.15
1929-30.....	(5.8)	11.27	206.1	17.8	5.5	47.5	42.0	42.4	30.6	7.98	6.96
1930-31.....	(5.8)	10.17	226.0	19.4	62.1	31.2	81.2	46.7	35.4	11.76	8.53
Average 1925-30.....	(2.9)	10.62	205.8	18.7	44.6	72.6	74.3	41.0	29.5	9.77	7.16

B.—NET IMPORTS (Continued)

Crop year August-July	Sweden	Spain	Switzer- land	Austria	Czecho- Slovakia	Poland	Finland	Latvia	Estonia	Greece	Japan
1920-21.....	6.61	19.83	12.9	14.6	18.3	....	2.47	0.58	0.61 ^h	10.6	5.8
1921-22.....	3.85	8.02	13.2	19.0	11.6	1.20	3.39	0.74	0.76 ^h	13.7	24.9
1922-23.....	8.78	(0.18)	16.6	13.4	10.2	2.52	5.12	1.11	1.18 ^h	17.5	14.5
1923-24.....	12.35	(0.32)	17.1	18.1	21.2	2.63	5.12	1.80	0.97	18.8	29.1
1924-25.....	10.58	0.80	13.9	14.7 ^a	21.5	17.10	4.54	1.94	0.86	20.8	12.2
1925-26.....	6.10	(0.73)	15.6	14.7 ^a	21.7	(4.60)	5.23	1.56	0.97	18.8	22.7
1926-27.....	6.02	(1.01)	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	17.20	16.6	14.6	17.4	2.45	6.93	2.97	1.25	22.2	17.2
1929-30.....	7.32	3.41	16.0	19.6	13.7	(0.22)	5.92	2.54	1.19	21.7	13.6
1930-31.....	4.91	(0.17)	18.5	16.1	17.6	(4.41)	5.12	1.53	0.82	24.1	17.8
Average 1925-30.....	7.18	....	16.6	16.5	18.9	2.86	5.85	2.05	1.09	20.3	17.0

* 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.

^a July-June figure.

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

^c Gross figure.

^d Eleven months.

^e Net imports in "commerce général," compiled directly from *Statistique mensuelle du commerce extérieur de la France*.

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

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

^h Calendar years.

TABLE XXV.—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 ^b	23	197 ^c
1929-30.....	12,886	6,696	567	4,676	1,215	..	2,890	14	162	162
1930-31.....	11,817	6,677	516	5,308	964	..	2,045	112	44	217
Average 1925-30.....	12,364	9,661	627	5,045	1,619	..	2,204	196	154	526

B.—NET IMPORTS

Crop year August-July	France ^d	Italy	Belgium	Spain	Algeria	Tunis	Egypt	United Kingdom	Irish Free St.	Germany
1920-21.....	(68)	123	(2)	163	205	(4)	2,046	6,552		306 ^e
1921-22.....	(1,268)	(91)	(237)	(53)	(36)	20	1,478	7,559		61 ^e
1922-23.....	(2,051)	(393)	24	(43)	80	79	1,636	5,579 ^f	607 ^f	566 ^e
1923-24.....	(3,126)	(1,493)	(480)	(66)	(62)	(34)	1,798	2,764	2,126	4,166 ^e
1924-25.....	(3,295)	(1,245)	(787)	(59)	55	95	1,906	1,465	1,892	5,384 ^e
1925-26.....	(2,309)	(335)	(151)	(157)	5	.. ^g	2,436	2,483	1,748	1,411
1926-27.....	(772)	(195)	(64)	(218)	36	(24)	1,891	4,045	1,856	491
1927-28.....	(1,150)	(208)	(145)	(82)	(98)	(9)	1,490	3,161	1,907	2
1928-29.....	(1,752)	(445)	(176)	(36) ^h	110 ^f	(50)	2,586	2,129	1,677	(401)
1929-30.....	(3,202)	(673)	160	..	(40)	(79)	2,130 ^b	3,960	1,815	(258)
1930-31.....	(3,474)	(487)	8	..	..	(122)	1,817	4,180	1,861	56
Average 1925-30.....	(1,837)	(371)	(75)	..	2	..	2,107	3,156	1,801	249

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 ^c	3,094	3,326	973	1,324	(518)
1925-26.....	1,269	495	775	(17)	1,279 ^f	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)
1929-30.....	1,305	719	701	147	1,921	1,694	(61)	1,269	252	(982)
1930-31.....	1,908	790	711	35	1,574	1,235	(302)	1,097	84	(1,664)
Average 1925-30.....	1,594	703	760	98	1,634	2,144	29	1,251	789	(1,180)

* Data from official sources, in large part through International Institute of Agriculture. Figures in parentheses represent, under A, net imports, under B net exports. Dots (...) indicate that data are unavailable.

^a Calendar years 1921 and following.

^b Ten months.

^c Gross figure.

^d Imports in "commerce général," compiled directly from *Statistique mensuelle du commerce extérieur de la France*.

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

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

^g Net import of 224 barrels.

^h Five months.

ⁱ Eleven months.

^j July-June figure.

TABLE XXVI.—INTERNATIONAL TRADE IN WHEAT AND FLOUR, MONTHLY FROM JULY 1930*

(Million bushels)

A.—NET EXPORTS

Month	United States	Canada	India	Australia	Argentina	Roumania	Hungary	Jugoslavia	Bulgaria	Poland	Algeria	Tunisia
July	15.04	22.81	2.48	4.33	2.62	.33	.68	.40	.03	(.09) ^a	.42	1.02
Aug.	23.06	20.45	1.71	5.91	3.76	3.10	2.42	1.89	.71	.04	1.14	1.08
Sept.	16.57	31.10	.71	4.41	2.90	3.12	2.17	.78	.46	.54	2.65	.53
Oct.	9.80	33.42	.14	7.00	4.97	2.28	2.28	.65	.12	.58	1.59	.19
Nov.	7.09	34.76	(.32) ^a	6.58	2.85	1.68	2.98	1.09	.13	.71	.95	.18
Dec.	5.58	24.93	(.39) ^a	7.59	4.97	.87	2.25	.30	.07	.49	3.50	.09
Jan.	4.25	11.35	(.66) ^a	17.91	9.41		{.88	.07	.02	.24		{.01
Feb.	2.62	12.14	(2.24) ^a	17.81	16.53	.51	{.76	.01	.02	.32	(1.38) ^a	{(.06) ^a
Mar.	3.52	15.49	(1.34) ^a	17.76	14.45		{1.44	.01	.51	.38		{.08
April	5.34	6.14	(1.02) ^a	20.36	19.01		{.56	.13	.80	.38	.15	{(.08) ^a
May	9.05	31.66	(.43) ^a	16.12	17.14	3.32	{.96	.02	1.46	.22	...	{(.02) ^a
June	10.66	22.98	(.51) ^a	16.87	20.94		{1.39	.00	.68	.24	...	2.24
July	15.81	14.08	(.51) ^a	12.44	6.29	.43 ^b	.20	.67	.89	.26	...	1.60

B.—NET IMPORTS

Month	Spain	Irish Free State	United Kingdom	France ^c	Germany	Belgium	Italy	Netherlands	Switzerland	Austria	Czechoslovakia	Greece
July . . . . .	.00	1.53	19.41	(4.04) ^d	3.29	3.84	5.46	2.82	1.60	2.08	.88	1.78
Aug.	(.01) ^d	.86	17.15	1.77	3.23	4.54	4.50	2.96	1.56	.41	1.59	1.86
Sept.	(.01) ^d	1.64	22.69	5.15	4.42	4.27	6.06	4.55	1.90	1.08	1.90	2.04
Oct.	(.01) ^d	1.84	20.42	5.79	3.59	3.70	8.45	3.41	2.20	1.07	1.84	2.53
Nov.	(.01) ^d	1.63	20.64	3.60	1.45	3.66	8.52	3.24	1.87	1.09	3.72	1.31
Dec.	{(.04) ^d	{1.88	27.56	3.31	1.01	4.03	5.85	2.18	1.34	1.56	4.00	1.66
Jan.	{(.04) ^d	{1.45	14.57	4.14	1.94	1.82	5.62	4.34	1.74	1.15	.13	1.67
Feb.	(.03) ^d	1.14	10.57	3.21	1.65	2.95	5.20	1.95	1.19	1.17	.08	1.69
Mar. . . . .	.00	2.12	18.80	4.65	1.25	3.86	7.25	1.69	1.46	1.16	.20	1.98
April	(.02) ^d	1.19	16.97	4.90	1.70	4.68	7.63	3.23	1.15	1.38	.51	2.22
May	(.02) ^d	1.42	16.02	5.82	2.18	2.76	8.24	2.28	1.16	1.55	1.00	2.40
June	(.02) ^d	1.46	16.70	8.52	4.34	5.01	10.75	3.11	1.22	1.83	1.37	2.96
July	(.01) ^d	1.63	23.86	11.22	4.42	5.41	3.14	2.46	1.70	2.62	1.20	1.79

B.—NET IMPORTS (Continued)

Month	Denmark	Norway	Sweden	Finland	Estonia	Latvia	Lithuania	Portugal	Egypt	Japan	New Zealand	Union of South Africa
July . . . . .	.72	.52	.78	.50	.12	.33 ^e	(.01) ^{do}	1.01	...	.77	.05	...
Aug. . . . .	.67	.83	.52	.48	.11	.28 ^e	{.12	.68	.42	.09	.49	.49
Sept. . . . .	.91	.81	.73	.58	.07	.22 ^e	{.04	1.08	(.08) ^a	.04	.32	.32
Oct. . . . .	.96	1.03	.76	1.09	.17	.17 ^e	{.07	.56	.65	.06	.22	.22
Nov. . . . .	.89	.93	.53	.82	.18	.15 ^e	{.04	.97	.81	.40	.40	.40
Dec.	1.06	.72	.41	.12	.02	.10 ^e	(.21) ^{do}	.08	1.03	1.45	.16	.16
Jan.	1.27	.31	.30	.17	.05	.11 ^e	(.09) ^{do}	.06	1.63	2.21	.95	.95
Feb. . . . .	.59	.42	.32	.18	.02	.17	(.18) ^{do}	.11	1.16	{1.74	.06	.06
Mar. . . . .	.64	.51	.22	.26	.02	.14	(.18) ^{do}	.07		{1.90	.07	.12
April . . . . .	.92	.57	.32	.24	.02	.09	(.11) ^{do}	.11	1.93	{2.05	.18	.21
May	1.20	.70	.35	.36	.05	.06	(.01) ^{do}	.17		{2.50	.18	.24
June	1.72	.84	.19	.42	.06	.10	.00 ^e	1.31	.62	2.68	.05	.16
July . . . . .	.90	.66	.26	.41	.06	.08	.00 ^e	.52	.71	1.40	.05	...

* Data from official sources and International Institute of Agriculture.

^a Net import.^a Net exports.^b Exports of wheat only.^b Wheat only.^c Net imports in "commerce général."

TABLE XXVII.—EXPORTS OF WHEAT AND FLOUR AS WHEAT FROM SPECIFIED EXPORTING COUNTRIES TO JAPAN AND CHINA, FROM 1921-22*

(Million bushels)

A.—TO JAPAN FROM NORTH AMERICA AND AUSTRALIA

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
1929-30...	18.81	18.07	.74	9.17	6.79	2.85	9.17	6.09	2.81	.00	.70	.04
1930-31...	29.41 ^a	28.47	.94 ^a	3.24	8.21	17.96 ^b	3.06	7.45	17.96	.18	.76	... ^a
Average 1925-30...	24.16	23.56	.59	6.37	12.39	5.40	6.35	11.85	5.36	.02	.54	.04

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

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	Japan ^c
1921-22...	10.55	2.17	8.38	9.30	.37	2.03	.00	.14	.14	7.27	.37	.69	.05 ^d
1922-23...	17.49	1.95	15.54	13.73	2.88	1.11	.80	.04	.04	16.62	2.08	.32	.52
1923-24...	50.86	20.21	30.65	32.87	11.95	8.30	7.40	4.51	4.51	24.57	4.55	1.18	.35
1924-25...	7.70	.57	7.13	3.29	1.72	.37	.20	.00	.00	2.92	1.52	.65	2.04
1925-26...	24.95	8.12	16.83	5.29	13.72	.00	7.69	.43	.43	5.29	6.03	.47	5.04
1926-27...	17.36	4.24	13.12	6.06	6.96	.30	3.94	.00	.00	5.76	3.02	.21	4.13
1927-28...	20.12	1.26	18.86	8.72	6.11	.00	1.26	.00	.00	8.72	4.85	.29	5.00
1928-29...	49.57	12.56	37.01	13.18	22.47	1.25	8.61	2.70	2.70	11.93	13.86	.15	11.17
1929-30...	22.32	1.29	21.03	10.52	6.05	.16	1.13	.00	.00	10.36	4.92	.15	5.60
1930-31...	54.00 ^{e,f}	33.55 ^e	20.45 ^f	12.34	9.21	1.88	7.27	24.40 ^g	24.40 ^g	10.46	1.94	.29 ^f	7.76 ^g
Average 1925-30...	26.86	5.49	21.37	8.75	11.06	.34	4.53	.63	.63	8.41	6.54	.25	6.19

* Data from official trade statistics of the exporting countries.

^a Australian flour exports to Japan, usually small, not reported for 1930-31.^b Wheat only.^c Total flour exports of Japan. In the years 1925-26 and following, for which detailed data are available, total Japanese flour exports were identical with exports to China, Hong Kong, and Kwantung.^d August-June.^e Includes Australian wheat exports to China only.^f Includes Australian flour exports to Hong Kong only.^g Not including December exports.

TABLE XXVIII.—EXPORTS OF WHEAT AND FLOUR AS WHEAT FROM SPECIFIED EXPORTING COUNTRIES TO BRAZIL, EGYPT, THE WEST INDIES, AND UNION OF SOUTH AFRICA, FROM 1921-22*

(Million bushels)

July-June	A.—TO BRAZIL FROM NORTH AMERICA AND ARGENTINA						B.—TO EGYPT FROM NORTH AMERICA AND AUSTRALIA					
	Wheat and flour			Wheat and flour from			Wheat and flour			Wheat and flour from		
	Total	Wheat	Flour	United States ^a	Canada	Argen- tine	Total	Wheat ^b	Flour	United States ^b	Canada ^b	Aus- tralia ^c
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...	34.25	25.80	8.45	3.91	.05	30.29	19.57	4.94	14.63	1.03	1.65	16.89
1929-30...	30.83	23.73	7.10	3.67	.04	27.12	9.39	1.85	7.54	.99	.22	8.18
1930-31...	27.36	22.20	5.16	3.15	.34	23.87	11.56 ^d	3.28 ^d	8.28 ^d	.87	.12	10.57 ^d
Average 1925-30...	28.75	20.32	8.43	4.00	.49	24.26	13.92	3.18	10.74	1.17	.78	11.97

July-June	C.—TO WEST INDIES FROM NORTH AMERICA			D.—TO SOUTH AFRICA FROM CANADA AND AUSTRALIA								
	Total Flour ^e	Flour from		Wheat and flour			Total from		Wheat from		Flour from	
		United States	Canada	Total	Wheat	Flour	Canada	Aus- tralia	Canada	Aus- tralia	Canada	Aus- tralia
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
1929-30...	12.62	8.77	3.85	3.23	2.14	1.09	.81	2.42	.60	1.54	.21	.88
1930-31...	11.59	7.33	4.26	5.14	4.51	.63	3.75	1.39	3.55	.96	.20	.43
Average 1925-30...	13.24	8.92	4.32	5.63	4.32	1.31	1.05	4.57	.77	3.55	.28	1.02

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

^a Flour as wheat only.^b Australia alone exports wheat to Egypt.^c Exports from Australia to Egypt and Sudan, except as noted.^d Australian exports of wheat to Egypt; Australian flour exports to Egypt and Sudan.^e 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 XXIX.—INTERNATIONAL TRADE IN WHEAT AND FLOUR, AND APPARENT DOMESTIC UTILIZATION, IN SPECIFIED COUNTRIES BY CALENDAR YEARS FROM 1921*

(Million bushels)

Year	Net exports or net imports						Apparent domestic utilization					
	Portugal ^a	Morocco ^b	Chile ^b	Uruguay ^b	Union of South Africa ^a	New Zealand ^a	Portugal ^c	Morocco ^c	Chile ^d	Uruguay ^d	Union of South Africa ^d	New Zealand ^d
1921.....	6.57	0.30	2.17	....	....	....	15.83	22.92	21.03	....	....	....
1922.....	8.14	0.71	0.07	0.43	2.86	(1.21)	18.20	12.18	23.57	9.54	11.53	9.35
1923.....	6.49	0.16	1.49	0.01	7.00	0.00	19.68	19.89	24.45	5.14	13.27	8.40
1924.....	3.18	1.66	7.20	5.18	7.70	3.55	13.75	27.09	20.89	8.16	13.67	7.73
1925.....	5.96	0.72	5.12	2.28	6.13	2.64	18.45	23.15	19.35	7.63	13.26	8.09
1926.....	4.30	0.78	1.05	1.32	4.54	2.97	12.86	24.21	26.62	8.70	13.75	7.59
1927.....	7.94	2.42	(0.30)	1.94	5.81	1.94	18.39	25.79	23.60	8.30	14.07	9.89
1928.....	11.97	4.05	0.54	6.05	8.81	1.21	19.52	24.01	30.07	9.35	14.77	10.75
1929.....	5.76	4.09	0.29	4.28	7.70	0.52	16.57	27.67	29.39	8.02	14.94	9.35
1930.....	....	....	....	....	....	....	....	....	....	....	....	....

* Trade data from official sources in large part through International Institute of Agriculture; apparent domestic utilization data computed from production data given in Table I and the above trade data.

^a Net imports except as noted with parentheses.

^d Crop of 1920 plus net imports or minus net exports of 1921 and following.

^b Net exports except as noted with parentheses.

^c Crop of 1921 plus net imports or minus net exports of 1921 and following.

TABLE XXX.—OCEAN FREIGHT RATES ON WHEAT, 1913 AND CROP YEARS 1921-22 TO 1930-31*

(Cents per bushel)

Period	Canada to United Kingdom	New York to Liverpool	Northern Range to United Kingdom	Black Sea to Antwerp and Hamburg	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	... ^a	25.7	10.6	12.2	20.4
1921-22 (Aug.-July)	10.7	8.5	10.3	... ^a	25.3	14.6	12.8	28.6
1922-23 (Aug.-July)	9.2	5.5	8.0	... ^a	22.2	14.3	15.4	23.6
1923-24 (Aug.-July)	9.4	6.8	8.6	... ^a	21.2	13.7	15.0	21.8
1924-25 (Aug.-July)	9.4	6.3	8.8	... ^a	21.3	12.0	14.7	25.2
1925-26 (Aug.-July)	9.0	7.0	8.0	... ^a	20.0	10.9	13.1	22.3
1926-27 (Aug.-July)	12.0	9.7	12.1	... ^a	23.9	19.9	15.8	28.5
1927-28 (Aug.-July)	7.7	5.6	7.7	... ^a	19.5	13.9	13.2	23.2
1928-29 (Aug.-July)	8.5	6.1	9.1	... ^a	19.6	14.9	13.1	23.1
1929-30 (Aug.-July)	5.5 ^b	4.7	5.4 ^e	... ^a	14.7	8.3	9.9 ^d	16.7
1930-31 (Aug.-July)	5.6 ^c	4.6	5.4 ^f	7.1	14.5	10.9	12.5	19.3
1930 July	5.1	4.6	n.q.	... ^a	13.2	9.0	10.5	16.8
Aug.	5.8	4.6	n.q.	7.2	14.2	11.4	11.7	19.8
Sept.	5.9	4.6	n.q.	7.6	14.9	10.0	12.8	21.7
Oct.	5.5	4.6	n.q.	7.4	15.1	8.8	11.4	20.8
Nov.	5.0	4.6	5.0 ^e	7.2	13.8	9.4	11.6	19.3
Dec.	5.3 ^h	4.6	4.9	7.1	15.0	11.3	12.9	19.8
1931 Jan.	n.q.	4.6	5.1	7.1	14.6	11.0	13.5	19.6
Feb.	n.q.	4.6	6.1	7.2	14.6	12.8	12.8	19.5
Mar.	n.q.	4.6	5.5	6.9	14.2 ⁱ	12.0	12.9	19.1
Apr.	6.2	4.9	5.3 ⁱ	6.8	13.8	12.0	12.8	18.6
May	6.6	4.6	5.9	6.7	15.3	11.9	12.7	18.7
June	5.1	4.6	5.4	6.7	14.5	10.6	12.4	17.8
July	4.9	4.6	5.3 ⁱ	6.7	13.7	10.2	12.3	16.8

* 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 Not available before August 1930.

ⁱ November-July.

^h One week only.

^b April-July.

^d May-July.

^e Two-week average.

^f Three-week average.

^c November-May.

^e August-December, and April-July.

TABLE XXXI.—UNITED STATES AND CANADIAN CARRYOVERS OF WHEAT, 1919-31*
(Million bushels)

Year	United States (July 1)					Canada (August 31, 1919-23; July 31, 1924-31)					
	Total	On farms	In country mills and elevators	Commercial visible ^a	In city mills	Total	On farms	In country mills and elevators ^b	In terminal elevators	In transit	In flour mills
1919.....	.....	19.3	19.7	10.9	....	....	2.1	0.8	2.5	...	...
1920.....	.....	49.5	37.3	23.4	....	....	2.1	1.0	6.0	...	0.2
1921.....	121.9	56.7	27.2	10.0	28.0 ^c	13.7	2.1	1.6	3.3	6.0	0.7
1922.....	116.5	32.4	28.8	20.3	35.0 ^c	20.6	2.4	4.6	6.4	4.6	2.6
1923.....	146.4	35.9	37.1	29.4	44.0 ^c	11.7	1.4	2.4	2.7	2.8	2.4
1924.....	144.2	31.0	36.6	38.6	38.0 ^c	45.2	7.4 ^d	4.7	22.7	5.9	4.5
1925.....	114.6	29.4	25.3	29.3	30.6 ^d	26.5	2.7	2.7	15.2	3.9	2.0
1926.....	98.9	21.0	29.5	16.5	31.9 ^d	36.4	3.9	1.3	24.1	3.2	3.9
1927.....	118.4	27.2	21.8	21.1	48.3 ^d	47.8	4.2	1.5	35.6	2.3	4.2
1928.....	124.4	23.7	19.3	38.6	42.8 ^d	77.6	4.2	4.7	48.9	13.7	6.1
1929.....	241.9	45.5	41.5	90.4	64.5 ^d	104.4	5.6	6.3	76.3	8.7	7.5
1930.....	290.6	47.2	60.2	109.3	73.9 ^{d,e}	111.1	5.3	16.8	69.3	12.8	6.9
1931.....	319.1	32.1	30.6	204.0	52.4 ^{d,f}	133.4	19.5	34.1 ^f	71.1	7.3	1.4 ^f

* Official data except as noted, mostly from *Agricultural Yearbooks* of the U.S. Department of Agriculture, and *Canada Yearbooks*. Dots (...) indicate that data are not available.

^a Bradstreet's visible 1919-26; U.S. Department of Agriculture's statement of commercial stocks 1927-31. Bradstreet's figures for 1927-31 are as follows, in million bushels: 25.5, 42.2, 95.7, 112.8, 202.0.

^b More precisely, stocks "in country, private, and mill elevators in the Western Division."

^c Rough approximations published and designated as "unofficial" by the U.S. Department of Agriculture in *Wheat Facts*, Part I, July 1930, p. 18.

^d Wheat stocks in and in transit to city mills reported

to the Census Bureau (see Table XXXV), raised by the U.S. Department of Agriculture to 100 per cent to account for stocks in non-reporting mills.

^e Includes estimates by the U.S. Department of Agriculture of 12.5 and 18.4 million bushels "stored for others" in city mills in 1930 and 1931 respectively.

^f In 1931, classifications were shifted so that some stocks formerly reported as "in flour mills" are now reported as "in country, private, and mill elevators in the Western Division."

TABLE XXXII.—APPROXIMATE WHEAT STOCKS IN IMPORTANT AREAS, AUGUST 1, 1921-31*
(Million bushels)

Year	United States ^a	U.S. in Canada ^b	Canada ^c	Canadian in U.S. ^d	Argentina ^e	Australia ^f	Danube basin ^g	India ^g	Northern Africa ^g	European Importers ^g	Afloat to Europe ^h	Total
1921.....	122	1	25	1	54	46	13	55	6	95	58	476
1922.....	117	1	40	1	51	18	16	15	13	186	49	507
1923.....	146	1	32	1	64	28	26	22	6	96	39	461
1924.....	144	1	45	3	66	27	36	42	12	160	42	578
1925.....	115	3	27	3	58	24	10	37	5	104	33	419
1926.....	99	1	37	4	67	17	30	35	10	143	39	482
1927.....	118	1	48	5	69	23	36	19	12	144	46	521
1928.....	124	3	78	14	95	27	16	19	8	161	45	590
1929.....	242	3	104	23	130	27	66	15	16	194	38	858
1930.....	291	5	111	16	65	40	35	15	19	173	39	809
1931.....	319	15	133	6	85	45	53	62	5	143	38	904

* Based so far as possible upon stocks reported either officially or unofficially. United States wheat stocks as of July 1; others as of August 1 or nearest dates possible.

^a Data from Appendix Table XXXI.

^b Official data from *Canadian Grain Statistics* on United States wheat in Canadian ports.

^c Data from Appendix Table XLII.

^d Official data from *Canadian Grain Statistics* on Canadian wheat in lake and Atlantic ports of the United States.

^e Data from Appendix Table XLIII.

^f Data from Appendix Table XLIV.

^g Rough estimates based on statistics of net retention (crops minus net exports or plus net imports, minus estimated seed use) and estimates of consumption. The stocks estimates represent cumulative summations of differences between net retention and estimated consumption, plus an allowance for minimum stocks. See text, pp. 128, 146-47.

^h Data from Appendix Table XXXIII.

TABLE XXXIII.—WORLD VISIBLE WHEAT SUPPLIES, AUGUST 1, 1921-31, AND MONTHLY, 1930-31*
(Million bushels)

Date	United States	Canada	Argentina	Australia	United Kingdom ports	Afloat to Europe	North America	Argentina, Australia	U. K. and afloat	Grand total
1921 Aug. 1.....	56.2	8.9	3.7	30.0	7.6	57.9	65.1	33.7	65.5	164.3
1922 Aug. 1.....	43.1	19.3	2.2	3.0	7.1	48.9	62.4	5.2	56.0	123.6
1923 Aug. 1.....	73.3	14.1	4.4	18.0	8.2	39.0	87.4	22.4	47.2	157.0
1924 Aug. 1.....	72.1	31.6	6.8	30.0	9.9	41.8	103.7	36.8	51.7	192.2
1925 Aug. 1.....	57.3	23.4	7.7	8.4	9.2	33.3	80.7	16.1	42.5	139.3
1926 Aug. 1.....	64.2	28.3	4.1	6.2	4.3	38.6	92.5	10.3	42.9	145.7
1927 Aug. 1.....	65.9	42.7	5.9	12.7	7.8	46.1	108.6	18.6	53.9	181.1
1928 Aug. 1.....	88.1	69.2	5.9	9.5	10.1	44.7	157.3	15.4	54.8	227.5
1929 Aug. 1.....	190.3	99.8	16.2	20.0	6.2	37.6	290.1	36.2	43.9	370.1
1930 Aug. 1.....	221.9	103.5	7.0	33.5	6.5	39.2	325.5	40.5	45.7	411.6
Sept. 1.....	294.2	87.4	6.6	27.0	6.0	47.7	381.6	33.6	53.8	468.9
Oct. 1.....	316.9	154.8	5.9	13.0	9.0	44.2	471.7	18.9	53.2	543.7
Nov. 1.....	289.2	174.1	4.8	7.8	10.0	42.2	463.3	12.5	52.2	528.1
Dec. 1.....	277.7	194.7	4.0	5.0	13.9	45.6	472.4	9.0	59.6	541.0
1931 Jan. 1.....	260.1	209.5	6.6	60.0	19.7	27.3	469.6	66.6	47.0	583.2
Feb. 1.....	253.6	199.2	6.6	87.5	17.4	37.3	452.8	94.1	54.6	601.5
Mar. 1.....	267.2	187.0	9.2	96.0	13.0	57.9	454.3	105.2	70.8	630.3
Apr. 1.....	267.7	178.4	9.2	84.2	12.6	48.0	446.1	93.4	60.6	600.1
May 1.....	242.4	156.9	6.6	67.5	9.9	48.1	399.3	74.1	58.0	531.4
June 1.....	234.9	130.6	5.5	51.5	7.2	60.4	365.4	57.0	67.6	490.0
July 1.....	234.2	113.2	6.6	34.0	6.6	49.8	347.4	40.6	56.5	444.5
Aug. 1.....	275.1	112.4	7.0	20.0	10.6	37.9	387.6	27.0	48.5	463.1

* 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.

TABLE XXXIV.—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
1929-30.....	9,337	11,058	10,372	10,968	9,538	8,905	9,510	8,783	9,347	9,071	8,981	8,687	114,557
1930-31.....	9,466	10,313	10,674	10,816	9,184	8,973	9,233	8,242	8,724	8,494	8,015	7,762	109,896
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
1929-30.....	9,988	11,810	11,084	11,715	10,179	9,510	10,182	9,411	9,993	9,690	9,602	9,289	122,453
1930-31.....	10,128	11,013	11,395	11,534	9,808	9,575	9,891	8,840	9,351	9,107	8,599	8,331	117,572
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	1,245	1,118	986	1,051	13,547
1929-30.....	1,127	1,121	1,200	1,376	1,204	1,165	1,298	971	1,101	985	1,098	999	13,645
1930-31.....	989	1,266	1,461	1,387	1,203	945	996	808	775	811	838	872	12,351
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	8,595	8,118	8,988	8,517	110,009
1929-30.....	8,861	10,689	9,884	10,339	8,975	8,345	8,884	8,440	8,892	8,705	8,504	8,290	108,808
1930-31.....	9,139	9,747	9,934	10,147	8,605	8,630	8,895	8,032	8,576	8,296	7,761	7,459	105,221

* 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 detailed, but still partially incomplete, study of relations between monthly reported output and census totals and are subject to minor revisions.

TABLE XXXV.—UNITED STATES QUARTERLY CENSUS REPORTS ON CITY MILL STOCKS OF WHEAT AND FLOUR FROM JUNE 1925*

(Million bushels)

Year	U.S. flour output represented ^a %	Wheat stocks in					Total	Flour as wheat ^d	Grand total	In and in transit to mills ^e
		Country elevators	Public terminals	Private terminals ^b	Transit	Mills ^c				
<i>Sept. 30</i>										
1925.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1926.....	87.4	8.92	12.04	8.57	15.38	79.87	124.77	19.82	144.59	95.25
1927.....	89.1	6.23	12.15	3.98	16.12	77.25	115.73	20.05	135.78	93.37
1928.....	90.8	10.60	20.21	3.89	23.87	92.66	151.23	19.65	170.88	116.43
1929.....	93.2	12.78	19.65	15.06	17.94	109.34	174.78	21.05	195.83	127.28
1930.....	91.8	11.06	11.52	13.22	16.34	101.96	154.11	18.52	172.63	118.30
<i>Dec. 31</i>										
1925.....	88.0	7.55	12.70	.....	82.86	.....	103.11	21.55	124.66	.....
1926.....	87.5	8.47	11.95	10.66	13.49	71.84	116.41	20.38	136.79	85.33
1927.....	89.5	8.84	14.11	3.64	18.59	70.46	115.64	21.34	136.98	89.05
1928.....	92.8	9.94	27.78	5.08	22.84	88.23	153.87	21.61	175.48	111.07
1929.....	93.2	10.79	15.04	14.15	9.98	100.09	150.05	22.20	172.25	110.07
1930.....	91.9	9.06	8.76	17.77	12.12	89.48	137.19	18.88	156.07	102.60
<i>March 31</i>										
1926.....	88.4	4.67	7.10	3.65	3.29	45.93	64.64	18.28	82.92	49.22
1927.....	90.5	6.06	6.85	5.84	6.45	60.57	85.77	19.40	105.17	67.02
1928.....	91.2	5.48	9.33	2.11	9.41	59.05	85.38	19.69	105.07	68.46
1929.....	93.2	5.76	14.45	3.99	8.67	74.35	107.22	20.47	127.69	83.02
1930.....	92.8	4.63	7.35	7.35	8.06	69.18	96.57	19.92	116.49	77.24
1931.....	96.0	5.68	5.78	5.76	8.18	56.44	81.84	17.45	99.29	64.62
<i>June 30</i>										
1925.....	87.4	2.16	3.44	.....	26.72	.....	32.31	15.73	48.04	.....
1926.....	87.4	2.52	3.00	1.14	6.73	22.45	35.83	14.67	50.50	29.18
1927.....	90.1	2.56	3.88	1.61	10.39	34.15	52.59	16.76	69.35	44.54
1928.....	90.4	1.91	3.68	.55	10.16	29.78	46.08	17.08	63.16	39.94
1929.....	93.6	3.52	8.32	2.16	15.44	45.91	75.35	17.98	93.33	61.35
1930.....	91.8	3.50	3.80	1.79	13.79	43.78	66.66	16.61	83.27	57.57
1931.....	96.3	2.70	1.48	1.85	11.75	21.00'	38.77	13.30	52.07	32.75

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

^a Percentages of wheat flour output reported at successive biennial censuses of manufactures, as follows: June 30, 1925 to December 31, 1926—census of 1923 (114,438,544 barrels); March 31, 1927 to September 30, 1928—census of 1925 (114,689,930 barrels); December 31, 1928 to December 31, 1930—census of 1927 (118,132,027 barrels); thereafter census of 1929, preliminary (117,369,505 barrels).

^b In private terminal elevators not attached to mills.^c In mills and elevators attached to mills.^d In wheat equivalent (4.7 bu. = 1 bbl.).^e Summation, columns 5 and 6.^f In addition to wheat owned, 17,731 thousand bushels were stored for others in this position.

TABLE XXXVI.—APPARENT DOMESTIC UTILIZATION OF WHEAT (CARRYOVERS DISREGARDED), FROM 1920-21*
(Million bushels)

August-July	India	Hungary	Bulgaria	Jugo-Slavia	Roumania	Poland	Algeria	Tunis	Egypt
1920-21.....	362.8	37.9	28.1	39.2	59.9	....	21.8	6.5	42.9
1921-22.....	264.2	43.3	24.7	47.9	75.0	41.7	24.3	7.6	43.8
1922-23.....	338.4	49.6	28.2	43.5	90.4	49.3	21.2	4.4	43.7
1923-24.....	352.3	50.9	26.7	55.2	93.1	57.6	28.9	7.1	49.2
1924-25.....	322.5	38.0	26.4	48.2	67.2	54.6	17.7	5.0	44.1
1925-26.....	323.0	51.9	37.0	67.8	94.8	59.3	28.2	9.1	49.0
1926-27.....	313.2	53.0	34.3	61.7	99.7	60.5	25.2	12.7	46.0
1927-28.....	326.5	55.1	40.1	56.0	89.3	69.7	23.0	7.5	50.9
1928-29.....	315.2	73.2	48.9	94.5	114.0	61.7	27.1	6.8	50.9
1929-30.....	320.0	44.9	34.6	72.1	96.9	65.7	29.1	6.5	56.5
1930-31.....	395.7	66.1	51.4	74.7	115.3	77.9	....	4.6	51.2
Average 1925-30.....	319.6	55.6	39.0	70.4	98.9	63.4	26.5	8.5	50.7

August-July	British Isles	France	Germany	Italy	Belgium ^a	Netherlands	Denmark	Norway	Sweden
1920-21.....	258.1	306.6	142.4 ^b	241.7	42.4	24.9	7.7	4.9	16.9
1921-22.....	285.3	345.2	177.3 ^b	294.6	55.0	28.3	15.2	6.1	16.2
1922-23.....	276.7	298.3	109.4 ^b	277.3	50.3	30.0	15.5	7.5	18.3
1923-24.....	300.3	343.7	147.2 ^b	294.7	53.7	33.0	18.1	6.7	23.4
1924-25.....	281.8	326.8	170.1 ^b	258.8	52.4	31.4	12.4	6.1	17.4
1925-26.....	263.6	355.0	175.6	308.7	54.2	32.9	15.8	7.2	19.5
1926-27.....	289.3	315.3	187.2	307.2	53.0	33.9	16.0	6.8	18.2
1927-28.....	289.4	318.6	209.1	283.5	58.8	37.1	20.4	7.4	23.7
1928-29.....	270.3	347.9	219.2	316.3	59.9	37.3	28.9	10.0	26.4
1929-30.....	274.7	342.8	170.6	302.1	55.9	36.1	19.8	7.7	26.3
1930-31.....	288.7	293.2	170.4	291.3	60.4	41.5	22.0	9.3	26.4
Average 1925-30.....	277.5	335.9	192.3	303.6	56.4	35.5	20.2	7.8	22.8

August-July	Spain	Switzerland	Austria	Czecho-Slovakia	Finland	Latvia	Estonia	Greece	Japan
1920-21.....	158.4	16.5	20.1	44.7	2.7	.97	....	21.8	34.2
1921-22.....	153.2	17.0	25.5	50.2	4.0	1.53	....	24.1	51.8
1922-23.....	125.3	19.1	20.8	43.9	5.8	2.06	....	26.5	42.1
1923-24.....	156.8	20.9	27.0	57.4	5.8	3.44	1.70	27.6	54.2
1924-25.....	122.6	17.2	23.2 ^c	53.8	5.3	3.52	1.40	28.5	37.6
1925-26.....	161.9	19.4	25.4	61.0	6.2	3.72	1.76	30.1	52.2
1926-27.....	145.6	20.6	26.4	60.0	6.1	3.54	1.79	31.7	43.8
1927-28.....	147.7	22.7	28.3	68.6	7.1	4.15	2.20	32.5	45.5
1928-29.....	139.8	21.1	27.5	70.3	7.9	5.49	2.28	35.1	57.5
1929-30.....	157.5	20.4	31.2	66.6	7.0	4.81	2.45	30.2	44.1
1930-31.....	146.5	22.3	28.1	68.2	6.3	5.59	2.46	36.6	47.3
Average 1925-30.....	150.5	20.8	27.8	65.3	6.9	4.34	2.10	31.9	48.6

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

^a Luxemburg included with Belgium after May 1922.

^b 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.

^c Includes trade figures for 11 months only.

TABLE XXXVII.—VOLUME OF TRADING IN WHEAT FUTURES IN UNITED STATES FUTURES MARKETS, FROM JANUARY 1921, AND OPEN COMMITMENTS ON THE CHICAGO BOARD OF TRADE FROM JULY 1923*

(Million bushels)

A.—AVERAGE DAILY VOLUME OF TRADING, ALL UNITED STATES MARKETS

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 ^a
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	64.3	51.3	67.4	46.2	60.0	38.6	55.1	64.9
1930-31.....	52.2	61.2	48.6	44.6	49.7	20.4	13.3	16.8	16.3	27.9	25.4	28.3	33.7
1931-32.....	26.0	24.9	21.6	35.6	....	....	....	....	....	....	....	....	....

B.—OPEN COMMITMENTS, ALL CONTRACTS ON THE CHICAGO BOARD OF TRADE^b

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Year
1923-24.....	76.3	101.9	98.1	89.0	102.1	95.7	96.0	105.1	104.6	93.2	66.1	67.0	91.3
1924-25.....	78.2	117.2	106.3	110.2	118.3	124.1	117.2	109.8	107.4	92.9	86.6	104.0	106.0
1925-26.....	89.6	94.2	102.1	112.4	112.8	104.7	111.7	107.7	99.8	97.5	88.9	87.1	100.7
1926-27.....	88.7	99.0	100.5	100.5	109.6	96.2	88.3	88.0	90.4	81.7	68.5	74.8	90.5
1927-28.....	81.9	84.9	82.9	89.3	94.0	75.0	82.6	86.3	85.4	98.0	101.6	93.3	89.6
1928-29.....	83.5	112.3	116.2	123.2	129.7	128.0	116.3	127.6	145.9	146.9	127.1	125.5	123.5
1929-30.....	164.4	217.5	225.0	246.3	197.9	188.5	196.1	194.0	173.3	164.6	132.5	127.0	185.6
1930-31.....	109.6	142.8	162.4	174.2	184.1	155.2	132.2	132.8	130.1	125.9	93.0	78.3	135.0
1931-32.....	88.0	95.4	95.0	98.0	....	....	....	....	....	....	....	....	....

* Data from *Wheat Futures* (U.S. Department of Agriculture Statistical Bulletin 31), November 1930; U.S. Grain Futures Administration, *Trade in Grain Futures* and press releases. Earlier data not compiled.

^a Six months.

^b As of the 14th or 15th of each month.

TABLE XXXVIII.—MONTHLY AVERAGE PRICES OF WHEAT IMPORTED INTO GREAT BRITAIN, FROM AUGUST 1920, AND AUGUST-JULY 1894-95*

(U.S. dollars per bushel)

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted average
1920-21.....	2.912	2.880	2.941	2.777	2.994	2.743	2.254	2.112	2.012	1.935	1.823	1.742	2.504
1921-22.....	1.655	1.640	1.607	1.430	1.428	1.359	1.392	1.493	1.547	1.568	1.541	1.492	1.530
1922-23.....	1.454	1.329	1.309	1.358	1.416	1.426	1.404	1.380	1.369	1.402	1.385	1.322	1.383
1923-24.....	1.266	1.212	1.198	1.181	1.181	1.156	1.212	1.225	1.230	1.211	1.214	1.274	1.220
1924-25.....	1.432	1.494	1.619	1.748	1.823	1.928	2.032	2.031	1.939	1.876	1.881	1.780	1.772
1925-26.....	1.763	1.765	1.605	1.574	1.645	1.749	1.786	1.715	1.687	1.691	1.703	1.708	1.697
1926-27.....	1.679	1.650	1.634	1.703	1.675	1.655	1.615	1.601	1.581	1.605	1.628	1.633	1.637
1927-28.....	1.636	1.627	1.573	1.539	1.546	1.498	1.510	1.474	1.539	1.559	1.545	1.541	1.550
1928-29.....	1.439	1.341	1.328	1.314	1.303	1.292	1.331	1.349	1.331	1.308	1.256	1.300	1.324
1929-30.....	1.415	1.401	1.384	1.345	1.392	1.404	1.331	1.299	1.210	1.170	1.126	1.135	1.308
1930-31.....	1.086	1.034	.928	.831	.774	.743	.722	.680	.666	.689	.713	.664	.799
1931-32.....	.630	.568 ^a	.488	....	....	....	....	....	....	....	....	....	....
1894-95.....	.673	.672	.641	.648	.680	.670	.669	.699	.708	.725	.771	.734	.696

* Calculated from monthly quantities and declared values of wheat imports, as given in *Accounts and Papers Relating to Trade and Navigation of the United Kingdom*. Conversions for post-war period at monthly average exchange rates, New York on London; for pre-war period at par.

^a Converted to United States currency at \$4.86; converted at par the figure would be .529.

TABLE XXXIX.—MONTHLY AVERAGE PRICES OF REPRESENTATIVE WHEATS IN BRITISH MARKETS AND EXPORTING COUNTRIES, FROM JULY 1930*

(U.S. cents per bushel)

Month	United Kingdom		Liverpool				United States				Canada		Argentina	Australia
	British imports	British parcels	No. 1 Manitoba	No. 3 Manitoba	Argentine Rosafe	Australian F. A. Q.	All classes and grades ^a	No. 2 Hard Winter (Kansas City)	No. 2 Red Winter (St. Louis)	No. 1 Northern Spring (Minneapolis)	Weighted average (Winnipeg)	No. 3 Manitoba (Winnipeg)	78-kilo (Buenos Aires)	Australian (Melbourne)
July ...	114	104	112	108	103	111	83	80	85	92	93	91	90	92
Aug. ...	109	106	110	107	106 ^b	113	85	81	89	91	91	88	92	88
Sept. ...	103	93	96	92	93	96	79	78	88	87	78	75	85	72
Oct. ...	93	84	90	86	82	87	76	74	87	82	70	68	69	63
Nov. ...	83	79	84	80	75	86	70	69	83	75	60	58	60	59
Dec. ...	77	73	76	76 ^b	66	80	72	71	83	77	50	48	52	57
Jan. ...	74	68	74	70 ^b	61	70	71	69	78	76	49	47	46	47
Feb. ...	72	69	80	72 ^a	63	67	71	69	79	75	54	53	47	41
Mar. ...	68	68	77	70	61	64	71	70	78	76	52	50	46	40
Apr. ...	67	70	78	72	63	68	74	73	80	79	55	53	46	42
May ...	69	71	78	71	65	72	76	73	79	81	56	53	46	47
June ...	71	67	75	67	62	69	67	68	72	74	58	53	45	43
July ...	63	62	70	63	56	64	47	44	48	61	54	50	43	42

* British import prices: our computation as described in footnote to Appendix Table XXXVIII. British parcels prices: our monthly averages of all sales of wheat parcels in British markets as reported daily in the *London Grain, Seed and Oil Reporter*, converted at monthly average exchange rates. Liverpool prices: our computations of simple averages of Tuesday prices as given in Broomhall's *Corn Trade News*, converted at Tuesday exchange rates. (No. 2 Winter, formerly included in this table, was not quoted after the middle of October 1930.) United States prices: monthly averages of daily prices weighted by carlot sales, computed by the U.S. Department of Agriculture and published in *Crops and Markets*. Winnipeg prices: our computation of simple averages of weekly average prices for weeks ending Saturday: (a) weighted average prices—our series described in *WHEAT STUDIES*, March 1929, V, No. 5; (b) No. 3 Manitoba from *Canadian Grain Statistics*. Buenos Aires, 78-kilo: our computations of simple averages of (a) weekly averages of daily prices as quoted in *Revista Semanal*, converted at weekly average exchange rates, through October 1930; (b) thereafter, daily price quotations in *Revista Semanal*, converted at monthly average exchange rates. Melbourne: our computations of simple averages of daily prices of "Wheat, Trucks, Williamstown," as given in *Grain Trade Review*, Melbourne, converted by using Australian buying rates on London and (a) the par of Sterling exchange, New York on London, to May 1931, and (b) monthly average rates of Sterling exchange on London, from June 1931.

^a Six markets.^b Three-week average.^c Two-week average.

TABLE XL.—MONTHLY AVERAGE PRICES OF DOMESTIC WHEAT IN EUROPE, FROM AUGUST 1928*

(U.S. dollars per bushel)

Month	Great Britain			France (Paris)			Italy (Milan)			Germany (Berlin)		
	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31	1928-29	1929-30	1930-31
Aug.	1.33	1.52	1.09	1.66	1.58	1.80	1.72	1.74	1.80	1.49	1.59	1.63
Sept.	1.19	1.29	.95	1.64	1.52	1.75	1.81	1.75	1.77	1.36	1.47	1.55
Oct.	1.24	1.24	.91	1.67	1.53	1.73	1.88	1.84	1.70	1.38	1.50	1.47
Nov.	1.28	1.22	.87	1.66	1.50	1.76	1.87	1.85	1.63	1.37	1.51	1.60
Dec.	1.25	1.24	.80	1.63	1.47	1.77	1.87	1.90	1.46	1.33	1.57	1.61
Jan.	1.25	1.24	.73	1.65	1.44	1.79	1.92	1.94	1.49	1.35	1.60	1.68
Feb.	1.27	1.16	.67	1.69	1.37	1.87	1.96	1.89	1.54	1.40	1.52	1.77
Mar.	1.27	1.08	.67	1.72	1.41	1.90	1.95	1.86	1.49	1.44	1.55	1.86
Apr.	1.28	1.13	.69	1.70	1.41	1.97	1.93	1.94	1.52	1.45	1.75	1.87
May	1.29	1.14	.75	1.68	1.35	1.95	1.89	1.96	1.60	1.41	1.87	1.83
June	1.25	1.11	.78	1.67	1.40	1.99	1.91 ^a	2.02	1.43	1.39	1.95	1.76
July	1.35	1.08	.82	1.70	1.71	1.86	1.77	1.77	1.31	1.62	1.87	1.55

* Data for Great Britain are averages of weekly average *Gazette* prices as given in the *Economist* (London); for France, averages of daily prices of "Blés indigènes" in Paris (Marché Libre) as given in the *Bulletin des Halles*; for Italy, averages of Friday prices (Saturday prices after August 23, 1930) 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 sources above into United States money by monthly average exchange rates.

^a Three-week average.

TABLE XLI.—UNITED STATES WHEAT SUPPLIES AND DISPOSITION, JULY–JUNE, FROM 1921–22*

(Million bushels)

Item	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
Initial stocks ^a	122	117	146	144	115	99	118	124	242	291	319
New crop ^b	815	868	797	864	676	831	878	915	809	863	884
Total supplies	937	985	943	1,008	791	930	996	1,039	1,051	1,154	1,203
Net exports ^b	268	208	135	258	95	209	193	145	143	115	...
Seed requirements ^b	90	88	74	81	79	84	90	84	82	77	...
Net mill grindings ^c	464	468	477	478	495	501	503	511	509	487	...
Feed and waste ^d	43	73	98	57	35	43	49	60	62	164	...
Stocks at end ^e	117	146	144	115	99	118	124	242	291	319	...
Disposition accounted for...	982	983	928	989	803	955	959	1,042	1,087	1,162	...
Balancing item ^f	-45	+2	+15	+19	-12	-25	+37	-3	-36	-8	...

* Based so far as possible upon official data.

^a Data as described in Appendix Table XXXI.^b Official estimates. Estimates of seed requirements 1921–22 to 1923–24, as yet unpublished, furnished by the U.S. Department of Agriculture. Net exports include shipments to possessions.^c Food Research Institute estimates of the total wheat ground (including a constant figure for grindings in custom mills), based upon biennial censuses and monthly milling reports.^d Official estimates, as published monthly in *Agriculture Yearbook, 1931*, after 1924–25. The data relate to quantities fed on farms, and to quantities involved in farm loss, waste, and shrinkage. Figures for 1921–22 to 1923–24 do not represent direct estimates, but approximations based upon analysis of the ratio of wheat to corn prices; these figures furnished by the U.S. Department of Agriculture.^e A positive balancing item represents an apparent excess of total supplies over total disposition accounted for; a negative item represents excess of disposition accounted for over supplies. Fluctuations in this item from year to year must be due to errors in estimates of the several items of supply and disposition, to changes in unrecorded stocks, and to fluctuations in utilization not accounted for, such as use of wheat in prepared breakfast foods and in mixed feeds. The average 10-year excess of disposition accounted for over supplies may be regarded as pointing either to underestimation of some crops, or to overestimation of quantities used for feed and waste, since the stocks, net mill grindings, seed requirements, and net exports are presumably measured with a smaller margin of error.

TABLE XLII.—CANADIAN WHEAT SUPPLIES AND DISPOSITION, AUGUST–JULY, FROM 1921–22*

(Million bushels)

Item	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
Initial stocks ^a	25	40	32	45	27	36	48	78	104	111	133
New crop ^b	301	400	474	262	396	407	480	567	305	398	298
Total supplies	326	440	506	307	423	443	528	645	409	509	431
Net exports ^b	185	279	346	192	324	292	332	406	185	258	...
Seed requirements ^c	39	40	39	38	40	39	42	44	44	36	...
Milled for food ^b	37	41	42	42	42	43	42	44	43	43	...
Unmerchantable ^b	12	10	19	12	11	12	28	30	7	4	...
Lost in cleaning ^b	9	12	12	10	6	19	7	13	7	6	...
Fed to livestock ^d .....	...	...	...	...	...	...	...	...	...	41	...
Stocks at end ^e	40	32	45	27	37	48	78	104	111	133	...
Disposition accounted for...	322	414	503	321	460	453	529	641	397	521	...
Balancing item ^f	+54	+26	+3	-14	-37	-10	-1	+4	+12	-12	...

* Based so far as possible upon official data. Dots (...) indicate that data are not available.

^a Official estimates since 1924; see Appendix Table XXXI. Figures for August 1921–23 represent our rough adjustments.^b Official figures.^c Official figures. The estimate for 1930–31 is preliminary, and looks low in the light of official statistics of areas sown.^d Official figure representing an estimate, first made in 1930–31, of the quantity of wheat fed to livestock and poultry on farms where grown.^e The balancing item represents the quantity that must be added to or subtracted from "disposition" in order to make this item equal to "total supplies." A large positive item for years prior to 1930–31 may be taken to suggest either heavy use of wheat for feed and industry, or overestimate of the crop, and for 1930–31 solely overestimate of the crop, if it be assumed that other items given in the table are accurately estimated. A large negative item for years prior to 1930–31 and in 1930–31 as well would suggest underestimate of the crop.

TABLE XLIII.—ARGENTINE WHEAT SUPPLIES AND DISPOSITION, AUGUST-JULY, FROM 1921-22*
(Million bushels)

Item	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32
Initial stocks ^a	54	51	64	66	58	67	69	95	130	65	85
New crop ^b	191	196	248	191	191	230	282	349	163	236	219
Total supplies	245	247	312	257	249	297	351	444	293	301	304
Net exports ^b	118	139	172	123	94	143	178	224	150	123	..
Seed requirements ^c	20	21	21	23	23	25	27	25	26	21	..
Consumed for food ^d	45	44	48	52	54	57	60	61	60	61	..
Stocks at end ^e	51	64	66	58	67	69	95	130	65	85	..
Disposition	234	268	307	256	238	294	360	440	301	290	..
Balancing item ^c	+11	-21	+5	+1	+11	+3	-9	+4	-8	+11	..

* Based so far as possible upon official data.

^a Estimates of August 1 stocks reached as follows. For the period August 1, 1921 to August 1, 1927, stocks on December 31 following are taken to equal 10 million bushels each year, except in 1921 and 1926, for which figures of 25 and 35 million are employed; to these December 31 stocks are added the reported official net exports of the preceding August-December, and estimates of the amount of wheat consumed for food in August-December (5/12 of the respective items "consumed for food"); the sums are taken to represent roughly the stocks as of August 1. For the period August 1, 1928 to August 1, 1930, the same principle is followed except that stocks on December 31 are as estimated (with our adjustment to the proper date) by the *Times of Argentina*, in issues ordinarily appearing in the last week of December. The figure for August 1, 1930, is necessarily tentative, but rests upon an estimate by the *Times of Ar-*

gentina as of June 15, 1931 (issue of July 27, 1931). All figures are subject to a much wider margin of error than is true of stocks statistics of the United States and Canada.

^b Official data.

^c Based on official data for acreage sown and average seed requirements of 1.2 bushels per acre.

^d Based on official data of flour milled minus flour exported in calendar years 1921-30.

^e The balancing item represents the quantity that must be added to or subtracted from "disposition" in order to make this item equal to "total supplies." A large positive item suggests either heavy use for feed and waste, overestimate of crop, or error in estimates of stocks. A large negative item suggests underestimate of crop or error in estimates of stocks.

TABLE XLIV.—AUSTRALIAN WHEAT SUPPLIES AND DISPOSITION, AUGUST-JULY, FROM 1921-22*
(Million bushels)

Item	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32
Initial stocks ^a	46	18	28	27	24	17	23	27	27	40	45
New crop ^b	129	110	125	165	115	161	118	160	126	213	170
Total supplies	175	128	153	192	139	178	141	187	153	253	215
Net exports ^b	115	50	86	124	77	103	71	109	63	152	..
Seed requirements ^c	10	10	11	11	12	12	15	15	18	13	..
Consumed for food ^d	26	28	28	30	33	31	32	29	32	32	..
Stocks at end ^e	18	28	27	24	17	23	27	27	40	45	..
Disposition	169	116	152	189	139	169	145	180	153	242	..
Balancing item ^c	+6	+12	+1	+3	0	+9	-4	+7	0	+11	..

* Based so far as possible upon official data.

^a Stocks on August 1 are calculated by adding to the Australian visible supply as of December 1 following (see Appendix Table XXXIII) the net exports of August-November and estimated quantities of wheat consumed for food in these months. Since, however, there is evidence that the visible supply on December 1 contained mostly new-crop wheat in 1922, 1926, and 1928, we have employed figures of 1, 0, and 1 million bushels, respectively, for these years in place of 10, 2, and 8 million. Like our estimates of August 1 stocks in Argentina, the estimates for Australia are subject to a much wider margin of error than are those for the United States and Canada; and the estimate for August 1, 1931, is necessarily preliminary.

^b Official data.

^c Official data prior to 1928-29, for sowings of wheat both for grain and for hay. Figures for 1928-29 and later years represent official estimates of wheat grain areas sown, plus our approximation to wheat areas sown for hay, multiplied by the average quantity of seed used per acre (.928 bushels) in sowing the crops of 1919-28.

^d July-June figures. Figures for 1921-22 to 1928-29 are official, representing the wheat equivalent of flour milled minus flour exported as flour and as biscuits; see *Official Yearbook of the Commonwealth of Australia, 1930*, p. 482. Figures for 1929-30 and 1930-31 are our rough approximation.

^e See footnote (e), Table XLIII.

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