AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

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

of the FOOD RESEARCH INSTITUTE

VOL. XIV, NO. 7

(Price \$1.00)

APRIL 1938

MONETARY INFLUENCES ON POSTWAR WHEAT PRICES

V. P. Timoshenko

Interpretation of the course of postwar wheat prices in the light of specific supply-demand relationships on the world wheat market throws into relief numerous price movements in which monetary influences were important. Emphasis has commonly fallen upon the depressing effects on wheat prices of monetary and credit deflation following 1919-20 and 1929. The present analysis brings out important price-raising effects of monetary developments between 1924 and 1930. Unduly high levels of wheat prices during that period stimulated rapid expansion of wheat production and created disequilibrium between the supply and the demand for use. The ensuing price readjustment was deferred because speculative demand for wheat, stimulated by the same monetary factors, enabled surplus stocks to be carried for several years.

The long-deferred readjustment took place in 1930-31, in a collapse of wheat prices. Granting the previous course of prices, this was in the main unavoidable. It was, however, made still more drastic by certain governmental policies, and by the rapid depreciation of currencies in Argentina and Australia. The price collapse, however, preceded the general abandonment of the gold standard that began late in 1931.

The wave of currency depreciation following Great Britain's departure from gold tended to check further rapid declines of wheat prices in currency, but tended further to depress wheat prices in gold. These depressing effects were particularly marked in 1931-32 and 1933-34, when competitive depreciation of currencies was intensified.

By 1935, gold prices of wheat began to react normally to changes in the supply-demand situation, but on a level considerably below that which prevailed before the depression. To bring the level of wheat prices in terms of gold up to the pre-depression level would require a sharp rise of general price levels that would involve danger of new price disequilibria.

STANFORD UNIVERSITY, CALIFORNIA

WHEAT STUDIES

OF THE

FOOD RESEARCH INSTITUTE

Entered as second-class matter February 11, 1925, at the Post Office at Palo Alto, Stanford University Branch, California, under the Act of August 24, 1912.

Published eight times a year by Stanford University for the Food Research Institute.

Copyright 1938, by the Board of Trustees of the Leland Stanford Junior University.

MONETARY INFLUENCES ON POSTWAR WHEAT PRICES

V. P. Timoshenko

The postwar development of prices of staple commodities depended heavily upon influences affecting the general level of prices in the principal world markets, as distinguished from influences directly related to the supply-and-demand positions of those particular commodities. It is well known that wheat prices were affected by the two major declines in the general price level—one following the early postwar boom of 1919–20 and the other the crisis of 1929. But between these two severe price collapses, as well as in years following the world economic crisis in 1929, certain other movements of wheat prices were profoundly affected by monetary influences.

Moreover, instability of exchange rates between the currencies most important for world trade—the pound sterling and the dollar—was characteristic of the greater part of the postwar period. Stability prevailed only between April 1925 and September 1931, while the United Kingdom clung to the gold standard. From the point of view of the world wheat market, the period of relative stability of exchanges was much shorter. One of the leading wheat exporters, Argentina, did not return to the gold standard until 1927 and abandoned it by the end of 1929, and this departure was followed closely by a second large exporter, the Commonwealth of Australia. Even Canada was technically off the gold standard after 1929, although her exchange was maintained close to gold parity almost until Great Britain went off the gold standard in 1931.

During the world depression following the collapse of 1929, several countries inaugurated monetary policies—including some purposeful depreciation of currencies—designed to raise commodity prices in general and wheat

prices in particular. These policies had substantial effects upon domestic wheat prices in the respective countries, including practically all of the chief exporting countries at various times. But their influence also extended to wheat prices on the world wheat market, sometimes in a direction not contemplated. It is important not only to inquire how far the

objectives of these policies were achieved domestically, but also to consider their effects upon the world level of wheat prices. These effects were not clearly anticipated when the policies were formulated and adopted.

The instability of exchange rates and general price levels characteristic of the postwar period

stands in contrast with the relative stability in the two decades preceding the war. The contrast is particularly striking with reference to exchange rates, for the two prewar decades constituted a period when the gold standard was more widely accepted and functioned more satisfactorily than in any other period. But in comparison with the postwar period, the two prewar decades were also a period of relative stability in the general level of prices, when there were no such spectacular and widespread price collapses as the two that were experienced after the war.

An analysis of the postwar development of prices of any staple commodity must therefore accord to monetary influences much more attention than would be necessary with reference to prewar price developments. This is particularly true with reference to wheat prices. Moreover, monetary influences upon the movement of wheat prices in recent years may be studied also with a view to appraising the degree of success of those monetary policies which were designed to raise wheat prices.

CONTENTS

	PAGE
<i>Preliminary Considerations.</i>	264
<i>British Import Prices</i>	270
<i>Prices in Exporting Countries</i>	281
<i>Prices during the Period 1924–25 to 1929–30</i>	291
<i>Prices in the Period of Monetary Disturbance</i>	303
<i>Summary and Conclusions.</i>	312

I. PRELIMINARY CONSIDERATIONS

Students of the impact of monetary developments upon prices commonly analyze the movements of index numbers of prices of a group of commodities, such as a general index number of wholesale prices or index numbers of special subgroups of wholesale prices, rather than the price changes of a particular commodity. The common method of analysis rests upon the assumptions that such price movements of particular commodities as are determined by factors varying from one commodity to another will more or less compensate one another in the process of averaging, and that those factors which affect in the same direction all commodities included in a group will find expression in the movements of group index numbers. Among such general factors affecting the prices of all commodities, monetary influences will perhaps rank highest.

It is well known that the above-mentioned process of compensation is far from perfect. It is also clear that such general factors as monetary influences affect diversely the prices established in different types of markets (wholesale and retail), as well as the prices of different groups of commodities (as consumers' goods and producers' goods, manufactured goods and raw materials, agricultural and non-agricultural products, durable and non-durable goods). Objections to the use of the index-number method in analyzing the price effects attributable to the influences of general factors and particularly to monetary influences, have usually been met by further refinements in the construction of index numbers. Such refinements involve constructing indexes for various types of markets and for various groups of commodities, and grouping these so as to make them more nearly homogeneous with reference to the effects of general factors upon them.

Some commodities, however, lend themselves to another method of isolating the effects of monetary influences upon their price development. These are commodities whose prices have been adequately studied and interpreted in terms of specific supply-demand relationships. Several agricultural commodities, wheat among them, belong in

this group. Herein lies an important advantage. That part of the price movements which represents reactions to factors relating to particular commodities is likely to be better isolated and better understood than under the index-number method. The index-number method relies simply upon mechanical elimination of such price movements on the assumption of a principle of compensation. But one can never be sure that some of the movements of an index number are caused by general rather than by specific factors affecting the prices of one or a few individual commodities included in the group index number. Without certainty on this point, it is impossible to appraise or to understand price movements in periods when general price influences and specific commodity influences both seem likely to be operating.

Demand for many agricultural commodities, and particularly the consumers' demand for wheat, is relatively stable. This facilitates interpretation of the prices of such commodities in terms of changes in their total supply, or even in terms of changes in the size of their respective crops, so far as statistics of carry-overs are not available or are unreliable.¹ But when more thorough analysis of the price development is attempted—extending beyond short-term price fluctuations—changes in the demand must also be considered, even if, as with wheat, consumers' demand changes but slowly. Particular attention to the demand factors is essential in analysis of prices during periods of economic instability or of such considerable changes in the structure of society as characterized the postwar period.

¹ Absence of satisfactory statistics of year-end stocks for most agricultural commodities, which hampers direct measurement of the total supplies, may sometimes be supplemented by taking into consideration the size of the last crop and of one or two preceding ones, with results indicating the size of the carry-over at the end of a crop year. This method was followed in the present author's analysis of prewar wheat prices: V. P. Timoshenko, *Wheat Prices and the World Wheat Market* (Cornell Agr. Exp. Sta. Mem. 118, 1928), esp. pp. 32-37. This method sufficed to explain nearly nine-tenths of the wheat-price movements in the Liverpool market from one season to another, when they were correlated with the three preceding world wheat crops.

The difficulty, however, is to find quantitative measures of demand. Improvement of crop statistics throughout the world in recent decades, and some accumulation of more and of better statistics of stocks and carryovers of certain agricultural commodities, including wheat, provide a reasonably satisfactory basis for interpretation of their price movements in terms of changes in their supply. But it remains difficult to appraise changes in the demand.

One of the best and perhaps the simplest of indicators summarizing the relationship between the supply of and the demand for a commodity during a specified period of time, such as a crop year, is the year-end carryover of the commodity. A year-end carryover is a balancing item between the total supply of a given commodity and its utilization during the past crop year. An increase in the carryover means an excess of the current supply over the current effective demand for use at a given price, while a decrease means the opposite. A close correlation must therefore be expected between the year-end carryover of a commodity and its price during the past year. Statistics of year-end carryovers accordingly constitute perhaps the best available data for interpretation of the price movements of agricultural commodities, particularly of wheat, in terms of supply-demand relationships when demand is taken to mean demand for use.

This limited definition of demand is important. The year-end carryover is a balancing item between the total supply and the utilization during the past year. In a particular country, the foreign trade must of course be taken into the reckoning as well as domestic use for food, feed, and seed. But the world wheat carryover may be regarded as a balancing item between world supply and world utilization.

Speculative demand—demand represented by holding a commodity in expectation of higher price—occupies quite a different position in relation to the carryover. An increase in speculative demand means an increase rather than a reduction of the carryover.¹ The effect of a change in the speculative demand upon the year-end carryover is thus quite opposite to that of a change in what may be

called briefly demand for use. The fluctuations of speculative demand, which usually varies more rapidly and erratically than the demand for use, may prevent the emergence of correlation between the price and the year-end carryover as close as would otherwise be expected.

However, to some extent speculative demand is based on forecasts of the relationship between the supply and the demand for use. In this case its fluctuations will not, under normal market conditions, greatly disturb the relationship between the price and the carryover that balances the supply and the current demand for use, at least over periods as long as a crop year.

Yet changes in speculative demand of a more significant sort may occur as a result of the operation of other factors than those relating to a particular commodity. Among these factors, monetary influences ordinarily loom large. Changes in speculative demand due to such influences are likely to be violent and persistent, and the resulting wide fluctuations of speculative demand may considerably disturb an otherwise close correlation between price movements and year-end carryovers.

Price movements inexplicable in terms of the relationship between supply and the demand for use thus usually point toward the presence of disturbing effects arising from non-commodity factors affecting speculative demand for a given commodity. Among such factors, monetary and credit conditions are of course conspicuous, but other factors non-monetary in nature may also be present. Such are various forms of government intervention, and certain types of marketing policies. It is therefore difficult or impossible to isolate completely the monetary influences on the price development. These influences are usually intermingled with influences of other kinds that may give rise to price movements equally inexplicable in terms of the relationship between supply and demand for use. There is no known device capable of separating such influences and measuring their relative importance.

¹ By "speculative demand" we mean not only the demand of professional speculators but that of much wider groups active in the wheat trade.

Statistical analysis of the price development of a particular commodity like wheat, in terms of the relationship between supply and demand for use, can at least indicate the presence of price movements which seem inexplicable in the light of supply-demand relationships, and therefore requires supplementary explanation. Such analysis represents *a starting point for further careful study*; and the study must include search for other influences, monetary factors among them.

In such preliminary statistical analysis the use of carryover data for interpretation of price movements may be regarded as a satisfactory technical tool. Data on stocks and carryovers are very scanty and unreliable for some of the most important staple agricultural commodities, necessitating the use of rough estimates instead of direct measures. But wheat is in a peculiarly advantageous situation. Wheat consumption usually changes but slowly, and this facilitates estimation of year-end carryovers from the crop statistics even for countries where there are no direct statistical measures of stocks.

Systematic analysis of the world wheat situation made regularly in WHEAT STUDIES during postwar years has yielded as a by-product a satisfactory series of the world wheat carryovers distributed among the principal exporting and importing countries. For some countries, such as the United States, Canada, and Australia, year-end stocks are officially reported and directly estimated, and they are fairly comprehensive and trustworthy. This is true also of wheat afloat to Europe. For other countries and positions, estimates are mostly indirect; but so far as they are based on careful analysis of statistics of crops and of foreign trade, and because of the slowness of change in domestic utilization, these estimates may be regarded as satisfactorily reliable.¹

Chart 1 gives an example of the close correlation between change in the crop-year average price and year-end carryover for another agricultural commodity for which carryover estimates may be regarded as even more reliable than those for wheat. It shows the price of American cotton in Liverpool (in currency, gold, and deflated by the Board of

CHART 1.—AVERAGE ANNUAL PRICES OF AMERICAN MIDDLING COTTON AT LIVERPOOL, CROP YEARS ENDING JULY 31, AND WORLD CARRYOVERS OF ALL COTTON ON AUGUST 1, 1921-35*

(Pence per lb.; million bales; logarithmic vertical scale)

* Data as compiled by U.S. Department of Agriculture, Bureau of Agricultural Economics. August-July average prices are simple means of monthly average prices. Deflation by Board of Trade index numbers of wholesale prices converted to 1926 base. Adjustment to gold prices as indicated in footnote to Chart 5, p. 279. Stocks are of all kinds of cotton, American in running bales, all other types in bales of about 478 pounds.

Trade index of wholesale prices) and the world carryover of cotton of all kinds. This chart indicates that, even in the postwar period characterized by instability of the price level,

¹ For a description of the series and of the procedure used in estimating, see M. K. Bennett, "Estimation of End-year World Wheat Stocks from 1922," WHEAT STUDIES, February 1933, IX, No. 5. Current data on world wheat stocks ex-Russia as of about August 1 are regularly included in the "Review of the Crop Year," published annually. These estimates obviously do not include wheat stocks in countries where the size of the wheat crop is not known, or was not known for the whole period included in the study, such as China and other less important countries in Asia and in other continents. Russian stocks are also not included in the world total. The data are revised from time to time as new information accumulates. For the latest published estimates of the world wheat carryover, see WHEAT STUDIES, December 1937, XIV, 167; January 1938, XIV, 211-12. In the present study, these data are used as they stood on January 1938, exclusive of estimated stocks in British India. The estimates for India are less reliable than those for other positions, and wheat exports from India are determined largely by other factors and depend very little on Indian stocks as of August 1.

It is perhaps significant that similar data on total world stocks of old wheat recently published in Wheat Advisory Committee, *The World Demand for Imported Wheat* (Memo. 1 . . . prepared by the Secretariat . . . for the Canadian Royal Grain Inquiry Commission, July 10, 1937, mimeographed) deviate only slightly from the estimates published in WHEAT STUDIES.

the correlation between price changes and year-end stocks is close to perfect, not only in short-term fluctuations but even in general trend. In the following analysis it will be shown that there is a fairly close correlation also between wheat prices and the world carryover of wheat. But this analysis will also show several price movements which cannot be satisfactorily explained by the supply-demand relationship as represented by the year-end carryovers. Some such movements, though not prominent, can be perceived also in Chart 1.

REPRESENTATIVE PRICE SERIES

An important objective of this study is to present broad tendencies in the postwar development of wheat prices, with a view to isolating those price movements which seem inexplicable in terms of the supply-demand relationship and which suggest the presence of disturbing factors. For this analysis one must select markets in which price changes are little affected by special conditions in one or another of the producing areas, but in which, on the other hand, the general tendencies in all producing areas are reflected. In other words, one must select a wheat market which is broadly representative of world conditions.

From this point of view the British market, and especially the Liverpool market, seems to be the best choice. The British Isles received, during the postwar period studied here, nearly a third of the total world exports of wheat. British net imports were more than 40 per cent of the total net imports of all European importing countries. Practically all of the leading wheat-exporting countries participate in supplying the British market, where the various wheats compete directly. At Liverpool, the leading importing harbor of the United Kingdom, wheats from practically all wheat-exporting countries come into direct contact. The Liverpool wheat price therefore reflects the supply situation in all the chief exporting countries, but is not unduly affected by special conditions in any of them.

For other reasons wheat prices in British import markets must be taken as a starting point in the present study. Of all the major wheat-import markets, the British market is

most free from all kinds of trade barriers and governmental interventions. The duty on wheat imported from non-Empire countries, introduced in November 1932, is very small as compared with duties on wheat in other markets, and there are none of the quantitative restrictions of wheat imports (quotas) so common in wheat-importing countries during recent years.

It is also advantageous to study wheat prices quoted in sterling rather than in other currencies, since sterling is the most important currency for international trade in wheat. This may be questioned with reference to the early postwar period, when the United States dollar was of great importance in international trade as well as on the world capital market; but during recent years, with declining importance of United States wheat exports and with the pegging of the Argentine peso to sterling in 1933, there is no doubt that wheat prices in sterling are basic world wheat prices meriting first analysis when the formation of the world wheat price is to be studied. Sterling prices are followed in all wheat-exporting countries in the sense that domestic wheat prices must keep in line with British wheat prices so long as the respective countries are to remain on an export basis.

Even during the early postwar period, when the United Kingdom was off the gold standard and the sterling exchange was unstable in relation to gold currencies and particularly to the United States dollar, quotations of wheat prices in Liverpool expressed in sterling were of great importance for the development of the world wheat price. These changes of the sterling exchange in terms of gold currencies themselves became a factor affecting wheat prices expressed in gold currencies. There is evidence that wheat prices were affected at the time of the appreciation of sterling preceding the return of the United Kingdom to the gold standard in 1925, as well as later when sterling depreciated after that country went off the gold standard in 1931.

Prices of wheat on the Liverpool market expressed in sterling may be regarded as the basic world wheat price which welds into one system prices in all wheat-exporting countries. This does not mean, however, that all price

movements are initiated on the Liverpool market and that prices in other markets merely follow the Liverpool price. Every wheat-exporting country has its part in the formation of the world wheat price, as do all other wheat-importing countries than the United Kingdom. But the Liverpool market may be regarded as a focus in which all these influences interact, without any of them obtaining undue importance.

The reasoning that determines the selection of the United Kingdom, and especially Liverpool, as a wheat market representative of world conditions is pertinent also in the selection of a particular statistical series of wheat prices in that market. Price relations among the different wheats in the import market change from season to season. The price of wheat from a particular country may vary in its relations to prices of other wheats in consequence of variations in quality of the crop from season to season. The price of wheat from a particular country varies also, in its relation to other wheats, in consequence of changes in relative supplies of different classes of wheats. If hard wheats are relatively scarce, they tend to be high in price relative to soft wheats, while if hard wheats are relatively abundant they tend to be relatively cheap. Such variations in relative supply and in relative price of different classes of wheats may be large within seasons as well as between seasons.¹

Perhaps prices of some classes of wheat are more nearly representative of the effects of changes in general wheat supply and demand conditions than are prices of other classes of wheat. On general principles, however, it seems reasonable to suppose that an average of prices of all imported wheats should be more nearly representative of the effects of changes in the world wheat situation than prices of any one class or description of wheat. Such a price series is available in the British parcels price developed in *WHEAT STUDIES* and published regularly in the "Survey and Outlook" and "Review" numbers of this publication.²

In the series of British parcels prices, the different wheats receive weighting proportional to the number of reported sales of par-

cels of each description of wheat. The weighting thus obtained is not ideal, partly because parcels vary in size, and partly because import purchases of wheat from some countries are much less completely represented in the reported sales of parcels than are import purchases from other countries. Nevertheless the average of parcels prices accords well with the average, available monthly, of customs prices of all wheat imported into the United Kingdom, which is weighted according to quantities imported. Comparison of the parcels price with the monthly weighted customs price³ shows close agreement except that the customs price lags by about a month.⁴

The course of the British parcels price during a crop year may be affected by changes in the composition of United Kingdom imports. Hence, changes in the price from one part of a crop year to another may reflect not only the price tendencies but also the seasonal distribution of imports. During one part of the year, wheat imports into the United Kingdom may come predominantly from one region and during another part of a year from another region; and the price of the wheat from the first region may differ considerably from the price of the wheat from the second region.⁵

¹ Changes in price ratios between the wheats regularly quoted on the British market, by seasons and by six-month periods from August 1921, are discussed in Holbrook Working, "Price Effects of Canadian Wheat Marketing," *WHEAT STUDIES*, October 1937, XIV, 43-47.

² For a description of the construction of this series, and comparisons with other series of wheat prices on the British market, see M. K. Bennett, "British Parcels Prices, A World Wheat Price Series," *WHEAT STUDIES*, July 1928, IV, No. 8.

³ *Ibid.*, pp. 295-97. The present author has extended this comparison for years after 1927-28.

⁴ The lag of weighted customs prices becomes an important factor in periods of rapid change in wheat prices, for example, during the collapse of prices in 1930-31 as well as at the time of a sudden upturn of prices in sterling in the United Kingdom after abandonment of the gold standard in September 1931. In these periods, the weighted customs prices diverged substantially from the British parcels series for several months. This is one reason why weighted customs prices of wheat are not used in the present study, where short-term variations of prices are analyzed. When averages for crop years are used, the two series are in close agreement.

⁵ As an extreme example of this, the following may be mentioned. The British parcels price in May 1934 dropped much below the April average, whereas prac-

This suggests that changes in the British parcels price from one part of a crop year to another, or even from one crop year to another, may reflect not only price tendencies *per se*, but also changes in the quality of wheat imported. If so, doubt is thrown upon conclusions regarding changes in the price from one season to another. But such uncertainties arise also in connection with interpretation of changes in the price of futures, whenever it is necessary to compare prices of various futures that terminate in different seasons of the crop year.

It is unnecessary, however, to magnify this difficulty inherent in the British parcels price series. The wheat traded in the United Kingdom is mostly millable bread wheat, and British mills must maintain an average quality of wheat flour throughout the crop year. Consequently, an average millable value of imported wheat must be maintained regardless of the particular wheats that constitute the imports. Great variations in the millable value of imported wheat on the British market during a season are unlikely.¹

Use of the British parcels price as a basic series for analysis of price changes on the British market was not determined without reference to other series. Some of the series mentioned above were used to check the con-

clusions drawn from the study of British parcels prices. Weighted customs prices of imported wheat were used for comparison when periods as long as a crop year were used in averaging. For shorter periods, such as quarterly averages from one crop year to another, the Liverpool futures prices were used. The March future was given preference on the theory that quotations of this future during October–March depend on the crop situation (or outlook for it) both in the Northern and the Southern Hemispheres, and that it is not much affected by the condition of the next year's crop. These comparisons, as a rule, substantiated the conclusions about general tendencies in world wheat price developments obtained from analysis of the British parcels price. Particular aspects of the price movement illuminated by analysis of these additional series will be mentioned later.

In order to show the importance of developments in particular countries (mainly the four chief exporters) upon world wheat prices, attention was given to prices of representative wheats on representative domestic markets in each country. These price series were so selected as to be comparable with cash-price series quoted on the Liverpool market. For Canada and the United States which maintain official standards, selection was simple because domestic price series can be obtained for the same types and grades of wheat as at Liverpool. There was more difficulty in achieving comparability between domestic and Liverpool prices of Argentine and Australian wheats. But since the principal objective of this study is to analyze broad and general tendencies of prices rather than peculiar movements and spreads of special wheat prices, this presented no serious obstacle.

Analysis of the price movements of representative wheats on domestic markets of the four chief wheat exporters is reserved for Section III, pp. 281–91. Price movements of cash-price series quoted on the Liverpool market, in terms of deviations from British parcels prices, are presented in Chart 16, p. 303, and are used in the interpretation of specific movements of world wheat prices with a view to emphasizing the influence of individual countries on particular price movements.

tically all of the several wheat price series on the Liverpool market rose from April to May, as did prices in all the exporting markets. This "statistical" decline reflected the fact that parcels from Argentina comprised only about a fifth of the total number of parcels sold in the United Kingdom in April 1934, whereas in May they comprised about two-thirds of the total number; and prices of Argentine wheat in May were substantially below prices of other wheats, although they also rose from April to May. Such cases are exceptional. It was a coincidence that the Argentine Grain Regulating Board pursued a policy of restrained marketing in the earlier months of 1934 and then later, contrary to the usual seasonal tendency, sold on the world wheat market an enormous quantity of wheat when wheat prices had picked up in May. See "The Grain Regulating Board and the Wheat Market," *Banco de la Nación Argentina, Economic Review*, October–December 1934, VII, 143–48.

¹In exceptional periods, substantial quantities of feed wheat have been imported (for example, from France in 1934–35); but as a rule these imports would not greatly affect the average price of British parcels. Furthermore, efforts were made to exclude these exceptional quotations from the computation of averages of British parcels prices.

II. BRITISH IMPORT PRICES

Isolation and illumination of monetary influences upon the postwar development of wheat prices calls first for an interpretation of the price movements in terms of supply-demand factors. As an indicator of the supply-demand relationship in the world wheat market, the year-end world wheat carryover will be used mainly, as was explained above (p. 265). Thus the course of British wheat prices is interpreted below in terms of changes in world wheat carryovers at the end of successive crop years.

In order to anticipate criticism that the estimates of world wheat stocks in many positions are based on rather scanty information, certain other series will be used as subsidiary factors in explanation of price movements, particularly estimates of wheat stocks about August 1 in the four chief wheat-exporting countries. We have observed that the estimates of year-end stocks in these positions are much more reliable than in other positions, since they are officially reported or directly estimated (p. 266). The year-end carryovers of wheat in the chief wheat-exporting countries not only are more carefully estimated, but may affect the world wheat price development more strongly than do the stocks in other positions because of their concentration in a few countries and in more visible positions.¹ Hence there is reason to show them separately and to utilize them in interpretation of price movements.

In Chart 2, the several series on stocks and supplies are presented as separate curves and are contrasted with curves representing British parcels prices, averaged for a crop year.

¹ In this context the carryover is regarded as a causal factor affecting prices through its influence upon traders' opinions, rather than an indicator of the supply-demand relationship as we have spoken of it earlier and will usually regard it in further analysis. In this analysis, the *year-end* stocks are related to price movements in the *past* year, while *initial* stocks at the beginning of a crop year merely enter into the total supply of wheat during a *current* crop year. But use of the carryover as an indicator of changed relationship between the supply and the demand during the *past* year does not preclude consideration of it as one of the causal factors affecting prices during the *following* year.

Since our principal concern is to discover and explain monetary influences upon wheat prices, it was found necessary to study those prices expressed in various terms: (a) currency; (b) as units of a constant purchasing power—so-called deflated prices; and (c) in terms of gold. Instability of price levels and of exchange rates necessitates such analysis.

CHART 2.—AVERAGE ANNUAL BRITISH PARCELS PRICES OF WHEAT, AND "WORLD" WHEAT SUPPLIES, CROP YEARS ENDING JULY 31; AND YEAR-END WHEAT STOCKS IN THE "WORLD" EX-INDIA AND IN THE FOUR CHIEF EXPORTING COUNTRIES, ABOUT AUGUST 1, 1922-37*

(Shillings per quarter of 480 lbs.; million bushels; logarithmic vertical scale)

* Data from from Tables I, II, and IV.

Presentation of price movements in various terms widens the possibilities of disclosing and understanding monetary influences upon price changes in periods when prices expressed in these various terms show divergent tendencies. These divergent tendencies are associated with periods of depreciation or appreciation of a currency in relation to gold, or with change in the purchasing power of a unit of currency in relation to commodities in general.

Study of monetary influences upon wheat-price developments obviously necessitates consideration of price averages for periods much shorter than a crop year. An average of prices

for twelve months conceals many important price movements, including those connected with the changing monetary policies, particularly because monetary developments are not

Kingdom and in the chief wheat-exporting countries, all expressed in various terms as explained above. Chart 3 shows monthly average prices of British parcels expressed in

CHART 3.—BRITISH PARCELS PRICES OF WHEAT, MONTHLY, AUGUST 1921 TO JULY 1937*

(Shillings per quarter of 480 lbs.; logarithmic vertical scale)

*Monthly averages of daily prices summarized annually in Table IV.

usually synchronous with crop periods.¹ Accordingly, it is necessary not only to analyze wheat prices averaged by crop years but also to study in some detail price movements as represented by averages for shorter periods of months. It seems that practically all price movements significant for a study concerned with broad price tendencies, covering a relatively long period of over fifteen years, will find expression in monthly price averages. There is danger, on the other hand, that presentation of price movements in even greater detail, as by weekly averages, may be more confusing than enlightening. For the whole postwar period, we use therefore monthly averages of British parcels prices, as well as of certain other price series in the United

Kingdom and in the chief wheat-exporting countries, all expressed in various terms as explained above. This chart is complementary to Chart 2, where crop-year average prices of British parcels are contrasted with the supply-demand factors.

In further compromise between the disadvantage of using long-period average prices and the necessity of contrasting wheat price movements with supply-demand factors that can be given for wheat only by crop years, we have made a supplementary analysis based on year-to-year changes in quarterly averages of wheat prices in contrast with changes in year-end wheat carryovers or in total wheat supplies. Special attention was given to price averages for October–December and January–March, on the theory that the average price for October–December well rep-

¹ In agricultural countries such as Argentina and Australia, where domestic and foreign trade depend greatly upon crops and particularly upon wheat crops, currency depreciation or appreciation is often related to the crop-marketing season.

resents the influences of the Northern Hemisphere crops, and that the January–March average price is perhaps the most representative of the supply-and-demand influences for the crop year as a whole. In these months the principal results of the current crop year (August–July) are already well known and disseminated, while influences associated with the next year's crop are not yet very important. Our analysis of quarterly prices is not illustrated by charts in this study, but is brought to bear later in the discussion whenever the quarterly averages showed significant differences from the crop-year averages.

The data presented in Chart 2, taken in connection with the more detailed price data in Chart 3, reveal first of all the existence of fairly close correlation between changes in postwar British wheat prices and changes in year-end world wheat carryovers. The price of British parcels, representative of prices of all kinds of wheats imported into the United Kingdom, reflects in its movements fairly well the changes in the supply-demand relationship on the world wheat market,¹ as indicated by year-end carryovers.

The correlation between British prices of wheat and year-end carryovers of wheat in the four chief wheat-exporting countries is a little less pronounced but fairly close.² This last series, though more reliable than the world carryover series, represents the supply-demand relationship only in the chief exporting countries, whereas the movement of British prices must reflect the situation in secondary exporting areas and in import-

ing countries as well. A somewhat smaller correlation in this second case is to be expected, but the difference is not significant enough to warrant further discussion.

In spite of the fairly close correlation between the movement of British prices of wheat and the supply-demand relationship on the world wheat market over the whole postwar period, certain divergent movements characterize various parts of the period. These divergencies make it appropriate to divide the whole period included in this study into four parts, each requiring separate discussion:

1. The early postwar period preceding the crop year 1924–25, when prices were declining after the first postwar boom of 1919–20 and not always in agreement with the changes in the supply-demand relationship on the world wheat market.

2. A period of about six years beginning with 1924–25, during which wheat prices remained at what appear unduly high levels in view of the supply situation. During nearly four years of this period supplies were moderate or small (1924–25 to 1927–28) and prices were high by comparison with other years, especially when expressed in purchasing power (deflated). During the last two years of the period, wheat prices were at moderate or low levels in relation to other prices, yet higher than might have been expected in view of the relation of supplies to demand for use.

3. The period of collapse of wheat prices, beginning in the latter part of 1929–30 and extending to the end of 1933–34. The price movement during this period cannot be explained in the light of a changed supply-demand relationship, if for example one compares the situation at the end of 1928–29 with that at the end of 1931–32. On this period attention is particularly focused, for it was the period when the most important monetary disturbances occurred. It may be said in advance, however, that the price movement in this period, despite all of the concurrent important monetary influences, can be satisfactorily understood only in the light of thorough analysis of the previous period (1924–25 to 1929–30) when monetary influences were far less conspicuous.

¹ Chart 2 as well as other similar charts for the chief wheat-exporters is drawn to a logarithmic scale because detailed analysis of the relationship between prices and year-end carryovers ("scatter diagrams") demonstrates that in terms of logarithms these series show a linear relationship, pointing toward the existence of a proportional (inverse) relationship between them. The coefficient of correlation calculated without elimination of trend from either series was fairly large—for actual prices in currency, $r = -.84 \pm .08$; and for deflated prices, $r = -.79 \pm .09$. Even the smaller of these coefficients is about nine times its standard error ($\pm .09$).

² The coefficient of correlation between prices and year-end carryovers in the four chief exporting countries (in terms of their logarithms) was for actual prices in currency $r = -.83 \pm .08$; and for deflated prices $r = -.68 \pm .13$.

4. Finally, the last period, beginning with 1934-35 and continuing to date, was one characterized by a more or less normal relationship between the movement of wheat prices and the supply-demand situation on the world wheat market.

EARLY POSTWAR PERIOD

The early postwar period (1920-21 to 1923-24) requires only brief discussion. The early collapse of wheat prices following the post-war boom of 1919-20, along with prices of other agricultural commodities and raw materials, has already been adequately analyzed by others. Moreover, the data used in the price analysis of the present study, such as the statistics of wheat stocks and year-end carryovers, are scanty and unreliable for these early years. Finally, the transition from war-time fixed wheat prices and strict governmental control of domestic and international trade in wheat to free markets and free prices extended into 1922-23 in several countries; and this is an obstacle to study of the development of wheat prices during the early period. Thorough analysis of wheat prices in the light of the supply-demand relationship on the world wheat market during this period is hardly feasible.

Yet it can be said that the decline of wheat prices from 1920 to 1923-24 is not fully explicable by changes in the supply-demand relationship on the wheat markets, and must therefore be associated with the general deflationary process which took place on the major world markets after the early post-war boom of 1919-20. This is particularly true of the British and the North American markets.

The decline of wheat prices in 1922-23 seems peculiarly inexplicable in terms of the supply-demand relationship, for the change in the world wheat carryover from August 1, 1922 to August 1, 1923 points to a tighter position in the wheat market during 1922-23 than during the previous year. This was particularly in evidence on European importing markets because of the poor European wheat crop of 1922. In the chief wheat-exporting countries, however, the supply position was easier in 1922-23, as is indicated by the in-

crease of their carryovers of wheat in the course of the year (Chart 2, p. 270). In some degree this may explain the declining tendency of wheat prices on the British market during 1922-23; nevertheless, the decline was out of accord with the general supply-demand relationship on the world wheat market.

It was different with the continuing decline of wheat prices during the crop year 1923-24. This reflected an easier position on the wheat markets both in exporting and importing countries, thanks to the excellent crop of 1923, especially in Europe. Furthermore, during 1923-24 a degree of readjustment of prices from their low level of 1922-23 occurred, since prices perhaps declined somewhat less than could be expected from the changed supply-demand relationship. This readjustment took place mainly in the closing months of 1923-24, when wheat prices had already begun an upturn that continued into the following year. It will be shown later (Charts 8 and 9, p. 283) that, in the two exporting countries of the Southern Hemisphere, prices of wheat (averaged for their crop year, which practically coincides with the calendar year) rose in 1924 in spite of larger domestic supplies of wheat than in the previous year. Thus the effect upon wheat prices of the deflationary process following the 1919-20 boom appears to have been arrested during 1922-23, and continuing decline of wheat prices until the spring of 1924 was in accord with the supply-demand situation on the world wheat markets.

In this connection a special question arises: Were wheat prices abnormally low in 1923-24 from the point of view of a long-period equilibrium, and, if so, how much? An answer to this question is important in interpretation of price developments in succeeding years. If wheat prices in 1923-24 stood at an abnormally low level, then the violent increase during 1924-25 is explicable partly as readjustment from an abnormally low level in 1923-24. If wheat prices in 1923-24 were not abnormally low, the sudden rise of price in 1924-25 must be explained otherwise.

The answer to this question is not easy and may not be the same from the viewpoints of different exporting countries. Hence discussion of it must be deferred until we have

considered the movement of wheat prices in the chief wheat-exporting countries.

RELATIVELY HIGH PRICES, 1924-25 TO 1929-30

In 1924-25 wheat prices rose, both on the British market and elsewhere. The rise began in April 1924, before the close of the crop year 1923-24. The change in crop-year average prices from 1923-24 to 1924-25 therefore does not indicate in full measure the advance of prices during the fall and winter of 1924-25, and monthly average prices must be consulted.

The advance of prices beginning with April, before much was known about the new crops in the Northern Hemisphere, was associated first with revival of European continental buying of wheat that followed improvement in the financial situation and particularly improvement in the franc exchange;¹ but it was later supported by crop and weather factors, especially after May. By June it was apparent that drought had done considerable damage to Canadian wheat, and in July dry weather caused further deterioration. Thus changes in both the demand for and the supply of wheat contributed to the sudden and violent upturn of prices in 1924-25.

There is evidence, however, that other factors than those connected with the supply-demand relationship on the world wheat markets were important. Careful analysis of the change in wheat prices on the British market² as compared with the supply-demand relationship suggests that the rise of prices in 1924-25 was greater than could normally be expected in the light of the supply-demand situation. The rise was particularly large in terms of British wheat prices expressed in gold. From the beginning of 1924 until the return of the United Kingdom to the gold standard in 1925, the British pound sterling appreciated by nearly 15 per cent in relation to the gold currencies. The expectation

of early return of the United Kingdom to the gold standard at prewar parity caused considerable speculation in sterling exchange, which was strengthened by the instability of other currencies.

Thus, the rise of wheat prices on the British market, when expressed in terms of gold currencies, was a result of two independent processes: the movement of wheat prices in currency, which itself might be affected by speculative demand; and the appreciation of the pound sterling in relation to gold, which was associated with another type of speculative influence. Hence, even if one concludes that the advance of British wheat prices in British currency in 1924-25 was no more than a reflection of a changed supply-demand relationship, the advance of wheat prices in terms of gold must be regarded as excessive in the light of this relationship. But this excessive rise of British wheat prices expressed in gold might directly influence wheat prices in gold currencies, such as the dollar price of wheat, for the United States was then on gold and the Canadian dollar, though formally not on gold until July 1926, was close to exchange parity after the middle of 1922.

The reasons why wheat prices expressed in gold currencies increased more in 1924-25 than is reasonably explicable by the changed supply-demand situation on the world market need not be discussed in detail at this point. Here we need only to enumerate those factors which might contribute to this development in addition to appreciation of the sterling mentioned above.

In the United States, heavy speculation on the wheat market at Chicago was coincident with the beginning of a long speculative rise of security prices. The price of stocks increased during 1925 relatively more than in any other postwar year except 1929. This speculation both in wheat and in securities followed a period of expansionist policy begun in 1924 by the Federal Reserve Board, involving purchase of securities on the open market and reduction of discount rates from 4.5 per cent in 1923 to 3 per cent in 1924. During 1924-25 bank rates to customers stood at the lowest level since the war.³

¹ WHEAT STUDIES, December 1924, I, 45.

² Not only of British parcels prices but also of weighted customs prices of imported wheat, as well as of the Liverpool March future and of average prices both for crop years and for quarters.

³ U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *Survey of Current Business*, 1931 Annual Supplement.

Following the adoption of the Dawes plan in August 1924, export of capital from the United States and the United Kingdom increased greatly. In 1924 and 1925 the issues of foreign securities on the New York market reached a high level, much above the levels of preceding postwar years and exceeding those of later postwar years except 1927-28. This outflow of American and English capital went partly to such important wheat producers as Argentina and Australia, with inflationary effects on their markets.

Wheat prices on the British market, greatly elevated in terms of gold currencies during 1924-25, remained unduly high throughout the succeeding five years ending with the spring of 1930. During these years British wheat prices declined, yet failed to reflect in full measure the changes in the supply-demand relationship on the world wheat markets. In the first three years of this period the decline of wheat prices on the British market did not exceed that of the general price level in the United Kingdom, as represented by the comprehensive Board of Trade index numbers of wholesale prices. This may be seen from Charts 2 and 3 (pp. 270, 271), in which deflated prices of British parcels move horizontally practically up to the beginning of 1928. The same tendency appears also in the weighted average customs prices of wheat imported in the United Kingdom, as well as in the price of the Liverpool March future. An analysis of these prices averaged by shorter periods indicates that price averages for the earlier part of a crop year (October-December), when wheat from the Northern Hemisphere countries flows mainly to the British markets, show this tendency more clearly than do average prices for January-March, when Southern Hemisphere wheats move to Britain.

Deflated prices of wheat on the British market showed practically no tendency to decline during the three years following the speculative rise in wheat prices in 1924-25, while the supply-demand situation in the world wheat market changed from extreme tightness in 1924-25 to relative easiness in 1927-28.¹ This indicates that wheat prices on the British market participated little in the

deflationary process which occurred in the United Kingdom after the return to the gold standard at prewar parity in 1925.

The opinion has been widely accepted that the deflationary policy of the United Kingdom, which became necessary because of overvaluation of the pound, depressed not only British prices but also prices on the world market, and particularly the prices of agricultural products and of raw materials. Our analysis indicates that this view is not defensible, at least with reference to wheat prices. The appreciation of the pound sterling during 1924-25 contributed to an excessive rise of wheat prices in gold currencies, and these relatively high prices were not corrected downward in spite of the deflationary process operating in the United Kingdom during the following years. It is not pertinent here to discuss at length the reasons why British deflationary policy after 1924 was not effective with regard to world wheat prices.

The opinion that this policy depressed prices on the world market, though widely accepted, is not general. Some British authorities think that overvaluation of the pound in 1925 resulted in a higher level of prices of raw materials in the currencies of the producing countries than would otherwise have prevailed, and that these high prices could be maintained for several years in spite of the fact that the deflationary policy affecting British industries restricted imports of raw materials.² If prices of raw materials were main-

¹ The degree of tightness on the world wheat market may be measured by the world wheat carryover at the end of both of these years. On August 1, 1925, the world wheat carryover (excluding India) was at a record low level of about 477 million bushels, and on August 1, 1928, it was 662 million bushels, larger than in any preceding postwar year. The August 1 stocks of the four chief wheat exporters increased from 228 to 337 million bushels in the same period.

² See N. F. Hall, "Gründe und Folgen der Abwertung des Englischen Pfundes," *Weltwirtschaftliches Archiv*, XLIII, Heft 1, esp. pp. 5-6. Professor Hall (London) explains that high prices of raw materials did not result in an immediate adjustment of production because adjustment was postponed through the operation of other factors that tended to maintain the disequilibrium. The appreciation of the pound, of course, increased the burden of foreign debts of the raw-material-producing countries, but the extension of new British credits to those countries (and loans also came from the United States) prevented any

tained at high levels in spite of the fact that British manufacturing industries were indeed depressed by the deflationary policy, then it is much easier to explain the maintenance of high wheat prices on the British market, since the demand for imported wheat was in no way affected by the deflationary policy. The deflationary policy, by reducing the purchasing power of the population, could hardly depress its demand for wheat bread. In the United Kingdom bread is one of the cheapest foods, and under such conditions the demand for cheap foods tends rather to increase. Indeed, British imports of wheat did not decline, and were larger in 1926-27 and 1927-28 than in 1924-25.

In 1928-29 British wheat prices in currency averaged lower than during 1923-24, but in terms of gold they were about 5 per cent higher, and on a deflated basis even 11 to 12 per cent higher than in 1923-24. The carry-over at the end of 1928-29, however, was over 300 million bushels larger than at the end of 1923-24. The decline in British wheat prices between 1927-28 and 1928-29 was less than might have been expected from the increase

immediate pressure. But inflation and extension of new credits could only postpone the time when forces working toward re-establishment of stable equilibrium became effective. Professor Hall's opinion is that actually this took place in 1928 and 1929, when elasticity of supply acquired decisive importance, and general collapse of prices of raw materials necessarily followed. We may add here that, with reference to wheat prices, this readjustment did not take place until 1930-31.

Professor Hall also emphasizes the view that traditional methods of deflation—high bank rates and sales of securities in the open market—had not been applied in England during 1925-29, and that the large unfunded short-term debt of the government rendered the bank-rate mechanism ineffective to control the inflow and outflow of foreign short-term capital in the British market. This constitutes an additional reason why British deflationary policy was not effective.

¹ It must be observed, however, that relatively large utilization of wheat during these later years was due partly to increased feed use of wheat, the demand for which is different in character from the demand for wheat used for food. Because of lack of satisfactory statistical data on different types of use of wheat we are obliged, however, to group all uses together. This represents a substantial shortcoming of the analytical method followed here, but not a shortcoming likely to invalidate the principal conclusions of the study.

in supplies. Thus, there was no adjustment of wheat prices in 1928-29 from the point of view of a long-period equilibrium. If they were unduly high during the four preceding years, they remained so in 1928-29 as well.

In 1929-30 British wheat prices rose during the first half of the crop year. This rise may be regarded as a normal reaction of prices to the change in the supply situation; in spite of a large crop in European importing countries, the Northern Hemisphere crop was small in 1929. Especially poor was the Canadian crop, with marked effects upon prices of Canadian wheat, which were out of line with British prices for several months in the first half of 1929-30 (Chart 4, p. 278). The Southern Hemisphere crop was also small, and the total world wheat crop fell below current disappearance. Consequently, the world wheat carryover at the end of the crop year on August 1, 1930 was smaller than on the same date of the preceding year. Thus, in the light of short-term changes in the supply-demand situation on the world wheat market, the price level of wheat in 1929-30 might well have been higher than it was in 1928-29. But in the second half of 1929-30, British wheat prices began to decline, as did prices in the markets of the chief wheat exporters (Chart 4, p. 278); and this decline brought the crop-year average price of British parcels below the average for 1928-29. This decline was the beginning of the process of readjustment of wheat prices to the supply-demand relationship—a readjustment which had been postponed for several years, but which, because it was delayed, took the form of a catastrophic collapse of wheat prices in 1930-31.

This collapse is understandable only in the light of developments since 1924-25, and cannot be fully explained in terms of a decrease in consumptive demand for wheat between 1928-29 and 1930-31 or 1931-32. There was no important decrease in the demand for use.¹

The fact that the purchasing power of wheat on the British market (deflated prices) increased between 1928-29 and 1929-30 indicates that, although a process of readjustment began in the second half of 1929-30, it affected average prices for that crop year so slightly that they declined during 1929-30

less than did the general level of wholesale prices. Thus, practically no readjustment of wheat prices took place in 1929–30, and adjustment was almost wholly postponed to following years.

Why adjustment of wheat prices failed to take place in 1929–30 while other prices were already receding swiftly after the collapse in the security markets in the fall of 1929, and more generally, why this adjustment failed to get under way during the preceding period 1924–25 to 1928–29, are questions that can be answered only in the light of price developments in the chief wheat-exporting countries, regarded in the light of the supply-demand relationship in particular exporting countries. This analysis will be the subject of a special section following presentation of the situation in the chief wheat-exporting countries.

PRICE COLLAPSE AND MONETARY DISTURBANCES, 1930–31 to 1933–34

In the years from 1924–25 to 1929–30, wheat prices thus failed to adjust fully to the changing situation of supply and demand on the world wheat market, declining but slowly while wheat surpluses were accumulating rapidly. By contrast, the period from 1930–31 to 1933–34 witnessed price changes excessive in the light of changes in the relationship between supply and the demand for use. This is true particularly of the crop year 1930–31, when the major collapse of wheat prices occurred on the British market and on other world wheat markets as well. At the end of 1930–31 the world wheat carryover (excluding India) was practically the same as it was at the end of 1928–29 but the British parcels price had declined by more than half—from 46.9 shillings per quarter in July 1929 to 20.9 shillings per quarter in July 1931. The decline was somewhat smaller in terms of averages for crop years—from 42.6 shillings in 1928–29 to 25 shillings in 1930–31—but even this smaller decline cannot be explained in terms of relations between supply and the demand for use.

The contrast between these two crop years appears also in the price movement within each year. British wheat prices averaged practically the same in the first three months

and the last three months of 1928–29, while in 1930–31 wheat prices declined 30 per cent between the corresponding three-month periods (Chart 3, p. 271).

After September 1931, following British abandonment of the gold standard and depreciation of the pound, British wheat prices advanced sharply and then declined moderately. Wheat prices in British currency during the three following years moved in substantial accord with further changes in world wheat carryovers. But British wheat prices in terms of gold remained low and declined more during these years than can be reasonably explained by further accumulation of stocks (Charts 2 and 3, pp. 270, 271). Discrepancies were particularly evident in 1931–32 and 1933–34. Excessive declines of British wheat prices expressed in gold during these two years, inexplicable in the light of changes in the relationship between supply and the demand for use (as reflected by changes in the year-end carryovers), suggests the presence of special factors operating to depress prices on the British market.

It is quite clear that the collapse of prices in 1930–31 cannot be fully explained in terms of the changed situation of the supply and the demand *for use*. It is true that world wheat supplies for the crop year 1930–31 increased in spite of a somewhat reduced carryover from the short 1929–30 crop. The wheat acreage (sown) in the principal wheat-exporting countries, particularly in Australia, increased greatly in 1930–31, as a direct result of government propaganda—the “grow-more-wheat” campaign in Australia—and partly as an indirect effect of governmental interventions such as the operations of the Federal Farm Board in the United States. Although yields per acre were not high, the record wheat area in 1930–31 resulted in a crop second only to the huge wheat crop of 1928. World wheat supplies were further enlarged by heavy wheat exports from the USSR. World wheat *supplies* were thus much larger in 1930–31 than in 1929–30, and larger also than in 1928–29, although the 1928 wheat *crop* was substantially larger than that of 1930.

World wheat disappearance in 1930–31,

however, was also of record size partly because of increased feed use. Disappearance was especially large in the four chief wheat-exporting countries. Their wheat exports, though not as large as during the years just preceding 1929-30, were substantially larger than in 1929-30. European net-importing

Hence, disequilibrium between current wheat production and current disappearance in consumption hardly explains the collapse of wheat prices in 1930-31, since disequilibrium was not greater but smaller than in 1928-29.

Explanation of the collapse of wheat prices between January 1930 and August 1931

CHART 4.—CASH WHEAT PRICES IN FOUR CHIEF EXPORTING COUNTRIES AND BRITISH PARCELS PRICES, MONTHLY, AUGUST 1921 TO JULY 1937*

(Shillings per quarter of 480 lbs.)

* See Tables IV and V for annual data.

countries in 1930-31 imported substantially more wheat than in 1929-30, although they imported cautiously and held their year-end stocks (on August 1, 1931) to a low level. In consequence, wheat disappearance in the world ex-Russia in 1930-31 slightly exceeded the large wheat crop of 1930; and, even with the large Russian wheat exports, the year-end world carryover (excluding India), though larger than at the end of 1929-30, was practically the same as on August 1, 1929.

(Chart 3, p. 271) lies not so much in the changed relationship between the supply and the demand for use as in the extreme shrinkage of speculative demand for holding wheat in expectation of higher prices. The shrinkage of speculative demand was so rapid and so complete that at the end of that crop year private holders were ready to hold at a price only half as high as in 1928-29 only a fraction of the world wheat carryover which they had held at the end of 1928-29. For,

although the total wheat carryover (ex-India) on August 1, 1931 was as large as that on August 1, 1929, the United States Grain Stabilization Corporation held 257 million bushels of it (nearly four-fifths of the total United States wheat carryover); and the Canadian government guaranteed banks against loss on the stocks carried by the Canadian Wheat Pool, which composed a greater part of the large Canadian stocks. Strictly private holdings of the carryover on August 1, 1931 were not large but small.

CHART 5.—GOLD VALUE OF CURRENCIES OF THE UNITED KINGDOM AND THE FOUR CHIEF WHEAT-EXPORTING COUNTRIES, MONTHLY, AUGUST 1921 TO JULY 1937*

(Per cent of gold parity in 1929)

* Exchange rates used in computations from *Federal Reserve Bulletin*, January 1928, pp. 57 ff., and Banco de la Nacion Argentina, *Economic Review*, April-June 1934, VII, 45; gold values of currencies 1931-37 as given directly in various publications of the League of Nations, Economic Intelligence Service. The gold value of the Australian currency, 1922-31, was obtained by dividing gold values of the pound sterling by rates of exchange Australia on London.

In order to explain the collapse of wheat prices in 1930-31, it is first necessary to discover what factors may have affected the speculative demand for wheat. Among these, the changed financial and credit situation in most of the leading wheat-exporting and wheat-importing countries following the crisis of 1929 was of course important. Conditions of finance and credit usually affect speculative demand for wheat much more than they affect consumptive demand. Among the financial and credit influences were the monetary policies of several governments and these must be studied later in connection with the collapse of wheat prices in 1930-31, as well

as with the further, more gradual, decline of British wheat prices expressed in gold.

It is important to observe that the major collapse of wheat prices in 1930-31 preceded the mass abandonment of the gold standard and the competitive depreciation of currencies that followed British departure from gold. The catastrophic decline of wheat prices preceding September 1931 was directly affected, however, by depreciation of the Argentine and Australian currencies. The Australian pound was depreciating with particular rapidity during 1930-31, especially between December 1930 and February 1931 (Chart 5). These factors will be considered in some detail later in explanation of the price collapse in 1930-31; here we need say only that this collapse represents, at least in part, readjustment of wheat prices from the excessive level at which they were maintained during the period 1924-29, under the influence of the financial and credit situation characteristic of that period.

The declines of British wheat prices expressed in gold in 1931-32 and 1933-34, excessive in the light of supply-demand relationships (Chart 2, p. 270), coincided with two periods when competitive depreciation of currencies was especially pronounced. One of these followed British abandonment of the gold standard in September 1931, and the second followed the depreciation of the United States dollar following April 1933. Such synchronism suggests a connection between wheat price changes and monetary developments during these two periods.

Depressing effects upon wheat prices, as well as on the prices of other staple commodities, are commonly ascribed to the depreciation of the British pound, whereas depressing effects on prices, particularly prices of wheat, are usually not assigned to depreciation of the United States dollar. One of the principal arguments supporting the theory that depreciation of the dollar did not adversely affect world wheat prices is that wheat prices in the United States following depreciation of the dollar were above the world market wheat prices.¹ This situation

¹ See S. E. Harris, *Exchange Depreciation* (Cambridge, 1936), pp. 340-41.

is shown in Chart 4, in which wheat prices in the four chief wheat-exporting countries expressed in British shillings are compared with the British parcels prices (in the United Kingdom). But in order to understand the effects of depreciation of both sterling and the dollar, one must consider not only the direct but also the indirect influences. The indirect effects were exerted through the instrumentality of other currencies affected by the depreciation of the pound and the dollar, particularly the currencies of the chief wheat-exporting countries. British abandonment of gold caused depreciation of the Canadian dollar and further depreciation of the Australian pound and the Argentine peso. The depreciation of the American dollar caused a severe further depreciation of the Canadian dollar, some further depreciation of the British pound and the Australian pound, and eventually depreciation of the Argentine peso (Chart 5).

Under these circumstances, appraisal of the total effect, direct and indirect, of sterling and dollar depreciation upon wheat prices requires examination of the repercussions upon monetary developments in other countries. Hence, detailed discussion of both of these episodes—1931–32 as well as 1933–34—must be postponed until after wheat price developments in the chief wheat-exporting countries have been presented.

Here it suffices to mention that there is little reason to ascribe to depreciation of the British currency all of the excessive decline of wheat prices in terms of gold from 1930–31 to 1931–32 (Chart 2, p. 270). Other factors and policies were in some degree responsible. For example, the stabilization operations of the Federal Farm Board maintained United States wheat prices during most of 1930–31 above world market prices, and cessation of stabilization purchases in June 1931 resulted in drastic decline of American wheat prices during the last two months of 1930–31. This was accompanied by substantial decline of British wheat prices (Chart 4). Discontinuance of price-supporting operations by the Farm Board may reasonably be regarded as more responsible than other factors for the drastic decline of British wheat prices in June–August 1931, because wheat prices in other ex-

porting countries did not decline sharply during these months as did American and British prices. Yet certain developments tend to support the theory that the severe decline of British wheat prices in June–August 1931 was independent of Farm Board policy. At this time the United Kingdom was experiencing extreme financial strain preceding the abandonment of gold in September 1931, and British prices were being depressed. The price of wheat, however, declined much more than the general price level, as appears from the behavior of deflated wheat prices on the British market shown in Chart 3, p. 271.

Moreover, immediately after Britain's departure from gold, British wheat prices rose more than in proportion to depreciation of the pound, and in the rest of the crop year (October–July, 1931–32) continued above their August and early September level, not only in depreciated currency but also in gold (Chart 3). Even in July 1932, when the British parcels price declined substantially, it stood in terms of gold about as high as in the previous August. This indicates that British wheat prices expressed in gold were not depressed after the depreciation of the pound, as compared with their level during the month just before abandonment of gold. The departure from gold relieved financial strain and tended to raise wheat prices even in terms of gold. This does not mean, however, that further depreciation of the British pound in subsequent years did not adversely affect wheat prices expressed in gold currencies. There is also doubt about the comparison of British wheat prices in October–July of 1931–32 and in the preceding August, since the August level was exceptionally low as compared with wheat prices in the four principal wheat-exporting countries, as may be seen from Chart 4. As compared with the average price level in January–June 1931, British average wheat prices expressed in gold in October–July 1931–32 were considerably lower. This suggests depressing effects from the depreciation of the pound. Conclusions concerning the effect of the depreciation of the pound upon the movement of wheat prices expressed in gold currencies must therefore be postponed until we have considered the repercussion of ster-

ling depreciation upon the currencies of the chief wheat exporters.

THE PERIOD SINCE 1934-35

Little need be said here about developments after 1934-35. In these recent years British wheat prices have moved closely in accord with changes in the supply-demand situation on the world wheat market, so far as it is reflected by changes in year-end world wheat carryovers.

In 1934-35, wheat prices expressed in gold were somewhat sluggish in responding to

rapid disappearance of wheat surpluses attributable to the poor wheat crops of 1934, particularly in the principal wheat-exporting countries. But with further stabilization of exchange rates in the following years, wheat prices expressed in gold closely followed those in currency, remaining, however, at the low level to which they had been brought during the preceding period (Chart 2, p. 270). The causes of the low level of wheat prices expressed in gold and the outlook for recovery are considered in the concluding section of this study.

III. PRICES IN EXPORTING COUNTRIES

This section deals with broad tendencies in the postwar course of wheat prices on the markets of the four chief wheat exporters. The presentation must be summary in character, since it is incidental to our principal concern of analyzing wheat prices on the world market. But detailed consideration of price movements in the world market during certain specific periods will require consideration of influences originating in particular wheat-exporting countries. The general course of wheat prices in these countries requires condensed discussion and interpretation in terms of the supply-demand situation, not merely on the world wheat market as a whole, but also on the wheat markets of respective countries.

INDICES AND PRICE SERIES

Wheat prices in any wheat-exporting country usually move in approximate agreement with prices on the world wheat market, as represented here by British import prices. There often occur, however, divergencies that reflect special localized circumstances. Among these circumstances the following merit particular mention: (a) a specific supply-demand relationship for wheat of a particular country, reflecting change in the supply or change in the demand for its wheats; (b) government policies affecting trade in wheat; (c) change in the cost of transporting wheat to the market regarded as the world market (here the British market); and (d) monetary developments in a particular country that affect the national ex-

change rate and the national general price level.

Just as it was earlier necessary to select certain specific indices characterizing briefly the supply-demand relationship in the world wheat market in order to interpret movements of the British wheat prices, so it is advisable here to fix upon specific indices reflecting supply-demand relationships in particular wheat-exporting countries. Since fluctuations of wheat prices depend heavily upon changes in the supply, we relate wheat prices in particular wheat-exporting countries to supplies in those countries. In order to account for changes in demand, year-end wheat carryovers are taken for each country. Changes in domestic wheat carryovers reflect changes both in the wheat supplies of the country and in the demand, including the demand for exports. Hence, the domestic carryover may be used as a summary index of the supply-demand relationship for wheat of a particular exporting country.

Since wheat prices in exporting countries reflect supply-demand relationships not only on domestic markets but also on the world wheat market as a whole, it seemed advisable to interpret price movements in particular exporting countries in the light of the supply-demand relationship in the world wheat markets. As an index characterizing briefly the situation in markets outside of any exporting country, we use the year-end world wheat carryovers excluding the carryover in the country in question. This division of world

CHART 6.—AVERAGE ANNUAL PRICES OF NO. 2 HARD WINTER WHEAT AT KANSAS CITY AND TOTAL UNITED STATES WHEAT SUPPLIES, CROP YEARS ENDING JUNE 30; AND YEAR-END WHEAT STOCKS IN THE UNITED STATES JULY 1, AND ABROAD AUGUST 1, 1922-37*

(U.S. cents per bushel; million bushels; logarithmic vertical scale)

* U.S. stocks include U.S. wheat in Canada; stocks abroad are "world" stocks excluding U.S. and Indian. See Tables I, II, and IV.

wheat carryover into a domestic part and a part located abroad serves to bring into relief certain tendencies peculiar to a particular exporting country. It must not be supposed, however, that domestic carryovers characterize specifically the supply-demand relationship in a separate country and carryovers abroad that on the world wheat market, for domestic carryovers themselves are affected by the situation of the world market and constitute, in turn, part of the situation affecting the world market.

All of these indices have been used in interpretation of wheat price movements on the markets of the chief exporters. They appear in Charts 6-9.

Since emphasis falls on the world wheat market in this study, the price series selected for each of the exporting countries are representative of export wheats and are prices quoted on markets important in the export trade. The attempt was made to select a price series in a domestic market comparable with a price series quoted in Liverpool. In accordance with these general principles, the follow-

ing series were selected for individual exporting countries:

For Canada, prices of No. 3 Northern Manitoba at Winnipeg (basis Fort William and Port Arthur) were used. This is one of the chief Canadian export wheats. Preference was given to No. 3 Northern as against other grades on the ground that it is relatively well representative of Canadian wheat exports, is perhaps less affected than other grades by special conditions of particular crops,¹ and lends itself well to comparisons of price tendencies in Canada with those in Liverpool.

CHART 7.—AVERAGE ANNUAL PRICES OF NO. 3 NORTHERN MANITOBA WHEAT AT WINNIPEG AND TOTAL CANADIAN WHEAT SUPPLIES, CROP YEARS ENDING JULY 31; AND YEAR-END WHEAT STOCKS IN CANADA AND ABROAD, AUGUST 1, 1922-37*

(Canadian cents per bushel; million bushels; logarithmic vertical scale)

* Canadian stocks include Canadian wheat stored in the U.S.; stocks abroad are "world" stocks excluding Canadian and Indian. See Tables I, II, and IV.

For the United States, prices of No. 2 Hard Winter in Kansas City were used. This has been the most important grade of export wheat throughout the postwar period, and Kansas City is the chief cash market. Quotations of this grade in Liverpool are more consistent than for any other grade of United States

¹ See graphic comparisons of prices of various grades of Canadian wheat at Winnipeg in M. K. Bennett, "A Weighted Series of Cash Wheat Prices at Winnipeg," *WHEAT STUDIES*, March 1929, V, 186-88.

wheat, though in several years preceding 1937, when the United States was not exporting such wheat or was exporting little, it was not quoted at Liverpool.

For Argentina, monthly average wheat prices at Buenos Aires were used, a series carried in the official *Boletín Estadística Agropecuaria*. Buenos Aires is the principal wheat-exporting harbor of Argentina, and these prices may therefore be regarded as representative of Argentine export wheats and substantially comparable with the series of Rosafé prices quoted almost regularly in Liverpool.

CHART 8.—AVERAGE ANNUAL PRICES OF ARGENTINE WHEAT AT BUENOS AIRES AND TOTAL ARGENTINE WHEAT SUPPLIES, CALENDAR YEARS 1922-37; AND WHEAT STOCKS IN ARGENTINA AND ABROAD, AUGUST 1, 1922-37*

(Argentine paper pesos per quintal; million bushels; logarithmic vertical scale)

* Stocks abroad are "world" stocks excluding Argentine and Indian. Supplies represent stocks as of January 1 plus new crop. See Tables I, II, and V.

Finally, for Australia we have used wheat prices at Melbourne (basis on trucks, Williamstown).¹ Although Melbourne prices cannot be regarded as representative of all kinds of Australian wheat exported from all Australian ports, Melbourne is one of the principal export harbors. This series seems satisfactory for present purposes.²

For every exporting country, we present wheat prices (a) in national currency; (b) in units of constant purchasing power, or prices in currency deflated by a national index num-

CHART 9.—AVERAGE ANNUAL PRICES OF AUSTRALIAN WHEAT AT MELBOURNE AND TOTAL AUSTRALIAN WHEAT SUPPLIES, CALENDAR YEARS 1922-37; AND WHEAT STOCKS IN AUSTRALIA AND ABROAD, AUGUST 1, 1922-37*

(Australian shillings per bushel; million bushels; logarithmic vertical scale)

* Stocks abroad are "world" stocks excluding Australian and Indian. Supplies represent stocks as of December 1 plus new crop. See Tables I, II, and V.

ber of wholesale prices; (c) in terms of gold, thus taking into account the depreciation of national currencies in relation to gold currencies; and finally (d) in terms of sterling currency, for comparison with wheat prices on the British market. Average crop-year prices of representative export wheats in each exporting country, variously expressed, are contrasted in Charts 6-9 with the indices

¹ Through July 1929, monthly average wheat prices at Melbourne are computed from weekly averages furnished by John Darling & Son. Data from August 1929 are monthly averages of daily prices published in *Wheat and Grain Review* (Melbourne).

² Comparison of monthly average wheat prices at Melbourne, for the period 1930-37, with monthly weighted averages of shippers' limits for growers' bagged lots, Sydney, Melbourne, and Adelaide—a series published regularly in Commonwealth Bureau of Census and Statistics, *Monthly Summary of the Wheat Situation in Australia*—shows that Melbourne wheat prices reflect fairly closely the movement of the weighted average prices of wheat at these three principal Australian harbors. Unfortunately, this weighted average series could not be used here because it is obtainable monthly only since 1930.

characterizing the supply-demand relation in the same country.¹ Monthly averages of the same prices, required in more detailed study of price movements in the principal wheat-exporting countries, appear in Charts 10-13.

GENERAL COURSE OF PRICES

As would be expected, the general course of wheat prices in each of the four chief wheat-exporting countries moves fairly closely with the general course of British parcels prices, as appears in Chart 4 (p. 278). Here (on an arithmetic scale) all prices are expressed in British shillings per quarter of 480 pounds. All of the large fluctuations of British wheat prices discussed earlier were reflected on domestic markets of the four chief wheat exporters. Yet in particular years, or even groups of several years, wheat prices in particular exporting countries diverge rather substantially from the course of British prices, to say nothing of short-term divergencies of a few months duration, which are normally present. These rather long-term divergent movements are pronounced and persistent for United States wheat prices, while Argentine and Australian wheat prices with a few exceptions follow rather closely the course of British parcels prices. Canadian prices seem to occupy an intermediate position.

¹ It was impossible to show in these charts prices expressed in national currencies and in sterling. Sterling exchange rates of foreign currencies fluctuated during the postwar period, so that prices in national currencies and in sterling plotted on constant scales, even if different for each series, would not be comparable over the whole period. Wheat prices in exporting countries and the United Kingdom, all expressed in British shillings, are given in Chart 4, p. 278.

² See R. D. Calkins and Holbrook Working, "Price Leadership and Interaction among Major Wheat Futures Markets," *WHEAT STUDIES*, November 1933, X, 35-70.

³ Charts 8 and 9 show Australian and Argentine wheat prices as annual averages for calendar years, which practically coincide with the Southern Hemisphere crop year, in contrast with world wheat carryovers elsewhere at the end of the Northern Hemisphere crop year (August 1). The use of price averages for calendar years permits them to be compared on the same charts with appropriate Southern Hemisphere crop-year domestic supplies. But changes in August-July average wheat prices in Argentina and Australia also correlate closely with total world wheat carryovers (including Southern Hemisphere stocks) at the end of the Northern Hemisphere crop year.

Such differences in the course of wheat prices are easy to understand, since in the United States the domestic market is more important than the foreign, while for the other three chief wheat exporters the relationship between domestic and foreign markets is the opposite. The intermediate position of Canada rests on different circumstances. The wheat which she produces is of a special character. The flow of exports to the United Kingdom is less variable from Canada than from either Australia or Argentina, but Canadian wheat, even of the intermediate quality represented by No. 3 Manitoba Northern, may vary widely in price relative to other wheats according to its relative abundance. Further, Canadian marketing policy is different from that of Argentina and Australia; whereas Southern Hemisphere countries export freely within each current crop year, leaving only small carryover at the end, the Canadian policy resulted in an accumulation of substantial stocks of wheat carried from one crop year to another. There was also a larger degree of governmental interference in the marketing of wheat in Canada during recent years, such as the government-sponsored stabilization operations on the Winnipeg market. Furthermore, in both Canada and the United States short-period divergencies from the course of the British price average may arise from the strong holding power in these countries, resting largely on the presence of large wheat futures markets. These markets often take the leadership in initiation of major international wheat price movements² whereas Argentine and Australian markets do so but little. All this seems to explain why Canadian wheat prices diverge more widely than do Argentine or Australian prices from the course of world market prices as represented by British parcels prices.

It is therefore not surprising that Argentine and Australian prices move in closer agreement with the supply-demand situation on the world wheat market, as indicated by year-end world wheat carryovers,³ than do United States or Canadian wheat prices. Charts 8 and 9 indicate the high degree of correlation between Argentine and Australian wheat prices expressed in currency and world

wheat carryovers outside of either country. Thus the course of wheat prices in Argentina and Australia reflects changes in the supply-demand relationship on the world wheat market, as represented by the August 1 world wheat carryover, much better than it reflects changes in total supplies of domestic wheat.¹ Argentine and Australian wheat prices depend as much upon the supply-demand relationship on the world wheat market as do British wheat prices, if the dependence is measured by closeness of correlation between the prices and the world wheat carryover.²

UNITED STATES PRICES

The situation was different in the United States and Canada. Wheat prices in the United States, as represented by the most important export grade of wheat (No.2 Hard Winter at Kansas City), changed in much closer agreement with the supply-demand relationship as indicated by domestic year-end carryovers of wheat than with the supply-demand situation on the world wheat market as represented by the world wheat carryover outside of the United States. This appears clearly from Chart 6 on comparison of the curve represent-

ing prices in currency with the two curves representing domestic and external wheat carryovers. As we have seen, closer correlation between American wheat prices and domestic wheat carryovers would be expected because the domestic market exceeds foreign markets in importance, especially in recent years when the United States was on an import basis. It may be also significant that the United States carryover, representing a large portion of the total world carryover, is to a certain extent a good index of world supplies of wheat relative to demand. Under such conditions, close correlation of American wheat prices with domestic carryovers may not mean greater dependence of prices on the supplies of domestic wheat. Indeed, correlation between American wheat prices and total supplies of American wheat is not so close³ as between prices and domestic carryovers.

Although there was fairly close correlation between American wheat prices and domestic year-end wheat carryovers, there were also divergent movements between these two series. During the postwar years preceding 1928 there was nearly perfect correlation between prices of No. 2 Hard Winter wheat and domestic year-end carryovers; but during the following four years, 1928-29 to 1931-32, the correlation was far from perfect. Wheat prices failed in 1928-29 to decline in full response to a great disequilibrium between supply and demand, with a resulting great increase in the year-end carryover on July 1, 1929. In 1929-30, American wheat prices even rose a little in spite of further substantial increase of the year-end carryover.⁴ On the other hand, prices declined during 1930-31 and 1931-1932 proportionately much more than the year-end carryover increased, in spite of the stabilization operations of the Federal Farm Board during the first of these years. Although American wheat prices from November 1930 up to the movement of the new crop in June 1931 were held above the world price level (see Chart 4, p. 278) by these stabilization operations, they declined heavily on the average for the crop year 1930-31, and with the abandonment of stabilization declined further in June-July 1931. These two divergent movements—insufficient price reaction in 1928-29 and 1929-

¹ Australian wheat prices correlate as well with domestic stocks of wheat on August 1 as they do with stocks abroad, as appears from data in Chart 9. Domestic stocks of wheat, however, reflect not only the supply-demand relationship in the Australian market, but also the situation of world demand for Australian wheat. In Argentina, wheat prices correlate much less closely with domestic stocks of wheat on August 1 than with the world wheat carryover abroad.

² The coefficient of correlation between Argentine wheat prices (average for calendar years, in currency) and wheat carryovers outside of Argentina (both in terms of logarithms), 1922-37, is $r = -.92 \pm .04$; the corresponding coefficient of correlation for Australia is $r = -.85 \pm .07$.

³ The coefficient of correlation between the prices of No. 2 Hard Winter wheat at Kansas City (crop-year averages) and year-end carryovers in the United States (both in terms of logarithms), 1921-22 to 1936-37, was $r = -.86 \pm .07$, while the correlation coefficient between the same prices and year-end wheat carryovers abroad was $r = -.53 \pm .18$, and between prices and total supplies of American wheat, $r = -.66 \pm .14$.

⁴ Nearly the whole increase of the United States wheat carryover during 1929-30 consisted of wheat held on June 30, 1930, by the Grain Stabilization Corporation, operating on loans from the Federal Farm Board.

30 followed by an excessive price reaction in 1930–31 and 1931–32—are similar to the price movement in other exporting countries and on the British market, except that American wheat prices declined relatively less in 1930–31 but more in 1931–32.

Considerable divergencies between the movements of American wheat prices and of domestic wheat carryovers may also be observed during the two years when American prices were affected by United States monetary policy, 1933–34 and 1934–35. From 1932–33 to 1933–34, American wheat prices in currency, affected by speculation partly induced by depreciation of the United States dollar, rose more than was justified by the changed situation on the domestic wheat market and in spite of further increase of wheat carryovers outside of the United States (see Chart 6 p. 282, and Chart 10). This was

Accordingly, the rise of American wheat prices expressed in the depreciated dollar during 1933–34 and 1934–35 was not on the whole larger than might be expected from the decline of the supply in relation to demand, even without monetary manipulation. At the same time, United States wheat prices in terms of gold reacted only slightly to the sharp change in the supply-demand relationship (see Chart 6, p. 282). Depreciation of the United States dollar probably contributed less to the rise of American wheat prices than first impressions suggest and many assume.

In the two years 1935–36 and 1936–37, the advance of American wheat prices, though reflecting adequately the decrease of the domestic supply in relation to demand, failed fully to reflect the still more rapid decline of wheat carryovers abroad. Chart 4 (p. 278) shows that American wheat prices were then

CHART 10.—PRICES OF NO. 2 HARD WINTER WHEAT AT KANSAS CITY, MONTHLY,
AUGUST 1921 TO JULY 1937*

(U.S. cents per bushel; logarithmic vertical scale)

* See Table IV for annual data.

the result of the depreciation of the United States dollar. But in 1934–35 the failure of the domestic wheat crop of 1934 resulted in a still greater reduction of the United States wheat carryover, since wheat utilization was substantially above the small crop of 1934; and the wheat carryover abroad also declined substantially. But American wheat prices (in currency) did not increase proportionally.

rising more slowly than British prices, as was natural because American prices necessarily moved from an import to an export basis.

In conclusion, it may be said that except for a period of speculative advance of wheat prices in the summer of 1933, monetary manipulation raised American wheat prices hardly more than they might have risen in

agreement with the changed relationship between supply and demand on the domestic market and abroad. But discussion of the total effect of United States monetary policy during 1933-34, including its repercussions on wheat prices abroad, is deferred to section V.

CANADIAN PRICES

The course of wheat prices in Canada, as we have seen, was intermediate between American and Southern Hemisphere movements in its conformity with the course of British parcels prices. The movements of the Canadian wheat price (No. 3 Manitoba at Winnipeg) do not correlate as closely with domestic wheat carryovers at the end of the crop year as did those of the United States, but they agree better than United States prices with changes in external wheat carryovers. In this respect, the course of Canadian wheat prices approaches the movements in Argentina, Australia, and Britain. Canadian prices, though not reflecting perfectly all changes in domestic and external year-end wheat carryovers, move in fairly close agreement with both. The agreement is better with changes in year-end carryovers, domestic and external, that depend on the relationship between supply and demand for consumption, than with the changes in the supply of Canadian wheat alone.¹

It is significant that in Canada, unlike the United States, the correlation was not close between the movements of wheat prices in earlier years (particularly from 1924-25 to 1928-29) and the changes in domestic year-end carryovers. The course of Canadian wheat prices was then concordant with changes in the development of the supply-demand relationship on the world market as represented by year-end carryovers outside of Canada; but price changes failed fully to reflect the increase of domestic wheat carryovers (Chart 7, p. 282). These rapidly increasing domestic

stocks were apparently carried firmly, partly by the Canadian Wheat Pool and partly by speculative holders of wheat, and thus did not act with full depressing effect upon the course of Canadian prices between 1924-25 and 1928-29.

In 1929-30, there was a degree of hesitancy in the movement of Canadian wheat prices. At the beginning of the crop year, prices rose in response to the short supplies of Canadian wheat from the poor crop of 1929, but later began to decline rapidly, partly in response to difficulties experienced by holders of wheat and particularly the Canadian Wheat Pool in connection with financing further carrying of stocks (see monthly prices of Canadian wheat on Chart 11, p. 288). On the average for the crop year, Canadian prices in 1929-30 changed but little from their 1928-29 level, and this was in accord with the short-term change in the supply-demand relationship on domestic and world markets. But stocks of wheat on August 1, 1930, domestic and external, remained as large after the poor crop of 1929 as they had been a year before following the record crop of 1928. Thus Canadian wheat prices during 1929-30, in spite of a big decline in the course of the crop year, failed to adjust themselves to a long-period equilibrium between supply and demand.

The much-delayed adjustment took place in 1930-31 in the form of a price collapse which cannot be explained in the light of the short-term change in the supply-and-demand relationship that occurred between 1929-30 and 1930-31 on both domestic and foreign markets. This price collapse in the face of a minor change in the short-term supply-and-demand relationship was evident also in Argentina and Australia as well as on the British market. But Canadian developments were distinctive in that Canadian wheat prices, not only in terms of gold but in currency also, continued to decline until early in 1933.

In 1931-32 Canadian wheat prices in depreciated Canadian dollars did not increase proportionally with depreciation of the currency, even from the low level to which they had fallen in the second half of 1930-31; consequently, wheat prices in terms of gold declined in 1931-32. On the average for the

¹ The coefficient of correlation between the price of No. 3 Manitoba at Winnipeg in currency (crop-year averages) and wheat carryovers outside of Canada (both in terms of logarithms), 1921-22 to 1936-37, was $r = -.77 \pm .10$. The coefficient between the same price and domestic wheat carryovers was $r = -.75 \pm .11$; and between the same price and total supplies of Canadian wheat, $r = -.51 \pm .19$.

crop year, wheat prices in currency were also lower in 1931–32 than in 1930–31 in spite of depreciation of the currency. This price movement occurred in spite of shorter supplies of Canadian wheat in 1931–32 than in 1930–31 and in the face of a moderate reduction of

pressed in currency continued to decline in accord with larger supplies of Canadian wheat and further accumulation of stocks in Canada and abroad, and reached their lowest postwar level. But at the beginning of 1933 the decline was checked and prices turned upward. This

CHART 11.—PRICES OF NO. 3 NORTHERN MANITOBA WHEAT AT WINNIPEG, MONTHLY,
AUGUST 1921 TO JULY 1937*

(Canadian cents per bushel; logarithmic vertical scale)

* See Table IV for annual data.

the domestic carryover between August 1, 1931 and 1932, although it was in accord with moderate increase of the carryover outside of Canada. Such price movements in Canada may perhaps be explained by the fact that other currencies—British sterling as well as Argentine and Australian currencies—declined in 1931–32 much more than the Canadian dollar (see Chart 5, p. 279), with depressing effects upon Canadian wheat prices expressed in Canadian dollars; or, perhaps, Canadian wheat producers and holders, receiving somewhat better prices in depreciated dollars, responded with more liberal supplies of their wheat. We shall consider this question further in connection with the synchronous excessive decline of wheat prices in terms of gold on the world wheat market.

In 1932–33, Canadian wheat prices ex-

rising tendency was later strengthened by speculation connected with depreciation of the United States dollar as well as the Canadian dollar, and the 1932–33 crop year ended with speculative boom. The average 1932–33 crop-year price of Canadian wheat accordingly failed to decline in full correspondence with the great accumulation of stocks in Canada following the good crop of 1932 harvested from a record acreage. It must be remembered here that 1932–33 witnessed the beginning of government-sponsored stabilization operations on the Winnipeg grain exchange, which were continued on a larger scale in 1933–34 and 1934–35.¹

In 1933–34, Canadian wheat prices were

¹ An analysis of these operations is given in W. Sanford Evans, "Canadian Wheat Stabilization Operations," *WHEAT STUDIES*, March 1936, XII, No. 7.

affected by further depreciation of the Canadian dollar in sympathy with the decline of the United States dollar, and crop-year average prices in Canadian currency were much higher than in 1932-33. But this increase is explicable in part by the supply-demand relationship on the Canadian market; the small wheat crop of 1933 did not suffice to cover current demand for Canadian wheat, including demand for exports, and the crop year 1933-34 witnessed a marked decline of the Canadian year-end wheat carryover. In the light of these facts, the rise of Canadian wheat prices in 1933-34 in depreciated Canadian dollars seems unduly small. Indeed, the average crop-year price of 1933-34, expressed in Canadian currency, did not increase from its 1932-33 level proportionally with the depreciation of currency, and wheat prices in gold declined (Chart 7, p. 282).

In December 1933, following the poor crop, Canadian wheat prices in gold were at nearly the same level as they had been a year before in spite of the substantially shorter Canadian supplies. Wheat prices in gold did not rise until June-July 1934, when disastrous effects of the 1934 drought became evident (Chart 11). Thus, both in Canada and in the United States, depreciation of currency failed to raise wheat prices as much as is commonly supposed, and the change in the supply-demand relationship on the Canadian wheat market was a factor not to be ignored. It must be said, however, that developments on the wheat markets abroad were perhaps such as to have been partly responsible for decline of Canadian wheat prices in gold in 1933-34; for the huge crop in Europe resulted in accumulation of European wheat stocks and contributed to drastic reduction of wheat imports into large countries of continental Europe.

In contrast with developments in the United States, wheat prices in Canada rose in 1934-35 practically by the same extent as in 1933-34, even though total 1934-35 supplies of Canadian wheat were about the same as in 1933-34 and supplies from the 1934 crop were larger than the demand for Canadian wheat, with resultant increase of the Canadian wheat carryover at the end of 1934-35. The stabilization operations on the Winnipeg grain ex-

change contributed to this increase of Canadian wheat stocks and may presumably have been partly responsible for the rise of Canadian wheat prices,¹ although a considerable decline of the external wheat carryover, particularly in the United States, may also have contributed to such strength in Canadian wheat prices. The movement of Canadian wheat prices in the following crop year 1935-36, when government-sponsored maintenance of prices on the Winnipeg market was discontinued, indicates that the upward movement of Canadian wheat prices in 1934-35 may be explained in some part by governmental intervention. For Canadian wheat prices in 1935-36 averaged about the same as in 1934-35 (prices did not rise until July 1936, on news of the new drought of 1936) in spite of the fact that the 1935 crop was the third consecutive small crop in Canada (and in the United States) and that surplus wheat stocks were much reduced during 1935-36 both in Canada and abroad. The behavior of Canadian wheat prices in 1935-36 as compared with 1934-35 may thus be explained merely by the changed wheat policy of the Canadian government—from withholding of wheat from the market in 1934-35 to liberal disposition of accumulated stocks in 1935-36.

ARGENTINE AND AUSTRALIAN PRICES

Here we need not discuss in detail the movements of Argentine and Australian prices. It was observed earlier that these prices moved in close agreement with world wheat prices, and that this agreement is explicable in view of the marketing policies involving sale of the Southern Hemisphere wheat crops in total within a crop year (p. 284). There was no such accumulation of surplus stocks in the Southern Hemisphere exporters as in the United States and Canada. Argentine and Australian stocks on August 1, which are not year-end stocks, reflect size of crops, as appears from Charts 8 and 9 (p. 283). Yet there was some tendency, if not toward accumulation of carryovers, at least to market slowly in Argentina during 1927-28 and 1928-29, and this may

¹ The increased premium of No. 3 Manitoba in Liverpool over the British parcels price in 1934-35 as compared with previous years (Chart 16, p. 303) also suggests this explanation.

have contributed to maintenance of wheat prices at relatively high levels during these years. In Australia, wheat stocks on August 1 were relatively large in comparison with size of crop only in 1928 and 1930, when the preceding Australian crops were small. Then, in both countries, stocks were abnormally large on August 1, 1934. In Argentina, this followed the "orderly marketing" policy of the Grain Regulating Board, but the stocks were disposed of later in 1934 when prices turned upward. In Australia, individual farmers withheld wheat because they were dissatisfied

with the course in North American countries, all expressed in national currencies, shows that domestic wheat prices were more stable throughout the postwar period in Argentina and Australia than in the United States and Canada. In some degree this is explicable by the differences in monetary policies. The North American countries clung more persistently to the gold standard, while the Southern Hemisphere countries, particularly Argentina, troubled little to maintain exchange rates and left their currencies to find their natural level or even depreciated them deliberately

CHART 12.—PRICES OF ARGENTINE WHEAT AT BUENOS AIRES, MONTHLY, AUGUST 1921 TO JULY 1937*
(Paper pesos per quintal; logarithmic vertical scale)

* See Table V for annual data.

with the low level of prices, and these stocks were in part carried over to the next year. These withholdings, however, did not raise 1933-34 wheat prices, which were rather low in the light of the supply-demand relationship on the world wheat market; and the problem is to explain why wheat prices in 1933-34 were so low.

A comparison of the general course of wheat prices in the Southern Hemisphere countries

as did Argentina in November 1933. This resulted not only in relative stability of wheat prices, but also in relative stability of general price levels, as is indicated by Chart 8 (p. 283) and Chart 12. These show that deflated prices of Argentine wheat coincided very closely with prices in currency. Relative stability of the index numbers of wholesale prices in Argentina cannot be explained by difference in the construction of the index numbers

themselves. On the contrary, Argentine index numbers of wholesale prices, consisting in relatively larger proportion of raw materials and agricultural products than index numbers

monetary policies, but also of the fact that Argentine prices had not been so much inflated during the war as were prices in the United Kingdom and the United States, as well

CHART 13.—PRICES OF AUSTRALIAN WHEAT AT MELBOURNE, MONTHLY, AUGUST 1922 TO JULY 1937*
(Australian shillings per bushel; logarithmic vertical scale)

* See Table V for annual data.

for the United States and the United Kingdom, under similar conditions would necessarily show greater instability. Actually, wholesale prices in Argentina were more stable than in the United States and the United Kingdom. This was the result partly of difference in

as in Canada (Chart 14, p. 292). This important fact helps to explain differences in the behavior of Southern Hemisphere wheat producers and North American producers during the early postwar years, a problem to which we shall return in the next section.

IV. PRICES DURING THE PERIOD 1924-25 TO 1929-30

The principal questions under discussion in this section are: Were world wheat prices too high, from the point of view of long-term equilibrium, during the period 1924-29? and if so, what factors permitted prices to be maintained, without immediate adjustment, for so long a period as five to six years? In order to answer the first question, however, it is necessary to examine wheat price movements during the preceding period, 1921 to 1924, when there were many complaints about the abnormally low level of agricultural prices in general and of wheat prices in particular.

WERE PRICES TOO LOW BEFORE 1924-25?

As we have noted earlier, it is not easy to decide whether wheat prices during 1921-24 were abnormally low from the point of view of long-term equilibrium. Here we cannot undertake detailed analysis of this problem, which has often been discussed by students of the early postwar agricultural crisis. Moreover, in our opinion it is impossible to answer this question by comparing prices with costs of production, as is commonly done, even if cost data were much more nearly exact and complete than they actually are.

One approach to the problem is possible, however, through study of the reaction of wheat producers to price movements. If price is regarded as too low by many producers, there may be a tendency to reduced crop output, partly through restriction of sown area accompanied by shifts to other crops, partly through employing less intensive methods of cultivation. If the price is regarded as remunerative, an expansion of production, on an increased acreage, may be expected. No doubt the reaction of agricultural producers to price changes is usually slower than that of other producers, and sometimes it may even seem irrational, as for example when some producers deliberately increase production in order to offset price decline. But reactions of this sort are unlikely to occur except during severe general depression when no alternative course is open, as during the worldwide depression following 1929. Since there was no such general depression in the early postwar years after the 1919-20 boom in the chief exporting countries, one would expect that the response of wheat producers to change in wheat prices during that period would be rational.

Study of changes in sown wheat acreage in the four chief wheat-exporting countries for the period 1920-29 indicates that wheat producers reacted rationally to changes in wheat prices. But it is of particular significance that the reaction in various countries was different. In North America, particularly the United States, the sown area of wheat was substantially reduced in 1923 and still more in 1924 after two years of low prices in 1921-22 and 1922-23. The same was true in Canada, although in somewhat smaller degree. But in the Southern Hemisphere the reaction of wheat producers was quite opposite, particularly in Argentina. Between 1921 and 1924 the sown wheat area in Argentina increased without interruption from 14.2 million acres in 1921 to 17.8 million in 1924, more than 25 per cent in three years. The wheat area in Australia did not expand as rapidly as in Argentina, but in 1924 it was more than a million acres larger than in 1921 and still larger than in 1920.

Thus while North American wheat pro-

ducers regarded the wheat prices prevailing during 1921-24 as unremunerative and were accordingly reducing their production of wheat, farmers of the Southern Hemisphere regarded prices as remunerative. This difference in response is in some degree explicable by the difference in the behavior of domestic prices during the war and the early postwar years preceding the crisis of 1920-21.

Wartime price inflation was much smaller in the Southern Hemisphere than in North America and Great Britain,¹ as appears on comparison of the national index numbers of wholesale prices shown in Chart 14. Differ-

CHART 14.—INDEX NUMBERS OF WHOLESALE PRICES IN THE UNITED KINGDOM AND FOUR CHIEF WHEAT EXPORTING COUNTRIES, CALENDAR YEARS 1909-37*

* Sources of data indicated in footnotes to Table IV and V.

ences in the structure of the index numbers may of course result in substantial difference in the changes of price levels under similar conditions of inflation, but in this particular

¹ The smaller degree of wartime price inflation in the Southern Hemisphere seems explicable partly by the shortage of shipping that limited European purchases from distant countries.

comparison the structure of Argentine and Australian index numbers is such as to suggest that they might well have risen more than the more comprehensive index numbers of the United States and the United Kingdom. Actually, the index numbers of wholesale prices in the United States and Canada were the ones which rose relatively the most between the years just preceding the war and 1920, when levels of wholesale prices were at a maximum in all four exporting countries. This is illustrated by the following tabulation,¹ showing index numbers of wholesale prices in the four chief wheat-exporting countries on a 1926 base:

Year	United States	Canada	Argentina	Australia
1913-14	69	65	76	61
1920	154	156	136	135
1922	97	97	98	96
1920 as percentage of 1913-14	224	241	178	222
1922 as percentage of 1920	63	59	73	71

The price level of 1920 was least inflated in Argentina. The Australian index for 1920 shows a much larger degree of inflation than the Argentine, and approaches that of the United States. But as Chart 14 shows, in Australia the price level increased much more in 1920 as compared with the immediately preceding years, during which the Australian index of wholesale prices was much below that of Argentina. When averages for 1916-20 are compared with averages for 1913-14, the increase in price level in Australia is no greater than in Argentina.

The relatively smaller degree of inflation in the Southern Hemisphere countries during the war and early postwar years involved relatively less severe deflation following the 1919-20 boom, as appears from the tabulation above. In the North American countries, wholesale prices declined about two-fifths from 1920 to 1922, but in the Southern Hemisphere countries only a fourth to a third.

There was a similar contrast in the course of wheat prices. In the United States and Canada, average wheat prices from 1922-23 to 1923-24 were less than half of their highest level between 1918-19 and 1920-21 (45 to 46

per cent for the series used in our analysis), while Argentine and Australian wheat prices declined in smaller proportion.

Thus, even with the smaller decline of the general level of wholesale prices, the purchasing power of wheat in the Southern Hemisphere countries, particularly in Argentina, was somewhat higher from 1922-23 to 1923-24 as compared with 1918-19 to 1920-21 than it was in the North American countries. This is shown in Chart 15. Detailed comparison of the course of "purchasing power" of wheat in the chief wheat-exporting countries as shown in the chart is unnecessary; it suffices to say that the deflated price series used in the present analysis² indicates that purchasing power of wheat in Argentina during 1922-23 to 1923-24 was about a fifth below its average level from 1918-19 to 1920-21, in Australia about a fourth, and in Canada and the United States about a third.

CHART 15.—INDEXES OF THE PURCHASING POWER OF WHEAT IN THE FOUR CHIEF WHEAT-EXPORTING COUNTRIES, PREWAR AVERAGE AND ANNUALLY FOR CROP YEARS ENDING JULY 31, 1917-37*

* See Table III.

° Average of calendar years 1913 and 1914.

Thus the different degrees of price inflation during the war and in early postwar years resulted in a crisis for wheat producers much less severe in the Southern Hemisphere than

¹ Index numbers in these tabulations are the same as those used in deflating monthly average wheat prices; see footnotes to Tables IV and V.

² Except for Australia, where instead of Melbourne wheat prices we have used the more representative weighted average prices of Australian wheat for the principal Australian shipping ports as given in Australia, Royal Commission on the Wheat, Flour and Bread Industries, *Second Report* (Canberra, Feb. 2, 1935), p. 119.

in North America; consequently, wheat prices which in 1922-24 seemed abnormally low to North American producers might seem remunerative especially to Argentine farmers. Chart 15, indeed, suggests that deflated wheat prices in Argentina in 1922-23 and 1923-24 were about on the same level as they had been in 1913-14. Therefore one cannot speak of abnormally low levels of wheat prices for Argentine wheat producers in 1923-24, or of their great increase in 1924-25 as readjustment from an abnormally low level.

Different degrees of price inflation during the war and early postwar years in various wheat-producing countries thus resulted in a situation where no wheat price on the world wheat market could be regarded as a long-term equilibrium price from the point of view of all the chief wheat exporters. A satisfactory price in one region was an excessive price from the point of view of another area.

The level to which wheat prices rose in 1924-25 can hardly be regarded as a long-term equilibrium price even from the point of view of North American wheat producers, if judged by their behavior during the following years to 1928. The reduction of sown area that was proceeding so rapidly during 1921-24 in the United States and Canada was arrested, and from 1924 to 1928 the United States sown area increased from 55.7 to 71.1 million acres. In Canada the increase was from 22.1 million acres in 1924 and 20.8 million in 1925 to 24.1 million in 1928. Expansion of wheat acreage in the Southern Hemisphere countries was accelerated after 1924, particularly in Australia. Closer analysis of United States wheat area indicates that wheat prices prevailing between 1924-25 and 1929-30 were not satisfactory for all American farmers, but were mainly so for those producing hard winter and hard spring wheats. In these regions the wheat area expanded rapidly, while in the United States soft winter wheat area and in the eastern area the acreage declined after 1924 though at a somewhat slower rate than from 1919 or 1920 to 1924.¹ This, however, was probably due less to differences in price levels than to tech-

nological changes in wheat production that affected various regions diversely—a subject beyond the scope of the present study. Here our problem is to explain how wheat prices came to be maintained on a level which seems to be above the long-term equilibrium price level during a relatively long period of five to six years, without immediate adjustment in response to the rapidly increasing supply.

WHY PRICES WERE MAINTAINED DURING 1924-29

It was explained above (pp. 274-76) that appreciation of the pound sterling and the return of the United Kingdom to the gold standard at prewar parity contributed to the rise of wheat prices in gold currencies in 1924-25. Mention was made also of several factors in the financial policy of the United States that were significant for price inflation, among them an increase of American (as well as of British) loans to agricultural countries, particularly Argentina and Australia. Now, after the summary presentation of the course of wheat prices in the chief wheat-exporting countries given on pages 281-91, it is feasible to inquire how these policies were reflected in the price movements in Southern Hemisphere countries.

The upturn of wheat prices in 1924 began during the crop year 1923-24 before the unsatisfactory results of the Northern Hemisphere crop of 1924-25 were evident. At that time both of the Southern Hemisphere wheat exporters were marketing their 1923 crops, which were larger than crops of the preceding year; and the situation of the world wheat market, as judged by stocks on August 1, 1924, was easier than it had been a year before. Thus, the supply-demand situation both on the domestic wheat markets of the Southern Hemisphere countries and on world wheat markets cannot explain the upturn of wheat prices, or at least its early phase.

We have seen earlier (p. 274) that the advance of prices was associated with revival of European wheat purchasing that followed improvement in the financial situation. Here it can be said that financial developments in the Southern Hemisphere exporting countries were also such as to contribute to price infla-

¹ See M. K. Bennett, "Trends of Yield in Major Wheat Regions since 1885," *WHEAT STUDIES*, November 1937, XIV, 74-75, Charts 3 and 5.

tion in 1924-25. Argentina had been in a phase of rising business activity since 1923, and the volume of exports as well as agricultural prices tended to increase during 1923 and 1924. Prices of pastoral products began to rise earlier than those of cereals, particularly wheat,¹ but in the spring of 1924 cereal prices joined the general tendency. That there was general price inflation in Argentina during 1923-24 and that it continued in 1925 may also be seen from the Argentine index numbers of wholesale prices presented in Chart 14 (p. 292). This is further reflected in the behavior of the deflated prices of Argentine wheat presented in Charts 8 and 12 (pp. 283, 290); the deflated prices rose in 1924 as well as in 1925 much less than did prices in currency, indicating that wheat prices in some degree merely followed a general inflationary tendency of prices in Argentina.

The increased volume of exports at rising prices of agricultural commodities during 1922-24 led to rapid improvement in the Argentine trade balance. The value of exports in 1924 was 30 per cent larger than in 1923. Grain exports in 1924 were of record size.² Consequently, the Argentine balance of trade turned from "unfavorable" during 1921-23 to highly "favorable" in 1924. Argentine borrowings of capital from abroad became more abundant after 1924 when acceptance of the Dawes plan created greater confidence on capital markets. As a result of all this, the outflow of gold which took place during 1922-24 was stopped, and in 1925 an inflow of gold began.

¹ See "Economic Indexes: Level of Agricultural and Pastoral Prices," Banco de la Nación Argentina, *Economic Review*, September 1928, I, 48-52.

² See "The Economic Position: Oscillations and General Trend of Exports," *ibid.*, January 1930, III, 1-8.

³ Statistics of the balance of payments for Argentina, Australia, and other leading agricultural countries of the world for 1923-30 may be found in V. P. Timoshenko, *World Agriculture and the Depression* (Michigan Business Studies, V, No. 5, 1933); see esp. pp. 118-19, Appendix Table 7.

⁴ See Australia, Royal Commission Appointed to Inquire into the Monetary and Banking Systems . . . , *Report* (Canberra, 1937), pp. 46-49.

⁵ See W. Phillips, "Australian Export Prices, 1880-1935," *Economic Record*, December 1935, XI, 185; also F. C. Benham, *The Prosperity of Australia* (London, 2d ed., 1930), p. 51.

This was accelerated in 1926 and particularly in 1927; and finally, after a short recession in 1925-26, the inflow gave support to a general inflationary process in the Argentine national economy that continued up to 1929.³

Developments were similar in Australia. Owing to large public borrowings abroad, investment of overseas capital in Australia, and influx of capital brought by immigrants, there was so great a movement of London funds to Australian banks in 1924, that difficulties of transfer from England to Australia arose, and in October 1924 sterling was quoted at a discount amounting at the maximum to 3½ per cent. Sterling could have exchanged for Australian currency if only this discount had been allowed to increase further. The banks, however, did not take this course, but converted their London funds by importing about £10.5 million in gold.⁴

The period from 1919 to 1929 on the whole was one of rising business activity in Australia, and in 1924 there was a boom. Prices of export commodities rose uninterruptedly from 1922 until the end of 1924, and the terms of trade improved as measured by the ratio of export to import prices. The Australian export-price index rose from an average of 93 in 1922 (1927 = 100) to 110 in 1923 and 131 in 1924.⁵ As in Argentina, the prices of pastoral products, particularly wool, led the advance; but in 1924 wheat prices joined in this general tendency. The general index number of wholesale prices in Australia attained its maximum in 1923 and thereafter tended to decline (see Chart 14, p. 292); but inflationary tendencies persisted in later years. Between 1924-25 and 1928-29 public borrowing, both overseas and internal, continued on a scale only slightly smaller than during the war. In the ten years ending June 30, 1929, the net addition to the overseas public debt was £224 million, and to the internal debt £173 million.

The inflationary tendencies are perceptible also in the rapid growth of deposits in the trading banks of Australia and in their rapid increase of advances and discounts. Between June 30, 1922 and June 30, 1929, deposits in trading banks increased from £222.4 million to £302.3 million, and advances, discounts, etc., from £168.1 million to £267.8

million. Credit inflation continued also in 1929–30 as trading banks further extended their advances to £284.3 million on June 30, 1930, although deposits began to decline.¹

Australian export prices, though somewhat reduced after 1924, were maintained on a relatively high level until near the end of the crop year 1928–29 and, according to Australian authorities, many export producers enjoyed large incomes in these years. The proceeds from sale of these exports tended to inflate the London balances of the banks, and this inflation was not checked by decline in overseas borrowing, which on the contrary continued to increase.²

Credit inflation was thus characteristic of both of the Southern Hemisphere wheat exporters before 1924–25, and agricultural prices there were affected by the inflationary process. Wheat prices lagged in joining this tendency, but in the last quarter of the 1923–24 Northern Hemisphere crop year, wheat prices in Argentina and Australia rose substantially, even in the midst of the marketing of good domestic crops and in spite of the easier situation on the domestic and the world wheat markets.

Since the rising tendency was accelerated in the later months of 1924, partly in response to crop developments in the Northern Hemisphere, average wheat prices for the calendar year 1924 (roughly corresponding to the Southern Hemisphere crop year) were substantially above the level of 1923 both in

Argentina and Australia. This made the further rise of wheat prices in 1925 less steep than the rise between 1923–24 and 1924–25 on the basis of the Northern Hemisphere crop year, particularly in Australia where the 1924 crop was much larger than that of 1923. Hence comparison of the annual average wheat price for 1925 with the price for 1924 (as given in Charts 8 and 9, p. 283), both in Argentina and Australia, does not indicate an excessive upward movement in the light of the changes in the supply-demand relationship both in domestic and in the world wheat markets; whereas comparison of Southern Hemisphere wheat prices for a Northern Hemisphere crop year indicates about as violent a price movement as in the countries of the Northern Hemisphere, particularly in terms of gold prices.

During 1924–25 the currencies of both Southern Hemisphere countries appreciated (Chart 5, p. 279). In terms of gold parity the Argentine peso rose from 76.3 per cent in January 1924 to 94.4 per cent in January 1925, and the Australian pound from 88.7 per cent to 101.9 per cent.³ While appreciation of the pound sterling contributed to an excessive rise of world wheat prices in terms of gold currencies, the high prices of wheat in gold contributed to a rapid appreciation of depreciated Southern Hemisphere currencies, particularly the Argentine peso, through their effects on the balances of payments of these agricultural countries. Consequently, domestic wheat prices in Southern Hemisphere currencies rose less than those in the United States and in Canada, but as we know they also declined less after the early post-war years and so could not be regarded as extremely low even in 1922–23 and 1923–24, particularly in Argentina.

Although the inflationary process in Argentina and Australia contributed to an excessive rise of wheat prices between 1923–24 and 1924–25 and to maintenance of those prices on a relatively high level in following years, particularly 1927–28 and 1928–29, it did not result in a substantial degree of direct withholding of wheat from the market. Largely owing to limited facilities for grain storage over extended periods, the marketing

¹ Australia, Royal Commission Appointed to Inquire into the Monetary and Banking Systems . . . , *Report*, pp. 47–48, and Appendix Table 21, pp. 328–29.

² See E. Ronald Walker, *Australia in the World Depression* (London, 1933), chapter iii, "The Boom before the Slump," esp. pp. 32–37. Mr. Walker holds strongly that inflationary effects of increased London balances of Australian trading banks were intensified by the Australian policy of high import duties, which prevented increase of imports. "If the imports rise rapidly enough," he says (pp. 34–35), "there will be little credit inflation; if they are sluggish the banks will be in a position to indulge in a protracted boom . . . larger credit inflation and internal boom will be associated with high export prices and heavy borrowing, the higher the tariff."

³ During 1924, on account of the difficulties of transferring London funds to Australia and the premium on the Australian pound, there was a premium on gold also when the pound sterling approached gold parity.

policy of the Southern Hemisphere wheat exporters (p. 289) was to sell their wheat during a crop year without carrying large stocks into the following year. The only evidence of holding tendencies during the years 1924-25 to 1929-30 in the Southern Hemisphere was of slow marketing of Argentine wheat crops in 1927-28 and 1928-29, which resulted in large stocks on August 1, 1928 and still larger stocks on August 1, 1929. Argentine stocks of 130 million bushels on August 1, 1929 were second only to United States stocks at that time, and twice as large as usual. But August 1 is not the end of the Argentine crop year; the large stocks reflected in part the huge Argentine crop of 1928-29; and they were exported rapidly in the first half of the crop year 1929-30 when Argentina experienced severe financial strain. This rapid disposition of Argentine stocks before January 1930 threatened to break wheat prices on the world wheat market; Argentina was underselling Canada at Liverpool, as appears from the spreads of prices of typical wheats by source of export from British parcels prices shown in Chart 16 (p. 303). The persistent holding tendency in North American countries, coupled with rapid disposition of Argentine stocks, resulted in a further accumulation of wheat carryovers in the United States and Canada.

As noted above (p. 287), wheat marketing policies of the North American wheat-exporting countries, particularly Canada, were developing on different lines during the years 1924-25 to 1929-30. With huge elevator capacity, these countries were technically in better position to carry large fractions of their crops from one season to another in response to the market and crop situations. North American wheat stocks increased greatly between 1925 and 1930, and were of embarrassing size even by 1929. This process of accumulation began somewhat earlier in Canada, where stocks were above their usual size even by August 1, 1927 and increased still further in subsequent years (Chart 7, p. 282). In the United States, stocks rose suddenly from normal size on July 1, 1928 to twice the normal on July 1, 1929 (Chart 6, p. 282).

The increase of wheat carryovers in Can-

ada in the course of several consecutive years and in the United States during the two years 1928-29 and 1929-30, without adequate effect upon the level of wheat prices, points to strong holding tendencies on the part of speculators and other holders. It is appropriate here to consider how far these holding tendencies may have contributed to the maintenance of wheat prices on a relatively high level during the years 1924-25 to 1929-30.

In that period in Canada considerable influence upon the marketing of wheat was exercised by the Canadian Wheat Pool; deliveries of wheat to the Pool were nearly two-fifths of the total annual deliveries in 1924-25, and from 1925-26 to 1929-30 averaged slightly above half of the total.¹ Hence the price-supporting policy of withholding wheat from the market was frequently ascribed to the Canadian Wheat Pool. On the other hand, the Wheat Pool officials consistently and emphatically denied that such was their policy, and insisted that they were always "free and anxious sellers."² It would be erroneous to attribute the holding policy exclusively or mainly to the Pool,³ for other dealers in Canadian wheat participated in what may be called a "holding policy" at one time or another during the period in question. But even in the data supplied by Pool officials,⁴ there is

¹ *Submissions by Wheat Pool Organizations of Western Canada to Royal Grain Inquiry Commission at Calgary and Regina, April-May, 1937*, p. 13.

² *Ibid.*, pp. 17-19.

³ See a special section on the Canadian Wheat Pool written by Holbrook Working, *WHEAT STUDIES*, December 1930, VII, 140-44.

⁴ The following data (*Submissions by Wheat Pool Organizations . . .*, p. 18) give Pool holdings of wheat as percentages of total Canadian carryover on July 31 and Pool marketings as percentages of total marketings in crop years ending with the same dates.

Year	Percentage of carryovers ^a	Percentage of marketings
1925	39.7	38.4
1926	53.1	53.2
1927	69.4	53.2
1928	47.0	52.5
1929	66.5	52.2
1930	51.0	51.2

^a Stocks of Pool wheat in all positions (whether delivered to the Central Selling Agency or still in the hands of the Provincial Pools, and without deductions for open contracts or for futures contracts sold on the option market) expressed as percentages of the total carryover of Canadian wheat in Canada and the United States.

evidence indicating that in two years the marketing policy of the Canadian Wheat Pool was such as to result in accumulation of year-end wheat carryovers in the hands of the Pool in a proportion larger than their share of the marketings of the crop. Of particular importance here is the fact that in the years when the Pool percentage of the total Canadian wheat carryover was unduly high, the spreads between the Canadian wheat price in Liverpool and Winnipeg were relatively narrow or the premiums on Canadian wheat in Liverpool were relatively high. The Pool percentage of the total Canadian wheat carryover was unduly high at the end of the crop years 1926-27 and 1928-29; and from Chart 4 (p. 278) it is clear that during the closing months of both of these years the price of No. 3 Manitoba was unduly close to the British parcels price in Liverpool, while Chart 16 (p. 303) shows that the premium for No. 3 Manitoba on the Liverpool market was larger than usual at the same time.

The same data, however, suggest that accumulation of surplus wheat stocks in Canada was not due solely to the marketing policy of the Canadian Wheat Pool, and that other holders shared the responsibility. The Pool's percentage of the carryover decreased substantially in 1928 and in 1930, while the total Canadian carryover increased greatly during the first of these years and remained in 1930 at the 1929 level. Hence wheat holdings by others than the Pool increased greatly during 1927-28 and 1929-30. Some authorities on marketing-control schemes believe, however, that private speculators were buying wheat in the belief that the activities of the Pool would raise the price;¹ if so, the Pool may have been in a sense indirectly responsible for non-Pool holding of stocks even in these years.

There was no accumulation of surplus wheat stocks in the United States before 1928-29, and this may be taken as evidence that domestic holding tendencies had not emerged by that date. This does not mean, however, that there were no extraneous factors tending to support the American wheat price. We have seen (p. 274) that the violent upturn of wheat prices in the United States in 1924-25

was coincident with the beginning of a long speculative rise of security prices following a period of expansion of credit begun in 1924 by the Federal Reserve Board. Though this upward movement was in agreement with the developments on the world wheat market, it occurred in the face of a substantial increase in the supplies of American wheat from the good crop of 1924 (Chart 6, p. 282). Continuation of the rising tendency in 1925-26—the average crop-year price of American wheat was higher in 1925-26 than in 1924-25—was opposed to developments on the world wheat market, but can be explained by the domestic supply-demand situation: the 1925 wheat crop in the United States was small and the domestic wheat market situation was tighter even than in the previous year. Yet it is also true that the upward movement of wheat prices in the United States in October-January 1925-26 coincided with a period of violent speculation on the Stock Exchange.²

The upward movement of American wheat prices in 1927-28—for which a price bulge late in the season, April-June 1928, was responsible—cannot be explained in general by the supply-demand relationship at home and abroad. Year-end carryovers at home and abroad increased, and total supplies of American wheat in 1927-28 were larger than in 1926-27 (Chart 6, p. 282). All this speaks for decline rather than increase of price. The coincidence of the bulge in wheat prices in

¹ J. W. F. Rowe, *Markets and Men: A Study of Artificial Control Schemes in Some Primary Industries* (New York, 1936), pp. 51-73, esp. p. 56.

² The basis of the initial sharp price rise in this period lay in reports of severe crop damage in Argentina, and Holbrook Working therefore classifies this price cycle as a "late-season crop-scare cycle." The 1924-25 price cycle, however, Dr. Working classifies as a winter cycle, "the peculiar characteristic of which rests on the absence of conspicuous new developments [as regards the crop situation] during the initial stages of the rise, and the development of a special type of speculative buying to change the gradual price increase into a sharp one." Such a characteristic of winter cycles, in which the 1924-25 price cycle is included by Dr. Working without reserve, perhaps suggests that extraneous factors such as credit inflation or speculation in other fields may be responsible for initiating a rising tendency on the wheat market as well as for further stimulation of speculative buying of wheat. See Holbrook Working, "Cycles in Wheat Prices," *WHEAT STUDIES*, November 1931, VIII, 23-24.

April-June 1927-28 with a period of rising speculation in securities—itsself coincident with steep rise in securities prices, increase in call money rates, and enormous increase in new issues of securities,¹ all following the period of cheap-money policy inaugurated by the Federal Reserve Board late in the summer of 1927—suggests that this upward movement of wheat prices was associated with general speculative activity stimulated by the cheap-money policy of 1927-28.

Speculative activity on the Chicago Board of Trade was not followed in full by the Liverpool market in 1927-28, and the spreads between Chicago and Liverpool were reduced.² But Winnipeg followed Chicago prices more closely, so that the spread between Winnipeg and Liverpool also narrowed (Chart 4, p. 278). In some degree this may be responsible for the abnormally small Canadian wheat exports in April and the moderate exports in May, although total exports from Canada in 1927-28 were large. In this connection it is desirable to recall that Canadian year-end stocks increased greatly during 1927-28, and this increase was not peculiarly due to the Canadian Wheat Pool but to wheat holders in general whose judgment may have been affected by the speculative cycle described above.

Year-end stocks of wheat in the United States increased only slightly in 1927-28, however, even though wheat exports had been very light since December 1927 and American wheat prices were above export parity. Heavy exports of American wheat had occurred in the preceding fall. It was in 1928-29 that holding tendencies in the American wheat market found full expression. In spite of the

record crop of 1928, American wheat exports in 1928-29, and particularly in the first seven months, were below the exports of the previous year; and the carryover on July 1, 1929 was twice as large as on July 1, 1928.

Prices were not sufficiently affected by this accumulation of stocks; there was serious disequilibrium between the supply and the demand for utilization; and holding tendencies were widely spread and not limited to a narrow group of professional wheat speculators.³ General optimism regarding the further course of wheat prices may well have been affected by the optimism then dominating other speculative markets, but holding tendencies on the wheat market may also have been strengthened by expectation of government intervention. During the second half of 1928-29 the United States Congress was deliberating upon the Agricultural Marketing Act which became law on June 15, 1929, and the Federal Farm Board was set up on July 15, 1929. Further accumulation of wheat stocks in the United States during 1929-30 and 1930-31, as well as transfer of stocks from invisible to visible positions, was associated with the activities of the Federal Farm Board.

Thus the financial and general business situation in all of the chief wheat-exporting countries during the period 1924-29 was such that it may well have contributed to the maintenance of wheat prices at a relatively high level. This effect came partly through the general level of prices, and partly through stimulus of speculative activity on the various markets, including the wheat market. The speculative boom created speculative demand for wheat and this gave rise to a holding tendency among large groups operating in the wheat trade. It remains to ascertain why readjustment of wheat prices did not occur during 1929-30, when the prices of securities and of a large group of staple commodities fell sharply.

WHY PRICES FAILED TO COLLAPSE IN 1929-30

In the midst of current events a reviewer of the course of wheat prices in 1929-30 would naturally concentrate attention upon explanation of the great decline of prices during the

¹ *Survey of Current Business, 1931 Annual Supplement.*

² On April 30, 1928, the Chicago July future stood 4 cents above the Liverpool instead of 21 cents below, as had been the case three months before; see *WHEAT STUDIES*, December 1928, V, 72.

³ In a summary of the year-end stocks situation in 1928-29 in *WHEAT STUDIES*, December 1929, VI, 62, it was stated: "That prices remained as high as they did was in some part due to the very upbuilding of the carryover, in so far as this was affected by accumulation in the channels closest to the producers and most remote from ultimate consumers."

crop year,¹ for short-term changes in the supply-demand situation from the previous crop year indicated that prices ought to have been higher in 1929-30 than in 1928-29. But in a retrospective study such as this, the problem is rather to explain why the adjustment of wheat prices, necessitated by the continuous disequilibrium between the supply and the utilization of wheat that had persisted for several preceding years, did not take place during 1929-30 but was postponed to 1930-31. Indeed, in spite of a great decline of wheat prices in the course of 1929-30, annual average prices for 1929-30 were higher in all the chief wheat exporting countries than in 1928-29.² British parcels prices declined somewhat from 1928-29 to 1929-30 (Chart 2, p. 270), but by less than the decline of the general price level, so that deflated prices of British parcels also averaged higher in 1929-30 than in 1928-29.

Thus, although price adjustment began in the second half of 1929-30, it did not come early enough or proceed far enough to affect annual average prices greatly; and this seems rather surprising because the general economic and financial situation of all the chief wheat exporters had fundamentally changed. This is true particularly of Argentina and Australia, where the impact of world depression was felt earlier than in other countries. As we have seen, one of the inflationary factors in the Southern Hemisphere had been a great inflow of foreign capital for investment which, coupled with other factors, resulted in heavy imports of gold into Argentina with resulting expansion of credit. But in the second half of 1928 the market for fixed interest-

bearing securities weakened considerably owing to the speculative movement on the New York market, and the amount of new loans abroad diminished greatly. This reduction was partially offset by a simultaneous expansion of new issues for private companies in overseas markets; but with rapidly growing imports the Argentine balance of payments was already showing an unfavorable tendency in the second half of 1928, and this was accentuated in 1929.³

There was a similar situation in Australia when, after the peak of the boom in 1927, a minor recession in business began in 1928, partly because of reduction in overseas borrowing. The year 1928-29 was one in which the net increase in overseas funded debts was reduced to £2 million, bringing to an end the period of extremely rapid increase in public debt.⁴

Affected by her unfavorable balance of payments, Argentina began to lose her gold reserve from September 1928. By December 1929 Argentina had lost all of the gold brought into the country during 1927-28, and in that month was the first country to go off the gold standard. Australia exported gold in moderate quantity in 1927 and 1928, but in 1929 this outward flow was greatly accelerated and at the end of the year Australian currency also was technically off gold. Under the banking conditions in both countries, outflow of gold automatically produced deflationary effects domestically, and it would be expected that under financial pressure these countries would enlarge exports of their products and this would contribute to downward adjustment of prices.

It happened that both of these countries, but particularly Argentina, had exceptionally large stocks of wheat on August 1, 1929, and were indeed exporting wheat heavily during the early part of 1929-30. This was particularly true of Argentina, whose exports during August-December 1929 were nearly thirty million bushels larger than in the same period of 1928, although deferment of considerable exports to the later months was characteristic of both years. But the heavy Argentine exports occurred at a time when holding tendencies in North American coun-

¹ See, for example, a special section "The Low Level of Prices in 1929-30," in *WHEAT STUDIES*, December 1930, VII, 130-32.

² On Charts 8 and 9 (p. 283) the annual average prices of Argentine and Australian wheats are given for calendar years, and show a substantial decline from 1929 to 1930. But averages for August-July years would show a rise of prices from 1928-29 to 1929-30 both in Argentina and Australia.

³ See "The Balance of Payments during the Last Decade, 1926-1935," Banco Central de la República Argentina, *Economic Review*, 1937, Series II, I, 11-22.

⁴ See Walker, *op. cit.*, pp. 37-39; also W. R. MacLaurin, *Economic Planning in Australia, 1929-1936* (London, 1937), p. 34.

tries had not yet been broken but were becoming even more marked—in Canada because of the poor crop of 1929, in the United States because of expectations of governmental intervention under new legislation. Hence Canadian exports of wheat during August–December were relatively light, not only absolutely but in relation to the small total exports of 1929–30; and United States exports, generally smaller in 1929–30 than in 1928–29, were even farther below the average for previous years during August–October.

Under the circumstances, rapid liquidation of year-end stocks in Argentina, and partly also in Australia, failed to break wheat prices at the time and the stocks were sold at relatively high prices; but Argentine wheat was underselling North American. The overseas price of Argentine wheat, moreover, had not yet been depressed by the depreciation of the Argentine peso; this became of major importance only in February 1930. Until the end of 1929, in fact, the depreciation of Argentine currency had been checked by heavy gold exports.

Later in the course of 1929–30, when the holding movement in Canada weakened, there was no great pressure of Southern Hemisphere wheat on the market, since the crops harvested late in 1929 and early in 1930 were very small in both Argentina and Australia. The financial pressure experienced by the Southern Hemisphere countries in 1929–30 because of their unfavorable balances of payments was itself partly a result of these short wheat crops. Consequently their wheat supplies in 1929–30 were limited, except for the large August stocks from the previous crop that were soon disposed of under the favorable conditions created by holding tendencies in North America.

Moreover, the deflationary process in Argentina and Australia, initiated by heavy losses of gold in 1929, was checked by credit expansion that persisted in both countries far into 1930. During the preceding period of prosperity in Argentina (1927–28), the growth of funds in the hands of the public (especially the increase in current account deposits) had relieved the market from the necessity of active use of credit for business requirements.

Bank loans therefore showed a continued decline, and began to rise only two months prior to the reflux of gold in September 1928. This resulted in enlargement of the cash reserve of the banks, which later permitted the great expansion of credit that continued through 1929 and also in 1930. This expansion of credit was accentuated in its later stage by the inflationary effect of fiscal deficits.¹

Furthermore, the influx of foreign capital in Argentina was renewed in 1930, temporarily relieving financial strain. This time foreign capital came in the form of short-term borrowings mainly by federal and provincial governments, though railroads also placed abroad large sums in debentures. The total foreign capital received by Argentina in 1930, mainly during the first half of the year, was larger than in any year between 1926 and 1929.² This, of course, relieved financial strain at the time of the capital inflow (mainly the first half of 1930), but because of the short-term character of the credit it paved the way for more difficulties in following years.

In Australia, too, 1929–30 was not a year when the process of deflation was strongly in evidence. It was part of the policy of the Labor administration which came to power in 1929 to resist deflation so far as possible, and not before the second half of 1930 were efforts made to check the advance in Commonwealth expenditures. Growing budget deficits were financed by advances from banks and by Treasury bills. The floating debt of the Commonwealth and state governments in London also had risen greatly during 1929–30. Bank advances continued to rise in Australia, as in Argentina, during the first year of the depression (until 1930). All these measures were inflationary in effect, and Australia was thus able to sustain her domestic price structure in 1929–30.³

Consequently there was no particular pressure of Southern Hemisphere wheat on the

¹ See "International Payments and the Monetary Cycle," Banco de la Nación Argentina, *Economic Review*, December 1929, II, 169–73; also "The Evolution of the Banking Situation," Banco Central de la República Argentina, *Economic Review*, 1937, Series II, I, 30–41.

² *Ibid.*, Series II, I, 11–21.

³ See MacLaurin, *op. cit.*, p. 64.

world wheat market during the second half of the crop year 1929–30, the months when marketing and exports from these countries are usually heavy. This was reflected in the price relationships on the world wheat market as represented by Liverpool prices. The beginning of the crop year was characterized by an extremely wide price spread between Canadian and Argentine wheat, too large to be explained fully by differences in quality. Later, under the pressure of competition, prices of Canadian wheat declined from their abnormally high level in August, while Southern Hemisphere wheat prices did not show so great a decline.¹ As a consequence, the move-

¹ Argentine domestic wheat prices expressed in pesos remained practically stable throughout the whole crop year; but in terms of gold they declined somewhat, though less than did prices in the other chief exporting countries (see Charts 4 and 12, pp. 278, 290). At this time the depreciation of the peso did not depress world wheat prices much, for the supply of Argentine wheat happened to be short; it contributed to a maintenance of domestic wheat prices in pesos. The depressing influences became effective, however, in the following year. Relatively high prices of Argentine wheat in pesos throughout the season presumably tended to stimulate expansion of the wheat area for the 1930–31 crop.

² It is not necessary here to discuss more than the salient points of the financial situation of Canada in 1929–30. The Canadian balance of trade turned from highly "favorable" during the four preceding years to very "unfavorable" in 1929–30 (year ending March 31); and gold flowed out of the country. Heavy losses of gold in 1929, coupled with the over-extension of the general banking position in the preceding years, forced the banks to replenish their reserves by borrowing from the government under the provisions of the Finance Act. These borrowings amounted to 88.7 million dollars on June 30, 1929, as against only 16.0 million on June 30, 1927, and they rose to a peak of 111.4 million dollars in November 1929. The banks sought to hold these borrowings to a minimum, particularly because there were some banks which did not borrow from the government. This led to substantial liquidation of current loans, although the liquidation process in Canada was even more pronounced in 1930–31. For more details see Canada, Royal Commission on Banking and Currency in Canada, *Report* (Ottawa, 1933), esp. pp. 37–44, 48–60; F. W. Field, *Economic Conditions in Canada to May, 1930* (Great Britain, Dept. of Overseas Trade, 1930), pp. 16–22; and S. R. Noble, "Canadian Monetary Experience in Depression," in *The Lessons of Monetary Experience, Essays in Honor of Irving Fisher*, edited by A. D. Gayer (New York, 1937), pp. 117–28.

³ For an appraisal of the first year's administration of the Agricultural Marketing Act (1929–30) see a section written by Alonzo E. Taylor in *WHEAT STUDIES*, December 1930, VII, 145–64.

ment of prices as between the four exporting countries and the British parcels price, shown on Chart 16, exhibited striking features during 1929–30. Argentine prices (Rosafé), contrary to the usual tendency, stood higher in relation to British import prices in the later months of the crop year than in the early months, while Canadian prices after January stood much lower in relation to British import prices than they did in September–December, also in contrast with the usual relationship. The spread between Argentine and Canadian prices changed from an extremely wide one in September–October to one narrower than usual during the last quarter of the crop year 1929–30.

The relatively firm tendency of Southern Hemisphere wheat prices of course relieved in some degree the wheat market situation in North America, where the holding movement was greatly weakened as prices declined, particularly in Canada. The financial stringency which was developing in Canada² doubtless tended to weaken the holding tendency. Even the largest holder of wheat in Canada at the time—the Canadian Wheat Pool—encountered difficulties in renewing bank loans and was obliged to apply to the Provincial governments for guarantee of these loans. This governmental intervention in the form of guarantee of credit forestalled even more drastic liquidation of wheat stocks that might otherwise have been necessary, and in this way postponed the readjustment of wheat prices.

Wheat prices were similarly affected in 1929–30 by the loan policies of the Federal Farm Board and the price-supporting purchases under the Board's auspices, although these stabilization operations were of far greater importance in 1930–31.³ The United States wheat crop of 1929 was substantially better than the crops of the other chief wheat exporters, and the total United States supply of wheat, including the big inward carryover from the previous crop, was even larger in 1929–30 than in 1928–29. This was the opposite of the supply position in the other major exporters. In the light of the abundant domestic supply, the maintenance of American wheat prices on a relatively high level is particularly difficult to explain. Without

price-supporting purchases under the Board's auspices and the carrying of these stocks (57 million bushels on June 30, 1929) into the market in 1929-30. But they resulted in sub-

CHART 16.—SPREADS BETWEEN PRICES OF REPRESENTATIVE IMPORT WHEATS AT LIVERPOOL AND BRITISH PARCELS PRICES, MONTHLY, AUGUST 1921 TO JULY 1937*

(Shillings per quarter of 480 lbs.)

* The base is monthly average price of all parcels, as summarized annually in Table IV. Specified price series are monthly averages derived from Tuesday prices published in Broomhall's *Corn Trade News*.

* Base line for Rosafé wheat prices when duty of 2s. per quarter is subtracted from British parcels prices.

next crop year, American wheat prices could hardly have been maintained even at their level subsequent to the decline during the second half of the crop year. The existence

stantial increase in carryovers of wheat in the United States, and these became a bearish factor on the world wheat market in following years.

V. PRICES IN THE PERIOD OF MONETARY DISTURBANCE

COLLAPSE OF WHEAT PRICES IN 1930-31

In the light of the foregoing discussion there is no difficulty in explaining the precipitous decline of wheat prices in 1930-31. We have seen that various inflationary factors had contributed to maintain wheat prices for several years at a level that seems to have been above the long-term equilibrium price. Governmental interventions in North America prevented the readjustment of prices during 1929-30, but this very postponement gave rise to more drastic readjustment later. Thus it is not surprising that the price reaction in 1930-31 was out of proportion to the further increase in the disequilibrium between supply and consumptive demand. It represents in part a long-delayed correction of a maladjustment. This correction was inevitable and would have occurred even without injection of new extraneous factors, simply through discontinuance or failure of policies or influences that had postponed the necessary

readjustment. Thus we need not here discuss this necessary readjustment of wheat prices but only the new extraneous influences that intensified the readjustment. Among these, it is necessary to review monetary and financial developments in the Southern Hemisphere, their governmental policies of "grow more wheat," and some of the effects upon world wheat prices of the stabilization operations sponsored by Federal Farm Board in the United States.

It was stated above that depreciation of the Argentine peso early in 1930 contributed toward the maintenance of Argentine domestic wheat prices at a relatively high level during the 1930 sowing period; and this presumably enhanced the effectiveness of governmental propaganda for expansion of wheat output in order to improve the balance of payments by increase of exports. In Australia the policy of both the trading banks and the Commonwealth Bank in 1930 was to hold the Australian pound as close to parity with the

pound sterling as possible; the procedure was to curtail the demand for foreign exchange not by increasing its value but by rationing exchange directly. This hampered decline of the Australian exchange, and depreciation of the Australian pound was held within 6 per cent up to October 1930 and within 8 per cent up to the end of the year.

Under these circumstances, Australian wheat prices in currency were weaker than Argentine prices in currency, and declined about as much as wheat prices in gold currencies during the second half of 1929-30. This might well have discouraged Australian farmers from expanding their wheat sowings. But the Australian governmental campaign to "grow more wheat" was much more energetic than the Argentine, and in order to protect farmers against further decline in prices, a Wheat Marketing Bill was introduced and debated. This bill provided that the Commonwealth and the states would guarantee a price of 4 shillings a bushel for the 1930-31 crop, and also included provision for a three-year compulsory wheat pool.¹ With such prospects held out, the campaign was successful as regards wheat expansion, and Australia contributed the largest portion of the expansion of world wheat area between 1929 and 1930.

In fact, however, the government found itself unable to fulfill its promises to farmers. The Wheat Marketing Bill was rejected by the Senate on July 4, 1930. Toward the close of its session early in December 1930, the Commonwealth Parliament passed a Wheat Advances Bill, which provided for guaranteeing farmers a price of 3 shillings a bushel, port basis. On January 19, 1931, however, it became clear that neither the Commonwealth Bank nor the government would be financially able to bear the burden of the guarantee, and farmers were left exposed to drastic price decline.² The campaign to "grow more wheat"

thus served to aggravate the price readjustment in 1930-31.

Monetary developments in both Southern Hemisphere countries during 1930-31 were also of a sort to contribute to further depression of wheat prices on the world wheat market. As we have seen (p. 301), the process of inflation in Argentina, as well as in Australia, continued throughout 1929-30 and mitigated the deflationary effects of the gold outflow. Loans and bond investments of Argentine banks continued to expand until December 1930, when the peak was reached. As regards bank deposits, the expansion of credit counterbalanced the restrictive effect of the gold exports, so that bank deposits declined but slightly in spite of the heavy drain on cash reserves. In consequence, the percentage of cash reserves to deposits fell from 24.8 in June 1928 to 12.1 in December 1930. But this compelled the banks to restrict credit, bank loans contracted rapidly during 1931, and an even more marked decline in deposits followed. At the end of 1930 and the beginning of 1931, monetary tension in Argentina thus became very acute, and increasingly so during the first three months of 1931. At the end of March, when the reserve ratio fell to 11.2 per cent, the process of deflation reached its climax. In April 1931 the federal government decided to apply the Rediscount Laws, and monetary circulation was relieved by rediscount of commercial paper in the Caja de Conversion. Hence the most acute monetary tension in Argentina came in the first third of 1931, the period of heavy marketing of the 1930 wheat crop. In later months financial strain was somewhat relieved, and by December 1931 the reserve ratio had risen to 14.8 per cent as contrasted with the minimum of 11.2 in March.³

The deflationary process did not immediately check the depreciation of the peso and its gold value averaged for January 1931 about 72 per cent of parity, against nearly 90 per cent during the first four months of 1930. However, during February and March there was some appreciation of the Argentine peso (see Chart 5, p. 279). Depreciation of the Argentine peso was thus of less importance in the decline of wheat prices in 1930-31 than

¹ MacLaurin, *op. cit.*, pp. 42-44.

² WHEAT STUDIES, December 1931, VIII, 85.

³ For further details see "Emergency Action Dealing with the Monetary Problem," Banco de la Nación Argentina, *Economic Review*, February-March 1932, V, 31-39; and "The Evolution of the Banking Situation," *Economic Review*, 1937, Series II, I, 30-41.

was depreciation of the Australian pound. Of greater importance for depressing wheat prices during 1930–31 was the severe liquidation of loans in Argentina, caused by monetary tension during the first third of 1931.

In Australia the deflationary process also became more severe in 1930–31 than it had been in 1929–30. As we have noted, the inflationary effects of government deficits had counterbalanced deflationary influences during the previous year. Advances by the banks to the Australian government, plus Treasury bills, had risen from £5.5 million on June 30, 1929, to £53.0 million on December 31, 1930.¹ The floating debt of the Commonwealth and state governments in London had risen to £38.1 million by September 30, 1930. But such rapid growth of short-term indebtedness of the governments alarmed the banks and they began to insist on limitation of government borrowing. At the end of 1930, government credit was practically exhausted.²

Pressure of the exchange was intensified in the last quarter of 1930. The attempts made by banks to hold down foreign exchange rates (p. 303) had resulted in the growth of an outside market, and when the Bank of New South Wales decided to follow this market, foreign exchange rates rose rapidly. By the

end of January the bank's official rate had reached £130.5 Australian per £100 sterling (see Chart 5, p. 279). So precipitous a depreciation of Australian currency in the beginning of the heavy marketing season for the 1930–31 wheat crop necessarily affected the course of wheat prices not only in Australia but also on the world market.

Acute financial pressure in Australia during the latter half of 1930 was then tending to depress the course of world wheat prices; Australian prices weakened earliest and declined most until mid-October. Large stocks of Australian wheat on August 1, 1930, in spite of the small crop of 1929–30, permitted heavy exports of Australian wheat. The persistent decline of wheat prices in Canada began somewhat later than in Australia, but in October–December the decline was greatest in Winnipeg. In Canada the process of liquidation also proceeded with greater intensity in 1930–31 than in 1929–30, as in the Southern Hemisphere exporting countries,³ and during November 1930 there were persistent rumors that the Canadian Pool would be forced to liquidate.⁴

But from the end of December 1930 until February 1931—the period of precipitous depreciation of Australian currency—Australian wheat prices expressed in sterling once more led the decline of world wheat prices, suggesting that depreciation of Australian currency was one of the contributing factors in the collapse of wheat prices on the world wheat market in 1930–31. Indeed, not only the leadership in the price decline during a short period when Australian currency was rapidly depreciating, but also price comparisons over a longer period, point toward greater responsibility of Australia than of other countries for the collapse of wheat prices in 1930–31.

This comparison of domestic wheat prices expressed in British shillings for January–March 1931 with those for the same period of 1930 appears in Chart 4, p. 278. Australian prices declined more than other series, both absolutely and proportionately. Argentine and Canadian prices declined absolutely about as much as British parcels, while Australian prices declined substantially more. The course of the prices of wheat from various exporting

¹ *Report of Conference of Commonwealth and State Ministers*, February 1931, p. 89, as cited in MacLaurin, *op. cit.*, p. 57.

² MacLaurin, in his thorough study of Australian economic and financial developments during 1929–36, makes this statement: "Australia had been able to sustain the internal price structure in 1929–30 by an increase in London bank loans, by dependence on London assets, and by large gold shipments; but these expedients had been almost exhausted" (*op. cit.*, p. 64).

Professor D. B. Copland, an authority on Australian economic and financial problems, characterizes the domestic situation as follows: "The public credit was deteriorating and by the beginning of 1931 it was impossible to raise loans on the Australian money market to meet the deficits of governments." See his "Australian Monetary Policy in the Depression, 1930–33," in *The Lessons of Monetary Experience*, p. 399.

³ F. W. Field, British Senior Trade Commissioner in Canada, after reporting that the rate of decrease of commercial loans during 1930–31 was greater than during the previous year, commented: "Whereas in 1929–30 the liquidation in loans proceeded at a slower pace than that of general business, the reverse was the case in 1930–31," *Economic Conditions in Canada, 1931* (Great Britain, Dept. of Overseas Trade, Report 508, 1932), p. 21.

⁴ WHEAT STUDIES, December 1931, VIII, 84–85, 93.

countries in the Liverpool market, as compared with British parcels prices (Chart 16, p. 303), also shows that Australian wheat prices declined relative to other imported wheats during 1930-31; in the second half of 1929-30 Australian wheat in Liverpool commanded a premium sometimes larger than that of No. 3 Manitoba, whereas in January-March 1931 Australian wheat prices stood far below the average British parcels price. Over the same period Australian wheat prices in terms of Australian currency declined much less on domestic markets because of the depreciation of the currency, as may be seen on Chart 13 (p. 291). Between December 1930 and March 1931 the price of wheat at Melbourne (monthly average) in Australian currency declined only about 15 per cent, while in terms of sterling—the same as in gold—it declined twice as much. The maintenance of relatively better prices in Australian domestic markets contributed to a more liberal flow of wheat from producers.¹

The effect of depreciation of the Australian pound was complete, however, in March 1931, and Australian prices rose in April in both the domestic and the world markets. The last step

¹ In Australia, Royal Commission on the Wheat, Flour and Bread Industries, *Second Report*, pp. 171-79, are published extracts of cables which, in the opinion of the Commission, substantiate the depressing effect on world wheat prices of the rapid depreciation of the Australian pound in January-February 1931. The conclusion of the Commission is that as the result of the rapid depreciation of the Australian pound with reference to sterling "the merchants were able to offer a fairly steady price despite the widely advertised collapse of the world price. Consequently, large numbers of farmers, thinking they were getting a very good offer, sold wheat in such quantities that the inevitable result of a rapid and undue depression on the price offered by purchasers overseas occurred. This depressed the value of Australian wheat in relation to other wheat unduly on the world market." The fact that stocks of wheat in Australia on Aug. 1, 1931 were rather small in relation to the huge wheat crop of 1930-31 supports the Commission's conclusion concerning the liberal flow of wheat from farmers.

MacLaurin, though rejecting depreciation of the Australian pound as the explanation of the drop in the price of Australian wheat, concludes that "Australian exchange depreciation probably served to precipitate a drop in the gold and sterling price of wheat, which was inevitable, rather than to cause a decline which would not otherwise have occurred" (*op. cit.*, pp. 150-56).

² WHEAT STUDIES, December 1931, VIII, 94, Chart 22.

in the collapse of world wheat prices in 1930-31—precipitous decline in Liverpool and in the United States in June, July, and August—was connected with change in the stabilization operations in the United States and with mounting financial strain in the United Kingdom (p. 280).

United States wheat prices during 1930-31 followed a course quite different from other markets. In July 1930 United States wheat prices were lower than in other exporting countries (Chart 4, p. 278), but in subsequent months prices declined in the United States much less than abroad. The precipitous decline early in November was definitely checked by the inauguration of extensive purchasing operations by the Grain Stabilization Corporation, and the Corporation assumed the burden of stabilizing prices for practically the remainder of the crop year. But on March 23, 1931 the Federal Farm Board announced that stabilization purchases would not be made in the 1931 crop. Purchases of old-crop wheat were continued into June, but were discontinued after the new winter wheat began to move. Cash prices consequently declined sharply in June and July.

Prices of British imported wheat reflected in some degree the collapse of cash wheat prices in the United States in June-July, but prices in the markets of other exporters declined only slightly. The course of the July future in Liverpool also moved closely with futures prices in Chicago, while in Winnipeg and Buenos Aires the July futures declined much less.² This points toward a depressing effect of Federal Farm Board policy upon world wheat prices during the last two months of the crop year 1930-31; and there can be little doubt that this policy contributed to the low level of wheat prices in 1931-32, for the volume of the United States wheat carryover was unquestionably increased in consequence of stabilization operations and the carryover was shifted from invisible to visible positions.

EXCESSIVE DECLINE OF WHEAT PRICES IN GOLD IN 1931-32

We have already considered (pp. 279-81) why wheat prices expressed in gold declined on the British market in 1931-32 more than

seems reasonably explicable in the light of supply-demand relationships; but definite conclusions concerning the effect of the depreciation of the pound upon that price decline were deferred until the repercussions of sterling depreciation upon the currencies of the chief wheat exporters were considered. It was stated, however, that there is little reason to ascribe all of the excessive decline of wheat prices in 1931-32 to depreciation of British currency. This conclusion rested on the fact that prices of British imported wheat in gold, when compared with the low level to which they fell just before the abandonment of the gold standard in September 1931, were higher during the rest of the crop year 1931-32 (Chart 3, p. 271).

We are now in a position to consider the movements of wheat prices during 1931-32 in those exporting countries whose currency depreciated after British abandonment of the gold standard. The greatest simultaneous depreciation came in the Australian pound, as would be expected because of the close relationship between the Australian pound and sterling. The Australian pound fell from 76.6 per cent of par value in August 1931 to 61.4 per cent in October and 55.2 per cent in December, but recovered somewhat during subsequent months (Chart 5, p. 279).

The Argentine peso, presumably influenced by heavy seasonal exports, had recovered by March 1931 to the relatively high level of 80 per cent of par value; but it depreciated for several months thereafter. Falling to 66.9 per cent of parity in August 1931, it remained at approximately this level until the United Kingdom left gold on September 21. In response to depreciation of the pound sterling, the Argentine peso declined further to 53.9 per cent of parity in October. Apprehending further weakening of the exchange, the Argentine government established control of purchase and sale, and at the end of the year created an Exchange Control Committee which fixed exchange rates. Beginning with December 1931 and until November 1933, the value of the paper peso was pegged at a little above 60 per cent of its par value (60.4 per cent in January 1932), and at this rate the Argentine wheat crop of 1931-32 was exported. The de-

preciation of the peso which may be regarded as a direct effect of the decline of sterling was thus kept within the limits of 10 per cent (from 66.9 to 60.4 per cent). The depreciation was about twice as large if the gold value of the peso in December 1931 is compared with its average gold value in January-July 1931, when most of the previous crop was marketed.

The Canadian dollar also began to depreciate under the financial pressure (even before the United Kingdom had abandoned the gold standard), but this depreciation was held within relatively narrow limits. Under the impact of the decline of sterling, the gold value of the Canadian dollar fell to 89.1 per cent of parity in October 1931 and to 82.7 per cent in December, but recovered somewhat during the following months. On the average for October-July 1931-32, the Canadian dollar ranged from 12 to 13 per cent below par value.

Since the Australian pound had depreciated in sympathy with sterling more than currencies of the other chief wheat exporters, it would be expected that Australian wheat might continue to lead the decline of wheat prices on the world wheat market as it did in 1930-31. Yet the course of Australian wheat prices in the months following the depreciation of currency failed to show this tendency either on the domestic markets or at Liverpool. In October and November 1931, Australian wheat prices at Melbourne rose more than in proportion to the depreciation of the currency, and consequently wheat prices in gold also rose. In November, gold prices of Australian wheat were above the level of January 1931; and during the rest of the crop year 1931-32 they did not decline to as low a level as that prevailing during February and March 1931 (Chart 13, p. 291). The 1932 calendar-year average of Australian wheat prices in terms of gold was even slightly above the average for 1931 (Chart 9, p. 283). The August-July average gold price of Australian wheat, however, was lower in 1931-32 than in 1930-31, but only on account of a relatively high level of prices before January 1931.

In general, Australian wheat prices expressed in gold declined from 1930-31 to 1931-32 less than prices in the other chief export-

ing countries partly because Australian prices had declined more than prices elsewhere in 1930-31, but partly also because there was less financial tension in Australia in 1931-32 than in 1930-31. The sale of Treasury bills to the trading banks by the Commonwealth government in order to finance deficits continued in 1931-32 on a larger scale than in 1930-31, supplementing the cash reserves of the banks and thus arresting severe liquidation. Although the banks continued reluctant to make new loans and loans continued to decline until the first quarter of 1932, the fall of deposits was checked by Treasury bill financing from the third quarter of 1931.¹ The movements of the Australian wheat price in Liverpool as related to other import wheat prices also show that Australian wheat was not pressed on the world wheat market in such degree as during January-March 1931 (Chart 16, p. 303).

There is accordingly little evidence that depreciation of the Australian pound in September-December 1931, though exceeding that of the Argentine peso and the Canadian dollar, depressed wheat prices on the world wheat market during the crop year 1931-32, as it had done during the preceding year.

The situation was different in Canada and Argentina. We have seen that Canadian wheat prices expressed in depreciated Canadian dollars did not increase in 1931-32 proportionally with depreciation of the currency, and consequently wheat prices in terms of gold declined in spite of shorter supplies of Canadian wheat and in the face of a moderate reduction of the domestic carryover of wheat at the end of the crop year (p. 287; Chart 7, p. 282). In October-November 1931, Canadian wheat prices rose as did wheat prices in other markets, but the rise was smaller than in other exporting countries or on the Liverpool market. When wheat prices fell in November, Canadian wheat prices expressed in gold declined shortly thereafter—in December—

to a point below their August level (Chart 11, p. 288). Depreciation of the Canadian dollar in November and December particularly had a depressing effect on world wheat prices. This was the time when the Canadian futures market was also relatively weakest. But later (in January) the May future in Liverpool declined concurrently with futures in Argentina, while the Winnipeg future rose and the spread between Liverpool and Winnipeg narrowed greatly. At that time the decline of world wheat prices was led by Liverpool and Buenos Aires. The Buenos Aires price of futures at the end of January, in terms of gold, was as low as in the preceding September-October. The sharp drop of futures in March (on all markets) was also associated with heavy shipments of wheat from Argentina.² The heavy discount of Argentine wheat on the Liverpool market, at a maximum in March 1932, also points to pressure of Argentine wheat on the world market (Chart 16, p. 303).

Thus in the two periods of 1931-32 when wheat prices in terms of gold declined to their lowest level in the course of the year, Canada led the first decline and Argentina and Liverpool the second. Both Canada and Argentina shared with the United Kingdom the responsibility for depressing wheat prices in gold on the world wheat market, and in both countries monetary and financial developments were such as to contribute to the decline of prices.

The deflationary process in Canada continued in 1931-32 no less vigorously than in the previous year, as judged by the greater decrease in demand deposits and by the sharp rise of interest rates that reached a peak in January 1932.³ The national wholesale price index number continued to decline in spite of the depreciation of the Canadian dollar. Under such conditions even the moderate increase of wheat prices in terms of the depreciated dollar, as compared with the level in the second half of 1930-31, seemed attractive to producers; and their marketings of wheat were liberal in spite of a short crop. The liberal supply of marketed wheat, partly from old-crop stocks, tended to depress world prices.

¹ MacLaurin, *op. cit.*, pp. 123-30.

² WHEAT STUDIES, December 1932, IV, 94-97, and Chart 19, p. 95.

³ Canada, Dominion Bureau of Statistics, *Monthly Review of Business Statistics*, September 1932, VII, No. 9.

In Argentina the monetary tension continued severe, though slightly relieved in April 1931 as compared with the acute position at the beginning of the year (p. 304). The fall in deposits was checked during the second half of 1931, but contraction of loans continued into 1932 in spite of improved reserve ratios. The increase of money in the banks, thanks to rediscount issues, strengthened the cash situation without making it easy and without extending the basis of credit.¹

Domestic prices of Argentine wheat in terms of the depreciated peso rose in 1931-32 as compared with the low level during the second half of 1930-31 more than the Canadian and more than the general level of Argentine prices (Chart 12, p. 290). Hence they may well have seemed attractive to farmers. The Argentine crop of 1931 was slightly smaller than that of 1930 on account of the smaller acreage, but yield was high and production ample. In August-July 1931-32, indeed, disposition of Argentine wheat exceeded that of the preceding twelve months. Producers obtained relatively high prices in depreciated pesos on the domestic market, while exporters had incentives to buy at home and sell abroad. Largely on account of the stimulus to sales by producers afforded by the relatively high level of domestic wheat prices in depreciated pesos, the Argentine wheat supply was thus sufficiently liberal in 1931-32 to depress prices in gold on the world market.

Under the prevailing circumstances the indirect depressing influences of the depreciation of the pound sterling in 1931, acting through the currencies of Canada and Argentina, may well have been of greater importance through increasing the available wheat export supply than was the direct influence of sterling depreciation through restricting the demand for wheat in the British market.

Professor Harris, after studying the price movements of various groups of commodities

on British markets following depreciation of the pound, concludes that "from September 1931 to July 1932 the prices of raw materials in the United Kingdom were not fully adjusted to the drop of sterling exchange. In other words raw materials (in gold) in Great Britain declined relatively to their movements in the United States." In another place he states that "for numerous commodities for which the British market is of great importance world prices were adjusted to the decline in sterling, and, therefore, the tendency was for world prices of these commodities to fall (or fall more) rather than for their sterling prices to rise."²

Although wheat belongs to this last group, we may say that the gold price of wheat was depressed by the decline of sterling seemingly less than prices of such other staple commodities as non-ferrous metals, rubber, wool, and sugar.³ During the first year after the abandonment of gold by the United Kingdom on September 21, 1931, British prices of imported wheats expressed in gold remained above the low level in the preceding seven weeks (Chart 3, p. 271), to which they had been depressed by various factors discussed earlier (pp. 280, 306). Perhaps the inelasticity of British demand for imported wheat was the cause. But this does not mean that further decline of sterling, particularly in 1933-34, did not depress world wheat prices, and this question next receives attention.

DECLINE OF WHEAT PRICE IN GOLD IN 1933-34

The behavior of wheat prices in terms of gold in 1933-34 may seem a futile question to discuss, since prices in gold were not then the actual market prices in any of the chief exporting countries or in a great majority of the importing countries. Prices in sterling unquestionably dominated the world wheat market at the time; and all exporters made their calculations in this currency, which fluctuated in relation to gold, rather than in the gold currencies that survived in 1933-34 only in some of the secondary importing countries. But discussion of the behavior of prices in terms of gold is of some interest, and it helps to illuminate the effects of some of the monetary policies adopted in 1933-34.

¹ *Economic Review*, February-March 1932, V, 31-39.

² Harris, *op. cit.*, pp. 434, 459.

³ Cf. M. T. Copeland, *International Commodity Prices and the Devaluation of the Dollar* (Publications of the Graduate School of Business Administration, Harvard University, XXI, No. 1, January 1934), esp. tables on pp. 44-69.

In considering the behavior of British prices, we observed that the decline of British prices of imported wheat in terms of gold in 1933–34 seems excessive in the light of supply-demand relationships (p. 279). In view of the supply-demand relationship in the four chief exporting countries, as indicated by their stocks of wheat on August 1, 1934, an even smaller decline of prices in sterling currency would have seemed inexplicable; for prices declined in the face of the decline of wheat carryovers in exporting countries. The crop year 1933–34 was one when excessive surpluses of domestic wheat emerged in several important European wheat-producing countries, and this gave rise to an increase in the total world wheat carryover at the end of 1933–34. Perhaps this development explains in some degree the decline of wheat prices in sterling, though even these sterling prices seem to have been unduly depressed. It is still more difficult to explain, merely by the changed situation of the supply-demand factors, the much greater relative decline of gold prices of wheat. Hence the question naturally arises whether or not this excessive decline of wheat prices in gold may not have been caused by the wave of currency depreciation that followed the depreciation of the United States dollar after March 1933.

Depressing effects of dollar devaluation upon wheat prices on the world market are usually denied on the ground that after the depreciation American wheat prices ruled above export parity. We suggested earlier (p. 280) that the indirect effects of dollar depreciation must be taken into account, and at this point some of the repercussions on the monetary situation in other countries may appropriately be considered.

Prior to the depreciation of the United States dollar, the depreciation of the Canadian dollar had been kept within a limit of 17 per cent. Then, under the impact of the decline of the United States dollar, the Canadian dollar depreciated to 67.8 per cent in July 1933 and to 60.1 per cent in July 1934 (Chart 5, p. 279). The Argentine government, partly in response to financial pressure following depreciation of the United States dollar, and partly deliberately with a view to improving the Argentine

competitive position, depreciated the peso on November 28, 1933 by increasing the buying rate for exporters' bills by 20 per cent; and a few weeks later Argentina pegged the peso to sterling, causing it to depreciate further with the decline of sterling. The gold value of the peso thus declined from about 60 per cent of par value before November 28, 1933 to about 50 per cent in December and to 47 per cent in July 1934.¹

The policy of the British government in response to depreciation of the dollar was to permit the pound to decline further, and its gold value fell from a little over 70 per cent of par value in March 1933 to 68.6 per cent in July 1933 and to 61.5 per cent in July 1934. This downward drift of sterling was perhaps of major importance in the decline of gold prices of wheat, since at the time wheat exporters were making their calculations in sterling rather than in gold currencies. Continuing depreciation of sterling in reference to gold therefore automatically resulted in a downward drift of prices in terms of gold, relatively greater than the decline of sterling prices that reflected adjustment to the changed supply-demand relationship. But the depreciation of sterling was important also because it entailed simultaneous decline in the peso and in the Australian pound (as well as in the currencies of other countries of the so-called "sterling bloc"), which were both pegged to sterling. The gold value of the Australian pound declined from above 55 per cent of par value at the end of 1932–33 to 49.0 per cent in July 1934. These monetary repercussions of dollar depreciation in the chief wheat-exporting countries and in the United Kingdom inevitably affected wheat prices.

It was stated above (p. 289) that the average price of Canadian wheat, expressed in currency, did not rise from 1932–33 to 1933–34 in proportion to depreciation of the Canadian dollar, so that wheat prices in gold declined. This decline occurred in the face of a much smaller Canadian crop in 1933 than in 1932,

¹ We mention the official purchase rate, for wheat exporters were obliged to sell their bills of exchange at this official rate. On the free market the peso had depreciated by July 1934 to 34.4 per cent of its par value.

and also in the face of reduction of the year-end carryover of wheat in Canada. After a speculative rise coincident with depreciation of the Canadian and United States dollars that culminated in July 1933, Canadian wheat prices expressed in gold declined so much that during October–April 1933–34 they were as low as in the preceding January–February, before depreciation of the United States dollar began. They did not reach the extremely low level of December 1932, but even so, October–April prices of Canadian wheat in gold seem unduly low in the light of the change in the supply-demand relationship in Canada from 1932–33 to 1933–34. Hence it is possible that the price development in Canada, namely that Canadian wheat prices failed fully to reflect depreciation of the Canadian dollar, tended to depress wheat prices on the world wheat market. Yet it is clear that Canada was not leading the decline of wheat prices in 1933–34, since Argentine and Australian wheat prices declined much more. Furthermore, it must be remembered that government-sponsored stabilization operations on the Winnipeg grain market were continued energetically in 1933–34; and during July–October, when prices were declining rapidly after the speculative boom, there were large purchases on stabilization account.¹ The course of Canadian wheat prices at Liverpool in relation to other imported wheat also indicates that Canadian wheat was not pressed on the market.

The rôle of Argentina in depressing world wheat prices in 1933–34 was much more important, although the 1933–34 wheat crop was mostly purchased by the newly-created Grain Regulating Board at a fixed price. Argentine wheat prices in August–October followed the general declining tendency of the world wheat market, but declined less than prices in North America because Buenos Aires had not participated in the same degree in the speculative rise of prices from March to

July 1933. During October–November 1933 the Argentine prices were nearly as low as in January–April 1933.

On November 28, the Argentine government altered its control of exchange and at the same time deliberately depreciated the currency further. It was expected that the resultant rise of foreign currencies in terms of pesos by 20 per cent would result in higher internal prices of export commodities in domestic currency, and would cause farmers to precipitate sales of Argentine grain with price-depressing effects on the world market. Hence the government simultaneously created a Grain Regulating Board. The board was to buy at fixed prices all the wheat offered, as well as maize and linseed. The fixed price was determined by adding 20 per cent to the market value previous to the decree of November 28, 1933, thus allowing for the changed domestic value of foreign currencies. The basic price for wheat was 5.75 paper pesos per 100 kilograms on railroad cars at the Port of Buenos Aires. But during the period that the crop was being marketed (December–May), the board sold wheat to exporters at prices lower than it paid, namely 5.20 paper pesos per 100 kilograms,² a price only 8.3 per cent above the market value before the additional depreciation of the peso. Thus, from the very beginning of the operations of the board Argentine wheat was sold for export at a price which in terms of gold (and sterling) was about 10 per cent below its predepreciation market level. In later months, when the peso (dropping with the pound sterling) had depreciated further below its November value, this export price in terms of gold was nearly 20 per cent lower.

Even though the policy of the Grain Regulating Board was not to press wheat upon the market, and its sales during the first five months of operation (December–April) were much smaller than its purchases, it was underselling competing wheats on the world market, for at the time of the deliberate depreciation of the peso it fixed the selling price of wheat to exporters below the previous market level. In this case the monetary manipulation was used as a competitive device, and it was in part a response to the deliberate depreciation of the United States dollar. The selling price

¹ See W. Sanford Evans, "Canadian Wheat Stabilization Operations, 1929–35," *WHEAT STUDIES*, March 1936, XII, esp. chart facing p. 268 and Appendix Table I.

² See "The Grain Regulating Board and the Wheat Market," *Economic Review*, October–December 1934, VII, 143–48.

of the Argentine Grain Regulating Board during December–May 1933–34 was lower than the pre-depreciation price on the Buenos Aires market, not only in gold but in sterling as well.¹

The behavior of the Argentine wheat price in Liverpool (Rosafé) during the same period also shows that Argentine wheat was under-selling other wheats on the world market as it did in 1931–32 and in the fall of 1929 (Chart 16, p. 303).² This stands in contrast with statements that the Grain Regulating Board policy “constituted an important factor for the maintenance of world prices at a relatively fixed level.”³

Australian wheat prices in sterling and in gold (Chart 4, p. 278), both domestically and at Liverpool, declined in 1933–34 no less than did the Argentine wheat prices represented by the selling price of the Grain Regulating Board. But Australian wheat prices declined also in terms of Australian currency, since the Australian pound depreciated relatively less during 1933–34. This retarded the marketing of wheat by farmers,⁴ and Australia accordingly did not fill her export quota provided under the International Wheat Agreement. Exports were only 87.5 million bushels instead of the quota of 105 million; Australian wheat stocks on August 1, 1934 were of record size; and a substantial part of these was even carried into the next crop year, as indicated by the fact that stocks on November 30, 1934

stood at the exceptionally high level of 40 million bushels.

The small exports and the large carryover indicate that Australia did not press wheat on the world market.⁵ Prices of Australian wheat simply followed the sterling price of Argentine wheat at which the Grain Regulating Board was selling to exporters. In so far as sterling was depreciating in relation to gold, wheat prices in gold were automatically depressed. But by deliberate depreciation of the peso and fixing the selling price of wheat in pesos low in comparison with depreciation of the peso with reference to sterling, the Argentine government also depressed the sterling price of wheat, in the face of its policy of “orderly marketing.”

Withholding of wheat from the market by the Grain Regulating Board in Argentina and by farmers in Australia thus failed to prevent an excessive decline of wheat prices in gold which was caused by the competitive depreciation of currencies following the deliberate depreciation of the United States dollar. Consequently, if one takes into consideration all repercussions of American monetary policy during 1933–34, it is impossible to believe that depreciation of the United States dollar did not affect wheat prices on the world wheat market. It depressed gold prices of wheat no less, and perhaps even more, than did forced abandonment of the gold standard by the United Kingdom in 1931.

VI. SUMMARY AND CONCLUSIONS

In the foregoing pages an attempt is made to interpret the course of wheat prices on the principal world wheat markets, particularly

the British, with a view to isolating such price movements as seem inexplicable in the light of changing supply-demand relationships on

¹ On Chart 4 (p. 278) Buenos Aires prices for those months are the prices paid by the Grain Regulating Board and not its selling prices, which were 11–12 per cent lower. Chart 4 therefore does not show the full decline of Argentine wheat prices in sterling during that period. Selling prices, when plotted, would be lower than Melbourne prices in sterling and not higher as shown on Chart 4.

² On Chart 16 the Rosafé price is shown throughout in terms of the spread between duty-free Rosafé prices and British parcels prices. From November 17, 1932, however, Argentine wheat paid a duty of 2 shillings per quarter, which should be considered if the spread from the British parcels price is to be comparable with that for the preceding period. The fluctuations

of the Rosafé price around the horizontal line *a* traced on Chart 16 after the date the duty was imposed are comparable with earlier fluctuations around the general base line.

³ “The Grain Regulating Board and the Wheat Market,” p. 146.

⁴ Australia, Royal Commission on the Wheat, Flour and Bread Industries, *Second Report* (p. 172) speaks of “the refusal of farmers to accept ruling prices.”

⁵ The Royal Commission quoted above definitely stated (p. 172), “During the season when Australian farmers were refusing to sell their wheat, Argentine wheat was virtually replacing Australian wheat for a large part of the quota which had been allotted to the Commonwealth.”

the world wheat market. These price movements suggest the presence of external factors that cause the course of prices to deviate from the course that supply-demand relationships would otherwise determine. Among these extraneous factors, monetary influences here receive particular attention, although in many cases it proves impossible to isolate monetary influences from other factors affecting the course of prices.

Our method in attempting to isolate monetary influences upon the course of prices of an individual commodity differs from the common method, which involves the use of index numbers of prices of groups of commodities. The advantage of the method here followed lies in the closer knowledge and better understanding of those price movements which represent response to factors peculiar to the particular commodity studied. The increasing fund of specific information on the world wheat market even now suffices to permit an interpretation of wheat prices in terms of the supply-demand relationship for wheat. With the specific effects of changing supply-demand relationships upon prices thus measurable, it becomes feasible to determine what elements in the course of wheat prices are not explicable in these terms and therefore require further explanation in the light of additional information about extraneous factors relevant to price movements—monetary influences among them.

As the simplest indicator summarizing relationships between the supply of and the demand for wheat during a crop year, we have made extensive use here of year-end carryovers of wheat. The carryover is regarded as a balancing item between total supplies of wheat and utilization of wheat during the preceding crop year. The "world" year-end carryover of wheat, summarizing the situation on the world wheat market as of about August 1 (the date conventionally accepted as the end of the Northern Hemisphere crop year), as well as wheat stocks on the same date in the four chief wheat-exporting countries, prove useful in interpretation of the movements of import wheat prices in the British market, which is selected as representative of the world wheat market. These same

carryover statistics prove useful also for interpretation of wheat prices in the chief wheat-exporting countries.

One conclusion of the present study refers to the quality of the statistics of world wheat stocks that have been accumulated in the process of careful analysis of the world wheat situation during the past fifteen years. Despite their admitted incompleteness and approximate character, the estimates of year-end wheat stocks appear to be most useful in interpretation of wheat price movements both in the British market and in the markets of the chief wheat exporters. The usefulness of these stock statistics in the interpretation of the price movements itself serves in some degree to reflect favorably upon the quality of the estimates of stocks; for such price movements as appear inexplicable in the light of the supply-demand factors in the world wheat market, as summarized by estimates of carryovers, can be understood in the light of such non-commodity influences as credit and monetary developments; speculative tendencies in other markets stimulated by monetary and credit influences; and governmental interventions.

Another conclusion may be drawn regarding the statistics and estimates of wheat stocks in all positions. Even in their present imperfect state, these seem reliable enough to be useful in interpretation of broad tendencies in wheat prices on the world wheat markets; yet there is great scope for improvement. More complete coverage of wheat stocks in various positions by direct statistics is desirable; so also is improvement of methods of collection and interpretation. The present study will have served a useful purpose if it contributes to stimulate such improvements.

Of the conclusions concerning monetary influences on the course of postwar wheat prices, the first is that the course was affected not only by contemporaneous monetary developments but also by those that occurred somewhat earlier. War-time credit and monetary inflation, and particularly its unequal magnitude in various countries, greatly affected the subsequent course of wheat prices. Since war-time price inflation in the Southern Hemisphere (particularly Argentina) was rela-

tively mild and of brief duration, the deflationary process that followed the early postwar boom of 1919–21 was also relatively mild and the crisis for Southern Hemisphere wheat producers not severe. Hence the level of wheat prices prevailing during 1922–24 was not so abnormally low for Southern Hemisphere wheat producers as it seems to have been for North American producers. That situation was an obstacle of some importance to the “settling” of wheat prices on the world wheat market at a level that could be regarded as equally satisfactory by wheat producers in all of the chief wheat-producing areas, and as a basis for a lasting equilibrium.

Under such circumstances the rise of wheat prices in 1924–25—due partly to supply-demand relationships in the world wheat market, but partly also to the influences of certain external factors emerging at the time—met great support and but little resistance. Among the external influences that then affected wheat prices, the return of the United Kingdom to the gold standard at prewar parity deserves first mention. In our interpretation, increase in the gold value of the pound sterling from early 1924 to May 1925 (when England was once more returned to gold) contributed to the sharp rise of wheat prices in terms of gold that occurred in almost the same period on world wheat markets.

On the other hand, the deflationary process which became inevitable in Great Britain in following years, because of the overvaluation of the pound sterling, did not serve to depress wheat prices significantly. Accordingly, the price of wheat was maintained at an unduly high level for several years; and this stimulated expansion of wheat production. Various other financial developments during 1925–28 facilitated postponement of the necessary price readjustment. Among these was a heavy flow of American and British capital for investment abroad, particularly into agricultural countries and among these into such important wheat producers as Argentina, Australia, and Canada. Heavy inflow of foreign capital into these countries, especially under the banking conditions prevailing there, contributed greatly to credit inflation and price maintenance, and stimulated speculative tendencies

in various commodity markets including that for wheat. These speculative tendencies involved a great increase in the speculative demand for wheat—demand for holding in expectation of higher prices and not for use. Certain monetary policies effective during this period—notably the credit expansion and cheap-money policy followed by the Federal Reserve Board in 1924–25 and 1927–28 in the United States—contributed to an upsurge of speculative tendencies. This in turn directly affected the Chicago wheat market in 1924–25, 1925–26, and 1927–28, and through Chicago affected wheat prices in other markets.

Greatly stimulated by these influences, speculative demand for wheat was helpful in carrying the larger stocks of wheat that began to accumulate, and the easy credit situation itself facilitated the financing of these stocks. Rapid expansion of wheat production stimulated by unduly high prices on the world wheat market thus did not result in an immediate price readjustment. The growing disequilibrium between the supply and the demand for use was balanced by increasing speculative demand.

Certain wheat-marketing policies contributed to the accumulation of wheat carryovers even in the absence of specific intentions to withhold wheat from the market. Sometimes accumulation occurred directly in the hands of such marketing organizations as the Canadian Wheat Pool, and sometimes holdings by other traders were stimulated indirectly by the emergence of optimistic expectations that wheat-marketing organizations would maintain or elevate wheat prices. When in the second half of 1929—and in the Southern Hemisphere even earlier—the financial situation began to change from a state of ease to a state of strain, wheat prices were not promptly readjusted. This was partly because the process of credit inflation and the governmental deficits offset the deflationary process in Argentina and Australia. It was partly due also to government interventions—notably by the Federal Farm Board in the United States, and in Canada by the governmental guarantee of bank credits extended to the Wheat Pool.

Maladjustment on the world wheat market was thus accentuated, and the long-deferred

readjustment took the form of a price collapse from the spring of 1930 to the fall of 1931. Prices then declined much more than in proportion to further increase of the disequilibrium between the supply and the demand for use. Speculative demand for holding wheat, which for several years had filled an ever-increasing gap between the supply of wheat and the consumptive demand for it, weakened greatly. Financial strain, developing in agricultural countries in 1930-31, contributed heavily to weaken speculative demand. But a large fraction of the collapse of wheat prices in 1930-31 must be explained as a long-deferred readjustment of wheat prices. The process of readjustment was inevitable, and its drastic character was a result of long postponement. The major collapse of wheat prices occurred prior to the general abandonment of the gold standard that followed the British move in September 1931. The principal monetary influences that made the price collapse so drastic in 1930-31 were associated with the process of severe liquidation that prevailed in most agricultural countries in that year. But this process of liquidation was simply an inevitable result of the previous overexpansion of credit.

The process of readjustment, however, was made even more drastic by additional influences. Certain governmental policies, such as the Australian campaign of 1930 to "grow more wheat," were contributory factors. Rapid depreciation of currencies in Argentina and Australia, which in 1929-30 had contributed to maintenance of domestic prices of wheat rather than to depression of world prices, began in 1930-31 to affect world wheat prices adversely. Sudden collapse of Australian exchange between December 1930 and February 1931 contributed especially to further decline of wheat prices on the world market.

The abandonment of the gold standard by the United Kingdom checked the rapid decline of wheat prices in currency on the British market, and during the following years currency prices moved in approximate accord with further changes in the supply-demand relationship on the world wheat market. But wheat prices in terms of gold continued to decline more than would be expected from the chang-

ing supply-demand position, particularly in 1931-32 and in 1933-34, when there occurred two waves of competitive depreciation of currencies.

The depreciation of the pound sterling in September 1931, accompanied by credit expansion, relieved financial tension on the British market; and wheat prices in depreciated currency rose more than in proportion to this depreciation. Depreciation of the pound thus seems not to have directly depressed wheat prices in gold on the British market during the first year following the abandonment of gold. But through indirect effects transferred through the currencies of the wheat-exporting countries — particularly depreciation of the Canadian dollar and further decline of the Argentine peso—farmers' marketings of wheat were stimulated by relatively higher currency prices even with lower gold prices, with the result that an excessive decline of wheat prices in gold occurred in 1931-32.

Further decline of the pound in response to depreciation of the United States dollar in 1933 presumably had relatively greater direct depressing effects on world wheat prices in gold, since sterling currency then dominated the world wheat market and price calculations were mainly in terms of sterling. Gradual decline of sterling in relation to gold thus automatically depressed wheat prices in gold, and the gap between prices in gold and in currency persistently increased. The deliberate competitive depreciation of the Argentine peso in November 1933 (also partly in response to depreciation of the United States dollar), as well as indirect effects of decline of the pound on the currencies in countries of the sterling bloc, contributed to further decline of gold prices of wheat.

Continued gradual depreciation of currencies during 1934 had the effect that wheat prices in gold were more sluggish than prices in currencies in responding to the much tighter situation on the world wheat market in 1934-35. It was not until 1935, when foreign exchanges became more stable, that wheat prices expressed in gold began to move in close agreement with currency prices as well as in close accord with changes in the supply-

demand relationship on the world wheat market. Gold prices of wheat, however, continued to move at the low level to which they had been depressed during 1930-34 far below their level even in 1923-24.

Since the principal currencies of the world, the pound and the dollar, are now depreciated in reference to gold by about 40 per cent, re-

covery of wheat prices in gold to their pre-depression level is possible only in the event of a sharp rise of the general price level. This would inevitably be associated with danger of new price disequilibria; and it may be expected that the government agencies now operating monetary controls will not, if they can help it, permit this to develop.

The author is expressly indebted to M. K. Bennett, J. S. Davis, and Holbrook Working for valuable suggestions. Charts in this study were prepared by P. Stanley King.

APPENDIX

TABLE I.—WORLD WHEAT STOCKS EX-RUSSIA EX-INDIA ABOUT AUGUST 1, 1922-37*

(Million bushels)

Year	Total	Four chief ex- porters	Total excluding				United States ^a	Canada	Argentina	Australia
			United States	Canada	Argentina	Australia				
1922.....	583	242	468	541	522	559	115	42	61	24
1923.....	515	263	382	482	451	482	133	33	64	33
1924.....	627	285	490	579	561	593	137	48	66	34
1925.....	477	228	366	446	419	449	111	31	58	28
1926.....	566	232	465	526	499	542	101	40	67	24
1927.....	611	271	500	555	542	576	111	56	69	35
1928.....	662	337	547	571	567	626	115	91	95	36
1929.....	928	530	696	801	798	887	232	127	130	41
1930.....	887	535	593	760	822	838	294	127	65	49
1931.....	931	608	602	792	851	871	329	139	80	60
1932.....	952	642	561	816	887	902	391	136	65	50
1933.....	1,104	730	722	886	1,029	1,049	382	218	75	55
1934.....	1,175	680	901	972	1,057	1,090	274	203	118	85
1935.....	930	504	782	716	845	873	148	214	85	57
1936.....	742	373	604	615	677	699	138	127	65	43
1937.....	502	218	411	465	452	462	91	37	50	40

* Food Research Institute estimates mainly from WHEAT STUDIES, December 1937, XIV, 167, but including revisions up to January 20, 1938.
^a As of July 1.

TABLE II.—WORLD WHEAT SUPPLIES, ANNUALLY FROM 1921-22*
(Million bushels)

Year	World ex-Russia	United States	Canada	Argentina	Australia
1921-22..		946	326	216	...
1922-23..	3,751	958	441	206	117
1923-24..	4,020	892	507	258	131
1924-25..	3,755	979	310	201	174
1925-26..	3,870	780	426	201	120
1926-27..	4,034	933	447	265	168
1927-28..	4,236	986	536	297	130
1928-29..	4,602	1,028	659	364	169
1929-30..	4,392	1,055	432	183	143
1930-31..	4,733	1,180	548	252	228
1931-32..	4,748	1,271	460	240	208
1932-33..	4,764	1,148	579	255	225
1933-34..	4,802	934	500	296	196
1934-35..	4,543	800	479	256	173
1935-36..	4,379	774	496	158	161
1936-37..	4,083	765	356	253	158

* World supplies equal initial stocks approximately on August 1 (as in Table I but including India), plus crops ("old series" which is exclusive of Turkey, Manchukuo, etc., as in WHEAT STUDIES, December 1935, XII, 161, 179), plus Russian exports. For each of the four chief exporters, supplies equal initial stocks (July 1 in the U.S., August 1 in Canada, as in Table I, but as of December 1 in Australia and January 1 in Argentina) plus crops.

TABLE III.—INDEXES OF THE PURCHASING POWER OF DOMESTIC WHEAT IN THE FOUR CHIEF EXPORTING COUNTRIES, ANNUALLY*
(1926 = 100)

Aug.-July	United States	Canada	Argentina	Australia
Average				
1909-14.....	93	102	86 ^a	101
1916-17.....	113	129	99	81
1917-18.....	136	129	79	77
1918-19.....	109	123	89	77
1919-20.....	106	106	119	103
1920-21.....	99	109	116	132
1921-22.....	85	88	102	91
1922-23.....	74	77	91	79
1923-24.....	75	70	84	75
1924-25.....	101	112	107	104
1925-26.....	105	100	100	100
1926-27.....	95	99	93	86
1927-28.....	95	95	88	89
1928-29.....	77	87	75	78
1929-30.....	79	90	82	79
1930-31.....	61	54	55	49
1931-32.....	50	54	54	66
1932-33.....	59	55	52	60
1933-34.....	79	64	47	54
1934-35.....	87	75	52	..
1935-36.....	90	76	74	..
1936-37.....	102	103	88	..

* For the United States and Canada, indexes are constructed from the deflated prices in Table IV, with the calendar year 1926 as base. For Argentina, indexes are constructed from August-July average deflated prices, corresponding to the January-December averages in Table V, with the calendar year 1926 as base. For Australia, instead of Melbourne wheat prices, we have used the more representative weighted average prices of Australian wheat for the principal Australian shipping ports as given in Australia, Royal Commission on the Wheat, Flour and Bread Industries, *Second Report*, p. 19.

^a Average of 1913 and 1914.

TABLE IV.—ANNUAL AVERAGE WHEAT PRICES IN THE UNITED KINGDOM, AND IN THE NORTHERN HEMISPHERE EXPORTING COUNTRIES, FROM 1921-22*

Aug.-July	British parcels ^a			No. 2 Hard Winter (Kansas City) ^b				No. 3 Northern Manitoba (Winnipeg) ^c			
	Currency	Deflated	Gold	Currency	Deflated	Gold	British units	Currency	Deflated	Gold	British units
1921-22.....	56	49	48	120	128	120	47	123	124	117	45
1922-23.....	47	44	44	113	111	113	40	106	108	104	36
1923-24.....	45	41	40	107	109	107	39	97	99	95	35
1924-25.....	62	55	60	151	150	151	52	160	156	160	54
1925-26.....	56	56	56	162	158	162	53	142	140	142	47
1926-27.....	54	55	54	136	141	136	45	136	138	136	45
1927-28.....	50	52	50	138	144	138	45	130	134	130	43
1928-29.....	43	46	43	111	114	111	36	115	121	115	38
1929-30.....	42	48	42	113	121	113	37	118	126	118	39
1930-31.....	25	34	25	73	94	73	24	58	75	58	19
1931-32.....	25	36	19	50	74	50	21	52	75	46	20
1932-33.....	25	36	17	51	82	49	23	51	77	41	19
1933-34.....	22	31	14	85	119	55	28	63	90	39	20
1934-35.....	26	36	16	100	129	60	33	75	105	45	25
1935-36.....	29	40	18	107	133	63	34	78	107	46	25
1936-37.....	42	50	25	128	152	76	42	118	144	70	38

* Arithmetic averages of monthly prices in domestic currency, deflated by an index of wholesale prices of "all commodities," adjusted to gold value of currency (see footnote to Chart 5), and converted to British units at current rates of exchange.

^a Basic data from *London Grain, Seed and Oil Reporter*; averages of all sales of wheat parcels on British markets, in shillings per quarter of 480 lbs. Deflation by the Board of Trade index, converted to 1926 = 100.

^b July-June averages of monthly data from U.S. *Department of Agriculture Yearbooks*; weighted averages of carlot sales in cents per bushel. Deflation by the U.S. Bureau of Labor Statistics index, 1926 = 100. Conversion to British shillings per quarter at monthly average exchange rates published in *Federal Reserve Bulletin*.

^c Data from *Canadian Grain Statistics, and Prices and Price Indexes* (data prior to August 1922 received direct from Dominion Bureau of Statistics), in Canadian cents per bushel. Deflation by Dominion Bureau of Statistics index, 1926 = 100, published in *Prices and Price Indexes*. Conversion to British shillings per quarter at monthly average sterling rates supplied by Dominion Bureau of Statistics and in *Prices and Price Indexes*.

TABLE V.—ANNUAL AVERAGE WHEAT PRICES IN ARGENTINA AND AUSTRALIA, FROM 1921-22*

Year ^a	Buenos Aires ^b					Melbourne ^c				
	Currency, year ending		Deflated	Gold	British units	Currency, year ending		Deflated	Gold	British units
	July	Dec.				July	Dec.			
1922.....	13.64	12.42	12.40	10.54	44.0					
1923.....	11.78	11.61	11.37	9.45	38.2	5.33	4.94	4.67	4.71	40.0
1924.....	11.48	12.94	11.96	10.56	44.0	4.64	5.24	5.10	4.90	43.0
1925.....	15.29	14.54	13.36	13.76	52.7	6.10	6.07	6.03	6.03	49.3
1926.....	13.38	12.95	12.95	12.38	47.1	6.08	6.12	6.12	6.14	49.1
1927.....	11.90	11.45	11.67	11.42	43.4	5.64	5.43	5.48	5.44	43.4
1928.....	11.27	10.59	10.75	10.59	40.2	5.48	5.15	5.26	5.13	41.0
1929.....	9.50	9.75	10.11	9.60	36.5	4.68	4.86	4.94	4.82	38.6
1930.....	10.07	8.92	9.65	7.76	29.5	4.81	3.88	4.41	3.68	29.5
1931.....	6.30	5.69	6.38	3.90	16.1	2.56	2.44	3.12	1.73	14.5
1932.....	6.26	6.49	7.24	3.93	20.6	2.91	3.07	3.98	1.77	19.7
1933.....	5.89	5.39	6.31	3.20	17.8	2.96	2.82	3.67	1.53	18.1
1934.....	5.68	6.12	6.22	2.88	17.8	2.60	2.62	3.26	1.28	16.7
1935.....	6.55	7.35	7.56	3.55	21.3	2.92	3.18	3.96	1.51	20.3
1936.....	9.43	10.60	10.68	4.90	30.8	3.56	4.16	4.93	2.00	26.6
1937.....	12.16	13.30	11.80	6.10	38.6	5.08	5.06	5.60	2.42	32.4

* For general footnote see Table IV.

^a Calendar years except as noted.

^b Averages of monthly data from *Boletín Estadística Agropecuaria*; paper pesos per quintal. Deflation mainly by the index of the Banco de la Nación Argentina, 1926 = 100, published in *Economic Review*, January-March 1934, VII, 30, continued in monthly issues of *Wholesale Prices*, U.S. Bureau of Labor Statistics; prior to January 1926, monthly index numbers estimated from annual figures. Conversion to British shillings per quarter, 1921-25, at monthly average of daily rates on London from *Monthly Bulletin of London and Cambridge Economic Service*; 1926-33, at monthly average telegraphic exchange of the pound sterling on Buenos Aires from Banco de la Nación Argentina, *Economic Review*, April-June 1934, VII, 45; 1934 to date, at the official purchase rate, fixed at m/\$n 15 per pound sterling.

^c For August 1922-July 1929, monthly averages of weekly prices furnished by John Darling & Son, Melbourne; from August 1929, monthly averages of daily data published in *Wheat and Grain Review* (Melbourne); throughout the period, prices are in Australian shillings per bushel, basis on trucks, Williamstown. Deflation by the Commonwealth Bureau of Statistics index for Melbourne, converted to 1926 = 100, published in *Quarterly Summary of Australian Statistics*. Conversion to British shillings per quarter at rates of exchange, Australia on London, published in Commonwealth Bureau of Census and Statistics, *Summary of Australian Financial Statistics* (Bull. 28, December 1937), p. 53.

WHEAT STUDIES *of the* FOOD RESEARCH INSTITUTE

VOLUME XII

- No. 1. *World Wheat Survey and Outlook, September 1935.* September 1935. \$.50
- No. 2. *World Wheat Prices, Canadian-Argentine Spreads, and the Ottawa Agreement.* October 1935. \$.50
- No. 3. *Japanese Self-Sufficiency in Wheat.* November 1935. \$.75
- No. 4. *The World Wheat Situation, 1934-35: A Review of the Crop Year.* December 1935. \$1.00
- No. 5. *World Wheat Survey and Outlook, January 1936.* January 1936. \$.50
- No. 6. *The Stale-Bread Problem.* February 1936. \$.50
- No. 7. *Canadian Wheat Stabilization Operations, 1929-35.* March 1936. \$.50
- No. 8. *New Data on United States Flour Production since 1899.* April 1936. \$.75
- No. 9. *World Wheat Survey and Outlook, May 1936.* May 1936. \$.50
- No. 10. *World Wheat Utilization since 1885-86.* June 1936. \$1.00

VOLUME XIII

- No. 1. *World Wheat Survey and Outlook, September 1936.* September 1936. \$.60
- No. 2. *The Timing of Wheat Marketing in Western Canada.* October 1936. \$1.00
- No. 3. *Wheat Problems and Policies in Germany.* November 1936. \$1.25
- No. 4. *The World Wheat Situation, 1935-36: A Review of the Crop Year.* December 1936. \$1.25
- No. 5. *World Wheat Survey and Outlook, January 1937.* January 1937. \$.60
- No. 6. *World Wheat Acreage, Yields, and Climates.* March 1937. \$1.25
- No. 7. *Soviet Agricultural Reorganization and the Bread-Grain Situation.* April 1937. \$1.00
- No. 8. *World Wheat Survey and Outlook, May 1937.* May 1937. \$.60

VOLUME XIV

- No. 1. *World Wheat Survey and Outlook, September 1937.* September 1937. \$.60
- No. 2. *Price Effects of Canadian Wheat Marketing.* October 1937. \$1.00
- No. 3. *Trends of Yield in Major Wheat Regions since 1885. Part I.* November 1937. \$.75
- No. 4. *The World Wheat Situation, 1936-37: A Review of the Crop Year.* December 1937. \$1.25
- No. 5. *World Wheat Survey and Outlook, January 1938.* January 1938. \$.60
- No. 6. *Trends of Yield in Major Wheat Regions since 1885. Part II.* March 1938. \$.75
- No. 7. *Monetary Influences on Postwar Wheat Prices.* April 1938. \$1.00

RECENT CONTRIBUTIONS FROM THE FOOD RESEARCH INSTITUTE

(Numbered reprints available free on request)

- G 74. "Differential Price Behavior as a Subject for Commodity Price Analysis," Holbrook Working. *Econometrica*, October 1935
- G 75. "Agricultural Fundamentalism," Joseph S. Davis. In *Economics, Sociology & the Modern World*, edited by Norman E. Himes (Cambridge, Harvard University Press, 1935)
- G 76. "International Trade in the Recovery Program," Joseph S. Davis. *Proceedings of the Western Farm Economics Association, 1936.* (Mimeographed)
- G 77. "On Measurement of Relative National Standards of Living," M. K. Bennett. *Quarterly Journal of Economics*, February 1937
- G 78. "Statistics and Social Engineering," Joseph S. Davis. *Journal of the American Statistical Association*, March 1937
- G 79. Discussion of "Past and Present Theory regarding Futures Trading" (by G. Wright Hoffman), Holbrook Working. *Journal of Farm Economics*, February 1937
- G 80. "Observations on Agricultural Policy," Joseph S. Davis. *Journal of Farm Economics*, November 1937
- G 81. "Standards of Living as a Factor in International Relations," Carl L. Alsberg. *International Affairs*, November-December 1937
- G 82. "Some Unsettled Questions in Commodity Price Theory," Holbrook Working. *Report of Third Annual Research Conference on Economics and Statistics, June 28 to July 23, 1937*
- G 83. "The Economics of the Ever-Normal Granary," Joseph S. Davis. *Journal of Farm Economics*, February 1938

FOOD RESEARCH INSTITUTE

STANFORD UNIVERSITY, CALIFORNIA

A research department of Stanford University, established in 1921 jointly by Carnegie Corporation of New York and the Board of Trustees of the Leland Stanford Junior University, for research in the production, distribution, and consumption of food.

DIRECTOR

JOSEPH S. DAVIS

ECONOMISTS

MERRILL K. BENNETT
HOLBROOK WORKING

ASSOCIATE ECONOMISTS

HELEN C. FARNSWORTH
VLADIMIR P. TIMOSHENKO

CONSULTANT

CARL L. ALSBERG
University of California

DIRECTOR-EMERITUS

ALONZO E. TAYLOR
Minneapolis, Minnesota

PUBLICATIONS

WHEAT STUDIES

Now published monthly from September through May except in February. Subscription, \$6.00. The volume includes a comprehensive annual review of *The World Wheat Situation*, three *Survey and Outlook* issues at four-month intervals, and four special studies. Bound Volumes I–XIII, \$6.00 each. (Recent issues listed on inside back cover.)

GRAIN ECONOMICS SERIES

Books on topics in grain economics not suited to full discussion in *Wheat Studies*. Latest issue: V. P. Timoshenko, *Agricultural Russia and the Wheat Problem*. September 1932. 572 pp. \$3.00.

FATS AND OILS STUDIES

Books on fats and oils of animal and vegetable origin, dealing primarily with economic aspects—production, trade, prices, and utilization—but with due reference to technical knowledge. Latest issue: G. M. Weber and C. L. Alsberg, *The American Vegetable-Shortening Industry: Its Origin and Development*. June 1934. 359 pp. \$3.50.

MISCELLANEOUS PUBLICATIONS

Books embodying the results of research in fields other than those covered by the series listed above. Latest issue: H. L. van de Sande-Bakhuyzen, *Studies on Wheat Grown under Constant Conditions*. June 1937. 400 pp. \$4.00.

CONTRIBUTIONS

Reprints from periodicals of articles by members of the Food Research Institute.

List of publications available free on request. Address all communications to

FOOD RESEARCH INSTITUTE

STANFORD UNIVERSITY, CALIFORNIA

European Sales Agents:

Great Britain: P. S. KING & SON, LTD., 14, Great Smith Street, Westminster, S. W. 1, London
Continental Europe: MARTINUS NIJHOFF, 9 Lange Voorhout, The Hague, Holland