WHEAT STUDIES

OF THE

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THE WORLD WHEAT PROBLEM

PERSISTING surplus characterizes the current world wheat problem. For four years world wheat stocks have been excessive, by 200 to 300 million bushels or more. Available supplies have continuously exceeded annual consumption plus normal carryovers, even after large diversion into low-price outlets. Margins between export surpluses and import requirements have been abnormally wide. Wheat prices in many countries have fallen distressingly low.

The bumper crop of 1928 was mainly responsible for the emergence of huge surplus. Deepening economic depression since 1929 has contributed to its persistence; but extensive government policies, adopted without regard to their bearings on the world situation, have been more largely responsible. Russia's exports, the outcome of Soviet-planned policy, have been important in the past two years. Measures of many other nations have caused contraction of consumption or restrained its expansion, stimulated production, and increased the effective burden of the surplus.

In the absence of such policies, Nature and economic forces combined to solve the wheat-surplus problem of the 1890's, and production expanded greatly in 1898–1914 without giving rise to another. Now no durable solution is in sight. Apparently Nature can merely alleviate or intensify the problem, while economic forces are so greatly modified. At best, the normal price of wheat in the present decade will probably seem low. The logical outcome of current trends, however, entails needless distress.

Many proposed solutions would prove impractical or illusory. A rational approach to solution lies through expansion of consumption and temporary contraction of production, supported by a re-orientation of national policies toward consumer interests. Removal of restraints on consumption and stimuli to production, accepting low prices as inevitable for the time being, facilitating wide dispersion of stocks, and constructively promoting general economic recovery: these steps would go far toward solving the problem.

STANFORD UNIVERSITY, CALIFORNIA

July 1932

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

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

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

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THE WORLD WHEAT PROBLEM

I. THE PROBLEM AND ITS SETTING

Wheat problems are legion, perennial. Today, however, we have reason to speak of *the world wheat problem,* overshadowing all the manifold specific wheat problems. With its ramifications, it vexes all wheat interests in most nations of the world. It is a problem of world wheat surplus. More wheat has been produced, is currently available, and is being produced than wheat markets will absorb except at prices that are unremunerative to large groups of wheat producers and ruinous to many of them.

This is a world problem. To ignore its international aspects is to hinder the solution of even the national wheat problems. It is a persisting problem. It came to the fore in 1928–29, after a huge world crop; it failed of solution in 1929–30, became more severe in 1930 and 1931, and continues without material alleviation in 1932. The core of the wheat-surplus problem is this: how may world wheat consumption be increased and/or new wheat supplies so reduced that wheat stocks, and carryovers plus new crops, will no longer be abnormally heavy, and so that prices may rise to levels remunerative to those producers who can survive the strains of readjustment? It is misconceived as a problem of price raising; it is rather a problem of facilitating adjustments such that, among other things, higher prices will come to prevail.

It is worth while to turn aside from current developments in the world wheat situation, and from detailed analysis of specific factors and phases, in order to consider this broad problem. What is the nature of the world wheat surplus? How did it arise? Why does it persist? Where is it? What is the bearing of current policies upon the surplus problem? How can it, and how can it not, be solved?

On all of these points there is a vast amount of misunderstanding. This has not merely given rise to all kinds of impractical proposals; it has also led to the adoption of policies that have complicated the problem and made it more difficult to solve. There is urgent need of clarifying the problem and the conditions favorable to its solution. The effort has an even larger justification. The world wheat problem, distinctive though it is in many respects, is one of a large family of problems with which a bewildered, anxious world is vainly trying to deal effectively. A careful examination of one of these has a bearing upon many others.

In these days when the economic machinery of the civilized world is functioning so poorly, there is increasing talk of social or economic planning as a basic means of improvement. Poverty in the midst of plenty, and restriction of consumption when so much labor and productive equipment are idle, yield appalling evidence of maladjustments. Whatever economic planning may or may not achieve, it is clear that, in so far as it is undertaken, it must deal with specific problems as well as with improved co-ordination within the social structure. It must seek to clarify the elements of a significant problem, and to set it forth as a whole, with its related parts; to distinguish the active forces and the obstacles that are responsible for an impasse that exists; and to suggest possible ways of breaking the jam. From this point of view, the present study represents a modest effort to analyze the world wheat problem and the basis for its solution, as these might be viewed by a competent planning organization of national or international scope. Like most such efforts, it will appear weakest in its constructive phases.

The wheat problem, in its present form, is not wholly novel. In the past there have been many brief periods of world wheat

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surplus when, for a year or two, severe price declines occurred. There have been a few periods in which a surplus condition somewhat comparable with that of the present has persisted for two or three years, as in the 1890's accompanying a world-wide depression, and in 1922–24 as the world was climbing out of the post-war depression. But in magnitude, scope, and duration of price declines, in the depths to which wheat values have fallen, and in the size of world wheat surplus and the obstinacy with which it persists, the present situation appears without parallel in history.

According to economic theory, a surplus condition such as exists in wheat should right itself: sooner or later, theory holds, very low wheat prices will force a readjustment of demand and supply such that a new equilibrium will emerge, with prices above the low. Economic history appears to support theory. Very low wheat prices in the middle 'nineties were followed by modest advances in 1895–97, sharply higher prices in 1897–98, and a readjusted level well above that of 1894–95 in the fifteen years before war broke out in Europe. Wheat prices were low in 1922–23 and 1923–24, but they rose sharply in 1924–25 and for several years ruled well above the low levels of 1922–24.[1] This time such a readjustment has not yet occurred. Wheat prices were low again in 1928–29; but they have since dropped to successively lower levels, until in 1931–32 wheat has been generally cheaper than ever before in terms of its purchasing power over commodities in general.

It is a common notion that there is a stable "parity" between prices of one commodity and the general average. This is a delusion, and, like many false notions, has done great damage. Such "normals" are subject to change as time brings improvements, different in their application to different products, in the technique of production, transportation, storage, and exchange, and alterations in consumption habits. It is quite probable that the "normal" level of wheat values (i.e., in terms of commodities in general) is lower today than in past generations, or shortly before the World War, or even in the first few years after the war. There is no reason to believe that the relationship of wheat prices to any general index of commodity prices in the five years before the war represents the normal relationship to be expected in the 1930's.

Yet there is good reason to believe that we are under no delusion in considering wheat prices of 50 to 60 cents (gold) in Liverpool abnormally low, even with the general price level where it is in 1932. Certainly the present relation between wheat supplies and disposition is one of abnormal maladjustment. For several years, stocks of wheat have been far above levels necessary to insure continuity of wheat flow, despite the diversion of exceptional quantities to low-price uses. The urgent problem of readjustment between wheat supplies and requirements has not vanished. It persists in 1932, not less acutely than in 1930 or 1931. If there are some grounds for thinking that the worst stage may be passing, for a time at least, there is yet no assurance that effective and sustained readjustment, or a solution of the wheat-surplus problem, is at hand.

In primitive societies, the event of surplus was regarded as fortunate; it meant that the group could take its ease for the time being. In modern economic society, with its intricate division of labor, an accumulation of commodity surpluses is a misfortune, for many of society's members take their ease perforce, without having a claim for a share in the surpluses and indeed without having a desire for much of the particular surpluses that exist. In the resulting widespread depression and unemployment, the character of the demand for goods is substantially altered, and, when this occurs, the effect is for a time to intensify, not to relieve, surplus situations.

The world wheat problem in the past has more commonly appeared one of shortage, present or future, than one of surplus. Malthus, whose essays on population profoundly influenced nineteenth-century thought, was pessimistic regarding the possibilities of rise in the standard of living because he believed that population growth tended constantly to exceed expansion in the food supply, of which wheat was the great staple. But other checks to the growth of population, coupled with increasingly effective use of natural sources of materials

[1] In Section VI, below, these recoveries are discussed, and it appears that other factors than low prices played an important rôle in each.

and power, have been so potent that his pessimism has proved broadly unwarranted, for the world at large.

In 1897–98, after a period of low prices, a short world crop brought a striking advance in wheat prices. In the midst of this Sir William Crookes, in his presidential address before the leading scientific association in Great Britain,[1] set forth the wheat problem as one of stringency for the moment and impending scarcity for the future. He made the gloomy forecast of a world wheat shortage by 1931, even if all the land suitable for wheat growing were then in cultivation—unless, perchance, the chemist could save the situation. "England and all civilized nations," he said, "stand in deadly peril of not having enough to eat. . . . . It is almost certain that within a generation the ever increasing population of the United States will consume all the wheat grown within its borders, and will be driven to import, and like ourselves, will scramble for a lion's share of the wheat crop of the world." The fixation of atmospheric nitrogen has become a fact, as Crookes rightly anticipated, but cheapened nitrogenous fertilizers have not been responsible for much of the increase in wheat production. Nevertheless, the actual position is in striking contrast to the prophecy.

During the World War a real wheat shortage developed, and, in spite of marked expansion in acreage in some regions, shortage persisted for a year or two after the armistice. Many American farmers felt aggrieved because the minimum prices for the 1917 and 1918 crops were fixed as low as $2.20 and $2.26 a bushel, basis No. 1 Northern Spring, Chicago; and prices went a good deal higher in 1919 and 1920. After a period of relative abundance and low prices, a shortage reappeared in 1924–25, and the world wheat position was "tight" for two years. Conceivably another such period of tightness may be around the corner; but confident expectations that the corner would be definitely turned in 1929–30 were rudely disappointed, and the present situation, in important respects, appears less promising for transforming ease into tightness than was that of 1923–24.

[1] Delivered September 7, 1898, before the British Association for the Advancement of Science, and published in book form in July 1899.

We venture to suggest that it is time to discard as illusory the view that our surplus problems—with respect to wheat and many other staple commodities—are purely transitory. The degree of surplus will vary, of course. Periods of relative scarcity will doubtless recur. Regional shortages will continue to occur. But the vast increase in the world's available productive capacity and the slackened rate of population growth make it probable that in most of the world of commerce, apart from war, the major economic problems will remain those of relative surplus, not of scarcity.

This does not mean, of course, that the world's capacity to produce desirable goods and services, with present knowledge, is in excess of the world's capacity to utilize that gross volume of goods and services. If such a gross excess of productive capacity be indeed conceivable, it is certainly not imminent. The wants of mankind are almost indefinitely expansible; and no one society, much less the world at large, has yet approached the position of amply satisfying the wants of all its people. If one were to interpret "means of subsistence" so broadly as to comprehend all the goods and services that men desire to have and enjoy, there is no doubt that population always has pressed, and probably always will press, upon the means of subsistence; but such an extension of the term is unwarranted. The greater the excess of productive capacity above the requirements for meeting the *essential* needs of man, the greater is the competition of one commodity with another, the greater is the specialized capital investment, the greater is the possibility for miscalculating the consumption of any one product, and the greater, therefore, are the chances of surplus capacity and surplus production in particular lines. The extensive development of fixed plant and specialized labor that leads to increased productivity per capita, at the same time lessens the facility with which productive power may be redirected; and so tends to make for the emergence of surpluses and the occurrence of severe depressions, whether the system of ownership be private capitalism, state socialism, or communism.

Our thinking and our national policies have been too long and too profoundly influenced by scarcity theories. The "means

of subsistence" which nowadays command the energies of man are not mainly "necessaries of life"; largely and increasingly they are non-essentials, either bound up with or separate from the essentials for maintaining life and health. The urgent economic problem of today is not to make the most of limited resources to sustain life; it is to find outlets to permit continuous, efficient utilization of available resources (including material capital, scientific and technical knowledge, and human working power) that are so abundant as to make possible marked advances in the standard of comfort. Within and among nations, the scramble for land and raw materials is out of date. It is no tragedy but a welcome fact that the era of "free land" is past. The major problems of business are increasingly those of developing markets for products, not of obtaining capital, materials, and labor or mastering the technique of production. The day of the consumer is here; and if this were widely recognized, the New Era of uninterrupted prosperity for producers might prove less of an illusion. Attitudes and policies that are suited to a "scarcity economy" are inappropriate to the "surplus economy" in which, in time of peace, most of the civilized world now lives without being aware of it. The wheat surplus merits consideration from this point of view.

II. THE NATURE OF A WORLD WHEAT SURPLUS

The idea of a world wheat surplus is none too easy to grasp. Many deny its existence, and scoff at those who consider it the heart of the world wheat problem. Some assert that the surplus is not real, but only apparent; that the appearance is due to grave defects in our system of distribution of goods or of wealth, or indeed to private ownership and control under the capitalistic organization of modern society. How, it is asked, can there be a true surplus of wheat when millions are hungry for bread, and even starving?

The answer to the skeptics and scoffers emerges from examination of various concepts of "surplus." The term has many meanings. As applied to wheat, it is used in several senses that are often confused. It is pertinent to review some of these in the process of arriving at the concept (already expressed in brief) that is most significant for the problem in hand.

Exportable Surpluses and Carryovers

A wheat grower's surplus is what he has for sale, out of his carryover and new crop, after reserving what he wants for seed and feed, and perhaps for domestic grinding or local custom milling for his household consumption. The surplus of a surplus-producing state is what it has for shipment beyond the state's borders, over and above its requirements chiefly for seed, food, and feed. Here one may distinguish between gross surplus and net surplus: some parts of a surplus-producing state may find it economical to ship in wheat or flour, or blending requirements may lead to inward shipments of wheat of types not grown or grades not available within the state; the net surplus of the state may be less than the gross surplus of home-grown wheat that is available for outward shipment. There are, of course, wheat-deficit states and regions as well as wheat-surplus areas. What is true of a state is true of a nation. Its "exportable surplus" (gross or net) consists of the excess of its carryover plus new crop over its requirements for seed, food, feed, and industry, plus a normal outward carryover.[1]

The word "requirements," however, is less definite than it seems. Sound milling wheat is sometimes fed on farms not because it is "required," but because the market price is unremunerative; the available exportable surplus is thereby reduced. Conversely, high export prices sometimes draw from a country so large a quantity that some of its requirements are left unsatisfied; thus the available supply for export is effectually increased.

In the world as a unit, however, there is obviously no "surplus" in the sense of exportable surplus. The sum of the export surpluses of exporting countries may, for

[1] On the concept of a "normal carryover," see below, p. 413. "Exportable surplus" may also be defined with reference to a minimum carryover, or the carryover that is likely to exist at prices that prevail or are anticipated.

convenience, be called the world export surplus, but this is not analogous to the export surplus of a single nation. There are wheat-deficit nations, as well as wheat-surplus nations. What some nations export, others import. The earth as a whole has no exportable surplus. Moreover, the aggregate export surplus of the wheat-exporting nations bears no necessary relation to the world wheat surplus of which we have to speak. Of this, more will be said below.

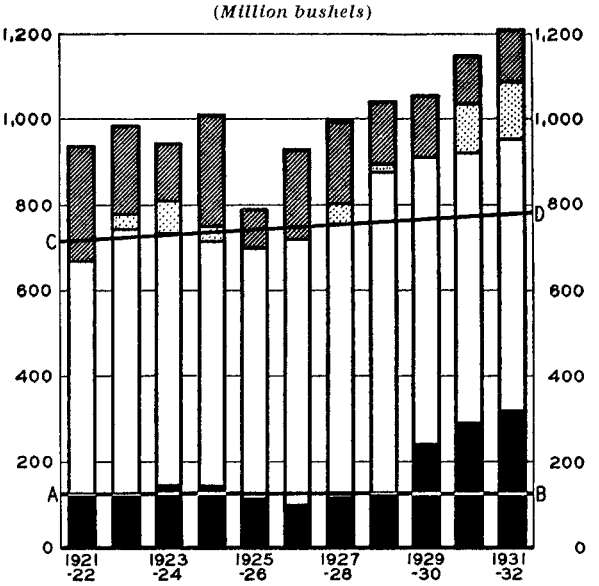
The term surplus is also sometimes applied to the supply of old wheat on hand when the new crop is harvested and marketed. Many wheat growers have some old wheat on hand at harvest time. The flow of wheat being continuous, there is always more or less wheat at every stage in the channels of trade from farm to mill. At the end of a "crop year," the "carryover" of old wheat, in various positions, represents a surplus over what has been used up; this remains to be added to the supply of new wheat.

It leads to confusion, however, to apply the term surplus to the total carryover. A substantial amount of wheat must be on hand in various positions, even when new wheat begins to come to market, if trading and milling operations are to be conducted smoothly and efficiently. A normal carryover permits and facilitates this. It is an "administrative item." When the volume of wheat carried over exceeds what is needed to serve this purpose, it is excessive or abnormally large. The excess over a normal carryover (which is by no means readily measurable) may be termed the "surplus carryover." The surplus carryover or the carryover surplus, when totaled for all countries of the world, is a significant factor in the world wheat surplus, and the persistence of abnormal carryovers, year after year, bears witness to a world wheat-surplus condition. But these do not constitute the world wheat surplus.

A convenient illustration of the foregoing concepts of national surplus, with reference to the United States, is given in Chart 1. It is not intended as an exact representation of the actual situation, for precise determination of the lines *AB* (normal carryover) and *CD* (ordinary domestic requirements, including normal carryover) is not possible, and line *CD*, at least, cannot properly be represented as a straight line. The entire bar in each year represents total supplies from carryover and new crop. The carryover is shown by the black part of each bar; the surplus carryover by that

CHART 1.—WHEAT SUPPLIES AND APPROXIMATE SURPLUSES IN THE UNITED STATES, FROM 1921–22*

(Million bushels)



* Official data for carryover, new crop, total supplies, and net exports (including shipments to possessions). The dotted portion represents roughly surplus domestic disposition, reached by deducting from domestic disappearance unaccounted for by seed and food 40 million bushels for ordinary feed and waste. Line *AB* is drawn on the assumption that a normal carryover is 125 million bushels; line *CD* is a rough approximation to the trend of ordinary domestic requirements. See WHEAT STUDIES, December 1931, Appendix Table XLI, and *ibid.*, May 1932, Appendix Table XIII.

portion above the line *AB*.[1] The total portion of each bar above the line *CD* represents the annual surplus of total supplies over ordinary domestic requirements including a normal outward carryover; this represents approximately the surplus potentially available for export in successive years. The cross-hatched portion of each bar represents net exports plus shipments to possessions. The portion of the bar above line *CD* that is not cross-hatched represents the unexported surplus over domestic requirements. The dotted portion represents roughly what was diverted into

[1] This excludes, however, unsold wheat in store in Canada, which in 1931 and 1932 constituted an appreciable additional quantity.

domestic surplus channels (chiefly feed use). The unshaded portion of the bar above line *CD* represents the unexported and unconsumed surplus that remains as the surplus carryover into the following year. Where the cross-hatched portion extends below line *CD*, it signifies either reduction of carryover below a normal level, or contraction of ordinary domestic requirements, or both.

The ideas of exportable surplus, carryover, and surplus carryover, valuable though they are, do not lead directly to the proper concept of a world surplus — of wheat or anything else.

Economic Surpluses

Another idea of surplus is sometimes expressed, often only to have its reality denied. This is that more has been produced or is available than can possibly be used by man. There are such surpluses of water and air—"free goods" of Nature. Conceivably there could be such surpluses of perishable foodstuffs not susceptible of canning or drying; it might be impossible (even disregarding costs) to distribute the products far enough and fast enough to get them consumed, free of charge, before they spoil. Wheat is not readily perishable and has never been so abundant over large areas that there has been a wheat surplus in this sense. It is proper to deny the existence of a world wheat surplus, so defined; but to do so is to strike at a "straw man."

In fact, however, it is not feasible, in the world as it is or as it is ever likely to be, to disregard costs, to ignore the factors of distance and purchasing power. The individual farmer or business man who disregards costs so far as to incur net losses on his operations cannot long remain in business. The same is true of a corporation. Even a nation, whatever its form of organization, ownership of accumulated capital, or operating procedure, cannot indefinitely afford a policy of disregarding costs. Widespread famine may occur in the interior of China or Russia, undernutrition may be common in India and Mexico, while foodstuffs are glutting accessible world markets, because no one is in position to bear the cost of paying even low prices plus costs of shipment to those in need. Whether or not society ought to be so organized that regional gluts should never be permitted while shortage exists anywhere, the fact remains that such coexistence frequently occurs because cost barriers intervene.

"Economic surpluses," therefore, exist when the supply of a commodity is so large that buyers for consumption, manufacture, or storage cannot be found to purchase the total supply at prices that will cover marketing costs and yield prices sufficiently remunerative to the great body of producers to make it worth their while to keep on producing the commodity. The surplus is the amount by which a crop (or crop plus carryover) exceeds the supply that can, under the circumstances, be disposed of at prices that would serve, in the long run, to maintain production at such levels as changing demands may call for.[1] For a time, of course, producers may continue for lack of a better alternative, or in the hope of a turn for the better, but with a sacrifice of invested capital, upkeep of equipment, or living standards that cannot be endured indefinitely. Occasional surpluses are tolerable; persisting surpluses are disastrous.

It is in this sense of economic surplus that we speak of the world wheat surplus. To repeat: "More wheat has been produced, is currently available, and is being produced than wheat markets will absorb except at prices that are unremunerative to large groups of wheat producers and ruinous to many of them." Commonly, a shortage exists when the supply is less than could be disposed of at prices that warrant producers in maintaining their production or increasing it to take care of gradual growth of demand; then prices tend to become so profitable to producers

[1] If the commodity is a perishable one, like fresh fruit, much of a surplus crop may be left unharvested, particularly where the market price at point of shipment does not cover picking, packing, and hauling costs. Even when part of the crop is thus "stopped at the source," the portion actually marketed commonly exceeds what would yield a normal return above direct costs of harvesting and shipping. If the commodity is not readily perishable, nearly all of the crop is harvested, shipped, and sold; most of the surplus is purchased for storage and subsequent resale. When a wheat surplus comes into existence, some increase in wastage may occur, but usually little of the surplus disappears through lack of harvesting or by spoilage at the source, as is common with fruits and vegetables.

as to stimulate more rapid increase of production. Temporary shortages are common and relatively harmless, but persisting shortages often lead to surplus conditions.

An illustration will help to give concreteness to these concepts. In a given year, a world supply of 4,000 million bushels of wheat, from carryover and new crops, would be normal. It would be just sufficient to provide—at prices neither discouraging nor stimulating to wheat growers—seed for the next crop; milling requirements to meet customary demands for flour, semolina, and their products by those accustomed to their use; the usual amount of millable wheat for commercial feed (in addition to inferior grades or qualities fed to livestock on the farms where it is grown); the usual insignificant quantity for industrial uses; and such a carryover at the end of the year as grain dealers, millers, and farmers want as a working stock.

Under such conditions a supply of 3,800 million bushels would be short, by 200 million bushels. This would not mean famine anywhere; but it would require resort to one or more economizing procedures, such as curtailment of wheat purchases for food by those less able to pay, reduced use of millable wheat for poultry feed, "stretching" by extracting more flour from wheat grain or by adding other cereals or potatoes to the flour, milling of inferior qualities ordinarily fed to livestock, and reduction of stocks to an inconvenient degree. To force such economies, a substantial advance in prices would need to occur.

On the other hand, with the same assumption as to requirements, a supply of 4,300 million bushels would be excessive; it would imply a surplus of 300 million bushels. Part of this surplus would remain in the carryover, but part of it would be used up during the year. The enlarged quantity would exert pressure for expansion of food use and feed use, increased holding for deferred use or sale, or probably all three. Such expansion requires inducements. More or less substantial reductions in price would be required to induce people not accustomed to eating much if any wheat to eat more; to induce farmers to feed good wheat to livestock to an unusual extent; and to induce farmers, dealers, millers, and speculators to carry forward larger stocks than usual in the hope of a later profit.

It is seldom possible thus to calculate the world wheat shortage or surplus precisely, in this sense, even after the statistics become available. Estimates of both crop and carryover are subject to error. We cannot make accurate estimates of the ordinary requirements or actual disappearance for food use, in any given year for the world at large, or of the amount of unmerchantable and millable wheat used for animal feed, or even of changes in world wheat stocks in all positions. If actual supplies and normal requirements are not susceptible of approximate measurement, derived estimates of surplus or shortage may be wide of the mark. The illustration serves to make the concept clear; but it is only in a hypothetical example that we can readily answer the question: How large is the world wheat surplus? We can even get only an approximate answer to the question: How large was the world wheat surplus last year?[1]

If it is impossible to compute precisely the world wheat surplus after the statistics are in hand and when a basis exists for filling certain gaps with estimates, it is even more difficult to gauge the amount of the world wheat surplus for a season early in the crop year. Frequently the stocks of old wheat are materially underestimated or overestimated. Forecasts and estimates of new crops are subject to a wide margin of error, and the errors may or may not compensate. Russia's crop in particular, and prospective Russian exports, can only be guessed at. Moreover, conditions affecting the demand are much more difficult to forecast than to appraise after a year is over. Major errors in most of these respects were responsible for exaggerations of the world wheat shortage early in 1925, and for underestimates of the surplus in 1929–30, which later proved disastrous.

This concept of world surplus must be sharply distinguished from that of the export surplus of individual countries. Every year the United States, Canada, Argentina, and Australia produce more wheat than they can advantageously use at home. Whether their own crops, or world wheat

[1] See, however, Chart 5 and accompanying discussion below, pp. 421–22.

supplies, are normal, short, or excessive, each of these countries has an export surplus from its carryover and new crop, usually even from its new crop alone. There is no direct relation between the size of any one country's export surplus and the existence of a world surplus. In 1923–24 the United States, because of a small crop of mediocre quality, had a relatively small export surplus, but the world surplus was large; in 1924–25 (as in 1897–98) the United States had a large export surplus, but there was a world wheat shortage. In Canada, in the same years, a large crop happened to coincide with a world surplus, and a small crop with world shortage. In 1925–26, however, the world situation continued fairly "tight," when Canada's export surplus was large while that of the United States was unusually small. In 1928–29 large export surpluses in all the four major exporting countries coincided with, and largely accounted for, a world surplus. In 1929–30, on the other hand, the world wheat surplus persisted in spite of great reductions in crops of these exporting countries and in their aggregate export surplus.[1]

It is therefore a mistake to regard the export surplus of the United States as constituting the heart of our wheat problem. Under some conditions, the larger our export surplus the better for our farmers and the nation at large; under other conditions, just the opposite is true.[2] It is the condition of world wheat surplus, to which the United States is simply one contributor, that renders our large surplus above domestic requirements a source of weakness rather than a source of strength.

Suppose one asks: "Where is the surplus?" The question itself implies a fundamental misunderstanding. The surplus is not this or that specific portion of the carryover or new crop, or the sum of several such portions. It is the more or less imperfectly measured excess over a normal supply, under prevailing conditions of demand. It is like the surplus item on a well-made balance sheet, which measures the excess of asset values over the liabilities plus the par value (or equivalent) of the capital stock; one cannot point to specific assets and say, "there is the surplus."

This explanation is relevant to questions concerning the responsibility for the surplus condition. Farmers who produce spring bread wheats in the interior Northwest, of which nowadays little moves to export, tend to disclaim responsibility for the surplus and to point an accusing finger at the hard winter-wheat growers of the Southwest. Farmers in the United States as a whole point to the fact that our wheat production in the past decade shows no upward trend, and infer that the rest of the world must be charged with producing the surplus. Wheat-importing nations disclaim responsibility for the surplus, for do they not have a national deficit, not a surplus, of wheat? In truth, the responsibility for the surplus cannot be definitely located. Contraction of demand is a factor, as well as expansion of supply. The most than can usually be said is this: those farmers, whatever types of wheat they produce and no matter where these are used, and those nations, whether wheat exporters or wheat importers, which have increased their wheat output, have especially contributed to the existence of the surplus; those who maintain or increase their output when a surplus exists are contributing especially to its persistence; and those countries which contract their consumption of wheat in a condition of world surplus also contribute to persistence of surplus.

The above explanation also has an important bearing on all sorts of proposals for what is called "surplus control." At best, control of wheat supplies even on a national scale is fraught with grave difficulties, and centralized control of world supplies can hardly be deemed attainable, even if one could imagine the gigantic task wisely executed. But if it were possible to measure the surplus early in a crop year, and to pick out certain wheat as surplus wheat, effective control of a world wheat surplus would be more readily conceivable. Since neither of these conditions exists, nothing like effective control of a world wheat surplus that has come into existence appears possible—unless or until it should be feasible to regulate subsequent production or to engineer extensive disposition through special surplus channels.

[1] See Chart 6, p. 423.

[2] This interpretation does not appear inconsistent with G. M. Peterson's chart and discussion in *The Annals . . . . ,* March 1929, CXLII, 396.

III. INDICATORS OF WORLD WHEAT SURPLUS

The existence of a world wheat surplus is usually evidenced by the concurrent appearance of (1) very low world wheat prices—the effect of the surplus; (2) abnormally heavy wheat stocks; (3) a large excess of carryovers plus new crops over prospective disappearance for the year, for seed, food, and feed; and (4) a large excess of exportable surpluses over import requirements for the season. When a world wheat surplus is accompanied by very low wheat prices, it usually leads to heavy diversion of wheat to feed use and to large exports of wheat and flour to the Orient, especially China. All of these are to be found in the current period of surplus.

Prices

World wheat prices are the most convenient barometers of world wheat pressure, but are sensitive to the pressure not only of actual supplies but of expected supplies. High prices indicate low pressure of supplies, or shortage in world wheat markets; low prices indicate high pressure, or surplus. Unfortunately, however, prices are expressed in value units that are not constant, but fluctuating, from time to time and from place to place. A barometric pressure of 30 pounds to the square inch at sea-level means the same thing everywhere, at all times. A price of a dollar per bushel of 60 pounds of wheat means something quite different at different times and places, even though the dollar may represent a constant weight of gold of constant fineness. In the 1890's, American farmers regarded dollar wheat as a goal to be achieved; in the 1920's, dollar wheat represented an ill fate to be averted at all costs. Moreover, current prices can seldom be viewed in due perspective. In retrospect, prices of wheat early in 1925 appear high—indicators of world wheat shortage. In the midst of that period many regarded them merely as normal.[1] Misjudgments of supplies or demands, current or prospective, sometimes prove seriously in error after having upheld or depressed prices unwarrantably for some weeks or months. Changes in transportation costs may lead to changing margins between the levels of wheat prices in different countries, and so cause prices in various countries to move diversely. Thus in 1926–27 the British coal strike led to sharp increases in ocean freight rates, and British import prices remained high as compared with prices in exporting countries. Wheat prices in individual countries are also subject to influence by tariffs, quota measures, and other public policies.

For these and other reasons, wheat prices alone are not an altogether safe barometer of world wheat pressure, and they afford very untrustworthy indications of the degree of surplus or shortage in periods separated by the lapse of years. Their testimony as to world wheat shortage or surplus, or shifts in conditions, is valuable, but not final.

The direction of price movement is often of special significance, like a falling or rising barometer. Low and declining prices may reflect persistence of a surplus, rather than an increase in its extent. A considerable advance in prices from very low levels may reflect substantial diminution of a surplus, not the appearance of shortage.

Significant light upon the occurrence of periods of shortage, as indicated by price, may be found in representative price series when they are roughly adjusted for the shifting value of the money unit.[2] One may chart, for example, the monthly average price of wheat grain imported into the United Kingdom (a convenient condensed expression of the world price of wheat) from 1883 to 1900 and from 1920 to 1931, adjusted by an index of wholesale prices on a 1910–19 base.[3] Through these monthly

[1] Three British economists, specialists in agriculture, said early in 1925, in their *Report of the Committee on Stabilisation of Agricultural Prices*, p. 28: "the crop of 1924 may fairly be described as a normal crop, and the result has been merely to raise wheat prices to what may be called a 'normal' level, that is to say to bring them up to the general level of wholesale prices from the abnormally low level ruling in 1923." Few in retrospect would say this today.

[2] Much as readings of a magnetic compass must be corrected by reference to the local variations due to the fact that the magnetic pole does not coincide with the true pole.

[3] See Wheat Studies, December 1931, VIII, 96–99. The chart there given does not include the years 1901–19. See also "Cycles in Wheat Prices," *ibid.*, November 1931, VIII, 29, for annual averages of deflated prices of Chicago wheat futures.

data one may run a straight line to represent roughly the long-time trend of wheat "values," which has been downward in Great Britain, over this period as a whole. Disregarding the war period and minor departures from such a line of trend, the years 1891–92, 1897–98, 1920–21, and 1924–27 appear to stand out as periods of special shortage; 1887–88, 1893–95, 1923–24, and 1930–32 stand out as periods of special surplus; and the latest period shows the most striking and persistent surplus. The picture is broadly correct; but, for example, 1928–29 and 1929–30 do not stand out as years of surplus, as they undoubtedly were, while 1891–92 and 1926–27 stand out as years of shortage, as they may not have been. In the light of other evidence, even selected, adjusted prices failed to furnish a highly reliable barometer of shortage and surplus between 1926 and early 1930; they appear to reflect simply the current appraisal of the burden—rather than the actual extent—of shortage or surplus. There is no question, however, that world wheat prices of 1931 and 1932 afford eloquent testimony to the existence of exceptional wheat surplus; and other evidence amply supports this testimony.

Wheat Stocks

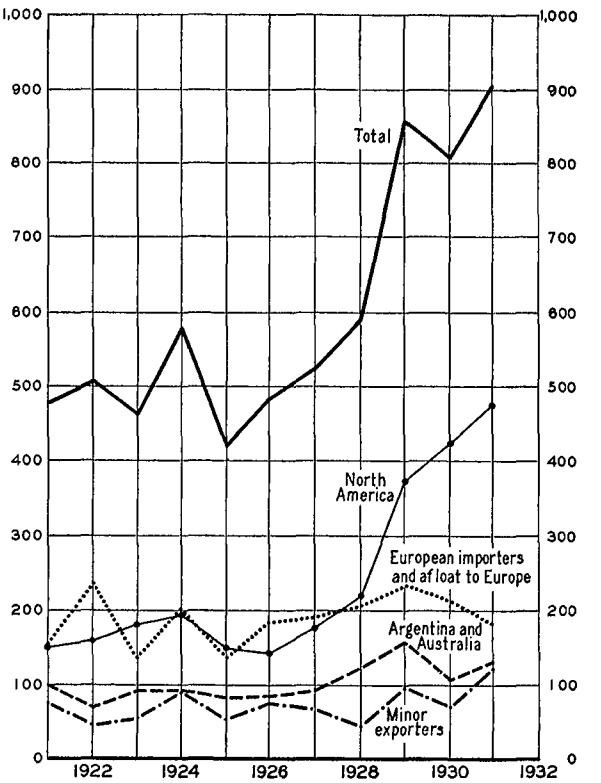
In view of the difficulties in adjusting wheat-price barometers and in reading them aright, we may well examine other indicators of wheat surplus and shortage. Outstanding among these are data representing wheat stocks, particularly carryovers and visible supplies.

No comprehensive statistics of world wheat stocks exist; the data are more extensive today than ever before, but there are important gaps which can be filled only by rough estimates or "guestimates," or not at all. For the United States, the best statistics relate to July 1; for Canada, to July 31. By combining these with other available data and reasoned estimates or "guestimates," the Food Research Institute has arrived at figures roughly approximating world stocks of old-crop wheat in July of each year since 1921. Even these are not comprehensive, for they do not cover Russia, some minor exporting countries such as Uruguay, Chile, and Asia Minor, ex-European importing countries (except India), and supplies en route to ex-European destinations.[1]

These estimates of "world carryovers," thus broadly defined, are shown by Chart 2.

Chart 2.—World Wheat Stocks, about August 1, 1921–31*

(*Million bushels*)



* As estimated by the Food Research Institute; see Wheat Studies, December 1931, Appendix Table XXXII. Minor exporters include Danube basin, India, and northern Africa, but not Russia. United States data are for July 1.

Between 1921 and 1928 the totals ranged from 419 to 590 million bushels, and averaged around 500 million. A world wheat surplus in 1923–24 is suggested by the great increase shown between the 1923 and 1924 figures, and the fact that the 1924 figure is so far above average. A world wheat shortage in 1924–25 is suggested by the great decline in carryover, and the fact that the 1925 figure is so far below average. An extraor-

[1] The procedure used by Dr. Bennett in arriving at these figures is set forth in "The World Wheat Situation, 1930–31: A Review of the Crop Year," Wheat Studies, December 1931, VIII, No. 2; see especially Appendix Table XXXII and footnotes thereto.

dinary surplus in 1928–29 is suggested by the huge increase in carryover between 1928 and 1929, to 858 million bushels in 1929. The world crop of 1929 was about 500 million bushels smaller than in 1928, and, if the inward carryover had been no larger than in 1924, world wheat supplies would have been short in 1929–30; but the carryin was so large and the new crop so distributed that a real shortage failed to develop, and the outward carryover remained excessive. The persistence of world wheat surplus is suggested by the very high level of carryovers in the past three or four years, the peak in 1931 exceeding that of 1929.[1] The figure for 1932, not yet calculable, seems likely to be higher than in 1930 but lower than in 1931, chiefly because of reductions outside of North America.

The picture given in Chart 2 suggests that world wheat stocks of old wheat as of July, thus calculated, normally average about 500 million bushels, and that stocks approaching 600 million bushels afford liberal reserves against the event of short crops. Other evidence lends support to this view. Carryovers of 800 to 900 million bushels, such as those of the past four years, are unquestionably excessive, by at least 200 to 300 million bushels. The persistence of such high carryovers is abnormal. Some reduction in world wheat stocks has presumably taken place in 1931–32, but there is no indication that world carryovers, as here defined, have been reduced to or below 800 million bushels. Until a reduction to 600 million bushels or less can be forecast with assurance, we may expect the world wheat situation to be characterized by surplus.

Less comprehensive series available on a monthly or weekly basis for wheat visible supplies, shown in Chart 3 (p. 420), afford supplementary indications of world wheat surplus and its development. The upper left-hand section shows the course of "world wheat visibles" monthly from August 1, 1925. In 1925–26 world visibles fluctuated on a low level, much lower than in 1923–24. They were not excessive in 1926–27, or particularly burdensome in 1927–28. In 1928–29, however, they rose to clearly abnormal heights; and they have run, broadly speaking, on successively higher levels in subsequent years. It may be that the curve for 1932–33 will fall below that of 1931–32, but there is yet no clear prospect of early return to the less abnormal levels of 1927–28. At least until this occurs, persistence of world wheat surplus will be indicated.

A large part of the world's surplus stocks of wheat, and especially of visible supplies, is commonly held in the United States and Canada. The upper right-hand section of Chart 3 shows how greatly commercial stocks of wheat in North America have risen in recent years. In 1925–26 they were low; in 1926–27 they were not much higher; in 1927–28 they were liberal; in subsequent years they have been clearly excessive. The subdivision of these, in the two lower sections of Chart 3, shows that while both countries have shared in this expansion, the most excessive commercial stocks are those of United States grain. Until these stocks run below the levels of, let us say, 1927–28, the presumption will be that this period of world wheat surplus is not ended.

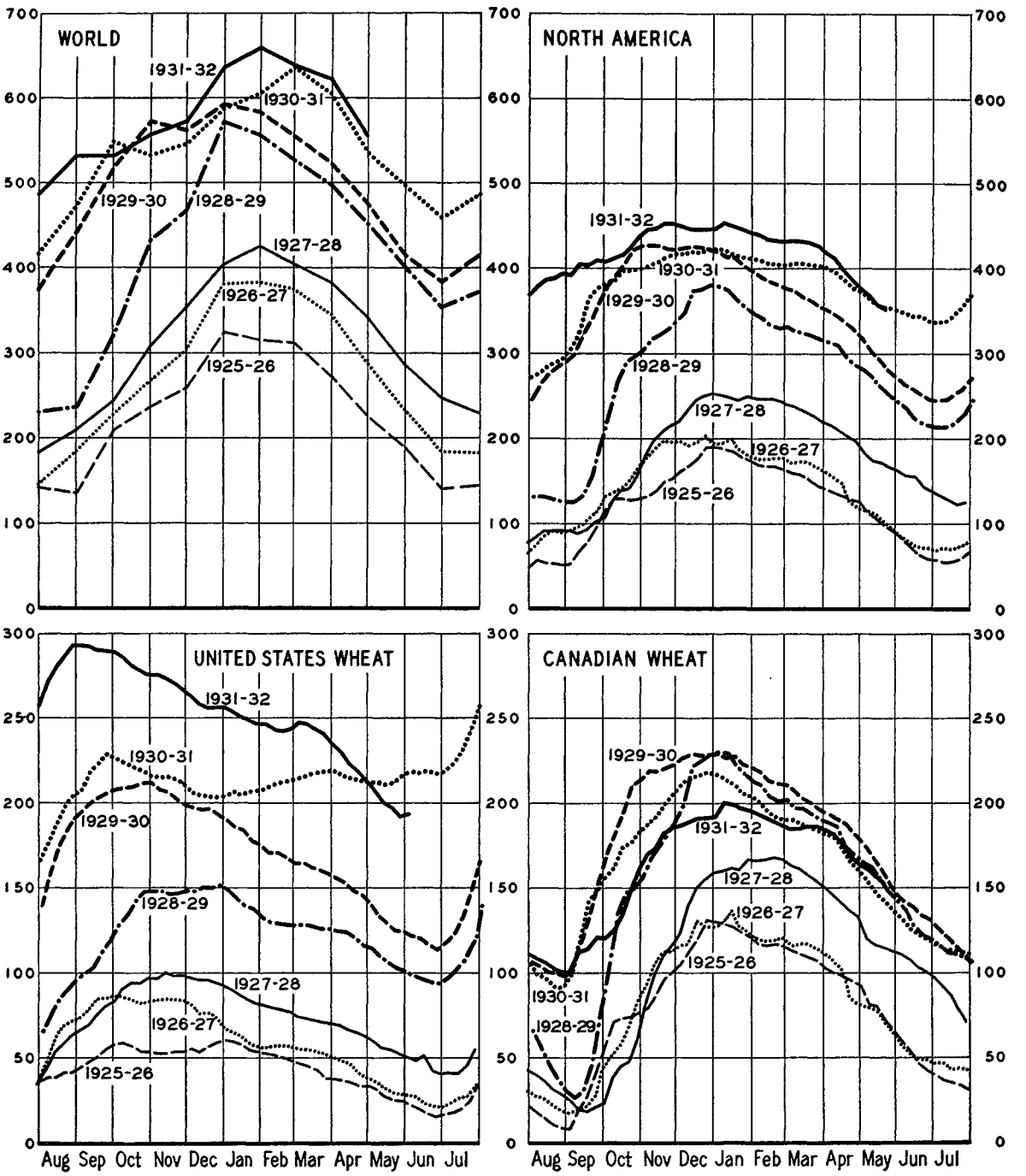
Chart 4 (p. 421) shows that the total carryover of wheat in the United States on July 1 varied, in the years 1921 to 1928, between 99 and 148 million bushels. The lowest figure, in 1926, was probably below normal. Figures approaching 150 million bushels, in 1923 and 1924, were high. In the last three years, however, the total has risen far beyond this range—successively to 247, 291, and 319 million bushels. The figure for July 1, 1931, can safely be regarded as something like 200 million bushels above normal, especially in view of the 15 million bushels of United States grain stored unsold in Canadian lake and bay ports. This year's figure is likely to be still higher, for the great bulk of the world surplus carryover is in the United States. At least as long as the United States carryover (plus United States wheat in store in Canada) exceeds 150 million bushels, we shall have suggestive evidence that the world wheat surplus has not disappeared.

The existence and persistence of abnormally heavy carryovers afford reliable evidence of the existence of world wheat surplus, but they do not measure the full

[1] If items omitted from this calculation could be included, notably Russia and import wheat in China, the increase in carryover in 1930–31 would be a good deal larger than is shown here, and the 1931 record would be relatively higher than the figure given.

CHART 3.—WORLD WHEAT VISIBLE SUPPLIES AND COMMERCIAL STOCKS IN NORTH AMERICA, FROM 1925–26*

(Million bushels)

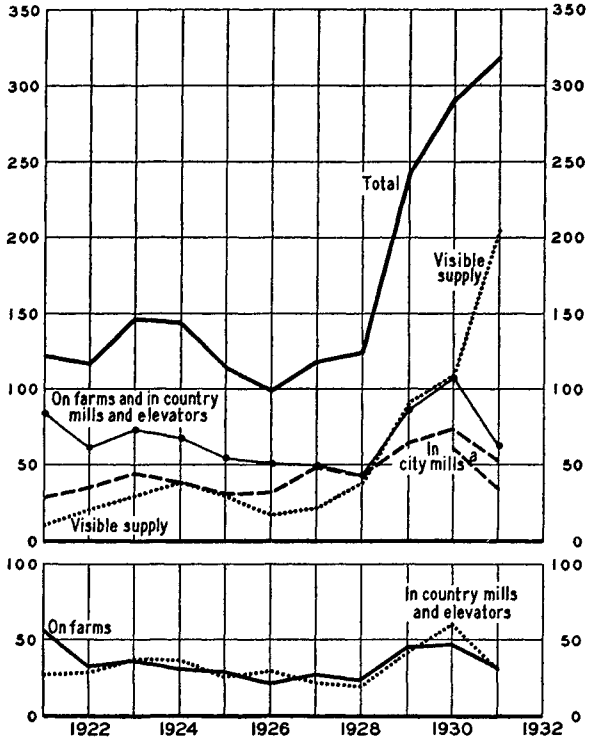


* World visibles from Broomhall's *Corn Trade News*, adjusted to include stocks of United States grain in Canada. United States stocks in United States and Canada as reported by U.S. Department of Agriculture (Bradstreet's visible plus *Canadian Grain Statistics* data on United States grain in Canada, prior to January 1927). Canadian stocks in Canada and United States as reported in *Canadian Grain Statistics*.

extent of the surplus. The abundance and low prices that give rise to heavy stocks also commonly lead to unusually large disposition in what may be called surplus channels, mainly feed use in a few countries (chiefly the United States) and food

CHART 4.—WHEAT CARRYOVER IN THE UNITED STATES, JULY 1, 1921–31*

(Million bushels)



* Based on data in WHEAT STUDIES, December 1931, Appendix Table XXXI, VIII, 2.

use in countries (such as India and China) where wheat is consumed more heavily or imported in very liberal amounts when it is very cheap.[1] As will appear below, the surplus from the bumper crop of 1928 went most heavily into increase of carryover, and only in limited degree into surplus-disposition channels. Very little of the surplus supplies available in 1929–30 went into surplus channels. With prices much lower, a larger part of the surplus crop of 1930 went into surplus-disposition channels than into increase of carryover; and a substantial fraction of surplus supplies in 1931–32 has disappeared in these channels.[2]

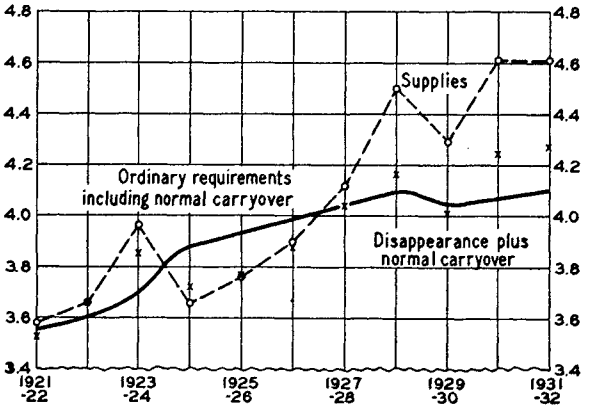
WORLD SUPPLIES VS. REQUIREMENTS

Another useful indication of surplus is afforded by high margins of available supplies (excluding Russian consumption and stocks), from carryovers and new crops, over ordinary requirements for current disposition and normal carryover. Every observer of the wheat situation is conscious of this fact, yet no statistical data now available reveal it distinctly. We venture to draw a synthetic picture that will at least give some concreteness to the concept.

A useful approximation to the supply figure, for such a comparison, is given by adding annual figures for July stocks (as given above), world wheat crops ex-Russia,[3] and Russian exports. Such figures reached in Table 1 (fourth column) are plotted in Chart 5. Ordinary requirements

CHART 5.—WORLD WHEAT SUPPLIES, ORDINARY REQUIREMENTS, AND DISAPPEARANCE ANNUALLY FROM 1921–22*

(Billion bushels)



* Data from Table 1, p. 422.

ex-Russia, however, must be estimated, to exclude disposition through low-price surplus channels and to include normal July stocks. Without presenting figures, we show also in Chart 5 a curve drawn roughly to represent ordinary *requirements* thus defined. The points marked "x" indicate apparent *disappearance* plus normal carryover, as shown in the final column of Table 1. When those points lie above the curve

[1] See below, Section IV, p. 427.

[2] See Chart 5.

[3] Also excluding China and minor producing areas for which comparable data over the period are not available.

of ordinary requirements they reflect disposition through surplus channels; when they lie below, they reflect a degree of unsatisfied ordinary requirements. The distance between these points and corresponding points on the "supplies" line reflects the degree of surplus (or subnormal) carryovers at the end of the year.

all kinds in Europe, ordinary requirements for wheat for food, in Europe and ex-European importing countries, were significantly curtailed. Large supplies and continued restriction of ordinary requirements, in the past two years, have resulted in continuance of wide margins between supplies and ordinary requirements, and even heavy dis-

TABLE 1.—WORLD WHEAT SUPPLIES AND APPROXIMATE DISAPPEARANCE, ANNUALLY FROM 1921–22

(Million bushels)

Year	Available supplies[a]				Disappearance plus normal carryover		
	Stocks July	Crops ex-Russia ex-China	Russian exports	Total	Disappearance[b]	Normal carryover[c]	Total
1921–22	476	3,104	..	3,580	3,073	450	3,523
1922–23	507	3,156	..	3,663	3,202	460	3,662
1923–24	461	3,481	21	3,963	3,385	470	3,855
1924–25	578	3,081	..	3,659	3,240	480	3,720
1925–26	419	3,312	27	3,758	3,276	490	3,766
1926–27	482	3,371	49	3,902	3,381	500	3,881
1927–28	521	3,593	7	4,121	3,531	510	4,041
1928–29	590	3,911	..	4,501	3,643	520	4,163
1929–30	858	3,421	10	4,289	3,480	530	4,010
1930–31	809	3,687	112	4,608	3,704	540	4,244
1931–32	904	3,624[d]	80[d]	4,608[d]	3,720[d]	550	4,270[d]

[a] From WHEAT STUDIES, VIII, 177, 182, 190, 401, with slight revisions in latest figures.
[b] Derived by subtracting estimated outward carryover from total supplies.
[c] Rough approximation.
[d] Preliminary.

There is a margin of error in every detail of this chart; yet we believe that the picture it gives is broadly true, and that it presents the most illuminating representation of the world wheat-surplus position. Low levels of ordinary requirements were mainly responsible for 1922–23 being a surplus year, and continued important in 1923–24 when a large crop brought a big surplus and substantial diversion into surplus channels. A substantial upward shift in the curve of ordinary requirements in 1924–25 coincided with a large reduction in supplies, and brought a deficit year in which ordinary requirements were not fully satisfied. Increased supplies in the two following years diminished the deficit but did not bring a surplus. In 1927–28, for the first time since 1923–24, supplies covered ordinary requirements and in addition brought the carryover well above normal. The big crop of 1928 vastly exceeded ordinary requirements, but went mainly into increase of carryover. In 1929–30, with the onset of depression and the harvest of big crops of

position in surplus channels has not sufficed to reduce the carryover to anything like normal proportions. The past four years stand out as years of large surplus, in contrast to three deficit years beginning with 1924–25 and a year of liberal surplus, 1923–24.

EXPORT SURPLUSES VS. IMPORT REQUIREMENTS

Comparisons of exportable surpluses of exporting countries with import requirements of importing countries afford another significant indication of surplus (when margins are wide) or shortage (when they are narrow). The special significance of such an index arises from the fact that the international market for wheat exerts great influence on prices throughout the world, although usually less than a fifth of the world's wheat production enters into international trade.

Exportable surpluses and import requirements, however, are not well-defined concepts. A country's effective exportable surplus depends not merely on the size of

the carryover and new crop, and upon its ordinary domestic requirements including a normal carryover, but to some extent upon other factors. If the pressure of importers' demands is relatively light, part of the potential exportable surplus may be diverted into domestic surplus channels; if this pressure is relatively heavy, ordinary domestic requirements may be contracted to permit more to flow abroad. Moreover, wheat import requirements of an importing country depend not only on the size of the domestic wheat crop and carryover, but to some extent on other domestic and imported crops, tariffs and milling regulations, other import controls, the domestic and import price of wheat, and the disposition to reduce or increase stocks. To some extent, therefore, exporters' surpluses and importers' requirements mutually influence one another, and direct statistical comparisons are not feasible.

Broomhall's current forecasts (revised at irregular intervals through a season), of which selected items are given in Table 2, show one authority's approximation.[1] As shown by Table 2, the calculated margins between the two reported figures were notably narrow in 1924–25, wide in 1929–30, and notably wide in 1923–24, 1928–29, and 1930–31. For the current year they appear less wide only because Broomhall makes allowance for holding back of United States wheat by the Grain Stabilization Corporation.

TABLE 2.—MARGIN OF EXPORTERS' SURPLUSES OVER PROBABLE IMPORTERS' PURCHASES, AT SELECTED DATES, FROM 1922–23*

(Million bushels)

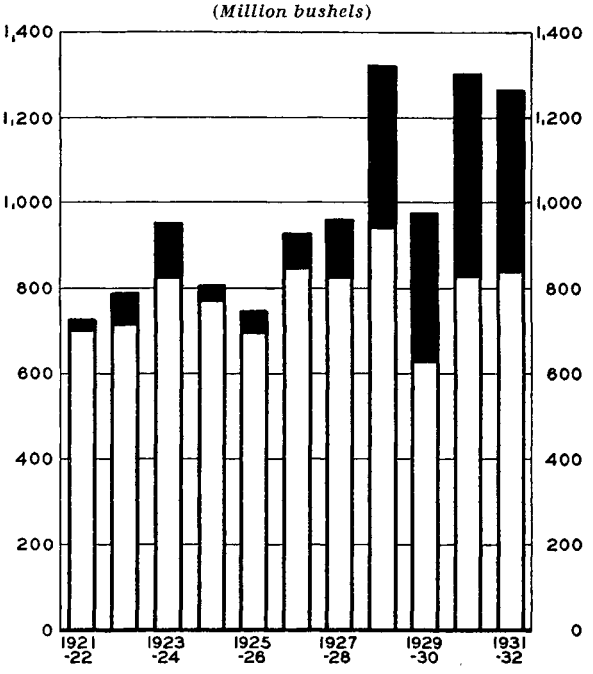
Year	November 1	February 1	May 1
1922–23	96	152	216
1923–24	304	248	248
1924–25	64	84	64
1925–26	176	80	94
1926–27	112[a]	148	148
1927–28	104	128	108
1928–29	320	400	360
1929–30	208	180[b]	256[b]
1930–31	440	408	364
1931–32	226[c]	208[c]	236[c]

* Derived from data in Broomhall's *Corn Trade News*, published in WHEAT STUDIES, Vols. I–VIII.
[a] Changed to 128 on November 2.
[b] Adjusted upward by 52 million bushels to allow for underestimate of Argentine crop.
[c] See accompanying text.

Another approximation, reached by a procedure different from Broomhall's, is shown in Chart 6. Here net exports of exporting countries are shown graphically deducted from exporters' surpluses; the latter are computed by subtracting, from carryovers plus new crops in exporting countries, estimated domestic disappearance plus approximately minimum carryovers (for Russia, exports only are used).

CHART 6.—MARGIN OF EXPORTERS' SURPLUSES OVER NET EXPORTS, ANNUALLY FROM 1921–22*

(Million bushels)



* The total bar shows estimated export surpluses, as defined in the text; the unshaded portion represents net exports; the black portion, the margin, or stocks left on hand at the end of the year. Latest figures are preliminary.

Narrow margins in 1921–22 and 1924–25 are easily observed. By contrast with these, the margins were wide in 1923–24 and 1927–28. Outstanding, however, are the very wide margins in the past four years. In this period, export surpluses, as above defined, have averaged 50 per cent above actual net exports, even though, in three of these years, net exports were increased by "surplus" shipments to China and though, in two of

[1] A chart showing successive estimates for five crop years ending with 1926–27 is given in WHEAT STUDIES, November 1927, IV, 10.

these years, export surpluses were notably reduced by diversion of exportable wheat to domestic feed use. The margins would have appeared wider still in three of these years, and also in 1923–24, if disposition through surplus channels were allowed for.

Surplus Disposition Items

Heavy use of wheat for feed is a subsidiary indicator of wheat surplus, though neither a very definite nor a highly sensitive one. Data on surplus disposition for feed use (i.e., good milling wheat fed to livestock because of exceptional cheapness) are not available. Even where statistical data are best, in the United States and Canada, figures for total disposition of wheat for feed are scanty, unreliable, or both. Residuals obtained by deducting from available supplies the sum of estimates of seed requirements, grinding for domestic consumption, net exports, and outward carryover give at best a rough approximation, affected by errors in all the estimated items. Estimates of the Department of Agriculture for wheat fed on farms where grown rest on insecure bases and often cannot be reconciled with data for supplies and total disposition. These two sets of figures for the United States are nevertheless of some value, and are given below in million bushels:

Year	Residuals[a]	Feed and waste[b] on farms
1921–22	—2	43
1922–23	75	73
1923–24	113	98
1924–25	76	57
1925–26	23	35
1926–27	18	43
1927–28	86	49
1928–29	57	60
1929–30	30	62
1930–31	150	164
1931–32	171[c]	...

[a] Wheat Studies, VIII, 407, and similarly computed for years prior to 1926–27.
[b] Including farm loss, waste, and shrinkage. See Wheat Studies, VIII, 197.
[c] Preliminary.

The two sets of figures roughly agree in reflecting light feed use in 1921–22, 1925–26, and 1926–27; liberal feed use in 1922–23; heavy feed use in 1923–24; and exceptionally heavy feed use in 1930–31 (and probably 1931–32 also).

Official estimates indicate that feed use of good milling wheat was heavy in Canada in 1930–31, but there are no comparable estimates for earlier years. There are also indications that feed use of wheat was heavier than usual in Australia, Argentina, Great Britain, Denmark, and perhaps a few other countries in 1930–31 and 1931–32. Altogether, probably some 150 to 175 million bushels of good milling wheat were fed to livestock in 1930–31 (mostly in North America) because wheat was very cheap; and in 1931–32 the figure may be of the same order of magnitude. It is doubtful if in any previous year since the war such surplus disposition exceeded 100 million bushels, but it may have approached this in 1923–24. Surplus feed use appears to have been not very liberal in 1928–29, and small in 1929–30.

Since China imports but little wheat and flour when wheat is dear, and a good deal when it is very cheap,[1] large exports to China are a subsidiary indicator of world wheat surplus, primarily through response to low prices. Three years of the past decade stand out as years of big exports to China, Hongkong, and Kwantung, as shown by the tabulation below, in million bushels:[2]

1921–22.....10.6	1926–27.....17.4
1922–23.....17.5	1927–28.....20.1
1923–24.....50.9	1928–29.....49.6
1924–25..... 7.7	1929–30.....22.3
1925–26.....25.0	1930–31.....54.0

In 1923–24, 1928–29, and 1930–31 the total from North America, Australia, and Japan was 50 million bushels or more, at least double that of any other year. The total for 1931–32 will presumably be larger still. Clearly these were years of world wheat surplus. By contrast, exports to China were exceptionally low in 1924–25; as this index properly suggests, this was a year of world wheat shortage. Exports to China were fairly liberal in 1925–26, not a year of wheat surplus, presumably because exports in 1924–25 were so small and because Canada had liberal supplies of low-grade wheat. Only one post-war year of substantial world

[1] See Section IV, below, p. 427.
[2] Wheat Studies, December 1931, VIII, 187.

surplus, 1929–30, does not appear as such in this index. This is explained by special factors: China's carryover of import wheat was heavy; Canada's 1929 crop was short and contained little low-grade wheat; North American wheat exporters held firmly; and Australia was not a pressing seller as in the next two years.

Part of the variation in exports to China is presumably traceable to variations in the size of Chinese crops of wheat and other cereals, particularly in areas from which shipments to the coastal area are feasible; and part, no doubt, to factors affecting import purchasing power. Yet the data given above strongly suggest that major variations in exports to China represent responses to prices of wheat and flour available to Chinese importers.

On other surplus-disposition items, such as heavy food use in India, there are some indications but no good statistical evidence.

The foregoing examination of various indicators of surplus and shortage yields concurrent testimony as to the existence of substantial surplus through three of the past four years, and adequate evidence that 1929–30 is also properly to be called a surplus year in spite of the short world wheat crop of 1929. Unfortunately, comparable statistics are not available for pre-war years. Such evidence as we have suggests that even the surplus of the middle 'nineties was less extreme than the present one: wheat visibles and carryovers, and margins between supplies and requirements for the world as a whole or in international trade, did not then reach levels relatively as high as they have in recent years.

IV. ELEMENTS IN THE DEMAND FOR WHEAT

Before we can intelligently discuss how the world wheat surplus arose and why it persists, some salient aspects of the demand for wheat require attention. For the moment we may disregard differences in types and qualities of wheat; to these incidental reference must later be made, for they prevent ready substitution of wheats from different regions, in contrast to what is true of sugar, for example. We may also reserve for brief notice what is sometimes called the demand for wheat for storage—largely a speculative demand, in a broad sense of the term "speculative." Attention will be centered on several elements in the demand for wheat for use, which differ with respect to importance, stratum or level, and degree of elasticity.

Six such elements may well be distinguished, namely:

(1) the demand for seed, slightly variable but somewhat inversely elastic;
(2) a fairly constant and highly inelastic demand for food use;
(3) a variable but somewhat elastic demand for food use;
(4) a highly elastic demand for food use, but of a low-price stratum;
(5) the demand for feed use, including another highly elastic demand element of a low-price stratum;
(6) a demand for industrial uses, theoretically highly elastic, but of a price stratum so low that it is of almost negligible practical importance.

1. Demand for wheat for seed is, so to speak, a first charge upon the wheat supply. Nowadays it absorbs probably about 12 per cent of the world's annual production (outside of China).[1] In all probability the great bulk of the seed used is reserved by farmers from their own preceding crop. Most of the rest is bought from specialists growing

[1] Cf. WHEAT STUDIES, September 1930, VI, 457. The ratio of seed requirements to average crop varies widely, of course, from year to year. The quantity commonly used per acre sown differs greatly in different regions; in most countries of Europe it runs from 2 to 3 bushels; in Russia around 2; in Canada probably between 1½ and 1¾; in India about 1½; in the United States between 1¼ and 1½; in Argentina about 1¼; in Australia slightly under 1. For the world as a whole there has probably been a downward trend in seed requirements per acre for many years, because of substitution of machine drilling for broadcasting, increasing use of clean and tested seed, better seed selection, wider use of evidence as to optimum requirements per acre, and expansion of acreage in regions where these practices are more common and where, for climatic reasons, seed requirements are below the world average. Since world average yields per acre have also tended upward, there has probably been an even greater decline, over the past forty years, in the proportion of the average crop required for seed use. Reliable comprehensive data in this field, either historical or current, are not now accessible to us.

wheat (often special varieties in supposedly pure strains) for seed use, at prices much higher than for commercial grain. Ordinarily very little seed wheat is drawn from the marketed supply of commercial grades, except to supply areas of severe crop failure.

The seed element in the demand for wheat varies little from year to year, and then chiefly as the wheat acreage sown changes under the influence of natural and economic factors. The quantity used for seed does not vary inversely with the going price of wheat. Probably few farmers economize in the quantity of seed used per acre when wheat is dear, or sow lavishly per acre when wheat is cheap. On the contrary, in so far as high prices for marketed grain tend somewhat to increase wheat acreage and consequently seed requirements, and vice versa, the demand for seed wheat may tend somewhat to increase with high prices and to decrease with low ones. The elasticity of this demand, such as it is, is therefore of a most unusual character, the reverse of the usual elasticity. But the comparative stability of this element in the demand, and its variability in response to weather conditions affecting acreage sown, overshadow even the indirect response to price changes.

2. In the next place, there is a highly inelastic demand for wheat for food in countries where wheat flour and bread are among the cheapest staples of the customary diet, and are bought and consumed in very much the same quantities per capita from year to year, practically regardless of whether prices of these products are high or low. Such countries include the United States, France, Canada, Australia, Great Britain, and probably several others. In addition, there are limited classes of people in most other countries (even in India, China, and Mexico) who contribute part of this element in the demand. Though not invariable, it is strikingly constant from year to year; but it is subject to influence by measures affecting quality as well as price, and changes in waste of bread may lead to apparent changes in food use per capita.[1]

This element in the demand for wheat is, of course, affected by trends due to population growth, changes in the age distribution of the population, and modifications in per capita food requirements and dietary habits. Such changes are not readily discernible in brief periods, but can be roughly distinguished over periods of a decade or longer. Broadly speaking, it is safe to say that the per capita consumption of wheat by these groups of people is lower than before the war and still lower than in 1900, and is still tending downward. Beyond a certain point, lessened physical requirements for food, increases in income in relation to food costs, and the availability of large numbers of food products tend to reduce per capita consumption of wheat. But there has been an increase in the absolute and relative size of population groups who furnish this element of the demand for wheat. At present probably well over a third and possibly over half of the world wheat production goes to supply this most inelastic element in the demand.

3. In the third place, there is the demand for wheat for food in countries, or among classes, where it is a staple of the diet but not the cheapest cereal food in common use, and where more wheat and less of other cereals will be used if wheat can be afforded. In the Southern states, for example, the cheaper corn meal was long the principal cereal in the ordinary diet, but it has gradually lost ground in favor of wheat flour, which at retail is ordinarily cheaper than corn meal. In Mexico, corn is still the staple cereal, though wheat has gained headway and would gain more at the expense of corn if tariff policy and purchasing power permitted. In the Danube basin countries and Italy, corn is widely used as a common cereal food, but wheat has tended to gain at the expense of corn. In most countries of northern and eastern Europe (including Germany, Poland, and Russia) rye is widely used as a bread grain, and in some more widely than wheat; but wheat consumption has tended to increase at the expense of rye. In India and China, and in other countries in lesser degree, still

[1] Formerly it was commonly accepted in the trade that, in periods of depression, wheat consumption for food increased per capita where it was the cheapest staple cereal food, and diminished when other cereal foods were cheaper. There are some indications that in the present severe depression, at least in the United States, per capita use for food has fallen off—perhaps because of lessened waste. See WHEAT STUDIES, May 1932, VIII, 390.

cheaper cereals, such as millet and grain sorghums, are widely used for food because wheat is relatively expensive.[1]

This third element of the demand for wheat is of substantial quantitative importance—second only to the constant element mentioned above. It represents perhaps a fourth to a third of the total consumption nowadays, if Russia be included. This demand is moderately elastic, instead of inelastic: the more expensive wheat is, the less of it these peoples consume; the cheaper wheat is, the more they eat of it. To a considerable extent, however, it is not the absolute dearness or cheapness of wheat, but the relation of its price to that of the cheaper cereals, in the localities concerned, that determines the amount of wheat that will be consumed.

On the whole, it is this third element in the demand for wheat that, if allowed free play, would afford the greatest contribution to wheat-price stability, by leading to enlarged consumption when wheat is abundant and cheap, and to contraction when wheat is relatively scarce and dear. Moreover, this element in the demand for wheat potentially affords, as it has afforded in the past, the major opportunity for expansion in world wheat consumption. It is this element that has been peculiarly restricted by government policies, in many countries, in the present surplus situation.

The three elements in the demand for wheat thus far discussed account for almost all the world's wheat consumption in years of scarcity, and somewhat larger absolute quantities in years of abundance. Those yet to be discussed have probably not yet absorbed, in any year, as much as 10 per cent of the world's crop, and the average over any five-year period has probably not exceeded 5 per cent.

4. A fourth element is distinguishable in degree, and in some respects in kind, from the third. It is best represented by the demand for imported wheat in China. The great bulk of the wheat raised in China is consumed in the regions or localities where it is grown. From wheat-growing regions accessible to populous cities on the seaboard and not far inland, domestic wheat flows to this coastal region, where it meets the competition of imported wheat and flour. The total wheat consumption of this market area is said not to vary greatly, but the proportion of domestic and imported wheat varies widely from year to year. In other words, the elasticity of the demand for wheat there is less than the elasticity of the demand for imported wheat. When import wheat and flour are very cheap, they add to and in part displace domestic wheat in this area; the wheat so displaced is consumed in the region where it is grown, presumably reducing the inadequacy of the Chinese diet to this limited extent.

Probably somewhat similar conditions obtain in India and other countries where undernourishment is common. In India, exports as well as imports are affected.

The striking feature of this element is the high degree of responsiveness to price, and particularly the substantial increase when prices are very low. At its maximum to date, this element of demand is relatively small; and in order to make it quantitatively important, even from the standpoint of international trade in wheat, prices must be so low that we have treated it above (p. 424) as a surplus outlet.

5. Demand for wheat for animal feed is itself a composite of four distinguishable portions. Some wheat is "unmerchantable," that is, unfit for milling; if used at all, it must as a rule be used for feed, and largely on the farms where it is grown. The amount depends chiefly on weather conditions, and therefore varies greatly from year to year; but it is never more than a small fraction of the world wheat crop. A second normal element is represented by the demand for wheat for feeding cattle, sheep, and hogs on wheat-growing farms where it is commonly cheaper to use wheat raised on the farm itself than to buy other grains. This element in the demand is relatively large in some localities, but very small in the world as a whole; it may be regarded as only moderately elastic. Contrasted with these "passive" or semi-passive demand components, there is in many countries regularly an active demand for millable wheat for feed (chiefly for poultry), either on the

[1] Rice and wheat are not, on the whole, similarly competitive, but tend rather to be consumed by groups with diverse dietary preferences; and rice is ordinarily the dearer food. Actually, though without consumers being aware of it, sugar and many other foods compete with wheat.

farms where the wheat is grown or elsewhere. In Great Britain a large fraction, and in Australia, the United States, and various other countries a small but significant fraction, of the wheat crop is so used. Though not of large quantitative importance in the aggregate, this demand is elastic; but the quantity used depends not alone on the price of wheat but considerably on the relative cost of different grains, feeding value considered. Usually, but not always, such wheat is of lower grade than the run of the crop. Finally, there is a special demand for good milling wheat for feed, to supplement or displace other feedstuffs, that arises only when wheat is exceedingly cheap or other feed grains very dear. Under such conditions, as we have seen (p. 427), this highly elastic element in the demand may furnish an outlet greater than all other feed uses combined, but when wheat is scarce and dear this demand is nil.

6. Industrial utilization of wheat, outside the milling industry and others which convert it into food products, is so small as to be almost negligible. Very limited quantities are used in the manufacture of starch, gluten, and sometimes industrial alcohol. This limited demand for wheat as raw material for industry is probably somewhat responsive to its price, but varies mainly with the demand for the end-products and the availability and price of competing materials. Wheat is physically and chemically capable of being used as raw material for industrial alcohol and many other products, on a large scale. It is not so used because, even when wheat is ruinously cheap, other materials are available at lower cost. One may conceive of a situation in which industrial uses of wheat would absorb a major fraction of the crop. We may reasonably assume that such a demand, if it were in evidence, would be an elastic one at very low price levels. Practically, however, there is now no prospect that wheat will ever be an important raw material for non-food industries, except, perhaps, in consequence of a surplus-control scheme involving a dumping into industrial channels. If industry should come to require more agricultural raw materials for conversion into non-food products, it is presumable the demand will be supplied by agricultural products that can be produced at lower cost than wheat. Per acre, wheat is not a relatively cheap source of starch.

In addition to these various classes of demand for wheat for different uses, there is a speculative demand that varies greatly in intensity with anticipations of price advances or price declines. Farmers, dealers, and millers, as well as speculators proper, contribute to this element of demand. Unlike the groups already discussed, it furnishes no ultimate outlet for wheat; hence its relation to the wheat problem is different from that of those which do. The burden of a surplus, however, is lessened if the disposition to hold wheat is strong and widespread, and increased if this disposition is weak or limited. Moreover, through effects on prices, elastic elements in disposition, and acreage and production, the condition of this speculative demand may affect even the volume of the surplus or shortage. In retrospect, it seems clear that the strength of speculative demand lightened the burden of the surplus in 1928–29, but it may have made for higher surpluses in later years than would have existed if this demand had been weaker in that year. The contrasting weakening of this disposition to hold, in 1929–30, increased the burden of the surplus; and perhaps helped toward bringing adoption of policies that increased the size of the surplus. But the further weakening in the two past years (in the world at large) has in some respects promoted the diminution of the surplus through low-price channels.

V. HOW THE SURPLUS AROSE AND WHY IT PERSISTS

Natural, economic, and political forces have been jointly responsible for the rise and persistence of abnormal wheat surplus since 1928. Factors of supply and factors of demand alike require consideration.

How It Arose

Nature was primarily responsible for the emergence of a huge wheat surplus in 1928 (as also in 1923—in both years outside of

Russia).[1] With conditions generally favorable for sowing, a record acreage was planted, appreciably above the line of upward trend of acreage for the decade. In the United States the sown acreage was higher than in any year except 1919, but abandonment was very heavy in the soft red winter-wheat belt and fairly heavy in a few other states, so that the harvested acreage was only moderately large. In Argentina the sown acreage was so large that even after liberal abandonment the acreage for harvest nearly equaled the peak of 1927. Growing conditions proved generally good, and exceptionally favorable in several important producing countries. Yields per acre were generally high or unusually high in the exporting countries, India and Australia excepted, and in some countries of importing Europe as well. Canada and Argentina harvested bumper crops; and the United States, Germany, the Danube exporting countries, and some minor producers had the biggest crops since 1919 or earlier. The average world yield per acre, ex-Russia, was about 16.4 bushels, one of the highest on record. Consequently, the world crop of 1928, ex-Russia, was by far the largest crop ever harvested.

Other factors, however, contributed toward the size of the surplus that made its appearance in 1928. World wheat acreage had risen rapidly from a low point in 1924, not merely because of favorable sowing conditions, but in response to good prices and a rapidly increasing use of automotive equipment and appropriate accessory machinery, including the combine harvester. World wheat acreage ex-Russia increased by 15 million acres, or nearly 7 per cent, between 1923 and 1928. This was due primarily not to Nature but to man, under the influence of economic motives. In the same period some recovery and advance in agricultural efficiency contributed to a rising trend of yield per acre.

The good prices of 1924–27 were due not solely to the short world wheat crop of 1924 and the short crop in the United States in 1925, for which Nature was mainly responsible, but in part to higher levels of demand for wheat in Europe, following the reparation settlements of 1924, a liberal international flow of capital, and a marked acceleration in European recovery. Moderate levels of wheat tariffs[2] and the general absence of other restrictions on international trade in wheat facilitated liberal expansion of consumption. The delay in Russia's return to the ranks of major exporters, as her people absorbed Russia's increased outturn, was a weighty additional factor. Moreover, the world wheat crop of 1927, ex-Russia, had been of record size, in consequence of good yields on a large acreage, and enlarged consumption did not suffice to prevent a surplus carryover into 1928–29. The bumper crop of 1928 led to more of a surplus because it followed a big crop in 1927 from which a liberal carryover remained.[3]

The continuance of favorable demand conditions in 1928–29, and the continued absence of Russia as a substantial exporter, limited the extent and burden of the surplus created by the huge wheat crop of 1928. In 1929–30 Russia was still out of the market, and the world wheat crop was radically reduced; but the anticipated disappearance of the surplus was prevented by a radical change in conditions of demand resulting from excellent crops in Europe, the onset of depression, and new government policies.

Why the Surplus Has Persisted

If one looks at the world wheat crop as a whole, or that of overseas exporting countries, it appears that Nature's influence was to correct, in 1929, the surplus condition created, largely by Nature, in 1928. As compared with the bumper crop of 1928, the world wheat crop was reduced in 1929 by about 500 million bushels; the reduction in the four principal overseas exporting countries and the Danube basin was some 635 million bushels; India's crop was again below her usual consumption; and Russia's was smaller than in 1928. The shrinkage was greater than between 1923 and 1924, when a surplus condition of two years' standing was converted by crop reduction

[1] See discussion and charts in Wheat Studies, December 1929, VI, 43–53, and December 1931, VIII, 69–84.

[2] There were some increases in wheat tariffs in Europe in 1924–28, which helped stimulate wheat-acreage expansion in Europe; but they were not a powerful factor in the situation.

[3] See Table 1, above, p. 422.

into a shortage that lasted for two or three years.

On the other hand, Nature favored the importing countries of Europe in 1929 with high yields not only of wheat but of other cereals and potatoes. Over the decade since the armistice, European agriculture generally had recovered practically to the prewar level. The direct result was a remarkable harvest exceeding that of 1925; and whereas the big crops of 1925 had followed short crops in Europe in 1924, the big crops of 1929 followed good crops in 1928.[1] European carryovers of cereals, including imported wheat, were large in 1929, whereas they had been small in 1925. The exceptional distribution of Nature's smiles and frowns in 1929 exerted a weighty influence, for Europe's need of wheat was sharply reduced, and Europe's demand is a major factor in the world wheat market.

But the beginning of economic depression in the summer and autumn of 1929 was an independent factor of great importance, both directly and indirectly. The short harvests of 1924 had been accompanied or shortly followed by substantial economic improvement; but the short crop of 1929 came in the opposite stage in the economic cycle. Directly, the onset of business depression occasioned a reduction in the demand for wheat in Europe and in ex-European importing countries. With unfavorable markets for their exports and a great shrinkage in the international flow of capital, their purchasing power for imports was reduced.

Moreover, several Continental European countries, including three of the major importers, took steps to protect their own farmers from the lower prices which big crops in Europe, reinforced by economic recession, were bringing. Germany in particular had a huge surplus of rye, from carryover and new crop, and cut down her wheat consumption by measures on behalf of rye and wheat growers. France had a surplus of wheat over domestic requirements and put in effect export subsidies for wheat. Italy had a small deficit, considering her carryover and new crop. All of these countries raised their wheat tariffs substantially between May 1929 and June 1930.[2]

In consequence of the abundance of other cereals in Europe, the economic crisis and recession, and agrarian protective measures, wheat disappearance did not increase in 1929–30 but was substantially lower than in 1928–29, and smaller even than in 1927–28.[3] Hence the huge surplus carryover was only moderately reduced in 1929–30. The burden of this carryover, moreover, was increased by secondary consequences that flowed from the same factors.

In 1928–29 the readiness to hold wheat had been general, resulting in lessening the burden through a wide distribution of surplus stocks in various positions in many countries. In 1929–30 this disposition weakened materially, as wheat supplies proved much larger than had been realized, as European demand fell far short of expectations, as shipments to ex-Europe fell off too, and as wheat prices joined the descent that characterized prices of all sorts of commodities. The Federal Farm Board, through its loan policy and early stabilization operations, undertook to check the price decline in the United States, but its presence in the market probably weakened the readiness of other interests to own wheat not currently needed. The holding policy of the Canadian Wheat Pool probably exerted similar influence. Outward carryovers in 1929, though smaller than those of 1928 by about 100 million bushels, were more heavily concentrated in exporting countries, particularly North America, and in visible positions.[4] Heavy losses of holders of wheat in 1929–30, and bitter disappointment at the failure of the short crop of 1929 to diminish the wheat surplus, weakened the ability and disposition to hold wheat for future profits.

The intensification of the surplus condition in 1930–31 was due to more complex causes than those which caused the emergence of the surplus in 1928–29 and its persistence in 1929–30.[5] Nature played a part, by giving Russia favorable conditions for planting, growing, and harvesting which re-

[1] See WHEAT STUDIES, December 1931, VIII, 77–78, 82.

[2] Graphically illustrated in WHEAT STUDIES, December 1931, VIII, 104; see also *ibid.*, December 1930, VII, 114–15.

[3] See Table 1, above, p. 422, and Chart 5, p. 421.

[4] See Charts 2–4, pp. 418–21.

[5] See WHEAT STUDIES, December 1931, VIII, 68–84.

sulted in high yields of wheat, rye, and barley. Generally, however, wheat yields in 1930 were neither high nor low, and the average for the world ex-Russia may be regarded as fairly normal.

Yet the world crop ex-Russia was a big one in 1930, exceeded only by the crop of 1928; for in spite of low prices in world markets world wheat acreage ex-Russia rose sharply, to a new peak some 9 million acres higher than in 1928. This increase was due in part to exceptionally light abandonment of fall-sown acreage in the United States, but more largely to the response of Continental European wheat growers to relatively favorable wheat prices resulting from protective policies, and to official propaganda in Australia strongly reinforced by official efforts to establish a guaranteed price there. Expansion of wheat acreage in Russia, to probably a record level for the crop of 1930, was also due mainly to government policy. To a substantial extent, therefore, the big crop of 1930 was the consequence of national policies; it was not due solely to Nature and the play of ordinary economic forces. It is striking, however, that nowhere was there substantial reduction in wheat acreage in 1930, such as the surplus condition might have been expected to induce. There might have been more if the world wheat position had been correctly appraised when wheat was planted for the crop of 1930.

Russian exports for the year 1930–31 amounted to 112 million bushels. Upon a world market for which ample supplies were available elsewhere, these were pressed because the Soviet government urgently needed funds to pay maturing credits for equipment and services imported in connection with the gigantic plan for industrializing the country. In a double sense, Russia's progress with her Five-Year Plan contributed to the world wheat surplus in 1930–32.

Restraints upon consumption, however, were powerful factors preventing the added absorption of abundant supplies in 1930–31; they not only prevented expansion but forced contraction of food use in various countries. The world depression increased in severity, affecting purchasing power for imports generally. Stabilization operations in the United States greatly restricted exports of flour from this country. Wheat tariffs were raised in many European and several ex-European countries. High tariffs were effectually reinforced in some European countries by milling quotas and other devices which tended to restrict wheat imports and consumption. Largely in consequence of these measures, in Germany, France, Italy, and some other countries of Continental Europe, wheat disappearance declined still further.[1]

Moreover, the private disposition to hold wheat was weakened still further in 1930–31. Flexible tariffs and quota systems in Europe effectually limited the holding of imported wheat in Continental European countries. Stabilization operations under the Federal Farm Board substituted virtual government holding for private holding, and these heavy accumulations made private individuals, here and abroad, fear to own wheat. With deepening depression, ability to hold wheat and hopes of profit through doing so were both restricted. Further increase in concentration of surplus carryovers in North America resulted, with the Grain Stabilization Corporation holding 257 million bushels on July 1, 1931.

With enlarged supplies, the return of Russia as a major exporter, continued restriction of ordinary demands, and lessened disposition to hold wheat, the surplus condition was thus intensified in 1930–31. It was relieved to only a limited extent by the opening of two surplus-disposition channels. The most important was increased use in the United States in partial replacement of corn, of which extreme drought had drastically reduced the yield; but there were also heavy exports to China.[2] In spite of these, the world wheat stocks in July 1931 reached a new peak of over 900 million bushels.

[1] Governmental measures affecting wheat in foreign nations and in the United States under the Federal Farm Board have been discussed at some length in various review and survey numbers of WHEAT STUDIES, especially December 1931, VIII, 149–67, and January 1932, VIII, 218–29. European policies have been broadly analyzed in "Economic Nationalism in Europe as Applied to Wheat," WHEAT STUDIES, February 1932, VIII, No. 4.

[2] See above, p. 424.

The persistence of the surplus condition in 1931–32 was also due to complex factors, including many which were present in 1930–31. The world wheat crop ex-Russia was again a large one, though not quite as large as in 1930. Nature gave excellent yields of winter wheat in the United States, but was responsible for drastic cuts in both acreage and yields in the spring-wheat belt of North America. On the whole, the average yield per acre for the world ex-Russia was good—better than in 1930. Wheat acreage was increased in Continental Europe, under the influence of agrarian policies; but reductions in (spring-wheat) acreage in the United States, and in Argentina and Australia, under the joint influence of natural and economic forces, brought the total acreage ex-Russia back to about the level of 1928. The lack of promising alternatives for farmers, in view of the depression, undoubtedly prevented a greater acreage contraction. Russia, however, had further expanded her wheat acreage under government pressure, and in spite of substantial reduction in yields was able to export some 80 million bushels. New financial crises and further deepening of the world depression, and extension of import restrictions and other protective measures, continued to restrict consumption of wheat for food. The flow of wheat to feed use, especially in the United States, and to China, apparently exceeded the volume so disposed of in 1930–31; but this disposition served merely to lessen the extent of the surplus rather than to eliminate it. World wheat stocks at the close of the crop year now seem likely to be only around 50 to 75 million bushels below the record peak of 1931. The great bulk of the world surplus carryover will be concentrated in the United States but with only around 100 million bushels in the hands of the Grain Stabilization Corporation. An important favorable factor is the disappearance of the rye surplus which had existed in Germany and the world market.

Some Conclusions

A summary view of the surplus period since the middle of 1928 leads to these broad conclusions. Nature was mainly responsible for the emergence of a big surplus in 1928, and also for excellent crops in Europe in 1929, in Russia in 1930, and in the United States winter-wheat belt in 1931; but also for drastic reductions in yield in exporting countries in 1929, in Canada in 1930, and in North American spring wheat in 1931. The world-wide depression of increasing intensity, and economic influences largely flowing from it, interposed significant obstacles to the absorption of the surplus, and made the surplus much more burdensome. Russia's economic policy was an important factor in increasing both the extent and the burden of the surplus in the past two years, but not earlier. Government policies in Continental Europe and elsewhere have played a major part in prolonging the surplus condition, by increasing production and restricting consumption for the past three years. Federal Farm Board policies in the United States have been of limited effect upon acreage, production, and consumption, but they have reduced exports and increased the concentration of the surplus in the United States and in visible positions, thus focusing attention upon the size of the world surplus and indirectly increasing its burden.

It is highly probable that the world wheat situation would not now be characterized by burdensome surplus if economic forces had not been supplemented by governmental measures. These were dictated, indeed, by the best of motives, but undertaken without realization of the extent to which they would complicate the whole situation. In no previous period of world depression or of world wheat surplus have such policies been so extensive, so effective in the immediate sense, and so far-reaching.[1] The Economic and Financial Committee of the League of Nations said in 1931: "From the general standpoint, we are forced to the conclusion that the general result of National measures to cope with the effect of the crisis is almost inevitably to prolong and seriously aggravate it." This statement is true as applied specifically to wheat.

By way of check upon these conclusions, a few figures may be mentioned. The surplus wheat stocks in the middle of 1932 are

[1] See Section VI, below.

something like 300 million bushels. Russia's exports, which may be regarded as almost wholly the result of government policy directed toward increased wheat acreage, production, and exports, have totaled roughly 200 million bushels in the past three years. The reduction in ordinary requirements for wheat consumption for food, in consequence of government policies, at least in comparison with expansion that would have occurred in their absence, probably approaches or exceeds 200 million bushels cumulatively over the past three years. German policies alone have probably accounted for at least half of this total, and reductions in various other Continental European countries have been important in the aggregate. Decreased palatability of wheat bread and relatively high prices for it have both resulted. Wheat production in Europe, in consequence of protective measures in force during these three years, has probably aggregated some 200 million bushels more than it would otherwise have been. The sum of these three items is double the present surplus stocks, and not far short of the current carryover surplus plus the wheat that has gone, in the past three years, into surplus-disposition channels. It may be that the depression, big European yields in 1929, and high yields in Russia in 1930 would have made the period 1929–32 a surplus period regardless of national policies; but there is little doubt that the degree of surplus would have been far less and the end more nearly in sight if such policies had not been widely adopted.

The Near Outlook

The outlook for the coming crop year, 1932–33, is highly uncertain this early in the season (June 1932). Present conditions are subject to radical change. At the moment the probabilities may be tentatively summarized as follows: (1) A world carryover somewhat lower than in 1931 and possibly as low as in 1930, but still far above normal, with the bulk of the surplus carryover in the United States and a large fraction of it in the visible supply. (2) A world crop ex-Russia not radically different from that of 1931—much smaller in the United States winter-wheat belt and the Danube basin, considerably larger in Canada, the United States from Minnesota westward to the Pacific, and France. (3) Reduced Russian exports because of a small carryover, moderate to low yields (?), and increased population. (4) Continued restraints upon wheat imports and/or consumption in importing countries of Continental Europe and in various ex-European countries such as India, Egypt, Brazil, and Mexico. (5) Continued depression (even if some measure of recovery takes place) adversely affecting world trade, international credit and exchange, and purchasing power of nations and individuals. (6) Reduced surplus-feed use in the United States because of a short wheat crop here and low prices for coarse grains. (7) World wheat supplies from carryover and new crop well in excess of requirements thus restricted. (8) Continued low wheat prices (with no implications as to specific levels) in open world markets, facilitating flow of surplus wheat to China and to feed use in several countries. (9) General resistance of farmers to painful contraction of wheat acreage, particularly in view of the scarcity of promising alternatives. (10) Lessened influence of Grain Stabilization Corporation control in the United States, as its holdings are disposed of.

If actual developments should broadly bear out these preliminary indications, a further moderate reduction in the surplus carryover in 1933 is the most that can be expected, and a moderate increase is not impossible. The degree of reduction in carryover, assuming the maintenance of restrictions of imports and consumption, will depend most upon the crop outturn in Canada, Russia, Australia, and Argentina, which cannot now be predicted within a wide margin of error. If all these crops should suffer severe reverses, the surplus carryover might conceivably be eliminated. The odds now appear strongly against this outcome, especially because an advance in wheat prices that would probably accompany such crop reverses would reduce materially the volume of wheat disposed of through surplus channels, as was the case in 1929–30.

Even a large reduction in the surplus carryover by accident of Nature in 1932–33 would no more insure the solution of the surplus problem than it did in 1929–30. So

long as the general depression continues and policies tending to restrict consumption and to increase production are in effective operation, such relief as Nature may give is likely to be temporary as well as disappointing in degree.

According to accepted economic theory, reduction in prices normally tends both to expand consumption and to decrease production. Within limits this is true, but even the law of supply and demand, as commonly understood, requires considerable restatement with reference to a business recession and various other conditions. It is commonly assumed that low world prices for wheat, for which there is a "world market" and a large volume of international trade, will tend to lower world wheat acreage and to increase world wheat consumption. That this tendency exists, there is abundant evidence; but other factors may overbalance it. In the present surplus period, abundance and low wheat prices have helped to set in motion, in various countries, political forces that effectually reversed the expected effects there. Most of Continental Europe, and portions of ex-Europe, are more or less walled off from the world wheat market, and wheat made artificially dear to consumers and at least relatively profitable to farmers. Various exporting countries have sought by governmental action to resist liquidation of wheat farming, and in some cases (notably Russia) to expand wheat acreage regardless of the world surplus condition. These policies, plus the depression itself, have counterbalanced world economic forces making for readjustment of supply and demand, and so prolonged the maladjustment. It is a striking fact that between 1928 and 1931 wheat acreage expanded by 1.4 million acres in the Danube basin, by 3.2 million acres in other Europe (mainly Poland, Germany, and Spain), and by over 15 million acres in Russia, even after making allowance for heavy winter-killing in Russia in 1928. Only in the United States and Argentina was there a significant net decline in wheat acreage, and much of this was due to adverse weather in the spring-wheat area of the United States.

There are a few signs of modification of national policies that have aggravated the surplus condition. Control measures in the exporting countries of the Danube basin have proved too costly to the national treasuries and have already been modified to permit somewhat freer play of economic forces. Stabilization operations in the United States have proved expensive to the Treasury and disappointing to farmers, and will presumably be a smaller factor in 1932–33 than in the past three years. Great Britain's domestic wheat policy may operate slightly to increase British wheat production and to decrease feed use of domestic wheat; but her example may influence some Continental European nations to modify their policies into a form that will contribute less than present policies do toward accentuating the surplus condition. Of radical change in significant government policies there is yet no sign.

VI. SOME LESSONS FROM HISTORY

History affords some instructive lessons in respect to emergence from two earlier periods conspicuous for wheat surplus, 1893–96[1] and 1922–24, and to the failure of a surplus to develop in the fifteen years before the World War in spite of a remarkable expansion in wheat production.

Two Earlier Surplus Periods

Nature played the leading rôle in solving the surplus problem of the middle 'nineties.[2] Crop failures or reduced yields in various countries in 1895 and 1896, and generally in extreme degree in 1897, were the major influence that brought shortage in 1897–98 and led to a restored equilibrium. In joint consequence of low prices and adverse weather, wheat acreage was some-

[1] There is some ground for regarding the surplus period as of longer duration. Judging from price evidence, 1891–92 appears a year of shortage, but the United States crop proved so large that a considerable carryover remained. The crop of 1893 was moderately short, but the combination of liberal inward carryovers and business depression made it appear a year of surplus.

[2] The following statements are presented tentatively, pending the completion of a study of wheat price decline and recovery in the 1890's.

what reduced in some countries, and the upward trend slackened in others; but apparently human decisions were not a major influence. Enlarged feed use, in view of severe drought damage to the corn crop of 1894, in Europe as well as in the United States, was a factor of some importance. Some measure of recovery from the severe world-wide depression had also taken place before the crop shortage of 1897. Except in the timing of the short crop in relation to the business cycle, however, all of these influences favorable to readjustment have been present in the recent surplus period.

The outstanding difference lies in the absence, in the 1890's, of anything comparable to the governmental measures that have been applied in the recent period. Tariff increases in the period of surplus were few. The level of tariff rates at its peak in the 1890's was lower, rather than higher, than in 1927–28, before the recent rapid increases took place. Nothing like the quota measures, import prohibitions, or restraints on consumption of the past three years were adopted by any country except Portugal, a very minor factor in the world wheat situation. No price support or bonuses on wheat production or exports were given in exporting countries. No government undertook frankly to stimulate expansion of wheat acreage, production, and/or exports, as Russia, Germany, Poland, and other countries (Australia in 1930) have in the current surplus period. In the absence of significant government measures, Nature and economic forces combined to solve the wheat surplus problem of the middle 'nineties.

Again in the 1920's Nature played an important part. Though low prices in 1923–24 were a factor of some influence in reducing or restraining expansion of wheat acreage, Nature was mainly responsible for a net reduction of some 7 million acres in the harvested area. Adverse weather conditions in the United States led to reductions in sowings of winter and spring wheats; with light abandonment there was little replanting of fall-sown acreage in the spring. In Argentina, liberal abandonment cut down the harvested area. More important, Nature gave low yields in almost every country except the United States, Australia, and India. Consequently, the world crop of 1924, ex-Russia, was 400 million bushels below the big crop of 1923, and smaller even than the moderate crops of 1921 and 1922.

Low prices in 1922–24 were a factor in relieving the surplus. Feed use of wheat in the United States was liberal in 1922–23, large in 1923–24, and fairly liberal in 1924–25 when Nature was responsible for a short corn crop in this country. Large shipments to ex-Europe, especially to China, were a factor in 1923–24, as in 1928–29. European countries also absorbed wheat liberally in 1923–24, in spite of fairly good crops there, instead of restricting imports by high tariffs and other measures. These factors prevented the carryover from the big world crop of 1923 from reaching such a high level as after the bumper world crop of 1928.

The most striking contrast between 1924–25 and 1929–30, however, appears in other directions. Europe's crops in 1924 were short, while in 1929 they were large; hence Europe welcomed heavy imports in 1924–25 instead of resisting them as in 1929–30. The year 1924–25 was marked by notable recovery in the general economic situation, and especially in Europe; following the acceptance of the Dawes Plan there was a remarkable revival of confidence in Europe's future, which led to liberal extensions of credit which undoubtedly facilitated European imports of wheat. By contrast, 1929–30 was marked by notable recession in the general economic situation, by shrinking confidence in European conditions and outlook, and by rapid diminution in credits to Europe. With such economic conditions reinforced by definite governmental measures, the great shrinkage of European takings in 1929–30 (from 658 to 498 million bushels) was in sharp contrast to the increase in European takings in 1924–25.

Moreover, continued economic recovery in Europe in the four years following 1924, the continued absence of Russia as a major exporter (except in 1926–27), and relatively moderate levels of governmental restrictions and aids to farmers stand out in sharp contrast to the deepening economic depression of 1929–32, the return of Russia as a major exporter in 1930–32, and the multiplication of national measures affecting

consumption, imports, exports, and prices. Enlarged crops in 1925, 1926, and 1927 were thus absorbed with facility, whereas the crops of 1930 and 1931 have not been and that of 1932 may not be.

Pre-War Expansion without Surplus

The fifteen years before the war witnessed a remarkable expansion of wheat production without giving rise to any problem of persisting surplus. Comparing averages for the years 1894–98 and 1909–13, world wheat production increased about 40 per cent, ex-Russian about 33 per cent, Russian production nearly 80 per cent. The net increase in the eighteen years between 1909–13 and 1927–31 was only about 20 per cent, exclusive of Russia (mostly in the recent years), and only about 16 per cent if Russia be included. Yet the much smaller expansion of wheat production in the later period has led to a big surplus problem, while the larger expansion of the pre-war period did not. Indeed, such was the expansion of wheat demand in the earlier period that not only did no persisting surplus appear, but wheat prices showed a moderate upward trend, generally equal to or a little greater than the rise in the level of commodity prices generally.

The pre-war period was interrupted by no major, world-wide depression; even in the United States the depression of 1907–09 did not extend to agriculture. It was broadly a period of peace and increasing productivity and prosperity, in which there occurred a substantial growth of population. Moreover, there was a material increase in the per capita consumption of wheat in countries where large classes had hitherto been accustomed to eat rye, corn, or other cheaper cereals, and were ready to eat more wheat if they could afford it. This took place most notably in Russia, but also in several countries of northern Europe, in the southern part of the United States, and in India as well. A significant increase in the consumption of wheat flour also occurred in various ex-European importing countries in which per capita consumption of wheat was still very low. To only a limited extent wheat was made more expensive to consumers by tariff duties, and there was a general absence of other restrictions on wheat imports and consumption. The wheat-exporting nations (including the United States) were debtor countries, while most of the wheat-importing countries were creditor nations, hence the flow of wheat fitted well into the balance of international payments. Both in Europe and in the United States farmers were relatively prosperous, and measures of agricultural relief were nowhere applied on an extensive scale. Obstacles to the international movement of goods and capital were not lacking, but they were nothing like so extreme as they have become in the past few years.

It is fallacious to speak of the pre-war period as a golden age, or to magnify contrasts with the post-war period. The plane of living was by no means ideal for farmers, wage earners, and other groups; for the masses of people it was probably not as high in 1909–13 as in 1925–29. Frictions and strains of many kinds abounded, and contributed toward bringing on the World War. Yet it was, on the whole, a period of substantial progress in production, trade, and consumption; and the world's economic system was strong enough throughout to permit necessary readjustments to be made without entailing a general breakdown. Doubtless another major depression would have come in the course of time, if the war had not supervened, but it was not clearly imminent in 1914.

The War and Its Aftermath

The war, however, not only upset the world equilibrium, in the wheat market as well as in everything else; it left a legacy of frictions, lack of balance, ill-will, and irreconcilable ambitions that did not prevent physical reconstruction but have rendered difficult the restoration of a really normal equilibrium. In respect to wheat, the war wrought a vast change in distribution of wheat production, slowed up the growth of population, led to sharp curtailment in wheat consumption per capita, and altered for the worse the international financial and economic relationships which had facilitated international trade in wheat.

In view of the handicaps of many kinds, the degree of economic recovery achieved in the first decade after the armistice was

notable; but there remained so many stresses and strains, so many disparities between strength in some parts and weakness in others, that the foundations of sustained advance were unstable to a degree that was not generally realized until they were subjected to a severe test. The present extreme depression, which afflicts all countries and all classes in varying degrees, reflects a more or less extensive breakdown of the world's economic machinery under such a test.

Even more than for alleviation of these evil consequences, the situation calls for strengthening the foundations of the economic structure, and so improving the balance among the various parts that the machinery may again function with reasonable smoothness and increased endurance. Thus far, vast energies have been expended in vain efforts to check the continuing recession, and efforts toward co-ordinated constructive measures have been limited and of little effect. In respect to wheat, national efforts have been concentrated upon dealing with domestic wheat problems, by more or less experimental procedures, without much regard to the effect of such national measures upon the world wheat situation. International conferences have thrown some light on the situation as a whole, but have had no success in reconciling conflicting convictions or in laying the basis for common attack on the broad problem of which the wheat problems of individual nations are only parts.

VII. APPROACHES TO THE SOLUTION

Unhappily we can bring forward no grand scheme that would readily solve the wheat-surplus problem. Probably there is none that would be at once practical and effective; indeed, the search for such a plan may retard progress toward the solution. Nevertheless, there are various lines of approach to the solution that deserve brief consideration. Some of these should be rejected, but others hold promise.

At the outset, let us face a few basic facts. The first is obvious, yet it needs repeated emphasis. The persistence of surplus implies a more than temporary excess of production over consumption. Any remedy to be effective must succeed in contracting production, expanding consumption, or both. Whatever leads, on the whole, in these directions helps toward the solution; whatever leads to expansion of production or contraction of consumption intensifies the problem. Another fact, not so obvious, also needs emphasis. In a period of abundance, the broader the distribution of the surplus the less is its burden, and the greater are the prospects of its absorption. Whatever leads to concentration of supplies tends to increase both the actual size and the realized burden of the surplus.

Third, wheat can now be produced in large quantities very cheaply. Prices that have been regarded by wheat farmers as merely remunerative are far above levels now required to induce production sufficient for what the world will use for seed and food. To produce more necessitates lowering wheat prices so that millable wheat will compete with cheap feed grains. At best, the normal level of wheat prices nowadays is low, though by no means so low as this. The world can spare for other work wheat growers whose costs are relatively high. Attempts to make all wheat farmers prosperous tend to bring them all to distress.

Finally, national wheat problems are intimately linked with the world wheat problem; and national policies, often far broader than wheat, may significantly affect the wheat situation, adversely or beneficially. The bearings of various national policies on the world wheat problem, and on other pressing world problems, deserve candid consideration.

The intensification of the surplus problem itself is due, in considerable measure, to separate national policies that have ignored or flouted these facts. Conceivably the solution may be sought by reckoning seriously with such facts. On the other hand, they may continue to be disregarded. Some kind of solution, some new equilibrium, will be reached if present lines of policy are pursued to their logical conclusion. We venture to sketch, in the following paragraph, the possible course that de-

velopments may take, though no one is competent to make a reliable prediction.

Serious depression of world wheat prices will persist for some time, now relieved, again intensified. Wheat growing in European importing countries will be maintained or further expanded, under régimes of subsidies, fixed prices, milling quotas, high tariffs, and import prohibitions or restrictions, but on a relatively high cost level. Continental European consumers, in many countries, will continue to pay dearly for poor bread. Russia will maintain or increase her wheat acreage, but only at heavy real costs, and export wheat to an extent involving curtailment of her people's diet, without getting much in return. European exporting countries will secure preferential export conditions within Europe, with disappointing results to exporting and importing countries, and with damage to economical trade. Large numbers of wheat growers in the major overseas exporting countries will gradually lose their farms for debt. Some contraction of wheat acreage will result, but much more extensive "liquidation" of farmers. Other farmers will step into their places with lower costs for land and equipment. Costs of wheat growing will fall further, and world wheat prices tend still lower. Eventually, European nations will be forced by labor, business, and consumer interests to adopt policies of cheaper, better bread. The change in policy will be disastrous for European wheat growers who have expanded their wheat production at high costs, and they in turn will undergo extensive liquidation. Meanwhile, the process will have increased the unbalance and distress that characterize the depression, and operate against recovery of general equilibrium. In some such way, the wheat-surplus problem may actually be solved, by restraint on consumption forcing liquidation of farmers, first in exporting countries and later in others.

To state the outlook for solution by this route, in these terms, suffices to stamp it as undesirable. Certain other approaches which at various times have commanded more or less extensive support merit dismissal as illusory, futile, or impractical.

1. Schemes for "control of the surplus" as a means of solving the surplus problem are illusory. To be really effective, such control would have to be world-wide, and combined with autocratic control over both production and disposition. Such degree of control is impractical. Within limits that are possible in time of peace, experience shows that it is easier to get control of a surplus than to exercise such control wisely. Holding wheat off the market does not eliminate its burden. Concentrated control of supplies may be appropriate in time of extreme scarcity, when the most economical disposition of limited supplies is in the best interest of all concerned. It is not an effective measure when supplies are so large that the major problem is the distribution of these supplies through all available channels. Attempts in this direction, in many countries, appear to have increased rather than diminished the burden of the surplus if not its actual size.

2. Schemes for international agreement on wheat export quotas are also illusory. With copper, production and export controls have not prevented drastic declines in prices or the increase of surplus stocks. The sugar quota system has never been given an effective trial, and the attempt has not prevented further declines in sugar prices. The problem with wheat would be far more difficult, in part because more countries are involved and international agreement is therefore harder to attain; and in part because different wheats are essentially diverse products while sugar and copper, from all sources and regions, are practically identical. An export quota system, if it could be adopted, would almost certainly tend to prevent the most effective disposition of the world's wheats; and it would not necessarily contribute toward either expansion of consumption or contraction of production.

3. Schemes for export dumping, at the expense of national treasuries, domestic consumers, and/or domestic producers, are untested on a large scale, would presumably evoke resistance or retaliation, and are at best inappropriate in a condition of *world* surplus. They would not go to the root of the difficulty, would be disappointing in their benefits to farmers, and might easily increase the forces making for persistence of the surplus.

4. Schemes for diversion of wheat into industrial uses, though representing a form

of interior dumping that is freer from objection than international dumping, yield no promise in view of the abundance of still cheaper industrial materials for which wheat might be substituted. Schemes for diversion of wheat to feed uses, by artificial coloring of part of the supply (as Germany has done with rye), probably merit more consideration as temporary measures; but the obstacles are numerous and serious. The same may be said of schemes for destruction of part of the supply (as Brazil has done with coffee).

5. Attacks on speculation or upon the traditional system of grain marketing yield no promise of aid in the solution of the wheat-surplus problem. Evils in the operation of these systems unquestionably exist; conceivably these evils can be eliminated or better systems developed. But even the existing systems render important services at low cost to producers and consumers; and even the most perfect system of grain marketing would not contribute appreciably toward solving the surplus problem.

6. Attacks on bread prices, and regulation of bread prices, promise no constructive aid in solving the wheat problem, at least in the United States; for the demand for bread is practically unresponsive to changes in bread prices, within wide limits.

7. Efforts to stimulate increased food consumption by advertising (e.g., "Eat more wheat," "Bread is your best and cheapest food") are futile. Advertising serves its chief function in stimulating consumption of specialties, not of staples; and however effective advertising may be in increasing sales of one company's bakery products, it is probably ineffective in influencing the consumption of bakery products generally.

Perhaps a benevolent world autocrat could solve the wheat-surplus problem without great delay, without going so far as to regulate the acreage planted to wheat, on some such lines as the following:

1. Abolish all measures that affect adversely the quality of wheat products and make them more expensive to consumers.

2. Eliminate measures now restricting operations of private merchants in finding consumer outlets for wheat at home and abroad.

3. Take steps tending to increase export outlets and thus the import-purchasing power of wheat-importing countries, that would import and consume more wheat if they could afford to do so.

4. Facilitate or even prescribe retention of low-grade wheat on farms, and the diversion of some millable wheat to feed and/or industrial uses.

5. Eliminate all policies tending to maintain or increase wheat acreage.

6. If the foregoing were insufficient, temporarily impose a charge on breaking in new lands to wheat and give a bonus for contraction of wheat acreage.

Such measures, though not directed toward price raising, could be expected to result in higher prices to producers than they can get in a period of persisting surplus, when prices of good milling wheat fall to levels that make wheat profitable for feed use.

There is, however, no world autocrat, benevolent or otherwise, and no prospect of his appearance. Nor is there any prospect of arriving at much the same result by international agreement among wheat-producing countries. Practically, solutions should be sought which do not depend upon dictatorial powers, within or among nations, and which rest rather upon increasing international understanding than upon formal international agreements. Furthermore, we may well face the fact that extensive control of economic forces imposes undue strains upon human powers. More promise lies in reckoning fully with these powerful forces, and seeking adaptation to them with only moderate attempts to guide them, rather than undertaking major "control" or diversion of them.

A different approach to the solution of the wheat problem lies through a reorientation of the economic policies of nations. Two significant tendencies have been manifested in recent years: to protect producers and stimulate production, rather than to protect consumers and stimulate consumption; and to enhance national self-sufficiency even at heavy cost, rather than to reap the advantages of international division of labor. These tendencies have been expressed in import prohibitions, rising tariff barriers, quota systems of various kinds, government subsidies to domestic industries and merchant marines, price-stabilization schemes, export bounties, export promotion efforts,

and so on. In one form or another, these have been almost universal, in rich nations and poor, in creditor countries and debtor countries, under democratic, fascist, and communist governments. They have led to overexpansion of agriculture and to extensive overbuilding of the world's physical plant, in all sorts of factories, in land transportation, and in shipping. Huge savings have thus been invested in enterprises that could not be profitable. The outcome has been disastrous to producers and investors, and in turn to consumers through the decline in the income they have to spend.

In a period characterized by scarcity of goods, there is virtue in such policies, for consumption is limited by the extent of productive power. In recent years science, engineering, finance, and communication have vastly increased the world's producing power. The influence of higher attainable standards of living, coupled with wider knowledge of birth control, has led to slowing down the growth of population. The result is that abundance rather than scarcity of goods and productive power characterizes the present situation in most of the civilized world. Under these conditions, measures directed primarily toward expansion of production are inappropriate; measures to improve the functioning of the productive machinery are needed, but measures directed toward facilitating distribution and expansion of consumption are most important.

These general considerations have a bearing on the wheat-surplus problem. It is not merely that policies applied to wheat have directly caused expansion of wheat production, contraction of ordinary requirements, and restraint upon normal expansion of consumption in the face of a surplus condition. It is not merely that these policies have played a large part in bringing on the general depression, which has bedeviled the wheat situation along with everything else. It is also that national policies of wheat-exporting nations have restricted their markets for imported goods to such an extent that wheat-importing nations encounter grave difficulties in finding export markets for the goods with which they could pay for wheat and other imports. The United States has given potent examples of such broad tendencies, notably through tariff policy and shipping subsidies, and thus made substantial indirect contribution to the creation of the world wheat-surplus problem.

For the time being these tendencies have been rendered more powerful by the depression itself. Plans and programs are directed primarily to national measures for dealing with national problems as such. Very inadequate to the task is the ability to deal with basic problems from a larger standpoint, and so to harmonize national policies as to bring rational solutions for the various nations concerned. While this trend persists, and separate national policies tend to prolong the world surplus condition, little more can be expected than alternation of alleviation and intensification by accidents of Nature.

If, on the other hand, nations should frankly recognize that the solution of problems of idle plant, unemployed labor, and commodity surpluses lies in the direction of facilitating consumption, extensive modification in national policies would ensue. Unquestionably extensive readjustments of production would be required, within and among nations; but extensive readjustments are inevitable under any policies. If policies of protecting producers lead where we believe they have led, producers themselves stand to gain, in no very long run, by policies directed toward increasing outlets for goods rather than in other directions.

Such a redirection of national policies would have a signal bearing upon the wheat problem. If Germany, for example, could find export markets for goods that her industries are admirably equipped to make, she could afford to buy increasingly heavy wheat imports and enlarge her dairy industry at the expense of food grains. If India, Mexico, and China were able to sell more freely what they can produce advantageously, all would probably absorb larger quantities of the world's wheat, to the better nutrition of their peoples. If Russia were to concentrate upon raising the food standard of living of her people, she would devote more acreage to feed grains and less to bread grains, and press less wheat into export. The United States government could do more for the wheat farmer by modifying its international commercial policies than by direct farm relief.

From one point of view, the world wheat surplus seems astonishingly small. The world surplus carryover, as we have computed it, has been at its peak (1931) no more than 350 million bushels or so. This is about 10 per cent of the average world crop ex-Russia in recent years, and about 8 per cent of the world crop including Russia. The annual surplus of production over ordinary requirements, restrained as they were, has averaged in the past four years less than 200 million bushels a year. This is less than 5 per cent of the average world wheat crop, including Russia. Small as the surplus appears when so viewed, the inelasticity of demand is such, under the restraints that have been imposed upon consumption, that the surplus has been large enough to have disastrous consequences. It is too large to be dealt with by any one nation.

On one ground disillusionment must be accepted. The view has long been held that during a depression, when purchasing power of individuals is diminished, the pressure for economy leads to increased per capita consumption of the cheapest staples of the diet, such as wheat in the United States, Great Britain, and France, rye in Germany and Poland, corn in southeastern Europe. For various reasons this view has not been clearly borne out in the present depression.

The experience of the fifteen years before the war, of rapid expansion of wheat production with no persisting surplus, probably cannot be duplicated now; for the growth of population in general outside of Russia and India is proceeding much more slowly, and displacement of other cereals by wheat for food has not so far to go. But if measures tending to restrain wheat consumption for food were removed, there is good reason to believe that in the next fifteen years, on a moderate level of wheat prices the world over, wheat consumption might expand with sufficient rapidity to absorb the product of increasing acreage even with gradually rising yields per acre. Many policies adopted on behalf of farmers have helped to accentuate, rather than relieve, the world agricultural depression; taken as a whole, in few countries have they served to improve the absolute position of wheat growers, even for the time being. Reoriented national policies, with consumers the world over more directly in view, would probably be more in the interests of farmers themselves than all direct farm relief measures combined. Some "liquidation" of commercial farming is perhaps inevitable, and some contraction of wheat acreage also for a time; but much less is really inevitable than will occur if present trends continue.

In the light of these observations, rational lines upon which the solution of the wheat-surplus problem might be sought can be summarized as follows:

Wheat prices would be permitted generally to continue low enough to permit liberal consumption for food and a liberal flow into surplus channels, to discourage acreage expansion and encourage some contraction—so long as carryovers remain excessive and until wheat acreage reaches such a level that average yields provide no current surplus over ordinary wheat requirements. Aid to farmers would be sought in harmony with such policies, and price enhancement through the operation of economic forces, not by price-raising and price-supporting measures which tend on the whole to defeat their own ends.

Efforts would be directed toward permitting and facilitating increase in consumption of wheat products. There is room for considerable expansion for food use in countries where the demand for wheat is elastic. Measures tending to restrict consumption, whether by increasing prices, injuring quality, or otherwise, would be abandoned. International inducements to insure modifications of such policies, when they are in force, would be sought.

Such tariffs and milling regulations as remained would be fixed for a period of years, not subject to frequent change. Any stabilization of returns to farmers would be sought by other measures. Thus stocks of wheat that are now forced to back up in exporting countries would be more widely dispersed, and both the burden of surplus and the impact of shortage lessened.

Constructive efforts would be made to repair and reconstruct the world's economic and financial machinery, within nations with full recognition of their international bearings, and among nations in respect to outstanding international obstacles

in the path. This would not only facilitate recovery from depression generally but aid in solving the world wheat problem.

Efforts would be directed toward facilitating the imports, by wheat-exporting countries generally, of export products of wheat-importing countries, in order that the import purchasing power of wheat-importing countries may be increased. Policies of opening markets to imported products would be substituted for policies of closing markets to imported products.

Measures for agricultural relief and advancement would be sought which will neither restrict cereal consumption nor increase cereal production, nor promote overexpansion of commercial agriculture. The current tendency to abundance of cereals points to the prospect of increased livestock feeding with increased outturn of dairy and other animal products for which the demand is relatively elastic; for dairy products in particular, per capita consumption is generally below the optimum for satisfactory nutrition. While the depression lasts, positive efforts to increase livestock are not promising; but as the world emerges from depression, enlargement of animal husbandry may be expected to afford substantially larger outlets for farming activity. Probably only thus can serious liquidation of commercial farming be averted.

Such a program is complex, not simple; unlike various grand schemes, however, it is simpler than it appears, not more complex. It presents challenging tasks, but not impossible ones. It is far-reaching in its implications, yet it presupposes nothing highly experimental or plainly impractical. It is perhaps along some such lines that a World Planning Board, if one existed, might make recommendations that national governments would do well to follow in the interests of their several peoples. It diverges so far from current trends of thought that progress in this direction will not be rapid, but it may come in due time.

VIII. SUMMARY

The world wheat problem is one of persisting surplus. More wheat has been produced, is currently available, and is being produced than wheat markets will absorb except at prices unremunerative to large groups of wheat farmers and ruinous to many of them. The existence of the surplus is reflected in wheat prices that not only appear extremely low, but are unprecedentedly low in relation to prices of commodities in general. The surplus is evidenced by abnormally heavy stocks of wheat; and by a continuing excess of supplies above ordinary wheat requirements, either for the world as a whole or for the international market. These conditions have led to substantial diversion of wheat to low-price outlets, such as feed use, heavier consumption in India, and enlarged exports to China, but without eliminating the surplus.

The present surplus first emerged in 1927–28, after good yields on a record acreage. It became substantial in 1928, in consequence of exceptional yields in the world ex-Russia, on a still higher acreage. It failed to disappear in 1929–30, despite heavy decreases in the wheat crops of exporting countries, because Europe had excellent crops of cereals and potatoes, and many countries restricted imports on behalf of their farmers and to protect their international financial positions. It persisted in 1930–31, in spite of heavy feed use in North America and large shipments to China, because of a big world crop (due in part to national policies), high yields in Russia and pressure of Russian exports, continued business recession, and intensified import restrictions in Continental Europe. It persists in 1931–32 in spite of moderate reductions in world wheat production and continued heavy diversion to feed use and to China, because of continued restrictions in European purchases, further recessions in business and in commodity prices, and renewed Russian exports.

The wheat problem is international in scope, yet it is profoundly affected by national policies, adopted with the best of intentions but with limited appreciation of their consequences. Extensive political alternations of economic forces are heavily responsible for prolonging the surplus condition. The logical outcome of continuing

these policies is an equilibrium reached by restraint of consumption and liquidation of farmers, both to an extent neither necessary nor desirable.

Absorption of accumulated surplus carryovers is especially difficult because the level of wheat acreage continues such that with average yields, at the levels to which they have recovered since the war, and with consumption held down by the depression and national policies, even current production tends to exceed what can be disposed of without substantial diversion of good milling wheat into low-price outlets. A significant, elastic element in the demand for wheat is constricted by the effect of the depression on purchasing power of European and ex-European importing countries, and by import prohibitions, high tariffs, milling quotas, and other devices. These operate to thwart, in many countries, the tendency to increase wheat consumption for food at the expense of rye, corn, and other foodstuffs. Such measures have led to reduced consumption and enlarged acreage of wheat in Continental Europe and some countries outside, thus intensifying the problem.

Some contraction of acreage, partly because of weather conditions, has taken place sporadically in some exporting countries; but in Russia, India, and Canada, as well as importing countries of Continental Europe, expansion continues. Acreage contraction by individual farmers, always made with reluctance, is hampered by lack of profitable alternative farming enterprises, in consequence of the general depression. Advice to reduce acreage, where given, has apparently had little influence. No country except Russia is in a position to force acreage contraction, and Russia has sought rather to expand acreage. Moreover, while financial stringency among farmers tends in part to reduce yields per acre, it also tends to stimulate efforts toward increased yields as a means of cutting costs per bushel.

Accidents of Nature, such as are playing a large rôle in reducing winter-wheat acreage and yields in the United States this year, will continue to affect the extent of the surplus; but they cannot be relied upon to eliminate it. A durable solution of the surplus problem is not yet in sight.

Stabilization operations by the Federal Farm Board, involving control of the surplus accumulated in the United States in 1930–31, to some extent cushioned the shock of price decline to American farmers. This policy, however, has made for concentration of surplus stocks, contributed nothing positive to solve the surplus problem for the United States or the world at large, and probably prevented some absorption of the surplus that would otherwise have occurred. Other proposed surplus-control measures, domestic or international (e.g., the export quota system), would also fail to go to the heart of the problem, could be expected to be similarly disappointing, and might even accentuate the surplus problem. No significant expansion of important inelastic elements in the demand is in prospect, except with slow growth of population. Demand cannot be stimulated directly, but expansion could be expected if various restraining factors were removed.

A rational solution of the world wheat problem in the general interest might conceivably be reached, not by extending the realm of controls but by abolition of whatever measures tend to expand production, restrain consumption, and impede the commercial flow of wheat and the wide distribution of wheat stocks. This approach to the solution implies a reorientation of thought, with primary consideration for consumers rather than producers, and with emphasis upon world-wide bearings of national policies, in a realm much broader than wheat. Modification of national policies, including that of the United States, to permit freer movement of goods other than wheat into countries now maintaining high barriers to imports, would tend to relieve the world depression and aid, both directly and indirectly, in solving the wheat-surplus problem.

At best, the wheat-price equilibrium that can be expected if and when readjustment between wheat supplies and requirements is achieved is likely to be at a level that will appear unsatisfactory to wheat growers generally. Some contraction of wheat acreage and some liquidation of wheat farmers is inevitable; but if present policies are persisted in, much more will be required if the policies are changed. Measures directed

primarily toward price-raising are, for the world as a whole, practically certain to result in more liquidation and lower prices than if liberal consumption is sought instead. The process of readjustment may be painful at best, but the pains will be less than the distress that will accompany extended prolongation of the surplus condition. Alleviation by removing restraints on consumption and stimuli to enlarged production promises more than adjustment by contraction of supply.

This study is the work of Joseph S. Davis. His colleagues on the Institute staff read the manuscript in draft and made helpful suggestions, but do not share the responsibilities of authorship.

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