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DECLINE AND RECOVERY OF WHEAT PRICES IN THE 'NINETIES

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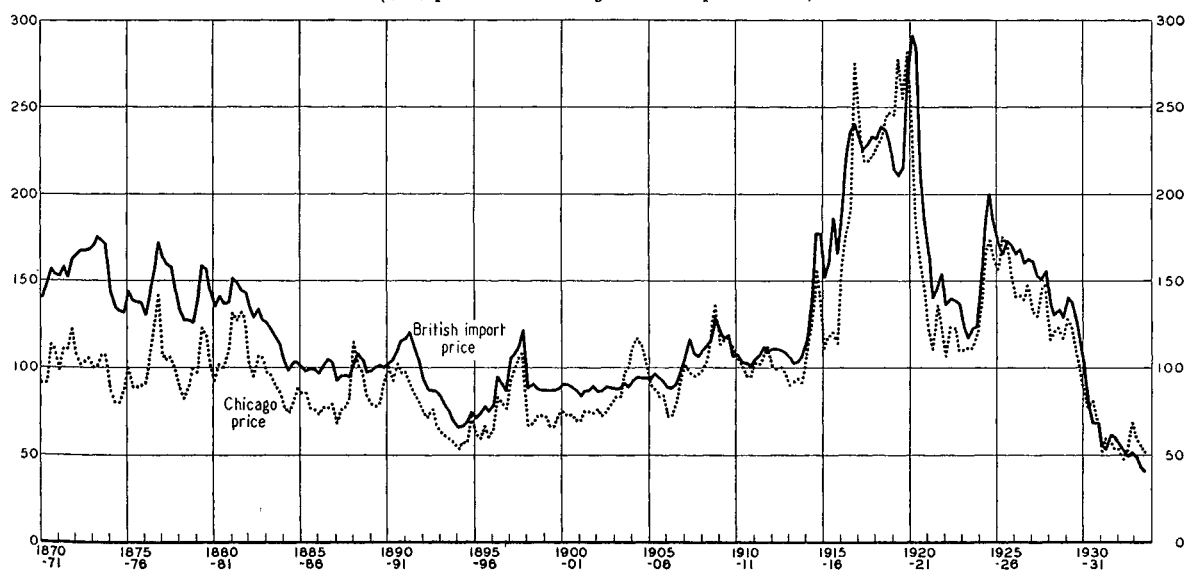
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The drastic decline and prolonged depression of world wheat prices since 1929 have led students of the wheat market to search history for precedents which may be useful in interpreting recent price developments and in judging the likelihood of recovery of wheat prices to a substantially higher level during the next few years.

Over the past sixty years the average price of wheat imported into the United Kingdom (as close an approximation to a "world" wheat price as is obtainable) has declined

precipitously in four different periods: 1881-84, 1891-94, 1920-24, and 1929-34 (Chart 1). In none of the three earlier periods did world wheat prices reach levels as low as those of 1931-34. Previously, the lowest prices recorded on the British import market, and also at Chicago after United States wheat became an important commodity in international trade, were those for August-October 1894. Then, prices of wheat imported into Great Britain were only about 15-25 gold cents higher than they have been recently; and

CHART 1.—BRITISH IMPORT AND CHICAGO CONTRACT CASH WHEAT PRICES,
QUARTERLY FROM AUGUST-OCTOBER 1870*
(U.S. pre-devaluation gold cents per bushel)



* Quarterly averages of monthly prices. For description of British import prices, see footnote to Table I. Chicago prices 1870-1919 from Henry A. Wallace, *Agricultural Prices* (Des Moines, Iowa, 1920), pp. 123-24, except that prices for 1870-78 were converted to gold cents by use of monthly factors in George F. Warren and Frank A. Pearson, *Prices* (New York, 1933), p. 351; prices for 1920-34 are averages of monthly range of No. 2 Yellow Hard, from *Daily Trade Bulletin* (Chicago), converted to United States pre-devaluation gold cents after April 1933 through rates on the French franc at New York until July, and later through the price of gold at London. Chicago prices for 1870-1903 are based chiefly upon No. 2 Spring; 1904-13, on No. 2 Red and No. 1 Northern; 1914-19, on No. 2 Red, No. 2 Hard, and No. 1 Northern.

Chicago prices were about as low as in recent depression years except for the periods May 1932—January 1933 and February—April 1934, when they averaged a few cents lower in terms of pre-depreciation gold cents.

In several other respects the general wheat situation in 1929–34 has closely resembled the situation in 1891–95. Both periods were characterized by world-wide depression in trade and agriculture; in both periods world wheat stocks were notably heavy; in both, wheat prices were low not only in absolute terms,

but also in relation to prices of other commodities.

Because of these similarities, it has seemed appropriate to undertake a detailed study of the conditions responsible for the decline and recovery of wheat prices in the 'nineties, with a view to gaining whatever light experience may throw upon the existing wheat situation and upon prospects for early recovery of wheat prices. The conclusions which emerge from this study are briefly stated in two subsequent sections (pp. 327–28 and 341–44).

I. THE DOWNWARD TREND OF WHEAT PRICES, 1870–1900

The decline of wheat prices in Great Britain during the first half of the 'nineties occurred toward the end of a general downward drift of wheat prices from about 1873 (Chart 1, p. 289). To understand the price decline of the 'nineties, one must, therefore, examine the factors underlying the general downward movement of wheat prices during the whole of the last quarter of the nineteenth century.

MONETARY AND NON-MONETARY FACTORS

For an explanation of any long-time price movement one turns first to that group of general factors, often but somewhat too narrowly designated as "monetary factors," which are reflected in the prices of any large number of commodities at wholesale. During 1873–96 British and American wholesale commodity prices declined almost continuously, except for interruptions in 1879–82 and 1886–90 of which the former was more pronounced in the United States index and the latter in the British (Chart 2).¹ It is outside the province of this study to examine the factors responsible for the downward trend of wholesale commodity prices during 1873–96;² but whatever these factors were, they were clearly reflected in the course of world wheat prices in this period.

We cannot present a perfect picture of what the course of wheat prices would have been in 1870–1900 if commodity prices in general had remained constant. We can, however, roughly eliminate from the wheat price series shown in Chart 1 the price influences common to a large group of commodities at

wholesale. This has been done in Chart 3, which shows British import wheat prices deflated by the Sauerbeck-Statist index of British wholesale commodity prices, and Chicago wheat prices deflated by the Warren-Pearson-United States Bureau of Labor Statistics index of wholesale commodity prices.³

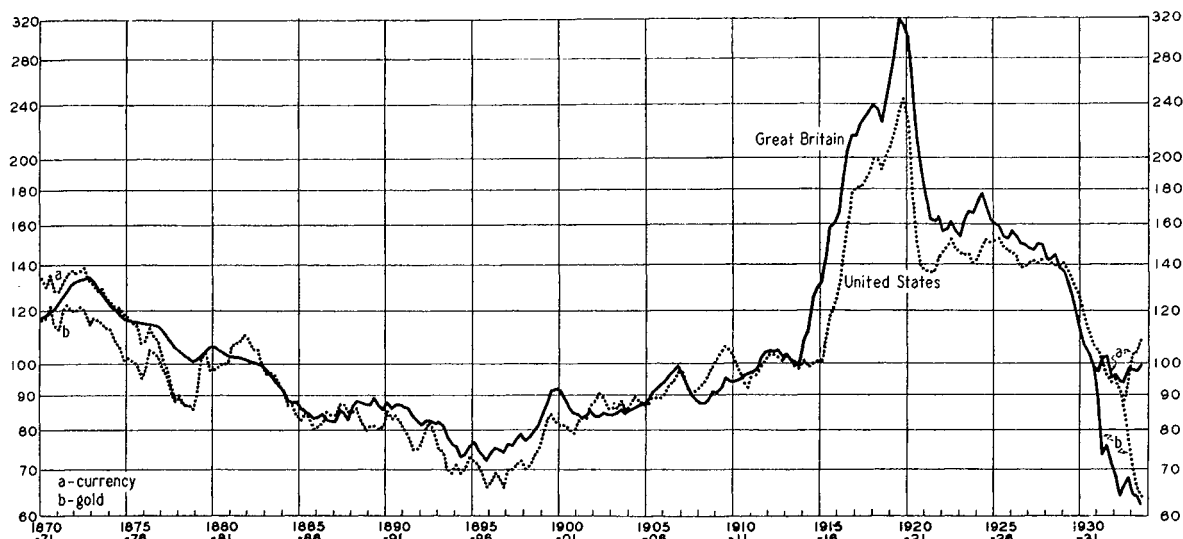
¹ The Sauerbeck index of British prices was first published in 1885; the U.S. Bureau of Labor Statistics index beginning in 1890 was first published in 1902; in 1932 index numbers of United States prices for years prior to 1890 were published by Warren, Pearson, and Stoker.

² Of unquestioned importance were (1) general demonetization of silver with adoption of gold as the single monetary standard in a number of leading countries after 1873, and (2) marked technical progress in many lines of enterprise which was reflected in rapid increase of the volume of goods produced during this period. It is perhaps also noteworthy that prior to 1879 the United States was gradually getting in position to resume specie payments on greenbacks. Thus, during 1873–96, there was on the one hand a general increase in the demand for gold for monetary purposes, and on the other hand an increased outturn of goods to be exchanged against money.

³ No existing index of general commodity prices may be considered a true index of the value of money. We make no claims for the price indexes here chosen except that they appear to be the most suitable and most homogeneous series available for the sixty-four years under consideration. Aside from the defects of existing general price indexes for purposes of deflation, it is noteworthy that in the early part of any period over twelve months in length that is characterized by a large change in general wholesale commodity prices, wheat prices usually react more strongly than the bulk of other commodity prices. Thus, early in periods when general wholesale prices are declining rapidly (as from the middle of 1920 to the end of 1921 and again from the middle of 1929 to the end of 1931), deflated wheat prices show a greater decline than they presumably would show if the value of money were not changing rapidly. Simi-

CHART 2.—WHOLESALE COMMODITY PRICE INDEXES FOR GREAT BRITAIN AND THE UNITED STATES,
QUARTERLY FROM AUGUST-OCTOBER 1870*

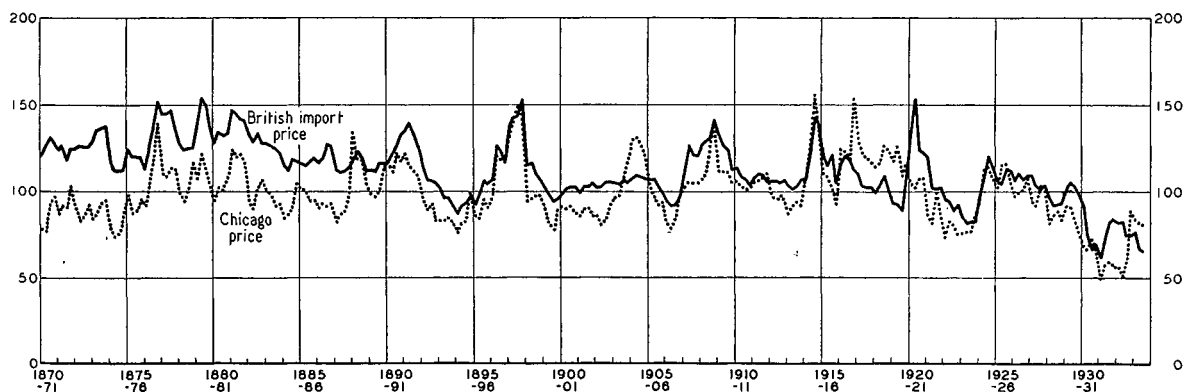
(Percentage of prices in 1910-14; logarithmic vertical scale)



* Sauerbeck-Statist index for Great Britain; Warren-Pearson-United States Bureau of Labor Statistics index for the United States (1910-14 = 100). Prices as currently quoted indicated by *a*; prices in terms of pre-devaluation gold currency indicated by *b*. Prior to 1885 the Sauerbeck index is available only on a yearly basis; the quarterly figures plotted above for the years 1870-84 are our rough approximations based on the annual figures.

CHART 3.—DEFLATED PRICES OF BRITISH IMPORT AND CHICAGO CONTRACT CASH WHEAT,
QUARTERLY FROM AUGUST-OCTOBER 1870*

(U.S. cents per bushel)



* Averages of original market quotations of wheat price series described in footnote to Chart 1, p. 289, deflated by *a* indexes shown in Chart 2 (1910-14 = 100). British wheat prices converted to United States cents at old par of exchange.

When Chart 3 is compared with Chart 1, it is immediately apparent that the major part of the decline in wheat prices during 1870-1900 was the result of influences which were

larly, in periods of a rapid rise in the wholesale commodity price level, deflated wheat prices generally show a relatively greater advance.

tending to depress commodity prices in general. The horizontal trend of deflated Chicago prices suggests that in so far as other influences affected Chicago wheat prices during this period, they tended approximately to offset each other. As regards British import wheat, however, the net effect of other factors

was further to depress its price. In deflated British import wheat prices there was a net decline of something like 20 per cent over this period.

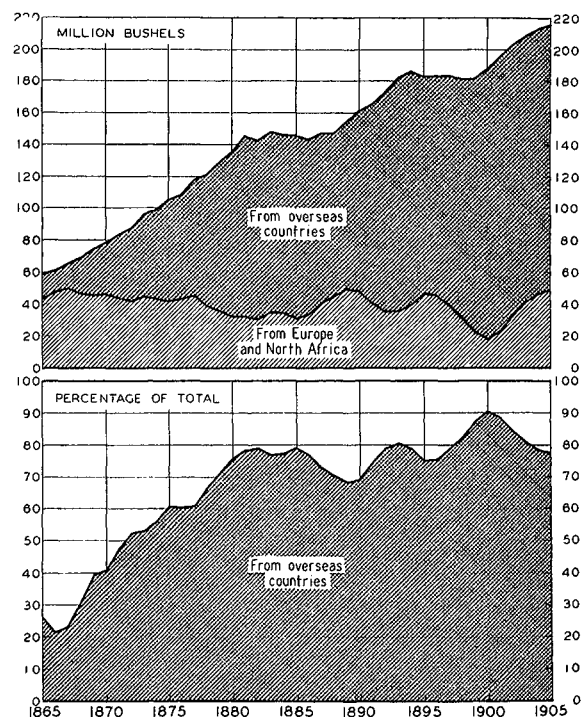
The decline of British import prices relative to wheat prices at Chicago during 1870–1900 primarily reflected decline in costs of transporting wheat from Chicago to British ports. Evidence of this reduction and of similar reductions on other trade routes is presented below (pp. 293–94). If decrease in transportation costs had been the only element tending to influence the course of deflated wheat prices in this period, British wheat prices, in terms of 1910–14 dollars, might have declined somewhat less than they did in actual fact, and Chicago wheat prices, deflated, might have tended slightly upward, instead of showing an approximate horizontal trend. Such, presumably, would have been the result if reduction in freight rates, and consequently in the price of British import wheat, had brought about an increase in European demand for overseas wheat which could be satisfied only through expansion of wheat production under conditions of increasing costs. But with fertile lands well adapted to wheat growing freely available to agriculturists in North America, Argentina, and Australia (pp. 295–96), with population rapidly increasing in these countries, and with railroad building going on at a rapid pace (in some instances more for the purpose of gaining land than in anticipation of immediate profits from operation), there is reason to believe that wheat production might have been expanded in these countries without encountering increasing costs. This might have been the case even in the absence of improvements in agricultural methods and machinery. Consequently, the decline of shipment costs in this period presumably tended substantially to lower the price of wheat to consumers in importing countries, while at the same time it tended to raise only slightly, if at all, the price to producers in exporting areas.

Partly as a result of reduced transport costs and partly on account of other factors mentioned below, wheat growing was notably extended during 1870–1900 in North America,

India, Argentina, and Australia—areas where wheat could be grown at relatively low cost. Wheat exports from these areas were greatly increased, and European wheat growers found it difficult to meet the intensified foreign competition.

Chart 4 illustrates the increasing extent to which British importers drew wheat from the various overseas countries during the last

CHART 4.—BRITISH IMPORTS OF WHEAT (INCLUDING FLOUR), ANNUALLY, 1865–1905*
(Five-year moving average)



* For source of data see "Statistical Notes," p. 345. Flour imports converted to wheat at 70 per cent extraction. "Overseas countries" include Canada, United States, Argentina, Australia, India, and Chile. Imports from "Europe and North Africa" represent the difference between total imports and imports from the "overseas countries."

few decades of the nineteenth century. Prior to 1870 less than 40 per cent of all British wheat imports came from these sources; during 1895–1900 the proportion approximated 80 per cent. Moreover, during these thirty years British wheat imports increased spectacularly, while British domestic wheat crops were reduced as a result of contraction of acreage.¹

¹ See Ada F. Wyman and Joseph S. Davis, "Britain's New Wheat Policy in Perspective," *WHEAT STUDIES*, July 1933, IX, 310–11.

These facts led many observers, including several prominent students of economic history,¹ to believe that foreign competition, rather than general monetary factors, was chiefly responsible for the decline of agricultural prices in Europe during the last quarter of the nineteenth century. In the *Final Report of the Royal Commission on Agriculture* (1897),² it was noted that most of the witnesses who gave evidence before the Commission attributed the fall in agricultural prices to increased foreign competition, which they regarded "as the source and origin of their troubles." A memorandum attached to the *Report of the Committee on Stabilisation of Agricultural Prices* (1925) stated that this had become "the almost universally accepted" explanation of the "great fall in corn prices" and of "the great decline in British agriculture between 1874 and 1896."³

There can be little question that expansion of wheat exports from overseas countries was an important factor contributing to the decline of world wheat prices during 1870-1900. However, if wholesale commodity prices in

general had been tending markedly upward rather than downward at this time, wheat prices presumably would have risen in spite of increased foreign competition on European wheat markets. Under such circumstances, however, British wheat prices would not have advanced as much as the general price level, and deflated wheat prices would probably have tended downward about as they did in 1870-1900.⁴

The expansion of wheat production in overseas exporting countries during 1870-1900 would not have been possible on so large a scale, even with reduced freight rates, if other factors had not been favorable. Among these, the most important were availability of free or cheap land, improvement of wheat varieties and methods of cultivation, extension of railroads, increase of population (to a large extent through immigration) in North America, Argentina, and Australia invention and introduction of better agricultural implements and machinery, and increase of world wheat requirements, primarily as a result of increasing population but partly on account of increase in per capita consumption. These various factors are discussed in detail in the following pages.

REDUCED TRANSPORTATION COSTS

Reduction in transportation costs during 1870-1900 rested primarily upon marked improvement in the construction and operation of steamships and sailing vessels, and secondarily upon progress in land transportation by rail. Coincidentally, there were apparently some significant decreases in shipment costs other than freights.

Ocean freight rates.—The first tabulation on page 294 shows ocean freight rates on wheat shipped to the United Kingdom from New York, Karachi, and Odessa, for five-year periods, converted to U.S. gold cents per bushel.⁵ From 1870-74 to 1900-1904 ocean freight rates on wheat from Karachi and Odessa declined approximately 70 per cent, and freight rates from New York declined almost 80 per cent, while general wholesale commodity prices in Great Britain fell just a little over 30 per cent. In terms of deflated cents per bushel of wheat, freight rates were reduced

¹ Among these, Michel Augé-Laribé, who has contributed much to our general understanding of French agriculture, has been an outstanding advocate of this view. In 1912, he wrote:

"Nous aboutissons d'ailleurs à cette conclusion que la crise agricole est un phénomène complexe qu'une seule cause ne saurait expliquer, mais que, cependant, la concurrence étrangère a sans doute exercé une influence dominante."—*L'Evolution de la France agricole* (Paris, 1912), p. 17.

² Great Britain, Parliamentary Papers, 1897, XV (Cd. 8540), 160.

³ Great Britain, Ministry of Agriculture and Fisheries, Economic Series No. 2, 1925, p. 83. The Committee, however, dissented from this view.

⁴ Just such a situation existed in England in the two decades prior to 1870. Between 1846-50 and 1871-75 wholesale commodity prices rose on the average 25 per cent, while wheat prices rose by only 6 per cent (Committee on Stabilisation of Agricultural Prices, *op. cit.*, p. 88). See chart of annual data in Wyman and Davis, *op. cit.*, p. 334.

⁵ Basic data from successive *Annual Statistical Report[s] of the New York Produce Exchange*; R. F. Crawford, "An Inquiry into Wheat Prices and Wheat Supply," *Journal of the Royal Statistical Society*, March 1895, LVIII, 92; *Second Series of Memoranda . . . on British and Foreign Trade and Industrial Conditions*, Great Britain, Parliamentary Papers, 1905, LXXXIV (Cd. 2337), 260; Th. H. Engelbrecht, *Die geographische Verteilung der Getreidepreise in Indien von 1861 bis 1905* (Berlin, 1908), p. 111.

during this period by about 10 cents from New York, 11 cents from Odessa, and 14 cents from Karachi.

Five years beginning	From New York		From Odessa ^a		From Karachi (via Suez Canal)	
	Actual	Deflated ^b	Actual	Deflated ^b	Actual	Deflated ^b
1870 ^c ...	16.7	13.3	26.3	20.4	33.2	25.9
1875....	15.1	13.7	19.3 ^d	17.2 ^d	25.1	22.5
1880....	8.8	8.7	14.0	13.8	19.9	19.8
1885....	6.3	7.4	10.5	12.3	14.0	16.4
1890....	5.0	6.1	9.4	11.3	13.3	16.0
1895....	5.9	7.7	8.0	10.4	9.3	12.0
1900....	3.5	4.0	7.8 ^d	9.1 ^d	10.4	12.1

^a Data from 1890 are not strictly comparable with data for earlier years. In the source from which the later data are taken, the rates are reported in shillings "per unit, new charter," without definition of the unit. We have converted these to cents per bushel on the basis of the average relationship between this series and the series given by Crawford during the period of overlap, 1885-89.

^b Deflated by Sauerbeck-Statist index, 1910-14 base.

^c Four-year average for Karachi, three-year average for Odessa.

^d Four-year average.

Inland freight rates.—Inland as well as ocean freight rates were significantly reduced during 1870-1900. The following tabulation summarizes the most significant available information on wheat freight rates within three of the leading wheat-exporting countries, in terms of U.S. gold cents per bushel.¹ These data, though fragmentary,

Five years beginning	United States Chicago to New York (lake-and-rail)		Russia Samara to Rybinsk (river)		India Jubbulpore to Bombay (rail)	
	Actual	Deflated ^a	Actual	Deflated ^a	Actual	Deflated ^a
1870....	21.1	16.8	...	...	29.2 ^b	22.8 ^b
1875....	12.4	11.2	6.9 ^b	6.8 ^b	19.8	18.0
1880....	11.8	11.7	6.5	6.5	18.4	18.4
1885....	10.6	12.5	4.5	5.3	15.6 ^c	18.5 ^c
1890....	8.0	9.7	...	...	....	....
1895....	6.5	8.5	...	...	....	....

^a Deflated for comparative purposes by Sauerbeck-Statist index, 1910-14 base.

^b Two-year average.

^c Average for two and a half years.

clearly suggest that rail, lake, and river freight rates declined during this period, and probably in most instances by a larger percentage than English or American wholesale commodity prices.

Not all freight rates on wheat were reduced as rapidly as wholesale commodity prices declined. For example, in the United States, railroad rates on wheat shipped from Kansas City to Chicago were higher in the 'nineties in relation to general commodity prices than they had been in the 'seventies. But these were not typical of other wheat freight rates in the United States—at least, not of rates on wheat shipped for export. As regards other exporting countries, the data are less complete, and it is more difficult to determine what reductions were significant and typical. However, from the data at hand, we infer that freight reductions in these countries generally exceeded the percentage decline in British wholesale commodity prices and contributed to the downward trend of deflated import wheat prices.

Elevator and other handling costs.—Not only freight rates, but also insurance rates, elevator charges, brokers' commissions, and other handling costs were generally reduced during the last quarter of the nineteenth century. Unfortunately, information as to these costs is so fragmentary that there is no firm factual basis for determining whether they were reduced more or less than the general wholesale price level.

While the general level of British wholesale prices declined about 32 per cent between 1870-74 and 1900-1904, brokers' commissions were reported by Broomhall to have been reduced only about 1 per cent.² Insurance premiums probably declined just about as much as, or a trifle more than, wholesale commodity prices in general. Elevator charges at Buffalo were reduced 55 per cent during this period;³ and port charges at Odessa, which were officially reported to have

¹ Basic data from Chicago Board of Trade, *Annual Report[s] of the Trade and Commerce of Chicago*; Crawford, *op. cit.*, p. 92; evidence of T. Comber included in the *Second Report of the Royal Commission on Gold and Silver*, Great Britain, Parliamentary Papers, 1888, XLV (Cd. 5248), Appendix V, 252. Dots (...) indicate that data are not available.

² *Corn Trade Year Book 1901-02*, p. xvi.

³ H. T. Newcomb (revision by E. G. Ward), *Changes in the Rates of Charge for Railway and Other Transportation Services* (U.S. Department of Agriculture, Division of Statistics, Bulletin 15, Revised, 1901), p. 61.

been reduced 38 per cent during 1888-93,¹ presumably declined more than 38 per cent during the longer period, 1870-1900. In the aggregate, however, these various incidental costs probably did not decline enough relative to wholesale commodity prices to account for any significant part of the downward trend of deflated British import wheat prices during 1870-1900.

AVAILABILITY OF NEW WHEAT LANDS

Wheat acreage was rapidly expanded in the United States, and to a less extent in the other overseas exporting countries, during 1870-1900, a fact which is readily apparent from the following tabulation of wheat acreage in million acres.²

Five-year average	United States	India	Argentina	Australia	Canada
1871-75	29.7	....	.2 ^a	1.4	2.0 ^b
1876-80	38.1	....	...	2.3	...
1881-85	41.6	....	...	3.1	2.4 ^c
1886-90	46.4	26.3	2.4	3.4	2.6
1891-95	49.2	27.7	4.5	3.6	3.2
1896-1900	53.4	22.7	7.4	5.1	3.9
Increase					
1871-1900	23.7	....	7.2 ^b	3.7	1.9 ^b

^a Official estimate for 1872.

^b Approximate.

^c Census figure, 1881.

The greater increase of wheat acreage in the United States was due to a combination of factors which are discussed in detail in this and the following sections. The first factor which we shall consider is the free availability of fertile agricultural land in the United States, Canada, Argentina, and Australia.

In the United States after 1862, and in Canada after 1871, excellent public lands were available practically free to "homesteaders."³ These homesteading laws, particularly those of the United States, encouraged agricultural production even in instances when such production did not repay all the costs of cultivation (including the wages of the farmer himself), since settlers frequently counted as part of their returns the expected increase in value of the land. Indeed, "instead of acquiring land for the purpose of growing crops, the order was, in many cases,

reversed, and crops were grown in order that the settler might acquire land"⁴

In Australia and Argentina most of the best, easily accessible land had early been taken over by individuals engaged in sheep raising or, in Argentina, in cattle raising. Yet for some years after 1870 there were still public lands, suitable for agriculture, which could be purchased at low prices on easy terms. In Australia several states enacted land laws which were specifically devised to promote agricultural settlement: such were Robertson's Act of 1861, which provided for free selection and purchase on easy terms of land in New South Wales, and Grant's Act of 1869, which established a system of safeguarded selection in Victoria. Under these laws large areas were taken over for farming; but, at least in New South Wales, more land was both legally and illegally taken over by the pastoralists. Thus, it could be said regarding the period 1860-85 in Australia that "these years, in all states alike, created perhaps the greatest problem of the future: the best land went to the squatters in perpetuity"⁵ In

¹ Crawford, *op. cit.*, p. 93.

² Official data, except in the case of the United States for which estimates of the Food Research Institute are given. See Holbrook Working, "Wheat Acreage and Production in the United States since 1866," *WHEAT STUDIES*, June 1926, II, 260-61.

³ See Benjamin H. Hibbard, *A History of the Public Land Policies* (New York, 1924), especially pp. 136-44; George R. Wickham, *Sixty-two Years of the Homestead Law*, 68th Congress, 1st Session, Senate Document No. 113; James Mavor, *Report to the Board of Trade on the North-West of Canada, with Special Reference to Wheat Production for Export*, Great Britain, Parliamentary Papers, 1905, LIV (Cd. 2628), 23-25; C. P. Wright, "Canada as a Producer and Exporter of Wheat," *WHEAT STUDIES*, July 1925, I, 240-42.

⁴ T. N. Carver, "Historical Sketch of American Agriculture," in L. H. Bailey, *Cyclopedia of American Agriculture* (New York, 1910), IV, 65.

⁵ Stephen H. Roberts, "History of the Pioneer Fringes in Australia," *Pioneer Settlement* (American Geographical Society, Co-operative Studies, Special Publication No. 14, New York, 1932), p. 397. See also Stephen H. Roberts, *History of Australian Land Settlement* (Melbourne, 1924). The term "squatter" was applied in Australia to men, rich or poor, who grazed their sheep on crown lands, often illegally. The large "squatters" were usually very wealthy, and not inclined to let the lands which they grazed go to farmers. Thus, by purchase, or by illegal registration for land under the various land laws, they managed to secure title to large holdings.

Argentina, national and provincial land laws generally provided during 1850-1900 for the sale, auction, rent, and concession of public lands. Land was "conceded" to an individual or to a company usually on condition that a stipulated number of persons be settled on the land within a given time.¹

Of great importance, too, in Argentina were the favorable terms upon which private lands might be rented by immigrant farmers who lacked capital. Many large Argentine landowners were willing to supply such immigrants with land, a mud hut, seed, bullocks, farming equipment, etc., with the understanding that the landowner would market the crop and, after deducting such costs as those for seed, bags, and binding twine, would divide the remaining proceeds between the farmer and himself as previously agreed. Considerable land was rented on other favorable terms; for example, many large ranchers, motivated by the desire to improve their grazing lands, allowed part of their land to be cultivated by colonists rent-free, on condition that after a specified number of years, usually four, the land be returned, sown to alfalfa.² Thus, wheat acreage expanded in Argentina partly because cattle raising was profitable and was increasing; yet at the same time wheat growing was handicapped by the fact that the best lands

in Argentina were owned and controlled by livestock-ranchers and not crop-farmers.

IMPROVEMENT IN METHODS OF CULTIVATION AND WHEAT VARIETIES

Common European wheats could easily be grown by ordinary methods of cultivation in the entire Pampa district³ and Entre Rios in Argentina and on the land east of the Mississippi and large stretches of the land west of the Mississippi in the United States. In contrast, only the southeastern part of Canada and the outer fringe of land in southern Australia were well adapted to common wheat varieties and common farming methods.

Settlers who took up land in western Canada soon discovered that wheat growing there was a hazardous venture, mainly because of frosts (early and late), drought, rust, and grasshoppers. Varieties of wheat and methods of cultivation somewhat different from those employed in Ontario, Quebec, and other eastern provinces had to be adopted before success in wheat growing was assured for the western provinces. Early ripening and drought-resistant varieties of wheat were developed, and "dry-farming" methods were widely introduced, particularly after the mid-'eighties.⁴ Wheats grown in western Canada and in the northwest of the United States sold at a discount prior to about 1880, because of their characteristic hardness—a quality which made them difficult to mill properly with the old millstones. However, after the introduction of purifiers, early in the 'seventies, and of roller mills, in the late 'seventies, hard wheats gained favor; and they later commanded prices as high as or even higher than the best soft winter wheats.⁵

These developments did much to encourage expansion of wheat acreage in the Prairie Provinces of Canada⁶ and in the Great Plains region of the United States during the last two decades of the nineteenth century. But the really big expansion of wheat acreage in western Canada came during the twentieth century, when the population was larger and the railways were further extended, and after the introduction of Marquis wheat.⁷

In Australia, wheat varieties imported from

¹ For a good discussion of early colonization and agriculture in Argentina, see Mark Jefferson, *Peopling the Argentine Pampa* (American Geographical Society, Research Series No. 16, New York, 1926).

² See Pierre Denis, *The Argentine Republic* (New York, 1922), pp. 195-97.

³ The Pampa district includes practically all of Buenos Aires province, most of Santa Fe, a large portion of Cordoba, and the extreme eastern part of La Pampa. For a description of this district, see Denis, *op. cit.*, pp. 161-79, and Jefferson, *op. cit.*, pp. 10-15.

⁴ See Mavor, *op. cit.*, pp. 35-37.

⁵ See Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States* (New York, 1929), pp. 113-25; also Mark A. Carleton, "Hard Wheats Winning Their Way," *Yearbook of the United States Department of Agriculture*, 1914, pp. 391-420.

⁶ In 1880 only 3 per cent of the wheat produced in Canada was grown in the Prairie Provinces; in 1890 and 1900 the percentage somewhat exceeded 40. See Ernest H. Godfrey, "Fifty Years of Canadian Progress, 1867 to 1917," *Canada Year Book*, 1918, p. 35.

⁷ See A. H. Reginald Buller, *Essays on Wheat* (New York, 1919).

Europe and India could be grown only in the cooler districts along the coast which were favored by good rainfall. Expansion of wheat acreage in that country therefore rested, in part, upon discovery and introduction, mainly after 1895, of drought- and rust-resistant varieties of wheat, and upon successful development of "dry-farming" practices.¹

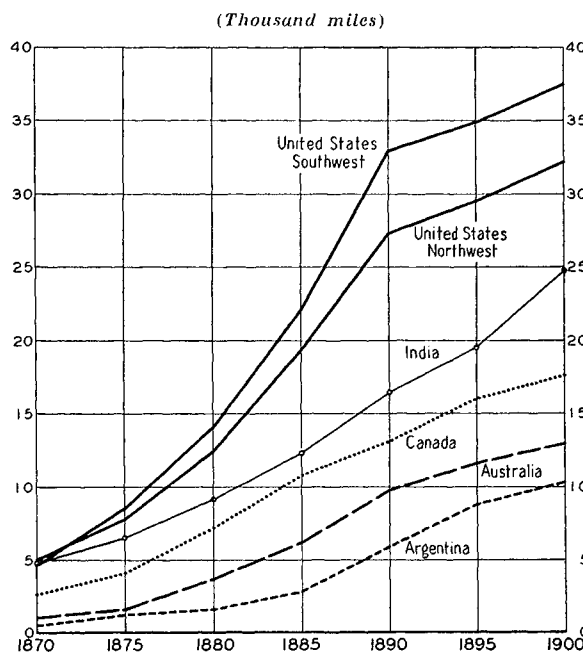
EXTENSION OF RAILROADS

In Argentina and Australia, wagon roads were so poor during the latter part of the nineteenth century that it was generally not feasible to raise wheat on land over 15-30 miles from a railroad or market;² and in the United States and Canada³ cultivation of the fertile western plains had to await development of transportation facilities for marketing the products of the soil.

Chart 5 shows the increase of railroad mileage in each of the principal overseas exporting countries (in the United States, specified states west of the Mississippi River) during 1870-1900. The United States was far in the lead of other countries in development of railways; this was an important factor in the greater increase of wheat acreage in the United States during this period. In addition to the increase of railway mileage indicated in the chart for the United States, there was substantial increase east of the Mississippi River and also in the Pacific states. Railway building

cast of the Mississippi was in general less important as regards opening up land to wheat growing; but that in California, Washington, and Oregon had a marked effect upon wheat acreage. Among the three Pacific Coast states,

CHART 5.—RAILWAY MILEAGE IN THE FIVE PRINCIPAL OVERSEAS EXPORTING COUNTRIES, QUINQUENNALLY, 1870-1900*



* Data from *Statistical Abstract of the United States* (years prior to 1902); *Canada Year Book*, 1931, p. 654; *Statistical Account of Australia and New Zealand*, 1902-03, p. 330; Ernesto Tornquist & Co., *The Economic Development of the Argentine Republic in the Last Fifty Years*, pp. 116-17; *Administration Reports on the Railways in India*, Great Britain, Parliamentary Papers. States included in the United States Southwest are Missouri, Arkansas, Texas, Kansas, Colorado, New Mexico, Indian Country and/or Oklahoma; in the United States Northwest, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Wyoming, and Montana.

California ranked first both in railway construction and in wheat acreage during 1870-1900. In fact, throughout that period, in contrast with recent years, California was an important net exporter of wheat.⁴

The fact that India was an old, densely populated country long before the opening of the nineteenth century suggests that wheat acreage there may not have expanded in response to railway development in 1870-1900 to the same extent as did wheat acreage in the newer countries. On the other hand, railway development together with the opening

¹ William Farrer, "The Making and Improvement of Wheats for Australian Conditions," *Agricultural Gazette of New South Wales*, February and March 1898, IX, 131-68, 241-60; W. S. Campbell, "An Historical Sketch of William Farrer's Work in Connection with His Improvements in Wheats for Australian Conditions," *Report of the Thirteenth Meeting of the Australian Association for the Advancement of Science* (Sydney, 1912), pp. 525-36; George L. Sutton, "The Realization of the Aims of William Farrer, Wheat Breeder," *ibid.*, 536-42.

² Frank W. Bicknell, *Wheat Production and Farm Life in Argentina* (U.S. Department of Agriculture, Bureau of Statistics, Bulletin 27, 1904), p. 32; Jefferson, *op. cit.*, pp. 160-64; Edward Shann, *An Economic History of Australia* (Cambridge, England, 1930), pp. 281-97.

³ See C. P. Wright, "Canada as a Producer and Exporter of Wheat," *WHEAT STUDIES*, July 1925, I, 229-33.

⁴ For a good brief history of California's wheat production and trade, see Horace Davis, "California Breadstuffs," *Journal of Political Economy*, September 1894, II, 517-35.

of the Suez Canal (1869) presumably tended somewhat to stimulate wheat growing in India, since they facilitated and cheapened the transportation of wheat to Europe. It is certain that Indian wheat exports increased markedly after 1870, and were particularly high during 1881-87;¹ but part of these exports may have represented wheat diverted from domestic use because of the increased profitability of exportation.

Increase of wheat acreage in Argentina, Australia, and Canada was relatively slow prior to 1885. But the following fifteen years witnessed considerable expansion of the area devoted to wheat in Argentina, which partly reflected heavy railroad construction in that country during 1885-95. There were also substantial increases in wheat acreage in Australia and Canada during the 'nineties; these, too, were at least partly dependent upon extension of railway facilities.

POPULATION GROWTH

In overseas exporting countries.—The agricultural development of all of the overseas exporting countries except India depended in large measure upon immigration and population growth. Between 1870 and 1900, population, in millions, increased in these countries as follows:²

Country	1870	1900	Absolute increase	Percentage increase
United States . . .	38.56	75.99	37.43	97.1
Canada	3.69 ^a	5.37 ^a	1.68	45.5
Argentina	1.88	4.61	2.73	145.2
Australia	1.65	3.77	2.12	128.5

^a Census dates 1871 and 1901.

In absolute increase of population, as in the extension of railways, the United States far outranked Argentina, Australia, and Canada. Among these three, both absolute and percentage increase in population was somewhat the largest in Argentina—a fact which may throw additional light upon the relatively greater expansion of wheat acreage in that country during 1870-1900.

Seasonal immigration, which is not reflected in the population figures, was also an important element in Argentina.³ Every year a large number⁴ of laborers, called *golondri-*

nas ("swallows"), left Italy in October or November and traveled by steamer to northern Cordoba and Santa Fe where they worked as harvest hands in the flax and wheat fields. As harvesting proceeded southward, these laborers, with bags containing their few possessions upon their shoulders, journeyed by foot to the fields of southern Cordoba and Buenos Aires province. From February to April the "swallows" were generally engaged in harvesting maize, after which they returned to Italy to help with spring planting, and later with harvesting. Though one cannot precisely determine the extent to which expansion of wheat acreage in Argentina was dependent upon laborers of this type, there is general agreement among students of Argentine agriculture that if such laborers had not been available the area under wheat would have expanded much less rapidly than it did prior to the World War.

In Europe.—While in the overseas exporting countries growth of population in 1870-1900 contributed largely to increase of wheat production and wheat exports, in Europe population growth was reflected mainly in an increased demand for wheat.

During these years, population in major European importing countries—the British Isles, Germany, France, Italy, Belgium, the Netherlands, Spain, Portugal, Greece, Norway, Sweden, Denmark, Switzerland, and Austria—increased from about 197 millions to 245 millions, or 24 per cent. Had per capita wheat consumption remained unchanged,

¹ See C. P. Wright and J. S. Davis, "India as a Producer and Exporter of Wheat," *WHEAT STUDIES*, July 1927, III, 363 (Chart 9).

² Data from *Statistical Abstract of the United States*; *Canada Year Book*; Ernesto Tornquist & Co., *The Economic Development of the Argentine Republic in the Last Fifty Years* (Buenos Aires, 1919), p. 140; *Official Year Book of the Commonwealth of Australia*.

³ Jefferson, *op. cit.*, pp. 182-87; Robert F. Foerster, *The Italian Emigration of Our Times* (Harvard Economic Studies, Vol. XX, Cambridge, 1919), especially pp. 243-44.

⁴ There is considerable question as to how large the number was in the 'eighties and 'nineties. The height of this movement appears to have been in 1907-13, when the number of *golondrinas* apparently approximated from 50,000 to 70,000. See National Bureau of Economic Research, *International Migrations* (New York, 1931), II, 150.

European wheat requirements would have been increased by the same percentage. This, in itself, would have been a significant stimulus to wheat production—particularly in the overseas exporting countries. In actual fact, per capita European demand for wheat was not stationary in this period but was slowly increasing. This was an additional factor tending to encourage expansion of wheat acreage in exporting countries. Trends in world wheat production and consumption in this period are discussed briefly below (pp. 301-02).

IMPROVEMENTS IN AGRICULTURAL MACHINERY

The last half of the nineteenth century witnessed a technical revolution in agriculture which, though world wide, was more extensive in the United States than in any other country. Numerous tasks that had been performed by hand prior to 1850 were being done by machine in 1900.

As regards wheat growing, the greatest progress was in the introduction of harvesting machinery. Though the McCormick reaper was first patented in the United States in 1834, and considerably improved during the next ten years, it was not extensively used until the early 'fifties.¹ By 1860 something like 70 per cent of the wheat grown west of the Alleghenies was cut by machine.² Then came the Civil War and, with it, high prices for agricultural products and scarcity of la-

bor, which encouraged extension of machine methods in agriculture. The harvester "carrying men to bind the grain" (introduced in the early 'sixties), the wire binder (introduced in the latter part of the 'seventies), and finally the twine binder (introduced about 1880) represented successive steps in the improvement of harvesting machinery in this country.³ By 1879 practically all of the wheat in the prairie regions, and about 80 per cent in the United States as a whole, was machine-cut;⁴ and by 1900 the percentage for the United States was probably closer to 100 than to 80. Improvements were also made in seeding and threshing machines during the last half of the nineteenth century; but in the United States, at least, these were clearly subordinate to improvements in harvesting machinery.

In Australia, Argentina, and Canada there was a similar though less pronounced shift from hand labor to machine labor. Prior to the 'fifties in South Australia, and to the late 'sixties in Victoria and New South Wales, wheat was generally reaped with large reaping hooks, threshed with flails, and winnowed with sieves on windy days. But late in the 'forties, Ridley's "stripper," a machine which stripped the heads from standing wheat, was introduced into South Australia; and after 1866-67 it came into general use in Victoria.⁵ The first strippers (like the later headers) simply cut the standing grain; but by the late 'eighties or early 'nineties many of the harvesting machines in use in Australia both cut and threshed the grain.

In Argentina, agricultural methods remained generally primitive until the last quarter of the nineteenth century. Until then, wheat was in most places reaped with a sickle, threshed by horses that trampled out the grain, and winnowed by throwing the mixed straw and grain up in the air, allowing the wind to blow away the straw. But by the late 'eighties or early 'nineties reaping was generally done by imported harvesters or strippers; and steam threshing and winnowing machines were in fairly general use.⁶

Canadian farmers adopted more or less readily the agricultural machines manufactured and used in the United States and Eng-

¹ For an interesting history of the development and introduction of the McCormick reaper, see William T. Hutchinson, *Cyrus Hall McCormick* (New York, 1930).

² Leo Rogin, *The Introduction of Farm Machinery in Its Relation to the Productivity of Labor in the Agriculture of the United States during the Nineteenth Century* (Berkeley, Calif., 1931), p. 79.

³ Dates of introduction based upon information presented by Rogin, *op. cit.*

⁴ William H. Brewer, "Cereal Production of the United States," *Tenth Census of the United States: Report on the Productions of Agriculture, 1880*, p. 73.

⁵ Shann, *op. cit.*, pp. 219-21.

⁶ John H. Williams, *Argentine International Trade under Inconvertible Paper Money 1880-1900* (Harvard Economic Studies, Vol. XXII, Cambridge, 1920), p. 227. See also Bicknell, *op. cit.*, pp. 65-76. Data on imports of agricultural machinery into Argentina from 1890 (*Estadística Agrícola, 1917-18*, pp. 70-71) indicate that during 1890-99 almost 54,000 reapers and headers and about 3,000 threshing machines (including harvesters) were imported into Argentina.

land, though improved machines were not extensively employed in Canada until wheat growing was expanded in Manitoba and the western territory.

ADJUSTMENTS IN EUROPEAN AGRICULTURE

As wheat exports from North America, India, Argentina, and Australia increased during 1870-1900, the area under wheat in western European countries was reduced or was extended less than the acreage under other crops and grass.

In Denmark farmers shifted from wheat growing to livestock raising and dairying. There, wheat acreage was contracted, while the area devoted to feed grains, roots, and pasture was increased. A similar shift to livestock raising, dairying, fruit growing, and gardening occurred in Great Britain, Holland, Belgium, and Switzerland.¹ In France, Germany, Italy, and several other countries, however, protective tariffs helped domestic wheat growers to resist the foreign competition and to keep their wheat acreage about unchanged.

In most European countries grain growers tried desperately to decrease their production costs as grain prices fell.² In this they were aided by growth of knowledge regarding crop rotations and artificial fertilizers and by improved farm implements and machinery (the latter being considerably more important for large than for small farms). Further progress was made, particularly on the continent,

in the movement toward inclosure and consolidation of private holdings; crop rotations became less rigid; production of root crops was increased; and there was a marked decline in the amount of land allowed to lie fallow each year.

The value of artificial fertilizers became generally recognized in Europe during the last half of the century. The foundation was laid by Justus von Liebig's book, *Organic Chemistry in Its Applications to Agriculture and Physiology*, published in 1840. Before Liebig died (1873) superphosphates, nitrates, sulphates, and other fertilizers were being used on many of the larger estates in England and Germany; and during the next twenty-five years their use was greatly extended in these and other European countries.³ This was due partly to increased recognition of the value of fertilizers, partly to a decline in their cost. In Germany, between 1880 and 1897, prices of nitrogenous fertilizers declined by 50-60 per cent, prices of superphosphates by 47 per cent, and potash prices by 36 per cent.⁴

Better agricultural implements and machinery also came to be widely used in Europe during this period. Improved plows, drills, hoes, cultivators, reapers, threshing machines, binders, and other types of equipment, little used (some not used at all) before 1850, were adopted more extensively after 1870 as their prices were reduced, and as small farmers, finally convinced of the advantage of employing such equipment, banded together for the co-operative purchase of some of the higher-priced machines. Among the major European wheat-producing countries, Great Britain and Germany (i.e., eastern Germany) took the lead in developing and adopting the newer forms of agricultural machinery, primarily because wheat farms were larger there than elsewhere. According to Clapham, "by the early nineties agricultural machinery had won the day in all countries where large farming was the rule."⁵ France, on the other hand, was a country of small and dispersed holdings; and "those machines which are the typical products of the application of nineteenth century metallurgy and engineering to agriculture, had not

¹ Data on use of land in various European countries, 1870-1900, are available in *Statistical Abstract for the Principal and Other Foreign Countries* (Great Britain), various issues. Some trends in land use in the United Kingdom are shown graphically in Wyman and Davis, "Britain's New Wheat Policy in Perspective," *WHEAT STUDIES*, July 1933, IX, 313-14.

² L. C. A. Knowles, *Economic Development in the Nineteenth Century* (London, 1932), pp. 23-25.

³ J. H. Clapham, *The Economic Development of France and Germany 1815-1914* (Cambridge, 1921), pp. 215-19, and *An Economic History of Modern Britain, The Early Railway Age 1820-1850* (Cambridge, 1926), pp. 456-58; Lord Ernle, *English Farming Past and Present* (3d ed., London, 1922), pp. 365-70; Augé-Laribé, *L'Evolution de la France agricole*, pp. 61-64.

⁴ T. H. Middleton, *Report on the Recent Development of German Agriculture*, Great Britain, Parliamentary Papers, 1916, IV (Cd. 8305), 37.

⁵ Clapham, *Economic Development of France and Germany*, p. 170.

even conquered the larger French holdings in 1892 . . ."¹ Yet even in France there was a substantial increase during 1860-1900 in the amount and quality of agricultural equipment employed.²

As a joint result of withdrawal of some of the poorer lands from wheat cultivation and of improvements in agricultural machinery and methods, yields per acre of wheat were increased and marginal costs of wheat production were somewhat reduced in most European countries during the last quarter of the nineteenth century. These developments, together with protective tariffs in a number of countries, and also increasing wheat requirements, permitted most European farmers to continue producing wheat in competition with growers in the overseas exporting countries. But since, in Europe, wheat production costs were reduced less rapidly than world wheat prices declined, the period 1870-1900 (particularly 1880-1900) was one of great hardship for European wheat growers.

¹ *Ibid.*, p. 171.

² According to Augé-Laribé (*op. cit.*, pp. 57-59), some of the leading forms of agricultural equipment increased in France as follows:

	1862	1882	1892
Hoes	25,846	195,410	251,798
Seeders	10,853	29,391	52,375
Threshing machines	100,733	211,045	234,380
Reapers	8,907	16,025	23,432
Mowing machines	9,442	19,147	38,753
Hay-makers and horse rakes...	5,649	27,364	51,451

In the Haute-Garonne (Toulouse) district, not a district of especially large holdings, the number of reaping and mowing machines was estimated to have increased as follows:

	1888	1892	1900	1908
Reapers, simple or complex..	50	180	1,500	25,000
Reaper-binders	10	60	800	1,200
Mowing machines	200	450	7,000	15,000

³ *Final Report*, pp. 160-61.

⁴ Acreage figures for India were included because the increase in wheat acreage there had resulted in increased exports to Europe. It is noteworthy that Sir Robert omitted estimates for Argentina and Australia; and that he apparently assumed that the percentage increase in wheat production in 1875-95 was practically the same as the percentage increase in wheat acreage.

⁵ Royal Commission on Agriculture, *Final Report*, Appendix V, pp. 73-74.

⁶ See Sir William Crookes, *The Wheat Problem, Based on Remarks Made in the Presidential Address to the British Association at Bristol in 1898* (3d ed., London, 1917), especially pp. 12-14.

TRENDS IN WORLD WHEAT PRODUCTION AND CONSUMPTION

Despite the notable expansion of wheat acreage in countries outside of Europe during 1870-1900, the Royal Commission on Agriculture (1897) concluded:

Although some witnesses have urged that the fall in [agricultural] prices is largely due to over-production, we have had no evidence, and we greatly question if such evidence could be adduced, to show that, compared with the increase of population, the food products of the world to-day are materially greater than they were before the fall in prices commenced [1874]. In the case of wheat, indeed, . . . the information which we have appears to point in the opposite direction.³

This statement was partly based upon evidence presented by Sir Robert Giffen which indicated that the aggregate wheat acreage in Europe, the United States, and India⁴ had increased 19 per cent during the preceding two decades, while the population of Europe and the United States had increased 26 per cent. From these figures, Sir Robert concluded that wheat production had not kept up with the growth of population, and that the decline in cereal prices, in so far as it was not attributable to appreciation of gold, was due to "a diminution of demand arising from various causes"—that people were consuming "less cereals per head because, with their increase of resources, they consume[d] more meat."⁵

Writing in 1898, after the short crop of 1897 had resulted in raising wheat prices to a notably high level, Sir William Crookes expressed great concern over the fact that the acreage under bread-grains had been increasing less rapidly than the population. He feared scarcity of wheat and high wheat prices in the future, partly because of this observed tendency, partly because he believed that the per capita demand for wheat was increasing. The low wheat prices earlier in the 'nineties he ascribed to unusually high yields per acre of wheat and rye in a number of successive years.⁶

Data now available suggest that per capita world wheat production was rising, not falling, during 1875-1900. Yet wheat stocks did not tend to accumulate over these twenty-five

years, and there is no evidence to support the view that this period was one of fairly continuous overproduction. In some European countries, notably France and Italy, per capita consumption appears to have been about stationary during 1875–1900; but in most countries, including the United Kingdom, Germany, Belgium, Denmark, Norway, Sweden, and Spain, the trend was distinctly upward.¹ In most of the important rye-consuming countries, per capita rye consumption remained about constant or, as in Sweden, declined during 1875–1900, suggesting some substitution of wheat for rye.

The increased *per capita* consumption of wheat in Europe during the last quarter of the nineteenth century represented in part, and perhaps primarily, the reaction of consumers to declining wheat prices. In addition, however, it probably reflected some increase in the demand for wheat at given prices in terms of other commodities. In certain of the rye-consuming countries, for example, the "taste for wheat" was apparently gradually increasing over this period; and more wheat per capita would probably have been consumed in 1900 than in 1870 even if the relationship of wheat prices to other prices had been the same in 1900 as it was in 1870.

THE BALANCE OF PRICE INFLUENCES

There is strong temptation to single out one or another of the factors tending to depress wheat prices during the three decades ending with 1900 and attribute to it chief responsibility for the decline; or alternatively to attempt to assign to each major factor some proportionate share in the responsibility. Neither of these procedures can adequately be defended. The influence of the group of factors which tended to alter the general level of commodity prices during 1870–1900 is, indeed, subject to rough independent appraisal, if it be assumed that wheat prices were affected no more nor less by these particular factors than were wholesale commodity prices on the average. On the

basis of this assumption, it may be concluded that the larger part of the decline of wheat prices during 1870–1900 was due to this set of factors.

Actually, some of the influences which were tending to alter the general level of commodity prices—such as improvements in transportation—probably had a greater effect upon wheat prices than upon the average of other commodity prices; and, in addition, there were presumably other factors which affected wheat prices but which had practically no significant effect upon the level of wholesale commodity prices. It is impossible to determine exactly what factors come under one or the other of these two heads. We can, however, name certain influences which appear to have been especially important in their effect upon wheat prices during 1870–1900; and we may perhaps assume that the bulk of these had a somewhat greater effect upon wheat prices than upon the average of commodity prices in general. Besides technical improvements in water and rail transportation, we include in this group the availability of fertile unused agricultural lands in the Americas and Australia, extension of railroads in these overseas countries, growth and changing distribution of the world's population, and improvements in wheat varieties, in methods of cultivation, and in agricultural machinery.

We have already noted that the aggregate influence of these particular factors is not strictly separable from the influence of the first group we considered, namely, those which combined to depress wholesale commodity prices in general during 1870–1900. Still less separable in effect, however, are the individual factors which constitute the second group. Had it not been for improvements in water and rail transportation and resulting reduction in transportation costs, wheat cultivation would have expanded less rapidly than it did in North America, Argentina, and Australia during 1870–1900; and British import wheat prices presumably would have declined less significantly. If, on the other hand, there had not been extensive unused lands well suited to wheat growing and freely available to agriculturists in these

¹ These statements are based upon crop and trade data for individual countries, with allowance for seed requirements.

overseas countries, lowered transportation rates would have had a less marked effect upon British import wheat prices over this period. Similarly, improvements in wheat varieties and in agricultural methods and machinery, extension of railroad lines in potential wheat-producing areas previously not served, and rapid increase of population in the newer wheat-growing countries, all played a part in the rapid expansion of wheat production in the overseas countries. At the same time these developments themselves arose partly out of the requirements and opportunities in the newer countries.

Many of the second group of factors were, therefore, related causally as well as temporally. Moreover, several of them (and their joint effect) would probably have been less marked if European wheat requirements had not been increasing at this time under the joint influence of increasing population and increasing per capita consumption of wheat.

The adjustments which took place in European agriculture during 1870-1900 were intimately associated with both groups of factors which we have just considered, but perhaps particularly with the second group. Had it not been for the stimulus of overseas competition, European wheat growers would presumably have been slower to adopt improved agricultural methods and machinery;

and, certainly, producers in western Europe would have shown less tendency to shift from wheat growing to other agricultural pursuits. As a result, the marginal cost of producing wheat in Europe would have declined less than it did in fact during 1870-1900.

We find no basis for belief that the decline of wheat prices during 1870-1900 was due to more or less continuous "overproduction" of wheat. On the whole, deflated prices of British import wheat tended downward because factors operating to increase the quantity of wheat available at lower prices in European markets more than counterbalanced the price-raising influence of increasing demand attributable mainly to population growth but partly to increasing preference for wheat in certain countries. In general, world consumption of wheat appears approximately to have kept pace with increase of world production during these years. Except for limited periods of time wheat stocks apparently did not become burdensome. The surplus years of the early 'nineties, which are the chief subject of analysis in the present study, were the most outstanding period of wheat surplus during 1870-1900. Mainly because this surplus period came near the end of a twenty-year decline of world wheat prices, British import prices then reached historic low points which were not broken through until 1930-31.

II. THE PRICE DECLINE OF 1891-95

Between November 1891 and October 1894 the price of British import wheat declined 58 cents per bushel to the historic low monthly average price of 64 cents. The absolute lowness of this price was partly due, as we have already observed, to the fact that wheat prices had been tending downward during the preceding twenty years; but the magnitude of the decline from November 1891 to October 1894 mainly reflected bearish developments in those three years. Also of importance in this decline, however, were bullish developments in 1890-91, which caused British import wheat prices to rise to a point in November 1891 higher than in any preceding month after December 1883 (Table I). An appreciable part of the subsequent decline

merely canceled this advance. We shall, therefore, consider the wheat price situation in 1890-91 before tracing the course, and discussing the various aspects, of the general price decline of 1891-92 to 1894-95.¹

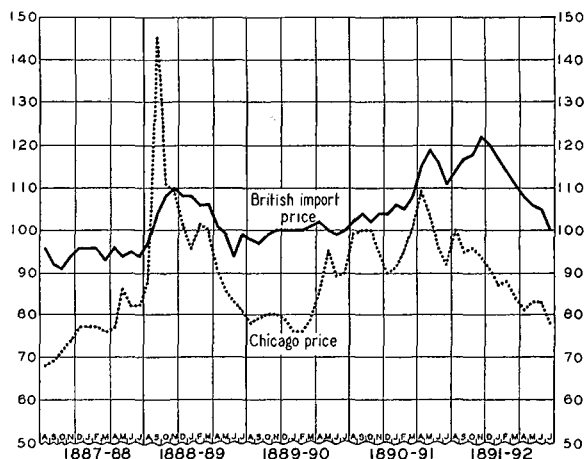
WHEAT PRICES IN 1890-91

The crop year 1890-91 opened with British import wheat prices only slightly above the average for the preceding crop year—an average which was notably low as compared with prices in the 'seventies and early 'eighties and only about 5 cents above the record low prices of 1887-88 (Chart 6). Chi-

¹ For sources used as the basis of discussion of the course of prices in 1890-91 and following years, see footnote 1, p. 309.

cago wheat prices, on the other hand, were relatively higher, having advanced almost 20 cents during February–July 1890 on reports of crop damage in the United States and unfavorable growing weather in Europe.

CHART 6.—BRITISH IMPORT AND CHICAGO CONTRACT CASH WHEAT PRICES, MONTHLY,
AUGUST 1887—JULY 1892*
(U.S. cents per bushel)



* See Table I and footnote to Chart 1, p. 289.

In early August, the wheat supply situation seemed to point to a higher level of wheat prices in 1890–91 than had prevailed in 1889–90. The *Corn Trade News* of August 12 carried the following comment by Broomhall:

The cereal year is closing amid considerable excitement, and the outlook ahead is decidedly a stirring one. Stocks everywhere are low . . . There has not been a single bumper crop raised anywhere in the world this season, if perhaps we except Roumania . . . Hardly ever before have the crops of one season so fallen short of the previous year's production . . . We should have to go back to 1881 to find an instance when both the Wheat and Corn crops fell short in the same season.

Later developments proved that the wheat supply position for 1890–91 was less tight than Broomhall's comment had suggested. Favored by good weather in the late growing and harvesting periods, the wheat crops of importing Europe and the Danube basin turned out well, partly offsetting deficiencies in the United States, India, and Russia, and bringing the total outturn to a slightly higher figure in 1890 than in 1889 (Chart 10, p. 311).

However, the world wheat crop of 1890 was below normal in size, trend considered; initial wheat stocks were low; and other food crops (corn, rye, and potatoes) were in the aggregate somewhat short.

Under the influence of these factors, and in the face of great financial disturbances, British import wheat prices tended slightly upward during August–January. There was general conviction that the world wheat statistical position was strong, and that tightness would appear later in the year. The shortage of United States wheat was emphasized by unusually light marketings, and by the strikingly low level of North American visible supplies (Chart 11, p. 313). These considerations, together with the fact that wheat prices at Liverpool were already low, and below import parity with prices in the United States, tended to sustain British wheat prices in November–December when Chicago prices weakened, partly under the influence of disturbed financial conditions (pp. 305–07).

From mid-January to mid-April 1891, wheat prices rose steadily and substantially at both Chicago and Liverpool. Severe cold weather in Europe damaged the growing crops and considerably stimulated wheat consumption. On March 10, Broomhall commented that the chief European wheat crops had made "the worst [start] in twenty years," and that "nothing short of a miracle" would be necessary to make good the loss which had already occurred. The European demand for foreign wheat, which had been light during the early months of the crop year, improved markedly after January as European merchants and millers showed inclination to build up stocks.

In contrast with unfavorable crop developments in Europe, the United States wheat crop wintered well, and as of April 1 was officially reported at 96.9 per cent of "normal"—the highest April 1 condition estimate since 1882.¹ After mid-April the good outlook for the United States crop received more attention, and Chicago prices drifted down-

¹ See U.S. Department of Agriculture, *Wheat and Rye Statistics* (Statistical Bulletin No. 12, January 1926), p. 17.

ward until mid-July¹ despite good export clearances, low visibles, further bad crop reports from Europe, and action by several leading European importing countries to lower existing tariffs on wheat and flour.

Liverpool wheat prices, influenced primarily by the unfavorable European crop outlook, did not reflect the weakness in United States wheat markets until June. Then, pressure from shipments set afloat when wheat prices were higher in April-May, improved growing weather in western Europe, and the favorable outlook for the United States crop became dominating market factors.

After mid-July 1891, Liverpool and Chicago prices again tended upward, under the influence of bad harvesting weather in western Europe, unfavorable crop reports from Russia, and an improved demand on the part of European importers. Liverpool prices continued to rise with only minor setbacks until late in November. Evaluations of the European bread-grain situation continued bullish, with serious shortage reported in Russia. In August, the Russian government published a ukase prohibiting exports of rye. This was followed in October by a second ukase prohibiting exports of potatoes, flour, and all cereals except wheat. There were persistent rumors during these months that Russia would also prohibit wheat exports; this she finally did by publication of a third export ukase on November 21.

Even in the United States, where wheat prices drifted downward after the middle of August 1891 under pressure of heavy offerings from the large new crop, early-season statements of the international wheat statistical position for 1891-92 were mainly bullish. It was generally believed that export surpluses were smaller than import requirements, and that after the early marketing period was over wheat prices would remain firm or advance to a higher level. These expectations were not borne out by later devel-

opments. In fact, over six years elapsed before Chicago contract cash wheat or British import wheat again commanded as high a price as in August 1891 or November 1891, respectively.

The high prices of August-November 1891—the highest since 1883 in Great Britain—reflected the moderately tight wheat statistical position that had prevailed in 1890-91, and, in addition, anticipations (eventually borne out) of short crops in Europe and in Russia in 1891, accompanied by striking underestimations of the new crop in the United States. In contrast, the four following years were characterized by general abundance of wheat. In addition, these were years of business recession and depression, of declining wholesale prices, and of disturbed financial conditions, particularly in the United States.

GENERAL ECONOMIC CONDITIONS, 1891-95

We have just noted that the decline of wheat prices in 1891-95, like that of the past few years, was associated with general economic depression and disturbed financial conditions. The question immediately arises: To what extent was the wheat price decline of 1891-95 due to these particular factors? This question cannot be answered in exact quantitative terms, but we can throw some light upon the problem by summarizing the principal changes which occurred in general economic conditions during 1891-95. Chart 7, which will be used as a partial basis of this summary, shows the course of several significant business and price indexes in comparison with the course of British import wheat prices during 1889-1901 and 1926-34.

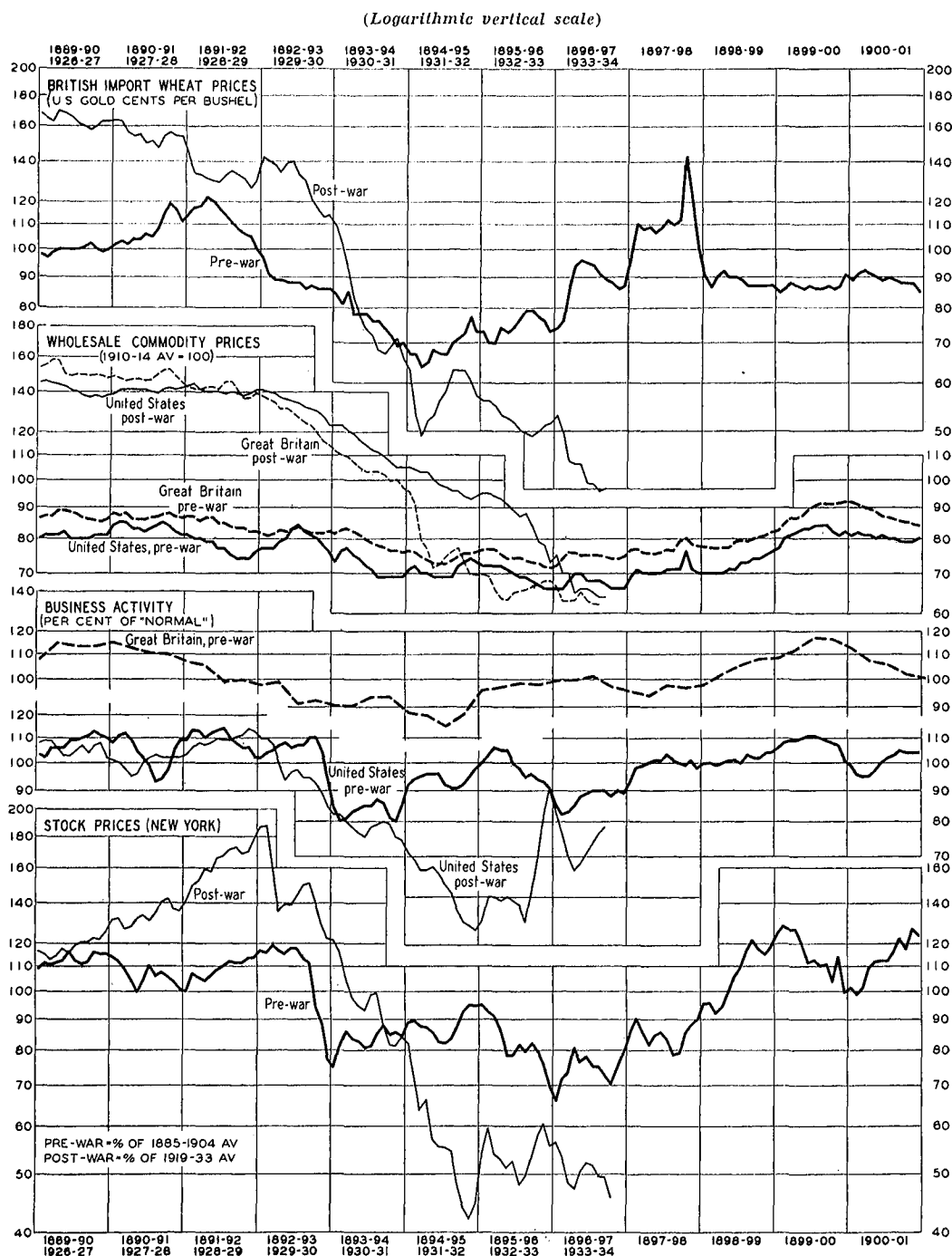
The business and trade depression of the 'nineties was severe, though much less severe than the one from which the world now appears to be emerging. The autumn of 1890 marked the onset of an extended business and trade recession in England and the United States. Signs of recession had appeared in France and Germany early in 1890, and in Italy business had been in a state of depression from the beginning of the year.²

In the United States, the business and financial situation was intimately associated with the government's monetary policy. The

¹ Market reports suggested that this price decline was partly attributable to the "bear" operations of a group of large traders.

² See Willard L. Thorp, *Business Annals* (Publications of the National Bureau of Economic Research, No. 8, New York, 1926), pp. 95, 192, 210, 267.

CHART 7.—BRITISH IMPORT WHEAT PRICES AND INDEXES OF WHOLESALE COMMODITY PRICES, STOCK PRICES, AND BUSINESS ACTIVITY, MONTHLY, AUGUST 1889—JULY 1901
AND AUGUST 1926—MARCH 1934*



* For British import wheat prices see Table I. British and United States wholesale commodity prices described in footnote to Chart 2, p. 291. Index of business activity for the United States is that of the Cleveland Trust Company; that for England was constructed by Dorothy Swaine Thomas, and is available only for pre-war years (see "Statistical Notes," p. 345). In plotting the Thomas index, we made the assumption that a standard deviation of 1.0 from secular trend is equal to a deviation of 10 per cent from "normal." Index of stock prices based on Axe-Houghton weighted average of specified industrial stock prices at New York (see "Statistical Notes").

Sherman Silver Purchase Act of July 1890 resulted in immediate flight of foreign (particularly British) capital from the United States and withdrawals were increased after the Baring failure in November.¹ Money became tighter; commodity and securities prices declined; business and bank failures became more numerous; and industrial production slackened. By the spring of 1891 business in the United States, as well as in a number of foreign countries, was in a state of depression.

But the summer and early fall of 1891 brought substantial recovery in the United States. The calendar year 1892 was, according to practically all indications, a year of prosperity in this country. Why did the United States enjoy prosperity in a year when practically all other important countries were suffering the effects of industrial recession or depression? Unquestionably, the bumper wheat and corn crops, and also generally large crops of other cereals, cotton, and tobacco, in the United States in 1891 were important factors in the situation. These yielded unusually large agricultural exports, both in volume and value,² afforded large railroad revenues, and put substantial purchasing power into the hands of farmers. It may also be that the McKinley tariff, enacted in October 1890, temporarily stimulated domestic production,³ though its net effect is not easy to appraise.

¹ For a good brief discussion of the principal factors underlying the failure of Baring Brothers, see Williams, *Argentine International Trade under Inconvertible Paper Money*, pp. 114-47.

² See Vladimir P. Timoshenko, *The Rôle of Agricultural Fluctuations in the Business Cycle* (Michigan Business Studies, Vol. II, No. 9, Ann Arbor, Mich., 1930), pp. 78-81.

³ See Victor S. Clark, *History of Manufactures in the United States* (New York, 1929), II, 164-65.

⁴ See Davis R. Dewey, *Financial History of the United States* (New York, 1922), pp. 440-41. Monthly data on the Treasury's net gold reserve in the 'nineties may be found in the annual reports of the Secretary of the Treasury.

⁵ For fuller discussion of the crisis of 1893 see Albert Stevens, "Phenomena of the Panic in 1893," *Quarterly Journal of Economics*, January 1894, VIII, 117-48; Dewey, *op. cit.*, pp. 440-50; Alexander D. Noyes, *Forty Years of American Finance* (New York, 1909), pp. 182-208; Clark, *op. cit.*, II, 164-66.

Prosperity was not, however, long continued in the United States. The grain crops of 1892 were notably smaller than those of 1891, and the cotton crop was distinctly poor. Partly on this account, agricultural exports were smaller in July-December 1892 than in the same period of the preceding year; and this, together with other factors, led to increased exports of gold. By the end of January 1893 the net gold supply of the Treasury (gold available for redemption of United States money other than gold certificates) was down to 108 million dollars. This appeared serious mainly because financiers and business men had for many years regarded 100 million dollars as the minimum below which the Treasury's net gold supply could not be reduced with safety.⁴ Relief was afforded, but only temporarily, in February when the Secretary of the Treasury induced a group of New York bankers to exchange some of their gold for legal-tender notes of the Treasury.

When President Cleveland took office in March 1893, a general feeling of uneasiness prevailed in business circles in the United States. Commodity and stock prices had declined appreciably during February; and the problem of the Treasury's gold supply remained unsolved. Moreover, economic conditions in England had become noticeably worse partly as a result of the disturbed financial situation in Australia.

The new Secretary of the Treasury, fearing that a bond issue might stand in the way of repeal of the Sherman Silver Purchase Act, to which the administration was pledged, followed his predecessor in appealing to the New York bankers for gold. But despite their co-operation the situation became worse.⁵ The net gold supply of the Treasury fell below 100 million dollars in April; there were rumors, officially denied, that the Secretary had decided to stop redeeming the notes of 1890 in gold; and in New York there was general insistence upon the gold clause in contracts. The first week of May witnessed a crash in the New York stock market. Thereafter, stock and commodity prices declined precipitously until August (see Chart 7); bank and business failures increased; and gold

flowed from New York to the West, where local banks were trying to strengthen their cash positions, and to England, where the discount rate had been raised (in May) to attract gold to offset the reduced flow from Australia.

Extreme stringency existed in American financial centers, and to a less extent in London, during May–July 1893. In New York, time loans were scarcely obtainable, and call money rose to 74 per cent late in June.¹ Money eased slightly, but continued tight, during July. Three New York banks combined to finance gold imports by means of loan certificates; and several well-known money brokers offered to exchange certified bank checks, carrying a premium, for United States currency. The financial developments of May–July naturally had an adverse effect upon business. Business and commercial loans were all but impossible to secure; and the existing uncertainties encouraged potential consumers to hoard rather than spend money, thus decreasing the demand for goods.

On August 7 the United States Congress met in special session to consider repeal of the Sherman Act. Repeal was voted by the House during the last week of August, but the Senate delayed action until October 30. Net imports of gold amounting to 41 million dollars in August relieved the acute phase of the financial crisis, and there was further marked improvement in the financial situation during the next few months. Hoarding declined; the premium on currency disappeared; stock prices advanced; and loans were somewhat easier to secure. On the other hand, business remained stagnant; wholesale commodity prices, after a temporary upturn in September–October, resumed a downward course; and the gold position of the Treasury remained disturbing until January 1895—almost a year and a half later. Then, when many were convinced that the United States would be forced to abandon the gold standard,

President Cleveland arranged a loan with the Belmont-Morgan and Rothschild interests which was so designed as to protect the gold reserve for approximately nine months. This restored confidence in the general monetary situation, and contributed to improvement in business and prices in the spring of 1895.

In a number of European countries, too, business depression gave way to revival during the crop year 1894–95. In Germany, improvement was apparent from the autumn of 1894; English wholesale commodity prices turned upward after January 1895 and business revival was under way in that country and also in France by the following summer. Italy and Netherlands, on the other hand, remained in the throes of depression until 1896.

To what extent the decline and depression of wheat prices in the 'nineties was due to factors in the general economic situation is far from clear. It is possible, however, to present some comparisons with other periods which may be illuminating. In relation to other business depressions of the last sixty years, that of the 'nineties stands out as one of the most severe and most widespread. In the United States, only the present depression and that of the 'seventies have clearly been worse, though Eckler, writing mainly from the standpoint of recessions, regarded the depression of 1920–21 also as worse.² The business depression of the 'nineties was not, however, accompanied by such drastic reduction in general wholesale commodity prices as has occurred in most other recent depression periods. This appears noteworthy, especially in view of Working's findings that:

(1) Wheat prices move rather strongly with changes in general wholesale price level and, over twelve-month periods, move 50 to 80 per cent more than the commonly employed wholesale price index number of the United States Bureau of Labor Statistics. (2) . . . There is . . . a tendency for declines in wheat prices to be associated with declines in business activity, and vice versa, but if allowance be made for the apparent influence of general wholesale price movements on wheat prices, there is nothing left to be attributed to an influence from either general business activity or from stock prices except a slight tendency for wheat prices after a lapse of some months to move in the direction opposite to that taken by general business activity and stock prices.³

¹ Noyes, *op. cit.*, p. 191.

² A. Ross Eckler, "A Measure of the Severity of Depressions, 1873–1932," *Review of Economic Statistics*, May 15, 1933, XV, 75–81.

³ See Holbrook Working, "Cycles in Wheat Prices," *WHEAT STUDIES*, November 1931, VIII, 45.

The following tabulation shows for England and the United States the *percentage decline* in general wholesale prices (gold) as compared with the *percentage decline* in wheat prices (gold) during each of the periods of major business recession and pre-recovery depression over the past sixty years.

Period	Wholesale prices		British import wheat	Chicago contract wheat	Ratio of decline	
	Eng-land ^a	U.S. ^b			Eng-land	U.S.
	A	B	C	D	C ÷ A	D ÷ B
Jan. 1873—Mar. 1878..	18.8	23.0	5.7	1.8	30.3	7.8
Jan. 1883—Mar. 1885..	12.6	18.1	21.6	22.2	171.4	122.7
Nov. 1890—Jan. 1895 ^c	15.7	16.9	35.8	42.1	228.0	249.1
May 1893—Jan. 1895 ^d	10.9	13.8	22.1	23.6	202.8	171.0
May 1920—Dec. 1921..	48.6	44.3	42.9	62.1	88.3	140.2
Nov. 1920—Nov. 1933..	51.7	52.6	67.3	54.8	130.2	104.2

^a Sauerbeck-Statist Index.

^b Warren-Pearson-U.S. Bureau of Labor Statistics index.

^c Approximate period of business recession and depression in England.

^d Approximate period of business recession and depression in the United States.

Clearly, in the depression of the 'nineties, the fall in wheat prices was much greater, relative to the decline in wholesale prices in general, than in any other recent major depression. While fluctuations in business activity doubtless exerted influence on the course of wheat prices in the 'nineties, we apparently must look to the wheat situation itself for the major explanation of the wheat price decline of 1891-95.

OUTSTANDING DEVELOPMENTS IN THE WHEAT SITUATION, 1891-95

To understand why wheat prices declined as they did from November 1891 to October 1894, it is necessary to review developments in the wheat situation year by year. The next few pages will, therefore, be devoted to brief summaries of the crop years 1891-92 to 1894-95—summaries designed to give the reader a picture of developments as they actually occurred and were interpreted in those years.¹

Principal features of 1891-92.—We have already noted that early-season forecasts for 1891-92 were predominantly bullish. They were based upon recognized shortage of bread grains, both wheat and rye, in importing Europe and Russia, and upon belief that the

United States wheat crop of 1891, though large, did not exceed the relatively short crop of 1890 by more than 125 million bushels.

Early anticipation that the Russian government would prohibit wheat exports lent additional support to the belief that world wheat prices would continue to rise. But because the Russian wheat export embargo was expected several months before it was finally decreed on November 21, Russian wheat exports were as heavy as usual in August-November 1891 (Chart 13, p. 315) despite the small size of the Russian crop. At the same time, wheat was rapidly flowing to export from the United States and India. Large shipments from the United States reflected a bumper domestic crop; Indian exports were stimulated by a moderately large crop and a relatively high level of wheat prices in terms of silver.²

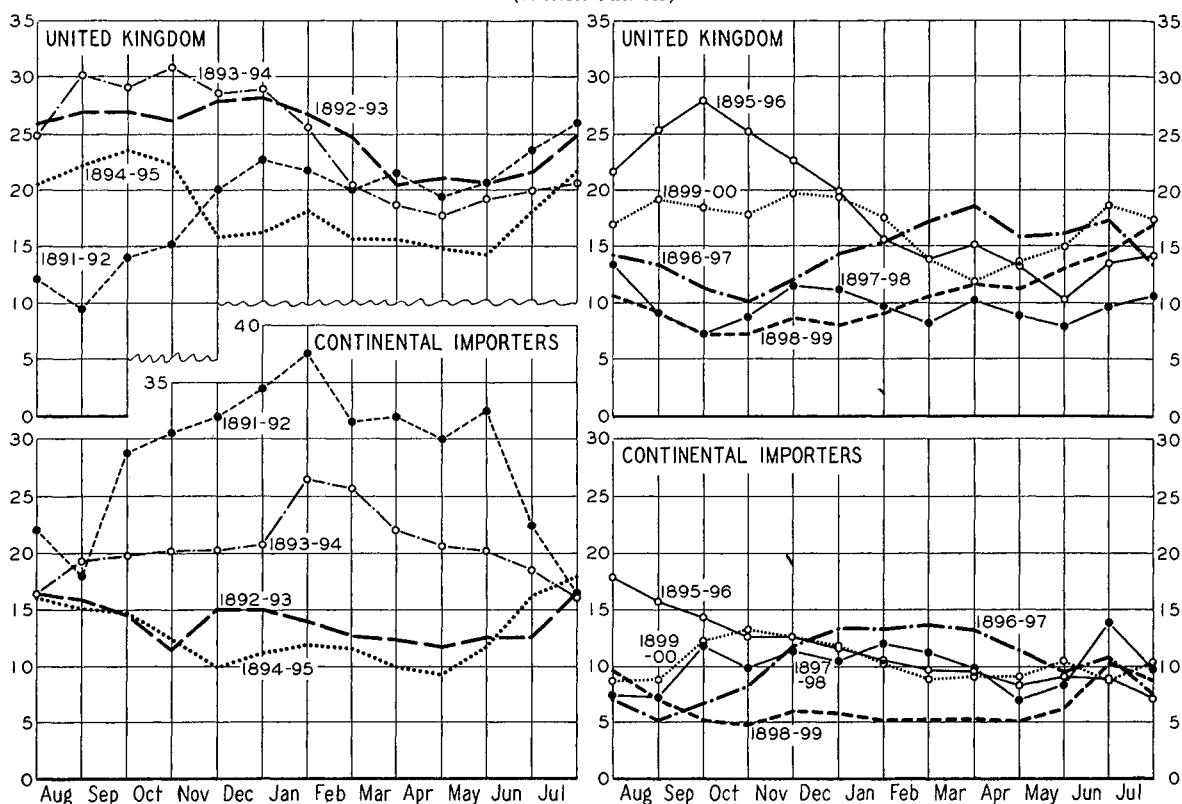
European millers and merchants, faced with short domestic crops (in many cases of poor quality), willingly absorbed the large offerings of foreign wheat in the first few months of 1891-92. But as British port stocks approached, then exceeded, 20 million bushels and stocks in French, Belgian, German, and Dutch ports rose above 30 million (Chart 8), the abundance of immediate supplies tended to depress international wheat prices (Chart 9). Not until early March, however, did most European and American observers relinquish the idea that the wheat statistical position for 1891-92 was actually tight and that American shipments would "soon" decline to a notably low level. Then, the United States Department of Agriculture published a bearish estimate of farm stocks—in terms of bushels, the highest estimate on record except

¹ The information upon which these summaries are based was derived mainly from various trade journals of the period: Broomhall's *Corn Trade News*, the *Daily Trade Bulletin* (Chicago), the *Weekly Northwestern Miller*, and the *American Miller*. We have relied most heavily upon the two journals first mentioned. In the following discussion we do not attempt to give specific references for all our statements; as a rule, references are cited only in instances where direct or specific indirect quotations are presented in the text.

² The silver price of wheat at Calcutta averaged higher in the calendar year 1891 than in any preceding year after 1879. See Engelbrecht, *Getreidepreise in Indien von 1861 bis 1905*, p. 111.

CHART 8.—VISIBLE WHEAT SUPPLIES IN UNITED KINGDOM PORTS AND IN PRINCIPAL CONTINENTAL IMPORTING COUNTRIES, MONTHLY, AUGUST 1, 1891—AUGUST 1, 1899*

(Million bushels)



* See Table VIII. The continental importing countries for which visible supplies are reported are: France, Germany, Belgium, and Holland.

that for March 1885.¹ This, and the fact that North American visibles continued to rule at a level well above the average of earlier years (Chart 11, p. 313), led students of the wheat market to revise their ideas of the wheat sup-

¹ Official estimates of farm stocks are published in terms of percentage of the preceding crop remaining on farms. The following tabulation shows these percentage figures and also estimated farm stocks in terms of million bushels based upon (1) original official crop estimates, (2) revised official crop estimates, and (3) crop estimates of the Food Research Institute (see footnote 2, p. 311).

March 1	Percentage reported	Original official	Revised official	F.R.I.
1891	27.8	111	105	143
1892	28.2	173	165	222
1893	26.2	135	138	178
1894	28.5	113	122	154
1895	16.1	74	83	102
1896	26.6	124	151	178
1897	20.8	89	113	127
1898	22.6	120	138	155
1899	29.1	196	225	242

² In the 'nineties, North American shipments were almost entirely shipments from the United States (Table IV).

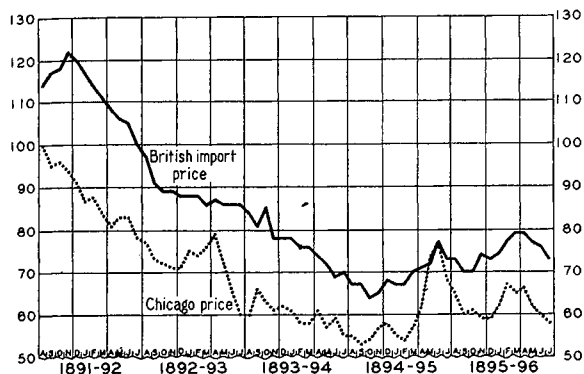
ply position in the United States, and also in the world at large. During the remainder of the crop year, United States exports continued unusually heavy, although total shipments to Europe were reduced to a notably low level (Chart 13, p. 315).²

Why were the early-season forecasts for 1891-92 so far from correct? Why did wheat prices decline in a year when the supply of bread grains in European importing countries and in one of the two major exporting countries was notably short? The answer lies mainly in the wheat situation in the United States. Declining wholesale prices, general worsening of economic conditions, and favorable development of the grain crops of 1892 all contributed to the price decline; but the major factor was the bumper United States wheat crop of 1891—a crop seriously underestimated at the beginning of the season. When Broomhall undertook in Septem-

her 1892 to review developments in the wheat situation in 1891-92, he commented with respect to the United States crop: "Never before has the result of a harvest so far ex-

forecasts in July-August 1891. Subsequent developments proved that even this later estimate was too low: by the fall of 1893 Broomhall carried, in place of the official estimate, an unofficial figure of 650 million bushels;

CHART 9.—BRITISH IMPORT AND CHICAGO CONTRACT CASH WHEAT PRICES, MONTHLY, AUGUST 1891—JULY 1896*
(U.S. cents per bushel)



* See Table I and footnote to Chart 1, p. 289.

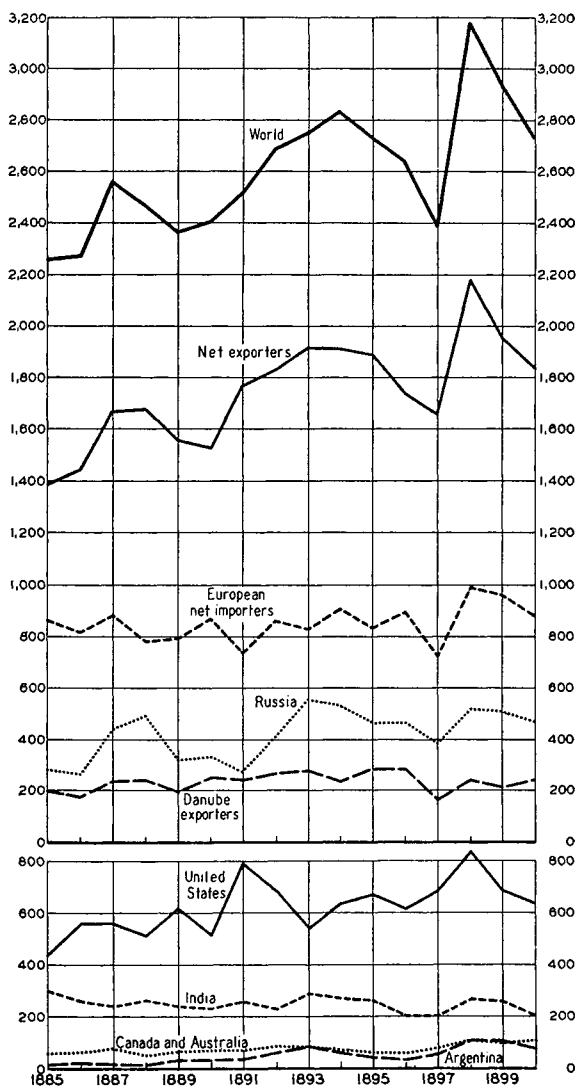
ceeded the expectation formed by the trade, by the crop experts and the official Government estimators."¹ At that time Broomhall was accepting the final (January) official estimate of the 1891 crop, 612 million bushels—a figure 92 million bushels higher than the crop figure he had used as the basis of his

¹ *Corn Trade News*, September 5, 1892, p. 537.

² The great underestimation of domestic wheat crops by the U.S. Department of Agriculture prior to about 1900 apparently rested primarily upon low acreage estimates which were based upon incomplete census returns. Since the agricultural census of 1890 was notably incomplete as regards reported wheat acreage, the wheat crops of 1891-99 were underestimated to a greater extent than the crops of most other years. Original and revised estimates of the U.S. Department of Agriculture for the crops of 1890-99 are shown below in comparison with standing estimates by Broomhall and by the Food Research Institute. See Holbrook Working, "Wheat Acreage and Production in the United States since 1866," *WHEAT STUDIES*, II, 260; and George J. S. Broomhall, *The Principal Countries' Wheat Crop since 1890* (issue published 1930).

Year	U.S.D.A. original	U.S.D.A. revised	Broomhall	F.R.I.
1890	399	378	410	516
1891	612	585	685	787
1892	516	528	580	681
1893	396	428	480	539
1894	460	516	530	634
1895	467	569	490	669
1896	428	544	470	613
1897	530	610	590	685
1898	675	772	713	832
1899	547	636	584	682

CHART 10.—WHEAT PRODUCTION IN PRINCIPAL AREAS AND COUNTRIES, 1885-1900*
(Million bushels)



* See "Statistical Notes," p. 345.

and a year later this, in turn, was raised to 685 million bushels. Broomhall's final estimate, like the still higher estimate of the Food Research Institute shown in Chart 10, indicates that the United States crop of 1891 was a record for its time, and around 270 million bushels larger than the crop of 1890.²

As soon as the approximate size of the United States crop became recognized, it was clear that the "world" wheat crop of 1891 was of moderate size (Chart 10) rather than strikingly short, as had previously been thought. Moreover, since wheat consumption was greatly curtailed in Russia, and wheat was sparingly used in several European countries which had harvested small domestic crops (notably Spain), the supply of wheat available for use in the remaining countries was moderately large—substantially in excess of the quantity available in 1890–91. In view of these facts, the downward movement of world wheat prices during 1891–92 is, in retrospect, not surprising.

Principal features of 1892–93.—At the beginning of August 1892 commercial stocks of old-crop wheat were of fair size and prospects for the new world crop of 1892 were moderately favorable. A good-sized outturn was expected in Europe, excluding Russia; the Russian harvest was generally regarded as of uncertain but probably average size; and although big reductions in yield were expected in the United States and India, the United States crop was regarded as a fairly good one.

Despite the outlook for ample, if not abundant, wheat supplies, leading students of the situation inclined to the view that wheat prices would probably rise during 1892–93, if only because prevailing prices appeared strikingly low and world wheat supplies appeared not to be extremely heavy. On August 2, 1892, Broomhall commented: "There is a very firm feeling evident, based on the conviction that, however large the supplies may be,

Wheat is cheap at a certain price, and that we must be near that price now."¹ Broomhall and a number of other commentators shared the belief that British wheat prices as low as one dollar per bushel would encourage heavy consumption and induce farmers, dealers, millers, and importers to carry large stocks. Developments in 1891–92 had furnished some grounds for supporting this belief. Farmers in the United States had marketed their wheat less freely than they probably would have done if wheat prices had been higher; stocks of imported wheat in European ports had been built up during the course of 1891–92; and European millers, as well as importers, were reported to have seized the opportunity to load their bins with low-priced wheat.

But although wheat consumption and stocks were actually well maintained, and in some instances increased, in both importing and exporting countries in 1892–93, wheat prices declined during the course of the crop year. World wheat supplies again proved to be more abundant than had been indicated by early-season estimates. Crop estimates for the United States, Russia, and the Danube countries were revised upward by over 100 million bushels in the aggregate during the course of 1892–93; and Argentina unexpectedly harvested a wheat crop of record size, about 20 million bushels larger than any of the three preceding crops. Moreover, in the United States, there was unprecedented piling up of wheat in visible positions (Chart 11), as the result of strikingly heavy early-season marketings² of both old- and new-crop wheat combined with only a fair export movement. The heavy marketings, and the rise in North American visibles to a new record-high peak late in December were at first generally interpreted to mean that *invisible* supplies in the United States were notably small; but this idea was abandoned in March after publication of the official estimate of farm stocks. Throughout January–July both North American and "world" visibles (Charts 11 and 12) stood at unprecedentedly high seasonal levels.

The course of cash wheat prices at Chicago was in several respects strikingly different from the course of British import prices dur-

¹ *Corn Trade News*, p. 242. Similar comments have been often heard in recent years.

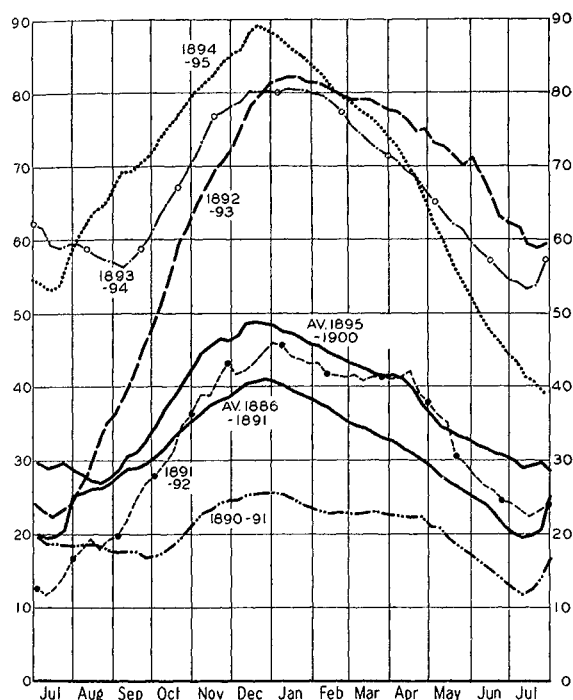
² August–December wheat receipts at eight leading western markets in the United States in 1892 compared as follows with receipts in the same months of the five preceding years, in million bushels and percentage of the year's crop:

Year	Aug.-Dec. receipts	F.R.I. crop estimate	Ratio of receipts to crop
1887	71	559	12.7
1888	61	516	11.8
1889	78	618	12.6
1890	64	516	12.4
1891	145	787	18.4
1892	156	681	22.9

ing January-July 1893 (Chart 9, p. 311). From early January to early April, prices of Chicago cash and May wheat rose, while the prices of British import wheat and of the Liverpool May wheat future showed a tendency to decline. After early February the

CHART 11.—NORTH AMERICAN VISIBLE WHEAT SUPPLIES, WEEKLY, JULY 1890—JULY 1895, WITH COMPARISONS*

(Million bushels)



* Data of the Chicago Board of Trade as published in the *Daily Trade Bulletin* except that the average for 1895-1900 does not include supplies at Fort William, Port Arthur, Galveston, and New Orleans, reported after July 1, 1899.

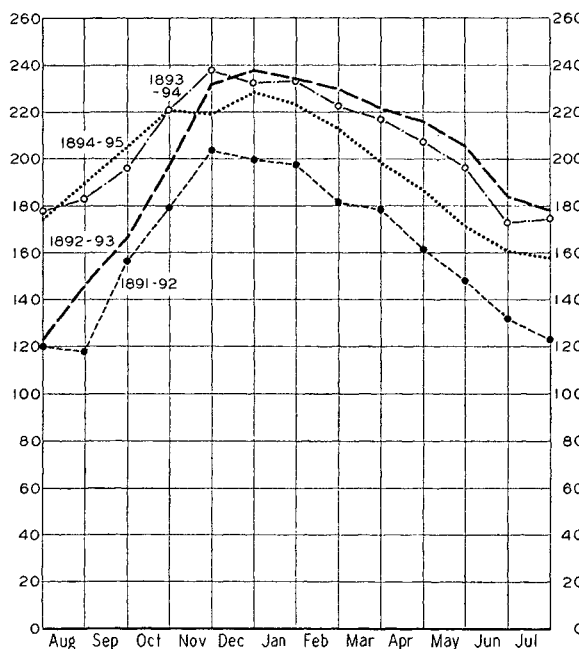
price of Chicago July wheat also declined. This situation was due, directly and indirectly, to a group of traders who were attempting a "squeeze" in the Chicago May future. After forcing some short-covering and settlements early in April, these traders apparently abandoned their former plans; and Chicago May and cash wheat prices reacted sharply, showing a tendency to "get in line" with Liverpool prices.

There was temporary improvement in market sentiment at Chicago the first week of May, but thereafter both cash wheat and wheat futures prices declined steeply to the

end of July under the influence of discouraging business and financial conditions in the United States (pp. 307-08) and in spite of a poor outlook for the new United States wheat crop. There was concurrent drastic decline of New York stock prices and of prices of other sensitive commodities. All speculative markets in this country suffered from contraction

CHART 12.—WORLD VISIBLE SUPPLIES OF WHEAT, MONTHLY, AUGUST 1, 1891—AUGUST 1, 1895*

(Million bushels)



* Data from Table VIII.

of bank credit at this time. New loans and extensions of old loans to carry wheat were in many instances refused; and carrying charges were greatly increased, with consequent widening of spreads between near and distant wheat futures.

In retrospect, the net decline of British import wheat prices during 1892-93 (only about 10 cents) appears surprisingly small in view of the abundance of world wheat supplies and the deepening of trade depression throughout the world. The fact that international wheat prices did not decline more is attributable mainly to the fact that merchants, speculators, and farmers in the United States, and importers and millers in Europe,

were willing and even eager to hold large stocks of wheat in anticipation of a rise in prices. An analogous situation existed in 1928-29. Developments in these two years support the generalization that, when prices first decline to levels which appear low in relation to prices in the years immediately preceding, wheat traders and merchants are likely to hold large stocks willingly in the belief that wheat prices will soon recover to a higher, "more normal," level.¹

Principal features of 1893-94.—The crop year 1893-94, like each of the two preceding years, opened with students of the wheat market forecasting higher prices. The world wheat crop of 1893 then appeared to be around 100 million bushels smaller than either of the crops of 1891 or 1892,² with the most striking reduction in America. Hence, a significant decrease in the depressingly large American visible supply seemed practically assured. In addition, there was general belief that world wheat consumption would be well maintained and stocks willingly held as long as import wheat prices were below a dollar per bushel, and that the financial situation in the United States was more likely to improve than to grow worse during 1893-94.

Broomhall's first forecast of trade for 1893-94 showed import requirements over 80 million bushels in excess of export surpluses after allowing for "considerable drafts upon the reserves of all countries, both importers and exporters." In presenting this forecast, he commented in picturesque manner: "Not for much longer will the seller in every land be calling to the importing merchant buy! buy!; for two years supply has largely overlapped demand, but now the requirements are quite certain to fully equal the present and prospective supplies."³

For the third successive year, however, early-season price forecasts proved to be wrong. The price of British import wheat (monthly average) declined almost 15 cents

during the course of the year; and the price of Chicago contract cash wheat showed a net decline of 5 cents (Chart 9, p. 311).

During August-December, unprecedentedly heavy visible supplies of wheat (Chart 12, p. 313) tended to depress world wheat prices in the face of what was then thought to be a bullish world wheat statistical position. Chicago wheat prices were held too high in relation to prices at Liverpool to allow United States wheat to flow freely to export in competition with wheat from Russia, the Danube countries, and Argentina (Chart 13); and partly because of this, North American visibles ruled at new high seasonal levels (Chart 11, p. 313). Port stocks in the United Kingdom also reached record heights in these months (Chart 8, p. 310): on November 1 they totaled almost 31 million bushels, a level not approached again until November 1931.

Despite the heavy visible supplies, and in the face of steadily declining wheat prices, Broomhall and others continued to maintain (at least through January) that the wheat statistical position for 1893-94 warranted higher prices. But shipments from Russia and the Black Sea did not fall off as sharply in January-March as had been expected; North American visible supplies declined but slowly; the official estimate of United States farm stocks as of March 1 was larger than had been anticipated; and the new Argentine crop was finally conceded to be of record size, 25-30 million bushels larger than the bumper crop of 1892. Thus it gradually became clear that the wheat supplies of 1893-94 had been seriously underestimated at the beginning of the crop year; and that the world wheat statistical position again favored buyers rather than sellers.

The decline of wheat prices during January-July 1894 reflected not only pressure of immediate wheat supplies and changed views regarding the wheat statistical position for 1893-94, but also an increasingly favorable outlook for the world wheat crop of 1894, and, to a lesser extent, continuance of general economic depression. Of some importance, too, was the fact that holders of wheat had become greatly discouraged; low wheat prices had prevailed for so long that there seemed

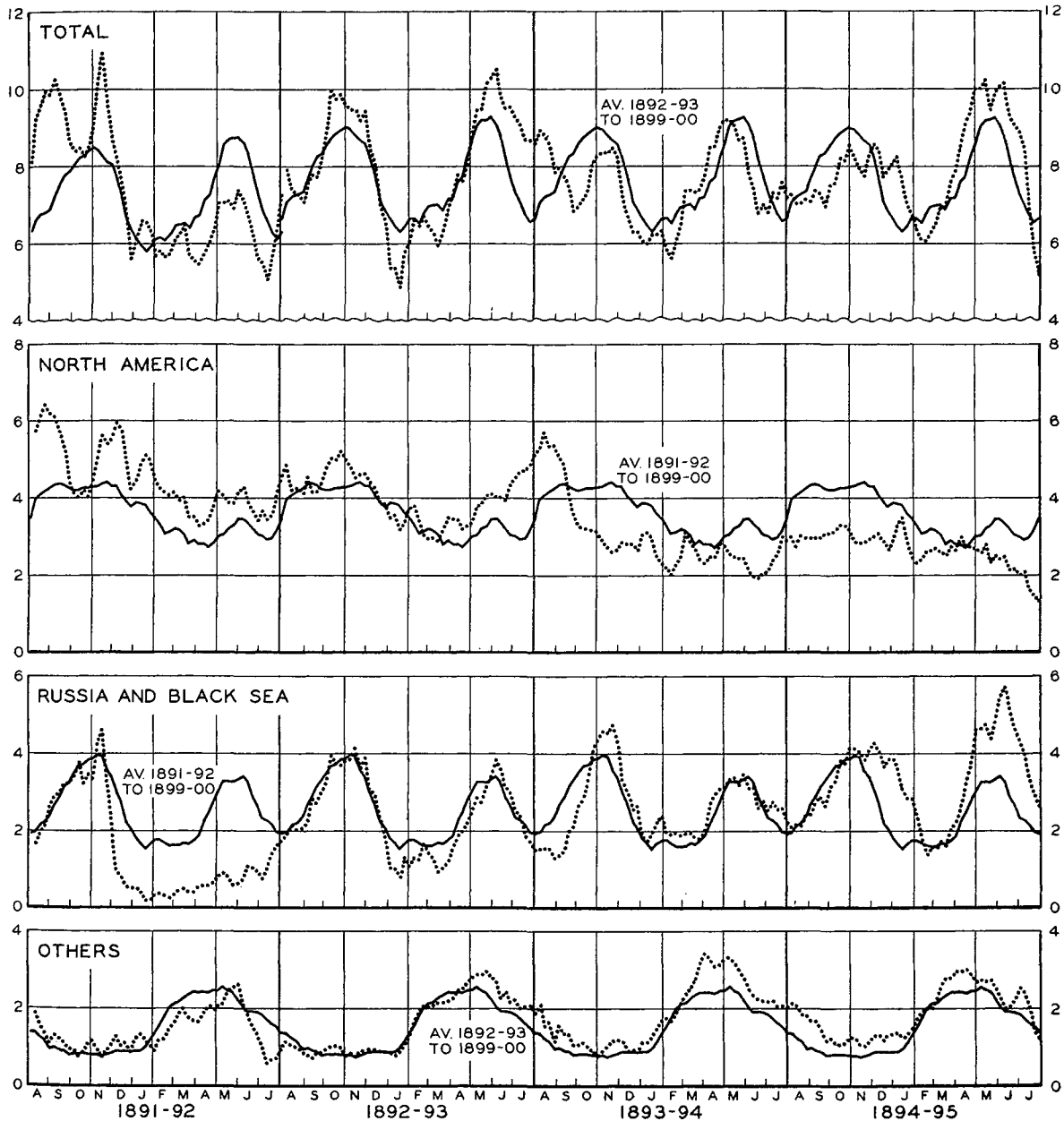
¹ For a fuller discussion of the "stocks theory" and its relation to the long cycle in wheat prices see Working, "Cycles in Wheat Prices," *WHEAT STUDIES*, November 1931, VIII, 39-40.

² *Corn Trade News*, September 28, 1893, p. 733.

³ *Ibid.*, September 26, 1893, p. 711.

CHART 13.—SHIPMENTS OF WHEAT AND FLOUR, BY SOURCES, WEEKLY,
AUGUST 1891—JULY 1895 (DOTTED LINES), WITH COMPARISONS*

(Million bushels; three-week moving average)



* Data from Broomhall's *Corn Trade Year Book 1901-02*. Broomhall's data appear to include flour shipments only from North America and Australia. "World" shipments not reported in 1891-92; shipments shown in the top box for that year are shipments to Europe, as is also the average presented for comparison. Weekly shipments from "Others" derived by subtracting shipments from North America and Russia and the Black Sea from weekly world shipments, or, in 1891-92, from shipments to Europe.

to many observers to be little reason to expect higher prices in the near future.

Principal features of 1894-95.—From the very beginning of 1894-95 it was clear, as

had been expected in the preceding months, that the new world crop would be large. By early October, most students of the wheat market were ready to admit that the crop

might be of record size. Moreover, world visible supplies of wheat on August 1 were practically as large as a year earlier (Chart 12, p. 313). In short, the wheat supply position for 1894-95 seemed to hold little promise of higher prices.

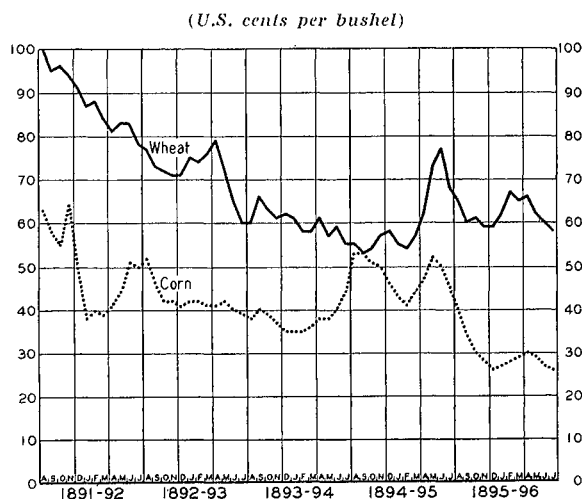
On the demand side, however, the situation appeared less bearish. The United States corn crop was strikingly short; and traders anticipated that a considerable amount of wheat (20 to 100 million bushels)¹ would be used for feed in the United States during 1894-95. In Europe, too, there were prospects for heavier feeding of wheat than usual. The European corn crop was decidedly small, particularly in Russia, the Danube countries, and Italy; and an unusually large part of the wheat produced in France, Germany, England, Belgium, and Holland was fit only for feeding. Moreover, it seemed probable that these leading importing countries would require more wheat than usual for flour production, since the millable domestic wheat was believed to be poor from the standpoint of flour yield. These aspects of the demand were expected to offset the bearish supply position, and to have a firming influence on world wheat markets during the course of the year. However, the early-season price forecasts for 1894-95 were less confidently optimistic than the forecasts which had been published in each of the three preceding years.

On the basis of actual price developments, the crop year 1894-95 was a year of deep depression in wheat prices and also a year of beginning recovery (Chart 9, p. 311). British import and Liverpool futures prices drifted downward to new record lows in October. At Chicago, the lows of September-October were broken in the following January, when contract cash wheat and the January wheat future fell slightly below the lowest cash and futures prices recorded in the preceding fall. In all leading markets, the second half of the crop year witnessed rising prices.

The wheat price decline of August-October was associated with rapid increase in North American visible supplies, which were already at a record high level (Chart 11, p. 313), and

with inactive buying of wheat by European importers and millers, who were looking forward to the possibility of lower prices. On the other hand, the large supplies in North America and in other exporting countries were not pressed upon European importers. The Russian export movement was just getting under way; and in the United States wheat prices were held above export parity, partly because of strength reflected from the corn market (Chart 14), partly because wheat prices were already so strikingly low that North American speculators were ready to gamble on a rise.

CHART 14.—MONTHLY AVERAGE PRICES OF WHEAT AND CORN AT CHICAGO, AUGUST 1891—JULY 1896*



* For source of data see "Statistical Notes," p. 345. The price of corn here given for May 1892 is the average of the highest and lowest prices for the first half of that month (data from *Daily Trade Bulletin*), and therefore takes no account of the high prices of late May brought about by a "squeeze."

Liverpool futures prices turned sharply upward after the end of October, in response to active bidding for wheat by European millers and merchants, who were faced with greatly reduced stocks in near positions. British port stocks declined by over 6 million bushels during November—the largest monthly reduction recorded in pre-war years; and on December 1 these stocks, and also import stocks in the chief continental importing countries, were at levels lower than they had been in any of the three preceding years

¹ *Corn Trade News*, September 11, 1894, p. 626.

(Chart 8, p. 310). This situation appeared particularly serious because of the low quality of northern European domestic wheats, and also because of increasing evidence that the world wheat statistical position was less easy than many European importers had previously believed. Reports from the United States indicated that wheat was being fed heavily to livestock. And from Argentina came reports that locusts and excessive rains in that country in late November and early December had done considerable damage; however, the extent of damage to the Argentine wheat crop was uncertain, estimates ranging from practically none to 25 per cent.

In United States wheat markets, the domestic corn position continued to attract primary attention: early in November a reliable trade journal¹ reported that about 40 million bushels of wheat had been used for feed up to November 1 and that 60-75 million bushels were likely to be so used during the course of the year. This estimate was partly confirmed by a later official report which suggested that the total for the crop year would probably reach 75 million bushels, and stated that 46 million had been fed prior to December 1.² These reports were construed as bullish, since subtraction of 50 million bushels or more (to allow 10-25 million bushels for normal feed requirements) from the United States wheat surplus would go far toward improving the world wheat statistical position.

In January, however, wheat prices again declined—in the United States, to slightly below the lows of mid-October. The decline came in spite of unusually large week-to-week reductions in the North American visible supply and a growing tendency to credit the more moderate rather than high estimates of the Argentine crop. Continued heavy shipments of wheat from Russia and the Black

Sea (Chart 13, p. 315), and, more particularly, unsatisfactory developments in the financial situation in the United States (p. 308), were dominating influences at this time. There was concurrent weakness in other United States commodity markets and in New York stock prices (Chart 7, p. 306). On February 5, Broomhall commented: "Were it not for the somewhat alarming weakness in the American money market, the general impression in Liverpool and on Mark Lane is that Wheat is on the eve of better times. As it is everyone is disposed to be ultra-cautious . . ."³

The next few months of 1895 brought improvement in the American financial situation and a better tone in the various stock and commodity markets. The wheat market was also helped by evidence that wheat consumption in Europe had been unusually heavy in August-January; Broomhall's estimate of European import requirements was revised upward by 26 million bushels early in February. The March official estimate of United States farm stocks was bullish, although it was generally believed to understate the size of the stocks; and North American visible supplies continued to decline rapidly.

After the middle of April world wheat markets were dominated by news of drought and consequent crop damage in the United States. Prices rose spectacularly, particularly at Chicago. The reports of crop deterioration, coming as they did at a time when Chicago wheat prices were close to past record lows and when (mainly because of improved financial and trade conditions) optimism was displacing pessimism in all markets, stimulated heavy speculation in Chicago wheat futures by members of the "outside public" as well as by professional traders. European importers and millers, whose stocks were still low at the end of March, bought wheat actively as prices rose in April and early May (Chart 13, p. 315). Even Broomhall was inclined at that time to take an optimistic long-time view of the wheat situation. Late in April, he commented: "It is impossible to disguise the fact that the great plethora of stuff that has been such a burden to Wheat merchants throughout the world since 1891 no longer exists."⁴

¹ *Cincinnati Price Current*, November 8, 1894 (abstract in *Daily Trade Bulletin* [Chicago], November 9, 1894).

² There is some question as to whether the 46 million bushels "already fed" refers to July-October or July-November. The original official report is not available to us, and statements in the trade journals we have differ as to the date.

³ *Corn Trade News*, February 5, 1895, p. 301.

⁴ *Ibid.*, April 30, 1895, p. 1028.

But late in May 1895 the enthusiasm of European importers appeared to wane, and the demand for import wheat slackened. At the same time, wheat shipments to Europe, mainly from Argentina and Russia, continued heavy. Yet despite these and other bearish factors, wheat prices continued to rise until mid-June. At Chicago, buying by the outside public continued heavy for some time after most professional traders were convinced that existing bullish factors had been more than discounted; and wheat trading was recognized to be "on a runaway order" as early as May 25.¹ The sharp decline in wheat prices after the middle of June did not, therefore, come as a surprise to students of the market. The timing of the decline was determined mainly by improvement in weather conditions in the American West and Northwest, and by the crop report of the United States Department of Agriculture which suggested a larger yield than many holders of wheat had anticipated. Not until the following spring did British import wheat prices again rule at a level as high as that of June 1895, and even then Chicago prices remained lower.

We have traced the course of the wheat price decline of 1891-95 year by year; we now turn to detailed discussion of (1) elements in the demand for wheat in 1891-95 and (2) conditions of supply in this period. These two phases of the wheat situation of the early 'nineties will be considered in the light of historical perspective, and similarities and contrasts with developments in recent years will be noted.

ELEMENTS IN THE DEMAND FOR WHEAT, 1891-95

The world wheat problem of the past six years (1928-29 to 1933-34) has been aggravated and complicated by contraction or restrained expansion of wheat consumption in

many countries. This has been due, in some part, to widespread unemployment and reduced purchasing power associated with the world economic depression; it has been due still more to general adoption in Europe (and to some extent elsewhere) of governmental measures designed to support domestic wheat prices and to reduce wheat imports. It is pertinent to ask to what extent similar factors influenced the demand for wheat, and hence the world wheat situation, in 1891-95.

Tariffs and import restrictions in Europe.—

The continued decline of wheat prices in the early 'eighties influenced France, Germany,² Italy, and some less important wheat-importing countries to abandon the principles of *laissez faire* and freedom of trade, which had gained such a hold in Europe during 1850-75,³ and to adopt what then appeared to be moderately high grain duties. The tariff changes in France, Germany, and Italy, shown in Chart 15 (section A), are more or less representative of changes introduced in the same period in a number of other countries (Table VII). By 1890 the French wheat tariff was over eight times as high as it had been ten years earlier; the German tariff was about five times as high; the Italian almost four times as high. Sweden, which had admitted wheat duty-free before 1888, was collecting a duty equivalent to 18 cents per bushel in 1890, and the tariff of Austria-Hungary (previously 7 cents) was then approximately 20 cents per bushel.

When wheat prices continued to fall during 1891-95, tariff increases were extremely moderate and not particularly numerous. Great Britain, Belgium, Holland, and Denmark held fast to their belief in the benefits of free trade—a belief which was still strong in these countries in 1930; and tariff increases in other European countries showed a range of from 0 to only 25 cents per bushel. Indeed, the average duty on wheat admitted to Germany was actually lowered in 1892, since the duty in force prior to that year was then supplemented by the lower "conventional" duty shown in Chart 15.

The import duties on wheat adopted during 1880-1900 appear low in comparison with tariff rates introduced during the past five

¹ *Daily Trade Bulletin*, May 25, 1895.

² Germany was then under the influence of the Caprivi tariff policy.

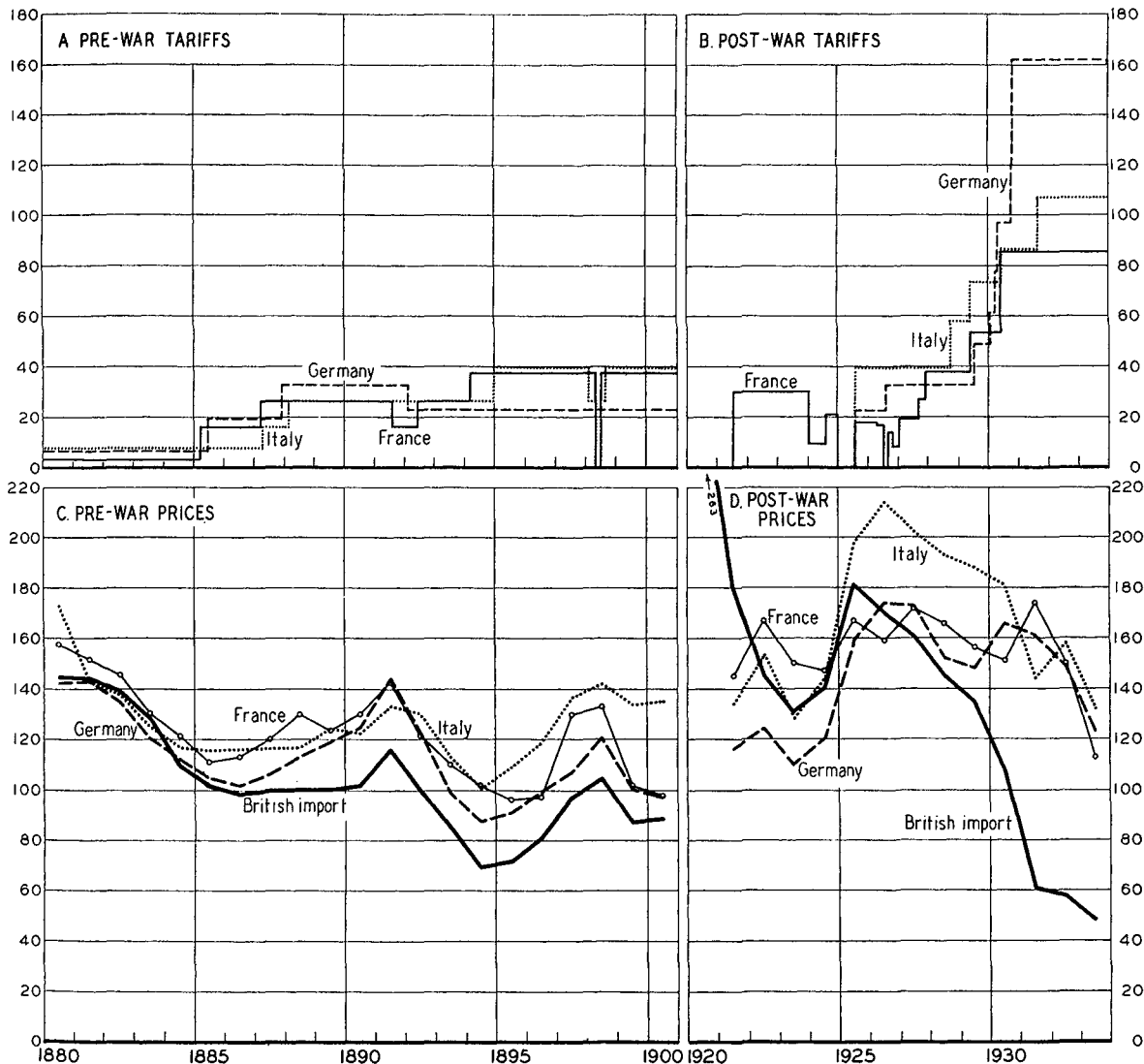
³ The Agricultural Tribunal of Investigation, in their *Final Report* (Great Britain, Parliamentary Papers, 1924, VII [Cd. 2145], 46), commented: "In . . . 1850-75, the principle of freedom of trade reached almost unlimited expression in the tariff policies of the great countries."

years (Chart 15, sections A and B). The highest wheat duty in force in Europe in the 'nineties was 55 cents (Spain and Portugal), in contrast with \$1.62 (Germany), the highest

the 'nineties, a tariff as high as one dollar per bushel would have outraged consumers and been considered unreasonable by statesmen who had been trained in the economic

CHART 15.—IMPORT DUTIES ON WHEAT IN FRANCE, GERMANY, AND ITALY, AND ANNUAL AVERAGE WHEAT PRICES IN THESE COUNTRIES COMPARED WITH BRITISH IMPORT PRICES, 1880-1900 AND 1920-33*

(U.S. cents per bushel)



* See Tables I, II, and VI.

in recent years.¹ The higher rates of recent years no doubt reflect in part a general change in social and economic philosophy and in part attempts to protect national exchanges. In

doctrines of Adam Smith, Ricardo, Bastiat, and other advocates of free trade. Today, consumers suffer mostly in silence while political leaders try out various expedients to aid producers and to protect the exchanges.

The increases in import duties in France, Germany, and Italy during 1885-95 kept

¹ The French general tariff is \$1.71, but most of the wheat imported into France is admitted under the conventional tariff of 85 cents.

wheat prices in those countries from declining as much as British import prices, or as domestic wheat prices in Great Britain, Holland, and other free-trade countries. However, the spreads between these various prices remained fairly narrow, especially in comparison with spreads in recent post-war years (Chart 15, sections C and D). Particularly noteworthy is the fact that the wheat price depression of the 'nineties was general throughout Europe, whereas the price depression of recent years has been practically confined to exporting countries and those wheat-importing countries where restrictions upon wheat imports, milling, etc., have been relatively unimportant.

Governmental measures other than tariffs, such as milling quotas, mixing specifications, direct price fixing, price-supplementing subsidies, international agreements to limit exports, etc., which have been common since 1928-29, had no counterpart in the 'nineties.¹

¹ Recent applications of such measures were facilitated by extensive experience with similar controls during the World War.

² In the earlier period, when imports of a given quantity of wheat were authorized by the Portuguese government, only millers were allowed to do the importing, and these, apparently, in proportion to the productive capacities of their mills. Import duties were then levied with a view to keeping the total cost of wheat to millers (including duty) at approximately \$1.75 per bushel (Table VII).

³ The law of 1894 provided for import certificates on wheat, rye, oats, legumes, barley, colza, and rapeseed. These certificates, equal in value to the import duties which would be paid on the same products if imported, were transferable and receivable at par for customs duties on specified commodities. The certificates were valid for a period of ten months from date of issue. During the first four months certificates issued against grain exports could be applied only on imports of the same kind of grain exported; during the following two months the certificates could be used in importing either grain or other specified products; and during the last four months they could be applied only against imports of other products. These features of the law of 1894 created a regular market for the sale of import certificates, and helped to maintain their prices close to face value. See Fritz Beckmann, "Erneuerung der Einfuhrscheine," *Archiv für Sozialwissenschaft und Sozialpolitik*, 1925, LIV, 446-68; U.S. Department of Commerce, *Handbook of Foreign Tariffs and Import Regulations on Agricultural Products: V, Grains and Grain Products* . . . (Trade Promotion Series No. 131, 1932), pp. 74-78; and Elna Anderson and F. Sohn, "A Review of the German Grain Import Certificate System," *Foreign Crops and Markets*, June 28, 1926, XII, 881-90.

It is true that Portugal's system (introduced in 1889) of allowing imports only under special governmental authorization, which depended mainly upon the size of the domestic crop, had some features in common with modern milling quotas; but on the whole, the resemblance was slight.² It is also interesting to note that Germany's present import certificate system dates from a law passed in 1894,³ which is reported to have stimulated wheat exports from eastern Germany and to have resulted in better prices to farmers in that region.

Wheat consumption.—It is impossible accurately to gauge year-to-year changes in wheat consumption during post-war years; as regards the 'nineties, when data on stocks were even more inadequate, inferences about consumption are subject to even greater error. Nevertheless, domestic utilization figures (production plus net imports or minus net exports—Table VI) yield some basis for judging changes in the level of consumption as between periods of several years. Mainly on the basis of these data, ex-seed use, we have arrived at certain inferences regarding wheat consumption in 1891-95 which appear reasonable in the light of other, more general, information. These inferences we present below without detailed discussion.

The various importing countries of Europe responded in somewhat different ways to the stimulus of declining wheat prices in 1891-95. The three Scandinavian countries all took advantage of the low prices to expand per capita wheat utilization. A similar though less striking expansion occurred in Germany and Finland. Prior to 1891-92 not one of these countries had a per capita wheat utilization (ex-seed) of over 2.5 bushels; and in all five, per capita consumption of rye was considerably higher. In view of these and other considerations, it seems probable that the larger wheat supplies available in these countries in 1891-95 moved more or less directly into consumption, instead of going primarily to increase stocks. To what extent the increased supplies went to animal feed rather than to flour consumption is open to question. Denmark has been outstanding in post-war years for her willingness to take low-priced,

low-grade wheat for feeding purposes; but we infer that in the early 'nineties the increased domestic utilization of wheat in that country, and also in the other Scandinavian countries and Germany, mainly reflected expansion of wheat consumption in the form of food. In the United Kingdom and Italy, wheat utilization was also relatively high in this period; but in these countries stocks were considerably enlarged and consumption was somewhat less affected.

The crop year 1894-95 was characterized by high apparent utilization in practically every important European importing country except Italy. To some extent this reflected accumulation of stocks in consequence of large domestic crops in 1894 and/or under the stimulus of rising wheat prices in the spring of 1895; but it also reflected heavier consumption for both food and feed, owing to the poor quality of the wheat produced in northwestern Europe in 1894 and to general shortage of corn supplies.

None of the European importing countries appears to have curtailed wheat consumption markedly in 1891-95,¹ as several—notably Germany and Italy—have done in recent depression years.² The contrast between these two periods of economic depression is probably attributable partly to the greater severity of the more recent depression and partly to the fact that per capita wheat utilization in Italy and several other countries was higher, and hence more susceptible of reduction, in the post-war period. But the principal factor

appears to have been that in 1930-34 stringent import and milling restrictions and artificially high wheat prices discouraged wheat consumption in a number of importing countries; whereas in the 'nineties governmental measures were of little importance, and continental wheat prices declined along with British import prices to notably low levels.

In the United States, per capita flour consumption appears to have fallen off during the business depression of 1893-95 as well as in the more recent depression years of 1930-33.³ There seems to be no good statistical record of the extent of the decline of consumption in the earlier period, but evidences of a decline, noted by contemporary observers, leave little doubt of its occurrence. The *American Miller* of October 1897 commented (p. 733): "Every miller knows that the consumption of Flour [in this country] fell off after the panic [of 1893] . . ." And regarding the apparent decline in per capita flour consumption at that time, the Statistician of the United States Department of Agriculture remarked:

It is not probable that there has been any reduction in the quantity of wheat bread actually eaten, but in the matter of waste there was a wide margin for retrenchment . . . many a crust and many a fragment of stale bread which ordinarily would have found its way to the swill barrel has undoubtedly been used to satisfy human hunger or to ward it off . . . If the cheapness of wheat during the period in question [March 1893—March 1894] may seem to have been favorable to a continued use of an unstinted supply of bread, it must be observed . . . that the price of baker's bread has not generally fallen . . .⁴

The decline in flour consumption in the United States in 1893-95, as in 1930-33, was more than offset by increased use of wheat for feed. The notably short United States corn crop of 1894 and high corn prices in 1894-95 resulted in the feeding of some 60-75 million bushels⁵ of wheat in that crop year alone. Although these figures do not appear so large when they are compared with estimates of the wheat fed on farms in the United States in 1930-31 and 1931-32 (157 and 171 million bushels, respectively), they represented an important element in the world wheat situation in 1894-95. In relation to

¹ Low apparent utilization in France in 1891-94 was presumably associated with reduction of stocks built up in 1890-91.

² See "The World Wheat Situation, 1932-33," *WHEAT STUDIES*, December 1933, X, 116-18.

³ Data for the full crop year 1933-34 are not yet available, but flour consumption appears to have continued low.

⁴ U.S. Department of Agriculture, *Report of the Statistician*, Division of Statistics, New Series Report No. 113, March 1894, p. 89.

⁵ An official report, published early in December, forecast wheat feeding in 1894-95 at 75.3 million bushels. No later government report on feeding appears to have been issued; but in June 1895 Broomhall commented that the quantity of wheat fed to animals in the United States in July-June 1894-95 would probably approximate 60 million bushels (*Corn Trade News*, June 4, 1895, p. 1340).

normal domestic requirements, the wheat fed in 1894-95 approximated 15 per cent, as compared with around 25 per cent in 1930-32.¹

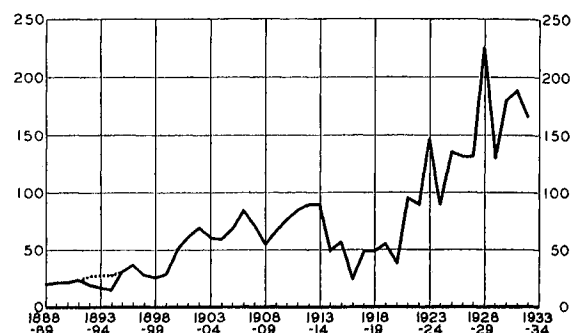
In other exporting countries, wheat consumption in 1891-95 appears to have increased as much as or more than normal (trend considered), except in Canada.² In India and Russia, consumption was apparently particularly heavy in the two years of lowest prices, 1893-94 and 1894-95, when both countries were favored with large crops. High apparent utilization figures for India in these years, and also in 1895-96, are in line with the observed tendency for Indian exports to be small and Indian wheat consumption relatively heavy when domestic crops are large and international wheat prices low. In Bulgaria, apparent utilization of wheat was relatively high in the three crop years 1891-94; and in Austria-Hungary it was similarly high in 1892-96. We assume that in these two countries the years mentioned were characterized by heavy wheat consumption and also by some building up of stocks.

Shipments to ex-European countries.—In post-war years, ex-European importing countries (particularly China) have absorbed import wheat much more heavily in years when international wheat prices have been low than in years characterized by relatively high prices.³ In fact, this tendency has been so strong that China has come to be looked upon as an important outlet for surplus cheap wheat.

In the 'nineties, however, ex-European markets were not well developed; and, to judge by Broomhall's shipments data, the elasticity

of wheat demand for which ex-European countries have recently been noted was then scarcely apparent (Chart 16). Even at that time, however, observers were aware of the fact that Chinese imports of wheat were likely

CHART 16.—SHIPMENTS OF WHEAT AND FLOUR TO EX-EUROPEAN COUNTRIES, ANNUALLY FROM 1888-89*
(Million bushels)



* Data from various issues of Broomhall's *Corn Trade Year Book* and *Corn Trade News*. Figures reported by Broomhall as "shipments to China, Brazil, etc.," in most years correspond with calculated differences between world shipments and shipments to Europe, but for 1892-93 to 1894-95 there was substantial discrepancy; for these years reported "shipments to China, Brazil, etc.," are indicated by a dotted line, while calculated differences between world shipments and shipments to Europe are indicated by the heavy line.

to be somewhat heavier when wheat prices were low. The following quotation from a letter written to the *Northwestern Miller* in 1895 shows clearly that such was the case:

There has been some increase of business [with China] during the last six months over the corresponding period of last year, but it is hard to tell how much is due to the war and how much to low prices. Whenever wheat is low or rice high, the consumption in China is stimulated⁴

The increase in business referred to was an increase of approximately 6 per cent, and applied only to the business of one company in the United States (the Sperry Flour Company). Broomhall's data on shipments to ex-Europe do not show any such increase as this between 1893-94 and 1894-95. It is possible (1) that larger Chinese takings were then offset by smaller imports by other ex-European countries or (2) that in 1894-95 China imported more wheat from the United States and less wheat from other exporting

¹ It is possible that these figures are not strictly comparable. We cannot be certain from the reports we have seen that the official forecast of wheat to be fed in 1894-95 referred only to wheat likely to be fed on farms.

² The utilization data for Canada are such as to cast doubt upon the validity of the crop estimates of that country; nevertheless, the fact that lower per capita utilization was coincident with economic depression and the early stages of revival in 1893-97 suggests that these data may picture with rough accuracy changes in the level of Canadian wheat consumption during the period under review.

³ See Joseph S. Davis, "The World Wheat Problem," *WHEAT STUDIES*, July 1932, VIII, 424-28.

⁴ *Weekly Northwestern Miller*, February 1, 1895, XXXIX, 172.

countries. In any case, it seems reasonably clear that in the 'nineties low wheat prices did not encourage significantly larger shipments of wheat to ex-European countries in general.

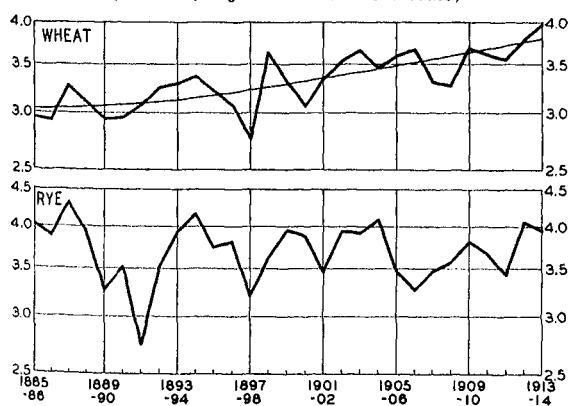
A GENERAL VIEW OF THE WHEAT SUPPLY POSITION, 1891-95

It is clear that Broomhall and other contemporary students of the wheat situation were convinced that the drastic decline of wheat prices during 1891-95 was associated, not with contraction of consumption, but with heavy production leading to the appearance and persistence of a world wheat surplus. We shall now examine the wheat supply situation of the early 'nineties with a view to answering the questions: Did a wheat surplus exist in 1891-95? If so, why did it exist? And how did it compare in size with the wheat surplus which has been hanging over world wheat markets in recent years?

The existence of a surplus.—In attempting to determine whether or not the period 1891-95 was a period of world wheat surplus, we may first consider the evidence afforded by data on per capita world wheat production. Chart 17 (upper section) indicates that the

CHART 17.—PER CAPITA WORLD PRODUCTION OF WHEAT, AND PER CAPITA EUROPEAN PRODUCTION OF RYE, ANNUALLY, 1885-1913*

(Bushels; logarithmic vertical scale)



* For source of wheat production data see "Statistical Notes," p. 345; for rye production data, see Table III; for population data see Table X.

world wheat crops of 1892-94, as we now appraise them, yielded more wheat per capita than any three successive crops prior to that

time (at least from 1885) or than any subsequent three crops up to the turn of the century.¹ After 1901, however, per capita wheat production was more or less regularly higher than in the period 1892-94. This might be interpreted to indicate that if a world wheat surplus existed in the early 'nineties much larger surpluses must have existed in 1902-07 and 1909-14, per capita consumption remaining unchanged. Actually, however, per capita wheat consumption was gradually increasing during 1890-1914, and was considerably higher in the later than in the earlier years of this period. How much higher cannot be determined with any degree of exactness; but for present purposes, the light solid line in Chart 17 (upper section) may be taken as a rough approximation of the trend of per capita ordinary wheat consumption. In relation to this trend line, the years 1892-94 stand out clearly as years of excessive wheat production and of potential surplus.

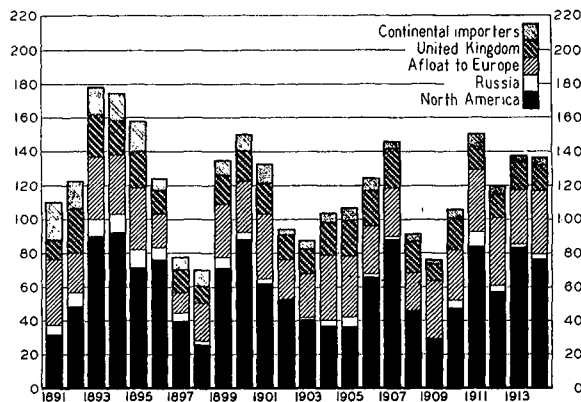
Another important feature of this period was the European rye situation (Chart 17, lower section). After securing a notably poor outturn of rye in 1891, Europe harvested a somewhat better rye crop in 1892, then two successive bumper crops. The latter two crops contributed to ease in the European bread-grain position in 1893-95, and thus indirectly to persistence of wheat surplus in these years.

That world wheat consumption did not keep pace with world production in 1892-95 is apparent from the available data on world visible supplies shown in Chart 18. Year-end stocks in primary visible positions were higher in the years 1893-95 than in any other pre-war year for which records exist. Visibles were larger than usual, not only in North America, but also in all other primary positions. In no other pre-war year (beginning in 1891) were August 1 stocks in North America so large as in 1893-94, or stocks in Russian ports so large as in 1893-95; and never again in pre-war years did visibles in continental European importing countries stand so high.

¹ For crops, see M. K. Bennett, "World Wheat Crops, 1885-1932," *WHEAT STUDIES*, April 1933, Vol. IX, No. 7; for population figures, see Table X.

CHART 18.—"WORLD" VISIBLE SUPPLIES AS OF AUGUST 1, 1891-1914*

(Million bushels)



* See Table VIII. In the later pre-war years these figures do not include visibles in all the positions reported by Broomhall; but they represent the most inclusive comparable series of visibles available for this span of years.

Why the surplus existed.—The evidence presented above may reasonably be considered to establish the fact that the crop years 1892-93 to 1894-95 were years of world wheat surplus. We now turn to the questions: How did the surplus emerge? Why did it persist?

The crop year 1891-92 was not strictly a year of *world* surplus production, but it was characterized by emergence of wheat surplus in the United States. The United States crop of 1891 was a record for its time, and (if Working's revisions of official estimates are reasonably reliable) was only twice exceeded up to 1914. Wheat stocks in the United States, particularly in invisible positions, were unusually heavy throughout 1891-92; and at the end of that year (July 1), despite extremely large exports, farm stocks apparently stood at a higher level than on the same date of any other year except possibly 1899, 1916, 1932, and 1933.¹

In Europe, the situation was strikingly different. As a result of short wheat crops in Russia, Spain, France, Germany, Belgium, and the Netherlands, and of short rye crops in the principal rye-consuming countries, European bread-grain supplies were distinctly below normal. And although European wheat stocks were drawn down during the course of the year, wheat consumption in Europe

was probably moderately low. If the world wheat crop of 1891 had been more evenly distributed among the various producing countries—if less wheat had been grown in the United States and more in Russia, Spain, and northwestern Europe—world wheat consumption would presumably have been heavier and the carryover at the end of the year less burdensome.²

The abnormal distribution of the crop of 1891, and hence the emergence of a surplus, was due primarily to weather conditions, and only in small part to intentional changes in acreage sown to wheat. Winter-wheat sowings in France were somewhat smaller than usual because of early onset of cold weather; and a severe winter (with drought in Spain) greatly reduced the acreage remaining for harvest in France, Germany, Spain, and several other European countries. Later growing and harvesting weather in these countries was generally adverse, and yields per acre turned out to be low. In the United States, on the other hand, weather conditions were unusually favorable. The area planted to winter wheat was large, partly because of favorable weather conditions, partly because wheat prices at Chicago were relatively high; winterkilling was close to a minimum; and the area harvested was considerably the largest

¹ The following tabulation gives estimates of July 1 farm stocks in the United States as originally reported in terms of percentages of the preceding crop remaining on farms, and also in terms of million bushels based upon (1) original official crop estimates, (2) revised official crop estimates, and (3) crop estimates of the Food Research Institute. The official estimates are available only from 1895. For several preceding years and also for 1895-99 we present in the last column current unofficial estimates, in million bushels:

July 1	Percentage reported	Original official	Revised official	F.R.I.	Current unofficial
1892	.....	....	....	....	88.0
1893	.....	....	....	....	65.0
1894	.....	....	....	....	40.0
1895	..... 5.6	25.8	29.0	35.5	30.0
1896	..... 8.5	39.7	48.5	56.9	40.0
1897	..... 5.4	23.1	29.2	33.1	25.0
1898	..... 3.3	17.5	20.2	22.6	10.0
1899	..... 9.3	62.8	71.9	77.4	70.0

² In recent years distribution of the world crop appears to have been particularly important as regards trade in wheat, wheat prices, and consumption in 1929-30 and 1932-33. See WHEAT STUDIES, December 1930, Vol. VII, No. 2; *ibid.*, December 1933, Vol. X, No. 3.

then on record.¹ Timely rains kept the United States spring-wheat crop from deteriorating significantly, and both winter and spring crops were favored by excellent growing and harvesting weather. The average yield per acre was 15.5 bushels, a yield not equaled again until 1906.

The world wheat crop of 1892 contributed largely to the growth of the world wheat surplus. Again Nature played the leading rôle, but this time she distributed her favors more evenly. The five leading overseas exporting countries all secured large or moderately large crops, mainly as a result of high yields per acre and in the United States of a large acreage² as well; the Danube exporting countries had good yields; Germany's crop was a bumper one; and most of the remaining European countries (including Russia) harvested moderate or moderately large crops from planted areas of about normal size, trend considered. In no important wheat-producing country were weather conditions so adverse as to cause such severe and extensive crop damage as there had been in France and Russia in 1891. The better distribution of the world crop of 1892 resulted in heavier world wheat consumption than in 1891-92; but in spite of this, the wheat surplus continued to grow, and the surplus stocks continued to be heavily concentrated in the United States.

The crop year 1893-94 might have seen the surplus enormously reduced, or even eliminated, had it not been for high yields per acre in eastern Europe (including Russia), Argentina, and India. The aggregate outturn elsewhere was low. Germany, Italy, and Spain harvested good-sized crops; but these were considerably more than offset by short crops in the United States and northwestern Europe (excluding Germany). In the United States, drought and severe cold weather were jointly responsible for unusually heavy abandonment and low yields per acre, while in

northwestern Europe drought was the chief damaging factor.

The world crop of 1893, though substantially larger than that of 1892, was so distributed as to result in a considerably smaller net addition to the world wheat surplus. The big crops of Russia, India, and Spain went more largely to increase consumption than to increase stocks, and were scarcely reflected in international trade statistics. Russian net exports were only 8 million bushels larger in September-August 1893-94 than in 1890-91 when Russia's crop was some 225 million bushels smaller; India's net exports in April-March 1893-94 were lighter than in any year of the preceding decade; and Spanish net imports, though small in absolute amount, were relatively large (Table IV). Despite heavy consumption, year-end wheat stocks must have been substantially built up in these three countries during 1893-94. But since stocks elsewhere were appreciably reduced in the aggregate, world year-end stocks were probably not greatly enlarged. There is little doubt, however, that the burden of carrying large stocks was felt much more keenly in 1893-94 than it had been in either of the two preceding years (particularly 1891-92) when farmers, speculators, and importers in many countries were willing to hold wheat in anticipation of higher prices.

The record world wheat crop of 1894—likewise attributable almost wholly to the favors of Nature—doubtless further enlarged the world wheat surplus, but considerably less than the size of the crop might suggest. Russia, India, and Spain again secured big harvests, which presumably went largely into consumption; and, as noted previously (p. 321), an unusually large amount of wheat was fed to animals in the United States and Europe because of shortage of corn supplies and poor wheat quality in northwestern Europe. Thus, the distribution and quality of the world wheat crop of 1894, shortage of corn, and low wheat prices combined to expand world wheat consumption in 1894-95. Nevertheless, production considerably exceeded consumption, and year-end stocks stood at a record height on about August 1, 1895 (Chart 24, p. 337). Stocks were built up

¹ See U.S. Department of Agriculture, *Reports of the Statistician*, especially April and June issues.

² A large sown acreage—the result of moderately high prices and favorable weather for seeding—and unusually low abandonment were responsible for the large harvested acreage.

during 1894-95 in practically every European importing country except Italy: these increases about offset reductions in the Danube basin and the United States, so that the actual net increase in world stocks was practically equal to the aggregate increase in Russia and India.

The size of the surplus.—It is impossible exactly to determine the size of the wheat surplus which existed during the early 'nineties, or to draw precise comparisons between the level of year-end world wheat stocks in 1891-95 and in 1927-33. However, the rough measures of surplus which are available or which may be readily constructed will serve to answer the important question: Was the wheat surplus of the 'nineties as large as, or substantially smaller than, the surplus which has existed in the past few years?

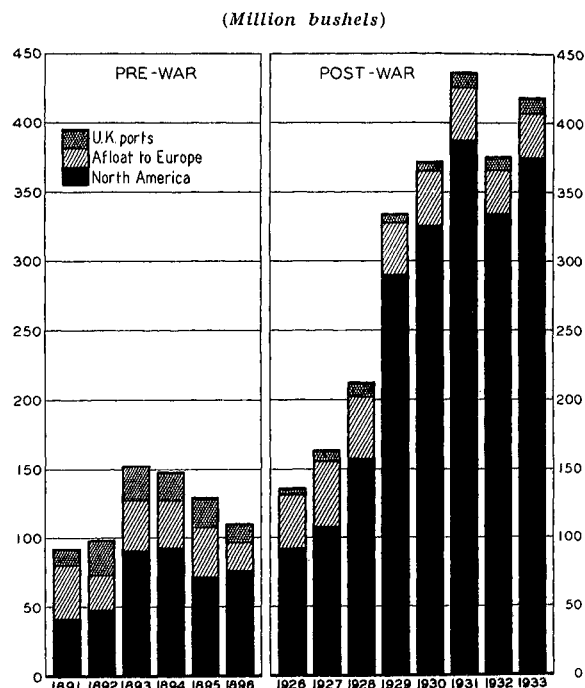
Broomhall's data on visible wheat supplies in North America, United Kingdom ports, and afloat to Europe appear to be reasonably comparable for the span of years from 1891 to 1933. These are shown in Chart 19 for the two short periods 1891-96 and 1926-33. Visible supplies in other positions now reported, such as Argentina and Australia, were not reported in the early 'nineties, while visibles in Russia, France, Germany, Belgium, and Holland which were recorded in pre-war years have not been reported regularly since the war.

It is apparent from Chart 19 that visible supplies in the positions indicated were over two and one-half times as large (on the average) in 1931-33 as in 1893-95. The excess of these visibles above an approximate "normal" level in 1931-33 was probably almost five times as large as the excess in 1893-95; but in relation to approximate normal requirements, which have increased over 50 per cent

during the past forty years, the excess was presumably only about three times as large in the later period.

Visible supplies are not, however, a very good index of the level of total year-end wheat stocks, nor of the excess of those stocks above normal. In the absence of approximations of world year-end stocks for pre-war years, such as are available for post-war years,¹ we

CHART 19.—VISIBLE SUPPLIES IN LEADING POSITIONS ON AUGUST 1, 1891-96 AND 1926-33*



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

have estimated roughly the pre-war carry-overs in leading exporting and importing countries, mainly on the basis of domestic utilization data and of general information relating to crop quality, supplies and prices of other grains, etc.² In Chart 20 we present these estimates as aggregates, in terms of excess of year-end stocks above minimum, for the period 1887-96, in comparison with corresponding estimates (ex-Russia) for 1924-33. The base or zero line in this chart represents minimum stocks;³ the dash line represents approximate normal stocks; and the shaded portion above the dash line, the approximate surplus carryover in the countries

¹ See M. K. Bennett, "Estimation of End-Year World Wheat Stocks from 1922," *WHEAT STUDIES*, February 1933, Vol. IX, No. 5; and "The World Wheat Situation, 1932-33," *WHEAT STUDIES*, December 1933, X, 134.

² These estimates have been constructed with the co-operation of M. K. Bennett. See Table IX for estimates of stocks in principal countries and areas.

³ Annual minimum stocks have been estimated for each country separately; in the aggregate, these show a distinct upward trend during 1885-1933.

specified. Since Russian wheat stocks were somewhat more important for the world wheat position in pre-war years, one may defend comparisons of pre-war aggregate stocks, including estimates for Russia, with post-war aggregate stocks ex-Russia. Such a comparison would show that the surplus

probably about twice as large in 1933 as in 1893.

SOME CONCLUSIONS

The decline and depression of international wheat prices during 1891-95 were associated primarily with emergence and persistence of a world wheat surplus. Other factors, such as widespread business depression, decline of general wholesale prices, and governmental restrictions upon the importation or use of wheat, were of decidedly secondary importance—much less important than such factors have been in 1928-34. Yet international wheat prices would not have fallen so low as they did in the mid-'nineties if British import wheat prices had not tended downward during the preceding twenty years under the influence of general monetary factors, declining freight rates, expansion of wheat cultivation in North America, Argentina, and Australia, and other influences.

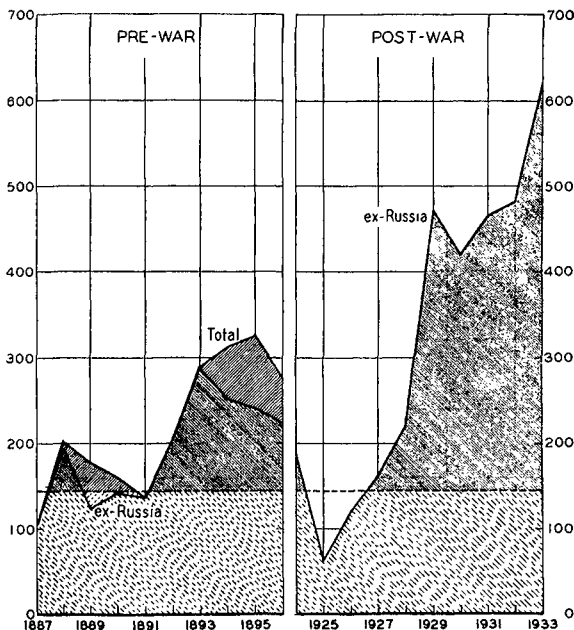
The wheat surplus built up in 1891-95 was considerably smaller, even in relation to normal requirements, than the surplus which has existed in recent years. We infer that the surplus about August 1, 1933, was around two and one-half to three times as large as the maximum year-end surplus in the 'nineties, or, in relation to normal world (ex-Russia) wheat requirements, about twice as large. In both 1891-95 and 1927-34, wheat stocks were held more willingly by farmers, merchants, and speculators in the first two years of surplus than they were thereafter; and throughout both periods, stocks were held more strongly in North America than in any other region or country.

The emergence and persistence of wheat surplus in the early 'nineties was attributable almost wholly to Nature and only slightly to other factors. This is in contrast with the surplus condition of the past six years, which, though attributable in part to Nature, has been greatly aggravated by human actions.¹

¹ For detailed discussion of the factors responsible for the recent surplus and its persistence, see Joseph S. Davis, "The World Wheat Problem," *WHEAT STUDIES*, July 1932, Vol. VIII, No. 8, and "Wheat, Wheat Policies, and the Depression," *Review of Economic Statistics*, April 15, 1934, pp. 80-88; also, F.R.I. annual reviews of the world wheat situation, *WHEAT STUDIES*, December issues, 1929-33.

CHART 20. — ESTIMATED EXCESS OF YEAR-END WHEAT STOCKS ABOVE MINIMUM AND NORMAL LEVELS IN LEADING IMPORTING AND EXPORTING COUNTRIES (EX-INDIA), 1887-96 AND 1924-33*

(Million bushels)



* See Table IX. The base line indicates minimum stocks; the dotted line indicates approximate normal stocks. Positions included are the United States, Canada, Argentina, Austria, Hungary (or Austria-Hungary), Bulgaria, Rumania, United Kingdom, France, Germany, Italy, the Netherlands, Belgium, Scandinavia, Spain, afloat to Europe, and, in pre-war years, Russia. No attempt has been made to correct for changes in boundaries.

carryover on about August 1, 1933, was something over two and one-half times as large as the maximum surplus carryover in the 'nineties. If Russian stocks are excluded from the pre-war as from the post-war estimates, the surplus carryover in 1933 may be taken as a little over three times as large as the maximum surplus carryover in the 'nineties. Finally, in relation to approximate normal world (ex-Russia) wheat requirements, the surplus carryover (ex-Russia) was

The present surplus arose partly through rapid expansion of world wheat acreage during 1925-28 in response to high wheat prices in 1924-25. It has persisted and increased largely in consequence of governmental measures in aid of wheat growers, which have encouraged further expansion of wheat acreage since 1929 and have operated to restrict wheat consumption in recent years.

Intentional expansion of wheat acreage played a less important part in building up the wheat surplus of the early 'nineties. In the five years preceding 1891, extension of world wheat acreage was not unusually rapid (Chart 25, p. 338); and even the relatively high wheat prices of 1890-91 failed significantly to stimulate wheat plantings except in the United States.

Governmental action to aid wheat growers was, in the 'nineties, confined to moderate or small increases in wheat tariffs. These had little effect on wheat prices, and consequently on either wheat acreage or wheat consumption, in the countries concerned. The price

decline of 1891-95, unlike that of 1929-32, was general throughout Europe—in importing as well as in exporting countries; European net imports were maintained at a high level (Table IV), not reduced as in recent years; and in many countries (particularly countries of low per capita wheat utilization) wheat consumption was expanded in response to low prices.

Expansion of consumption in 1892-95 was apparently more for food than for feed—another contrast with the recent surplus period. Both periods, however, included one year of virtual failure of the United States corn crop (1894 and 1930), when wheat was fed heavily to livestock in the United States. In both periods, India displayed characteristic reaction to low prices by reducing wheat exports and increasing wheat consumption. On the other hand, China, which has been an important market for surplus wheat in recent years, apparently did not markedly increase her takings of foreign flour or wheat as world wheat prices declined in the 'nineties.

III. RECOVERY OF WHEAT PRICES AFTER 1895

We have already observed that international wheat prices touched bottom early in 1894-95 and thereafter tended upward, recovering substantially even before the end of that crop year. But practically the whole of the sharp price advance which took place in the spring of 1895 was lost by the following September; and more permanent recovery in world wheat prices had to await evidence of further reduction in the world wheat surplus, and perhaps also more definite improvement in general economic conditions. Both of these developments took place within the next few years; and, as is apparent from Chart 21, world wheat prices advanced to distinctly higher levels.

THE ECONOMIC BACKGROUND

Rising wheat prices in the spring of 1895 were concurrent with temporary improvement in commodity and stock prices and with revival of trade at least in the United States, England, Germany, and France. But during the next crop year, improvement of wheat

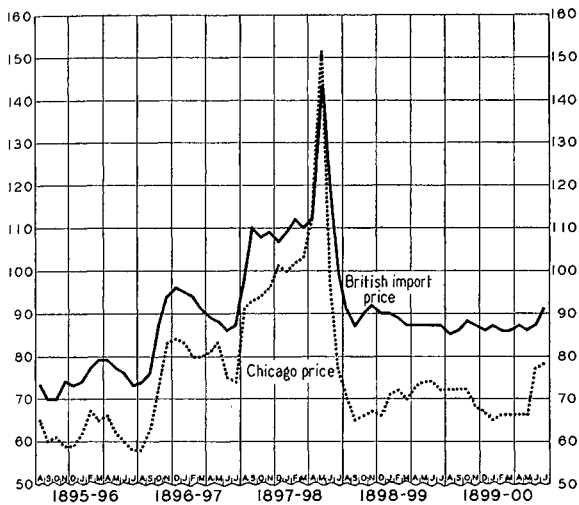
prices took place in the face of declining commodity and stock prices and of renewed business recession in the United States (Chart 7, p. 306).

After improvement in February-June 1895, the financial situation in the United States became suddenly worse in July, arresting advances in both stock and commodity markets. Recurrence of gold exports from the United States after July 20 (when the exchange monopoly of the Belmont-Morgan syndicate was broken by sales of English exchange by a New York coffee-importing house) again threatened the Treasury's gold reserve.¹ During August-September, the banking syndicate (which was then still operating under terms of the agreement it had made with the United States government) tried to protect the gold reserve by turning over to the Treasury some 20 million dollars worth of gold in exchange for legal-tender notes. This action

¹ For a fuller discussion of this and following points, see Noyes, *Forty Years of American Finance*, pp. 244-49.

helped only temporarily. After the government's contract with the Belmont-Morgan syndicate expired, the Treasury's gold reserve was reduced (mainly on account of gold shipments) from 93 million dollars at the end of October to 50 million at the end of January. A general tone of uncertainty

CHART 21.—BRITISH IMPORT AND CHICAGO CONTRACT CASH WHEAT PRICES, MONTHLY, AUGUST 1895—JULY 1900*
(U.S. cents per bushel)



* See Table I and footnote to Chart 1, p. 289.

pervaded all commodity and securities markets in the United States, and from one week to the next traders did not know whether the United States would be able to remain on the gold standard.

In January, however, these conditions were improved by announcement that the Treasury would float a new gold bond issue amounting to 100 million dollars. This project succeeded; the issue was oversubscribed four times. Net imports of gold took place, not only because gold was required for payment of the bonds, but also because, with confidence restored, investment capital returned from foreign countries. The gold reserve of the Treasury rose to approximately 124 million dollars by the end of February 1896, the highest figure after November 1892. But commodity and stock prices continued to decline during February–July, and general trade conditions in the United States grew worse instead of better.

The crop year 1896–97 brought substantial recovery of world wheat prices, though in the United States business remained depressed and wholesale commodity prices drifted downward after a temporary upturn in October–November 1896. In Europe, the crop year 1896–97 was marked by business revival and prosperity; and even in the United States it was apparently characterized in the later months by improved sentiment in most commodity and stock markets. New York stock prices reached their lowest point in August 1896, and business activity in the United States was at its lowest ebb in September–October. Moreover, after the election of McKinley in November, hoarded gold was returned to banks, and the Treasury's net gold reserve mounted steadily until the following May.

In 1897–98, there was noticeable revival of business activity in the United States, and some increase in stock and general commodity prices; but these changes were much less spectacular than the concurrent advance of world wheat prices up to mid-May. Outside the United States, most countries enjoyed at least moderate business prosperity in this year, and wholesale commodity prices tended upward practically throughout the world.

The last two crop years of the nineteenth century were years of world-wide economic prosperity. Commodity prices in general were rising and unemployment was everywhere reduced. New York stock prices turned downward after November 1899, but resumed their upward course the following year. Yet despite improvement in fundamental economic conditions, world wheat prices remained strikingly stable at about the low average price levels of 1892–93 and 1896–97 (Chart 1, p. 289).

This brief summary of economic developments during 1895–1900 indicates clearly that recovery of wheat prices in this period rested primarily upon factors outside the general economic situation. What these factors were, we may discover through detailed analysis of the wheat situation in 1895–1900—the subject of discussion on the following pages. Here, however, we may point out that, although general economic factors appear not to have been primary elements in the recovery

ery of wheat prices in this period, they presumably were modifying influences. It seems probable that world wheat prices would have advanced more than they did in 1895-97 if economic conditions had been more favorable, and that world wheat prices would have fallen lower in 1898-1900 if general commodity prices had not then been tending upward under the influence of increased gold supplies and improvement in economic conditions.

The question of leadership in recovery as between various commodity prices, and also as between commodity prices on the one hand and stock prices on the other, is of perennial interest. In the United States, the belief has been more or less current that *wheat* usually points the way out of a depression—that wheat is the common “bellwether.” Chart 7 seems to afford little basis for supporting this view as regards the depression of the 'nineties. It is true that the early signs of recovery of wheat prices in 1894-95 preceded definite and substantial upturn in stock prices and in wholesale commodity prices in general. But during August 1895-July 1897 wheat prices continued to tend irregularly upward, while stock and commodity prices in general showed a net decline. Indexes of British and American wholesale commodity prices and of New York industrial stock prices reached low points in July-August 1896—over a year and a half after lows had been recorded in leading wheat markets. These facts seem to suggest that wheat prices did not *lead*, though they did precede, other prices in recovery during the 'nineties.

OUTSTANDING DEVELOPMENTS IN THE WHEAT SITUATION, 1895-1900

Principal features of 1895-96.—In August 1895 current crop reports and estimates of carryover suggested that world wheat supplies would be considerably smaller in 1895-96 than in 1894-95, and somewhat smaller in relation to requirements than in either 1892-93 or 1893-94. On August 20, Broomhall commented:¹

Now for the first time for several years it appears to the writer as if supplies would fall distinctly short of the demand likely to be ex-

perienced in the season 1895-96 From present appearances it promises to be a difficult task this season to balance the two sides of the account, even after drawing liberally upon reserves in America and Europe.

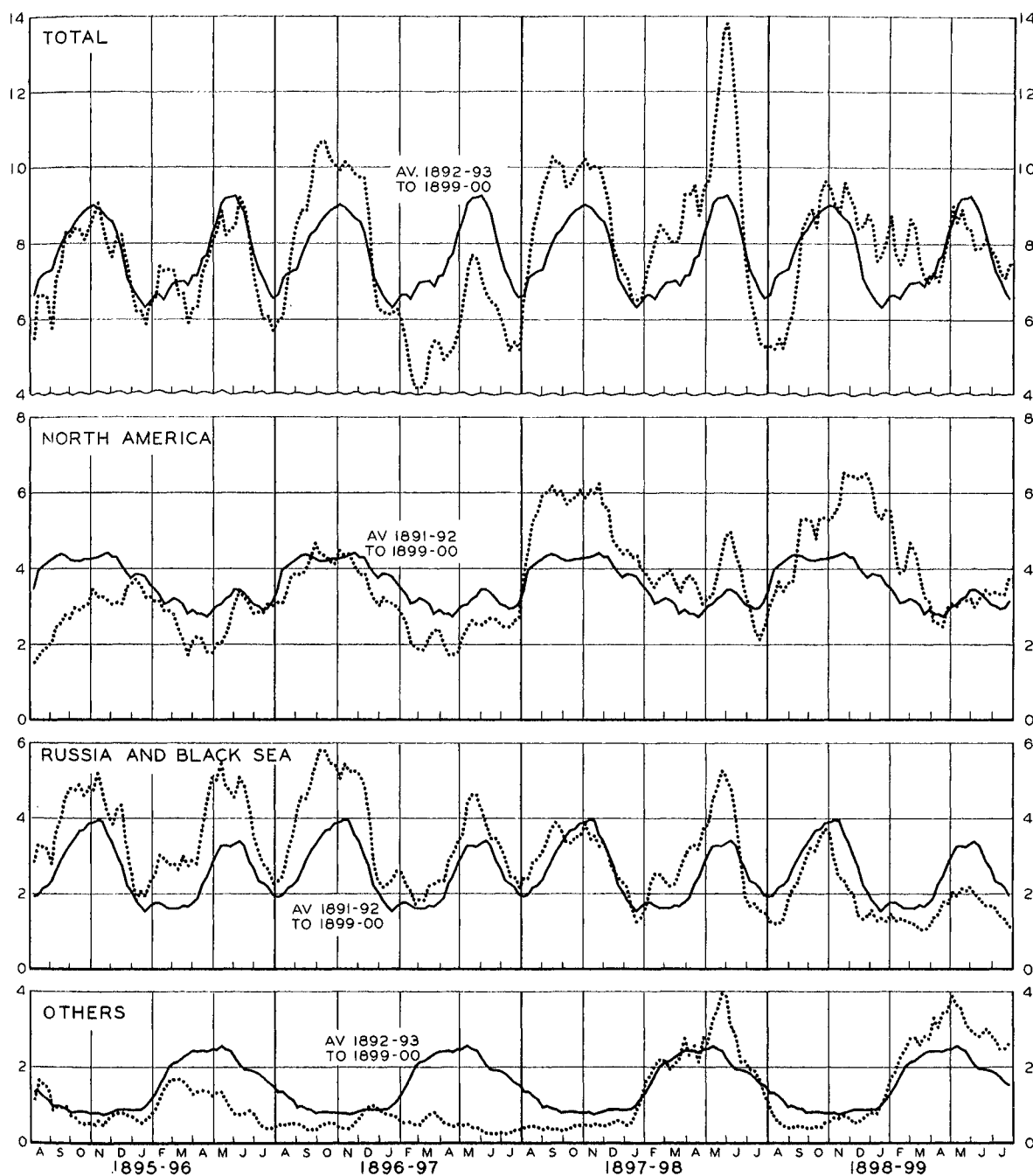
Actually, world wheat supplies proved fairly liberal in 1895-96, though they were distinctly smaller than in the preceding year. Moreover, the distribution and quality of the new crop and the position of other cereals were not such as to favor wheat consumption as heavy as in 1894-95. For the fifth successive year, therefore, world wheat markets remained under the influence of superabundant supplies. British import wheat prices rose but slightly, and Chicago wheat prices declined (net) from August 1895 to July 1896.

During August-December, Chicago prices were generally weak, while prices at Liverpool reflected substantial strength after mid-September (Chart 21, p. 329). Several factors were responsible for the greater relative weakness at Chicago. The crop-scare advance of April-June 1895 had carried Chicago prices far out of line with prices at Liverpool, and this situation was only partially corrected even by the end of August. As a result, United States exports of wheat were depressingly small in June-August, and only a little larger during September to mid-December (Chart 22). The light exports, in conjunction with heavy northwestern receipts, caused North American visibles to rise sharply to a peak at the end of December (Table VIII). Meanwhile Russia and the Danube countries were shipping wheat heavily; and European importers and millers were showing no concern over the supposedly tight wheat statistical position of 1895-96. These developments were particularly discouraging to holders of United States wheat, who at the same time were facing uncertainties in connection with the financial situation in the United States (see pp. 328-29).

After the Christmas holidays, however, world wheat prices rose sharply until early in February 1896, and thereafter remained fairly firm until mid-April. Strength in these months was based mainly upon apparent improvement in the world wheat statistical position. The Australian wheat crop turned out

¹ *Corn Trade News*, pp. 466-67.

CHART 22.—SHIPMENTS OF WHEAT AND FLOUR BY SOURCES, WEEKLY,
AUGUST 1895—JULY 1899 (DOTTED LINES), WITH COMPARISONS*
(Million bushels; three-week moving average)



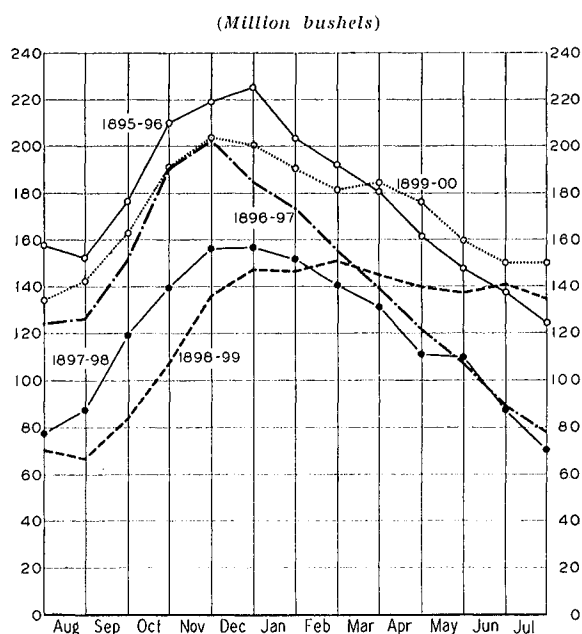
* See footnote to Chart 13, p. 315.

to be a failure; prospects for the new crop in India were poor; and estimates of the Argentine exportable surplus were lowered from 50-55 million bushels early in December to 30-40 million bushels in January, and eventu-

ally to 16-24 million late in February. Moreover, after the beginning of March, there were reports of severe damage to the United States winter-wheat crop; these were confirmed by the official April condition estimate, which

was the lowest in eleven years. Finally, world visible supplies of wheat declined more sharply than usual during January–April (Chart 23) with reductions seasonally large in North America, afloat, and in British and Russian ports (Table VIII).

CHART 23.—WORLD VISIBLE SUPPLIES OF WHEAT, MONTHLY, AUGUST 1, 1895—AUGUST 1, 1900*



* Data from Table VIII.

After mid-April, wheat futures prices declined fairly steadily to the end of June. Warm April rains considerably improved the outlook for the United States winter-wheat crop, and the condition of the North American spring crop was well maintained. European importers and millers continued to buy foreign wheat sparingly, preferring further to reduce than to build up their low stocks so long as European crops were developing satisfactorily. Under these conditions, heavy shipments from Russia and the Black Sea considerably limited purchases of United States wheat, which was held at slightly higher prices. North American visible supplies declined at a moderate rate, but much less rapidly than in the previous year; and from early June these supplies were larger than on corresponding dates of 1895. In the United States, factors outside the wheat situ-

ation were also depressing, since stock and commodity prices were declining sharply and business conditions appeared to be growing worse instead of better.

July brought practically no improvement in wheat prices, despite further crop damage in the United States, a sharp reduction in Russian and Black Sea shipments, and world visible supplies on July 1 some 23 million bushels lower than a year earlier. The crops of European importing countries generally maintained their early promise, and, although Broomhall was convinced that the wheat statistical position justified higher prices,¹ millers and wheat traders in Europe and America refused to take alarm. As one of Broomhall's readers had commented several months before: "They [wheat traders] have been deceived so many times by the cry of 'wolf' that they won't believe in him until they see him."²

Principal features of 1896-97.—At the beginning of August 1896, stocks of old-crop wheat were generally recognized to be considerably smaller than a year earlier, and the new world wheat crop was expected to fall a little short of that of 1895. Thus, it was early apparent that the world wheat statistical position would be tighter in 1896-97 than it had been in any of the four preceding crop years.

During August, world wheat prices failed to respond to the bullish supply position, mainly because of uneasiness created by the political and financial situation in the United States (Chart 21, p. 329). But from early September, prices rose spectacularly until mid-November, and then they remained firm until the second week of January. The sharp advance of September–November apparently originated in European markets, where traders were faced with scarcity of immediate supplies (Chart 8, p. 310) as well as prospects of scarcity later in the season. On September 1, stocks afloat were the lowest then on

¹ See *Corn Trade News*, July 23, 1896, p. 245.

² *Corn Trade News*, March 17, 1896, p. 683. In contrast with a conviction prevalent in North America in recent years that Broomhall has a characteristically bearish bias, it is clear that in the 'nineties he more frequently underestimated than overestimated wheat supplies.

record (beginning 1891) for that date; British port stocks were lower than on the same date of any preceding year except 1891; and stocks in visible positions in France, Germany, Holland, and Belgium were the lowest that had been recorded for any month.

After the beginning of October, additional stimulus was afforded world wheat markets by reports of drought in India and Australia and of locusts and late heavy rains in Argentina. The situation in India was extremely serious, for the poor wheat harvest of March–April 1896 had been followed by short crops of coarse grains in the summer. In October, grain riots were reported in Bombay; and continued drought threatened general food famine later in the year. By late December it was evident that the planted wheat acreage of India was greatly reduced as compared with the preceding year; that Australia would have no wheat for export in 1897; and that Argentina would export but little.

These developments caused bearish market news to be all but disregarded. Traders paid little attention to the facts that world shipments, mostly from Russia and the Black Sea, were strikingly heavy in September–November and that world visible supplies increased almost as rapidly in these months as they had in the surplus years of 1891 and 1892 (Charts 22 and 23, pp. 331 and 332).

The heavy shipments of September–November went to build up European stocks more largely than was then believed to be the case. Not only were European port stocks substantially increased, but, apparently more important, stocks in invisible positions (in mills, private warehouses, etc.) were greatly enlarged. This stocks position, and the reaction of millers and importers to it, was largely responsible for the general downward drift of world wheat prices during January–June. In these months, European importers and millers showed distinct preference to reduce stocks on hand rather than to make additional purchases of foreign wheat; as a result, shipments to Europe were far below average.

With market sentiment depressed by the absence of a good import demand, traders noted without enthusiasm the rapidly declin-

ing visible supplies and the reports of crop damage which were issuing from both Europe and America. Wheat futures prices moved sharply upward in mid-April partly as a result of crop developments, but mainly on reports of conflict between Greece and Turkey, which temporarily threatened to involve Great Britain and other European powers. But with the end of the Turko-Grecian struggle in mid-May, and with spring seeding in North America progressing rapidly under the influence of improved weather conditions, wheat prices again drifted downward.

Not until July did British and American wheat traders finally become convinced that the wheat statistical position for 1897–98 was going to be tight. Crop reports from Russia, France, Rumania, Bulgaria, and Austria-Hungary, which had been discouraging in June, were still worse in July; and although prospects for the United States crop appeared better than before, that crop was the only one of the major crops which seemed likely to turn out well. On the basis of this outlook, and in the belief that later weather conditions could not greatly improve the situation, traders and speculators began to bid up wheat prices. At Liverpool and Chicago, wheat futures prices advanced about 10 cents during July; and they continued to rise in the early months of the following crop year.

Principal features of 1897–98.—August estimates of the world wheat crop of 1897 were generally lower than estimates published in July; and, equally important, later estimates were lower still. Between August 1897 and September 1898 Broomhall's estimate of the world crop of 1897 was revised downward by 168 million bushels. This reduction was striking, partly because it was so large, but more particularly because Broomhall's early estimates of the six preceding crops had been revised upward—three by more than 100 million bushels and one by more than 60 million.

Aggregate stocks of old-crop wheat on August 1, 1897, were recognized at the time to be moderately low; and visible wheat stocks in the United Kingdom and leading continental importing countries were near a minimum (see Chart 8, p. 310). The low level of im-

port stocks and the increasing crop complaints from both Europe and America were important factors in the continued advance of Liverpool and Chicago wheat prices during August. At the end of August these prices averaged almost 30 cents higher than they had the first week of July.

During September–March it became apparent that the wheat statistical position was tighter than had seemed probable even in August: European crop estimates were further reduced and the Southern Hemisphere crops did not turn out so well as had been expected. On the other hand, early-season marketings of wheat were unusually liberal because of the high prices; and although United States wheat exports were notably heavy, United States visible supplies increased much more rapidly during September–December than they had the year before. But in Europe, despite heavy imports, wheat stocks did not pile up in either visible or invisible positions; and European importers continued to buy foreign wheat actively throughout the fall and winter months (Chart 22, p. 331).

These and other less important influences kept British wheat prices fairly stable throughout September–March. Among the secondary influences were favorable progress of the newly sown crops; improved economic conditions; and after late February, rumors that the United States might go to war with Spain. Meanwhile, Chicago wheat prices (both cash and futures) were tending upward, partly as the result of active speculative trading by Joseph Leiter.

The exact details of Leiter's transactions during these months are not matters of public information, but certain facts are clear. As early as June 1897 observers became aware that a "bull" interest (which, we assume, was headed by Leiter) was operating at Chicago;¹ but the trading activities of this interest were not spectacular until the following December.

¹ See Charles H. Taylor, *History of the Board of Trade of the City of Chicago* (Chicago, 1917), II, 941.

² Leiter was aided by the fact that in October No. 2 Spring wheat ceased to be a deliverable grade.

³ Henry C. Emery, "Futures in the Grain Market," *Economic Journal*, March 1899, IX, 58.

By that time Leiter had secured title to a large proportion of the outstanding Chicago December wheat contracts, to a substantial part of the small stocks of cash wheat of contract grade² in Chicago, and to a fair amount of cash wheat in the surrounding country. On the basis of this control, he expected to force December shorts to settle with him, practically on his own terms.

The shorts, however, were mainly elevator operators, headed by Philip Armour, who already owned fair quantities of wheat and who had for some time had agents in the interior buying grain. Wheat prices rose sharply in December; Chicago prices went out of line with other markets. But the shorts were not embarrassed. Wheat moved to Chicago from all directions; and Leiter was called upon to take delivery of something like 9 million bushels.³ This he did with apparent equanimity, having already chartered numerous freight cars and vessels for exporting grain from Chicago. Deliveries were strikingly heavy the last few days of the month, and wheat prices sagged. But since Leiter and his associates made no immediate attempt to liquidate their extensive holdings, the price decline was neither sharp nor long continued.

It soon became clear that Leiter was continuing speculative operations in the May future. These were greatly favored by political developments in the spring of 1898. On April 22 war was declared between Spain and the United States. European wheat merchants and millers were immediately alarmed, for stocks of both import and domestic wheat were low, and cold, wet weather was retarding crop development in Europe. When European importers began to send out bids for, and to accept offers of, United States wheat on a large scale, wheat prices rose sharply at Chicago. The concentrated holdings of Leiter and his continued activity in the wheat market were important factors in the upward movement, particularly during May; but there is no doubt that Chicago wheat prices would have risen to high levels in the spring of 1898 even if Leiter had not been attempting a corner in the market.

During the first ten days of May, Leiter profited heavily by selling May futures to

shorts, and cash wheat for export,¹ at rapidly advancing prices. On the other hand, in order to control prices when wheat receipts at leading United States markets were extraordinarily heavy, Leiter had to buy huge quantities of cash wheat, and also substantial quantities of July and September futures at the prevailing high prices. After May 10, he let the price of Chicago May wheat drop 35 cents in three days. Thereafter, the price fluctuated around \$1.50 until the last week of May when it rose to \$1.75 on May 28, then dropped back to \$1.25 on the following business day—May 31. Even then Leiter's operations were not finished: he still had a large amount of cash wheat to liquidate, and substantial holdings of July and September futures as well. On June 13 it became generally known that Leiter's speculative venture was at an end: he could not hope to complete it successfully in the face of movement of the new crop. Accordingly, his holdings² were transferred to other persons, including Armour, for liquidation.

Liquidation of this wheat was a price-depressing factor throughout June and at least part of July. In these weeks, other market factors were also mainly bearish. The outlook for the new world wheat crop was increasingly favorable; world wheat shipments continued notably heavy until late in June (Chart 22, p. 331); and European import wheat stocks, though still low, continued to increase through June (Chart 8, p. 310). Broomhall's summary of world crop prospects on June 21 suggested that the world wheat crop of 1898 would be about as large as the crop of 1894. This led many wheat traders to fear a return to the low wheat prices of 1894–95. Broomhall did not share this fear, but there is little doubt that it tended to depress wheat prices in the summer of 1898.

¹ It is noteworthy that import duties on wheat in France, Italy, and Spain were suspended until July 1 or later, effective from dates within this period.

² In *Corn Trade Year Book 1901–02* (p. xviii) Broomhall states that at this time Leiter's holdings of cash wheat were said to approximate 16 million bushels.

³ Broomhall's totals, adjusted to include the Indian crop of the preceding instead of the following March–April.

⁴ *Corn Trade News*, October 17, 1899, p. 1043.

Principal features of 1898–99 and 1899–1900.—During August 1898, market attention was centered on the excellent new-crop prospects, rather than on the near-minimum stocks of old-crop wheat remaining at the end of 1897–98. Broomhall's first detailed forecast of the 1898 crop, published September 20, indicated that this crop was expected to be slightly the largest on record. A year later, his revised estimate was 288 million bushels higher, or 300 million bushels above his standing estimate of the crop of 1894.³ This net upward revision, which was larger than that made for any other crop during 1890–1900, was believed by Broomhall to be excessive: in particular the revised crop figures for Russia, Rumania, Bulgaria, Spain, and France were considered too high.⁴ But neither Broomhall nor any other recognized authority doubted that the world wheat crop of 1898 was by all odds the largest crop produced up to that time.

Our present estimates indicate that the 1898 crop was approximately 350 million bushels larger than the previous record crop of 1894. But since initial wheat stocks were probably at least 275 million bushels smaller, and since the world population had increased significantly between 1894 and 1898, per capita world wheat supplies were probably no larger (and perhaps were slightly smaller) in 1898–99 than in 1894–95. Moreover, the better quality of the 1898 crop, and the more abundant feed grain supplies of that year, were probably offset by "normal" increase in per capita wheat consumption and lower per capita rye production (Chart 17, p. 323).

European importers, influenced by glowing crop reports from both Europe and America, purchased wheat sparingly from July to mid-September 1898 (Chart 22, p. 331), because of anticipation of lower prices. But when wheat continued to be held fairly firmly, when Russian shipments did not come forth in the quantities expected, and when European importers and millers found themselves in need of import wheat with little immediately available, world wheat prices advanced under the influence of a better import demand. The advance carried Liverpool futures to a peak at the end of October.

During the remainder of the crop year, Liverpool prices declined slightly, while prices at Chicago tended upward. These diverse price movements were largely due to the abnormally wide spreads which had prevailed in the fall of 1898 between wheat prices at Chicago and Liverpool (Chart 21, p. 329). In addition, Liverpool prices were affected more directly by the prospective and actual large Southern Hemisphere shipments of February–July, while Chicago prices were more affected by evidence of continued improvement in general economic conditions (Chart 7, p. 306).

In view of the huge wheat crop of 1898, it appears noteworthy that Liverpool futures and British import wheat prices did not decline more than they did during 1898–99. Their relative firmness is attributable mainly to four factors: (1) the high level of wheat prices in 1897–98 which made the prices of 1898–99 appear low in contrast; (2) the heavy need of wheat to replenish stocks which had been reduced far below normal in 1897–98; (3) light shipments of wheat from Russia, despite high estimates of the Russian crop; and (4) improvement in economic conditions.

The following crop year, 1899–1900, was likewise characterized by generally stable wheat prices. The new world wheat crop was only of moderate size in relation to trend (Chart 17, p. 323), but the inward carryover was the heaviest since 1895. Per capita wheat supplies were almost as large, therefore, as in 1898–99. In both years, however, farmers, merchants, and speculators in most countries showed willingness to hold wheat stocks; this was in marked contrast with their attitude in the depression years of 1893–94 and 1894–95.

During August–December 1899, small Russian shipments, unrelieved drought in India, and prospects (soon realized) of trouble between the English and the Boers in South Africa, sustained wheat prices in the face of substantial European port stocks, a fairly slow European demand, and a moderately rapid increase in North American visible supplies.

After the beginning of February, the European import demand for wheat improved. And although Southern Hemisphere shipments were heavy, Europeans were forced to

buy North American wheat in considerable quantity because of a continued light export movement from Russia. Reduction of the new Indian crop by drought, reports of heavy crop damage in France, and minor crop complaints from other countries (particularly the United States and Russia) also contributed strength to world wheat markets during the spring and early summer of 1900. But to offset these bullish developments, North American and “world” visible supplies declined slowly, and, after April, “world” visibles stood higher than in any of the nine preceding years except 1893, 1894, and 1895.

ELIMINATION OF THE SURPLUS, 1895–98

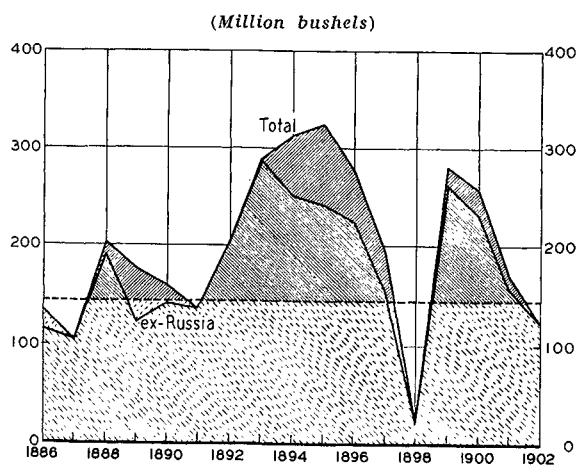
There is no doubt that the reduced wheat crops of 1895 and 1896 played an important part in reduction of the world wheat surplus of the mid-'nineties. Several questions, however, remain to be answered. Was per capita world wheat consumption strikingly heavy in these years, contributing to elimination of the surplus? Was the surplus practically absorbed before 1897–98, or did absorption finally take place only as a result of the notably short crop of 1897? To what extent was reduction of wheat production in 1895–97 due to curtailment of acreage in response to low prices, and to what extent to low yields?

Wheat consumption and the level of stocks, 1895–98.—A significant element in the wheat situation of the 'nineties was that world consumption was tending upward fairly rapidly, partly because of population growth, partly because of increase in per capita demand (Chart 17, p. 323). Undoubtedly, this helped reduce the wheat surplus. In the discussion which follows we concern ourselves mainly with the question: Was world wheat consumption heavy in relation to its trend during 1895–98? The world wheat crop of 1895, which was just about equal to “normal” requirements, was distributed in a fairly normal manner. Only a few countries harvested distinctly short crops; the most important of these were the United Kingdom and Australia. With inward carryovers large in most importing countries, with good-sized wheat crops in the Danube basin, France, and In-

dia, and with European rye supplies smaller than in either of the two preceding years, world wheat consumption was probably substantially above trend in 1895-96, but somewhat less so than in 1894-95. Feed grain supplies were liberal rather than short during most of the crop year; and the 1895 wheat crop was of a better quality than the crop of 1894. Moreover, Russia and Spain harvested smaller crops, and hence probably consumed less wheat than in 1894-95, though their stocks were presumably reduced in 1895-96 instead of being built up as in 1894-95.

At the end of 1895-96, the world wheat carryover was smaller—we estimate over 35 million bushels smaller (excluding India)—than it had been a year earlier, despite substantially larger stocks in the United States and Hungary. Chart 24 shows our estimates of the total net excess of year-end wheat

CHART 24.—ESTIMATED EXCESS OF YEAR-END WHEAT STOCKS ABOVE MINIMUM AND NORMAL LEVELS IN LEADING IMPORTING AND EXPORTING COUNTRIES (EX-INDIA), 1886-1902*



* See footnote to Chart 20, p. 327.

stocks above minimum and normal levels in leading importing and exporting countries (ex-India) from 1886 to 1902.

Importing Europe ex-Spain and the exporting countries of the Danube basin harvested fairly large crops in 1896, while Spain, Russia, and the overseas exporting countries all secured small or moderately small outturns. The distribution and general good quality of the 1896 crop were not conducive

to heavy consumption of wheat in 1896-97. Indeed, per capita consumption was doubtless lower than in either of the two preceding years, and perhaps also than in 1893-94. Reduction in per capita consumption was probably greatest in India and Spain, though in Russia too there was substantial decrease. Even in importing Europe ex-Spain, where wheat crops were large, wheat was probably used less extensively in 1896-97 than in 1894-95, and perhaps also than in 1895-96. European rye and feed grain crops were of fair size in 1896; the quality of European domestic wheats was generally good; and wheat imports were some 50 million bushels smaller than in 1894-95, when the aggregate crop of European importing countries was larger.

Although world wheat consumption was probably only of about normal proportions in 1896-97, world wheat stocks, ex-India, were presumably reduced by something more than 80 million bushels. Decreases in ex-European exporting countries and in Russia considerably more than offset a moderate net increase in Europe ex-Russia; and there was additional substantial decrease in India. A reduction of this magnitude would have little effect upon the huge surplus existing today; but in the 'nineties 100 million bushels represented the approximate difference between normal and surplus wheat stocks (Chart 24). By the end of 1896-97, therefore, world wheat stocks were again close to a normal level.

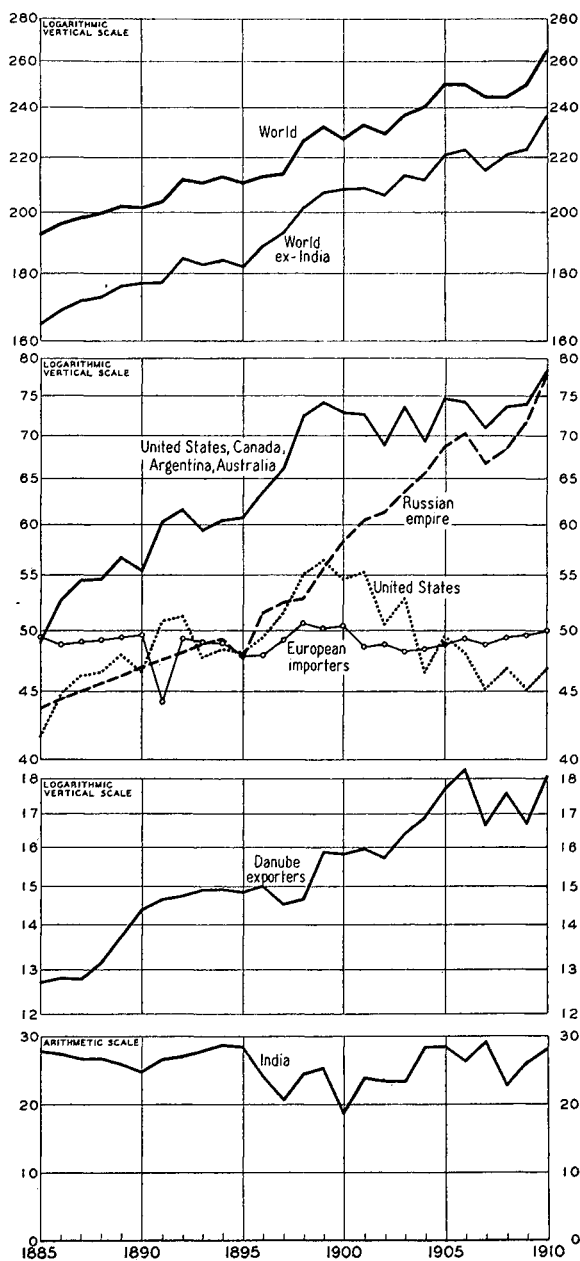
The short world crop of 1897 resulted in still lower per capita wheat consumption and further reduction in year-end stocks. Famine conditions prevailed in India and in parts of Russia, and throughout Europe there was general economy in the use of wheat. World wheat stocks, which had been only a little larger than normal at the beginning of 1897-98, were close to an absolute minimum at the end of that year.

Slow increase of acreage in 1893-97.—It is evident from Chart 25 that world wheat acreage, as now estimated, increased less rapidly in 1893-97 than it had previously. Offhand, this might be ascribed to the influence of low wheat prices. But detailed study establishes the fact that weather conditions were primarily responsible for this situation, and

that the level of wheat prices was only a secondary influence.

CHART 25.—WHEAT ACREAGE IN PRINCIPAL PRODUCING AREAS AND COUNTRIES, 1885-1910*

(Million acres)



* For source of data see "Statistical Notes," p. 345.

The world wheat acreage harvested in 1892 had been high in relation to trend, because of heavy sowings and light abandonment in the United States and of generally satisfactory

planting and growing weather in other wheat-producing countries (see p. 325). In 1893 world wheat acreage was slightly above trend; but it was a trifle smaller than in 1892, since a reduction of 4.5 million acres in the United States was only partly offset by increases elsewhere. Some part of the decrease in harvested acreage in the United States was due to low wheat prices in 1892-93, which discouraged wheat plantings as heavy as in the preceding year. But this factor was clearly less important than were dry seeding conditions in the fall of 1892 in several of the principal producing states, severely cold winter weather which resulted in unusually heavy abandonment, and a cold, backward spring which discouraged spring-wheat plantings.

In 1894, world wheat acreage was slightly higher than in 1893, and probably about normal in relation to approximate long-time trend. Only in northwestern Europe and the United States were farmers apparently influenced to plant less wheat because of the low level of wheat prices; and in northwestern Europe the reduction was only slightly greater than was to be expected from the general downward trend of wheat acreage in that region. In the United States, low wheat prices were presumably more effective in restricting wheat plantings for the crop of 1894 than they had been in the preceding year. But since abandonment was less heavy in 1894, the acreage harvested was slightly larger.

The world area harvested in 1895 was smaller than that of 1894, mainly because of sizable decreases in Russia and the countries of northwestern Europe (excluding France), where a severe winter resulted in heavy winterkilling and abandonment. Less significant reductions in acreage were recorded in the United States, India, and Spain. Low wheat prices were probably again a factor in the United States; but fall and spring drought and at least moderate abandonment from winterkilling also contributed to reduction of acreage in this country. The small decreases in India and Spain were probably due wholly to factors other than price—mainly weather factors.

The following year, 1896, brought recovery of wheat acreage to its approximate trend in

Russia, and substantial recovery in northwestern Europe (excluding France and Germany) and in the United States. But India's wheat area was strikingly reduced—by over 4 million acres; and in several important producing regions, such as the southwestern part of the United States, France, Spain, and northern Africa, the wheat area harvested was somewhat below trend. In all of these countries, but particularly in India, prolonged drought was chiefly responsible for curtailment of acreage. It is probable that the low level of wheat prices continued to play a part in keeping wheat acreage from expanding more in the United States and in restricting the area devoted to wheat in Germany and France. But this factor was clearly less influential than weather conditions.

The notably short world wheat crop of 1897 was harvested from an area a little larger than that of 1896. World wheat acreage was again below trend mainly because of small plantings in India. Indeed, in the world ex-India the wheat area harvested in 1897 was approximately of normal size, trend considered (Chart 25). Substantial increases in acreage in the other leading exporting countries, Spain, and northwestern Europe (ex-France) more than offset sizable decreases in France and Hungary.

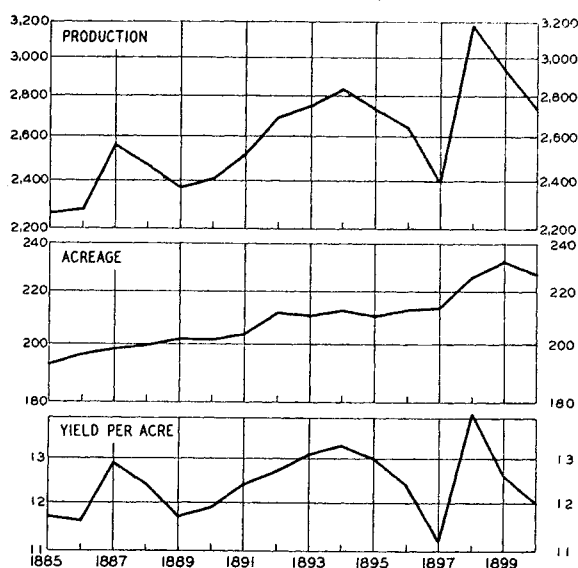
India, France, and Hungary harvested small wheat areas primarily because of adverse weather conditions. Drought, even more severe than in 1896, prevailed throughout the planting period in India. In contrast, prolonged spells of wet weather restricted sowings of both winter and spring wheat in France. Reports of the Hungarian crop were generally satisfactory until mid-May; but thereafter rains and floods resulted in extensive crop damage and presumably substantial abandonment. Increases in acreage in leading exporting countries ex-India were somewhat smaller than normal (trend considered) except in the United States and Canada. Drought interfered with the sowing of winter wheat in Russia and led to rather extensive abandonment in Australia, while swarms of locusts stripped a number of the wheat fields of Argentina. In the United States, good planting weather, higher wheat prices, and moderate

or moderately light abandonment resulted in an increase in harvested area of more than a million acres.

Wheat yields per acre in 1895-97.—Although the failure of world wheat acreage to expand normally in 1895-97 was partly responsible for the reduced wheat crops in these years, the influence of this factor was slight as compared with reduced yields per acre, at least in 1896 and 1897. This is readily apparent from Chart 26, which shows world

CHART 26.—WORLD WHEAT PRODUCTION, ACREAGE, AND YIELD PER ACRE, 1885-1900*

(Million bushels; million acres; bushels per acre; logarithmic vertical scale)



* See "Statistical Notes," p. 345.

wheat production, acreage, and yield per acre plotted on the same logarithmic vertical scale.

In general, the same weather conditions that restricted expansion of wheat acreage in 1896 and 1897 also caused yields per acre to be low. In 1896 drought resulted in low yields of wheat per acre in India, Australia, the United States winter-wheat belt, and northern Africa; locusts and late rains reduced yields in Argentina; and a late spring followed by hot weather tended, together with rust infestation, to lower yields in the North American spring-wheat belt. The following year was characterized by even worse weather conditions, particularly by a more abnormal distribution of rainfall in the principal wheat-producing countries. The wheat crops of

India, Australia, southern Russia, Spain, and northern Africa suffered from drought; in western Europe, excessive rain at seeding time gave the crops (especially the French crop) a bad start, a cold, wet spring was unfavorable for crop development, and storms in July resulted in further damage. In the Danube basin, the crops of 1897 progressed well until May, but during May-June prospects were greatly reduced by heavy rains and storms in Hungary, Rumania, and Bulgaria. Yields per acre in Argentina and Canada were also low: in Argentina, because of locusts, drought through October, November frosts, and rains at harvest; in Canada, because of summer frosts and late heavy rains, with hail in some districts.

This brief summary clearly demonstrates the fact that Nature, which was primarily responsible for the emergence and growth of a world wheat surplus in 1891-95, together with "normal" increase of world consumption, was primarily responsible for reduction and subsequent elimination of that surplus. Secondary factors were increase of consumption and contraction of wheat acreage in response to low prices.

SIGNIFICANCE OF DEVELOPMENTS IN 1898-1900

About August 1, 1898, year-end world wheat stocks were close to an absolute minimum level. A year later they were again extremely large—including Russian stocks, almost as far above normal as in 1893 (Chart 24, p. 337). From this high level there was some reduction during the course of 1899-1900; but not until August 1901 were world wheat stocks again of approximately normal size. From seeding to harvest, weather conditions were extraordinarily favorable for the 1898 crop. A larger area was planted to wheat, partly on account of good seeding conditions, partly because farmers were encouraged by the relatively high wheat prices of 1897-98; and yields per acre turned out to be notably high in most of the leading wheat-producing regions (Chart 26, p. 339). As the result of this combination of factors, a new wheat surplus emerged.

This surplus, which persisted for two years

before it was absorbed into consumption as a result of the relatively short wheat crop of 1900, deserves attention primarily because it was not associated with any such striking decline of British import wheat prices as had occurred under surplus conditions in 1891-95. It is true that during June-August 1898 world wheat prices declined some 50 cents (monthly averages) from the high speculative level reached in May. But the May price level (\$1.40) was recognized at the time as reflecting scarcity values of wheat that could not be expected to prevail under more normal conditions of supply. It is noteworthy, therefore, that after the sharp price decline to August 1898 British import wheat prices remained fairly stable for at least six years (Chart 1, p. 289).

The contrast between price developments in 1891-95 and 1898-1900 was based mainly upon three facts: (1) wheat stocks were held more willingly in the later surplus period; (2) wholesale commodity prices in general were tending upward fairly rapidly in 1898-1900 instead of drifting downward as in 1891-95; (3) wheat prices declined precipitously during June-August 1898 instead of drifting gradually downward as they had in the early months of the former surplus period.

Why were speculators, farmers, and merchants more willing to hold wheat during the last two years of the nineteenth century than they had been a few years earlier? The factor of primary importance was probably the shortness of the later surplus period. We have noted before the tendency for wheat stocks to be more firmly held during the first year or two after emergence of a surplus than in subsequent years when the surplus continues to persist. The surplus which resulted from the huge world wheat crop of 1898 was strikingly large, but it did not persist long enough (owing to the short crop of 1900) for holders of wheat to become greatly discouraged. Early in 1898-99 wheat owners were unaware of the real magnitude of the world surplus, since estimates of the 1898 crop then current were almost 300 million bushels below final revised estimates; later in 1898-99 optimism was partially maintained by indications that the world

crop of 1899 would fall below normal; and in the spring of 1900 prices were supported by evidence that the new world crop would probably be considerably smaller even than the crop of 1899.

Other important factors also contributed to firmer holding of wheat in 1898–1900 than in 1891–95. In the earlier period, general economic conditions were such as to make for pessimism in commodity and stock markets: business was in a state of recession or depression in most countries; national monetary or financial conditions were critical in several (particularly in the United States); and general wholesale commodity prices were tending downward practically throughout the world. In 1898–1900 opposite conditions prevailed. This period was characterized by world economic and business prosperity, absence of acute financial difficulties, and rising wholesale commodity prices. In addition, the more rapid immediate decline of wheat prices in the

summer of 1898 was less depressing to holders or potential holders of wheat than was the prolonged downward drift of wheat prices in 1891–95.

Although wheat prices remained fairly stable during August 1898—July 1900, they were weak in relation to average wholesale commodity prices, which were advancing fairly rapidly. Whether the decline of 20 cents in *deflated* British import wheat prices in 1898–1900 (Chart 3, p. 291) was larger or smaller than the decline which would have occurred on the open market if wholesale commodity prices in general had not been tending upward rapidly, it is impossible to say. A decline of this magnitude had occurred during August 1892—February 1894; but elements in the general economic situation had then been depressing, and wheat supplies in the world ex-Russia ex-India had been heavier in relation to requirements than they were in 1898–1900.

IV. PROSPECTS FOR RECOVERY FROM CURRENT LOW PRICES

Today, as in 1892–95, the question which appears most important to the various groups of persons producing, distributing, or processing wheat is: What are the prospects for sustained recovery of wheat prices? This question involves three distinct problems. First, what is meant by “price recovery”: is there some level of wheat prices which we may regard as “normal” for, let us say, the next five years? Second, what conditions are favorable or essential to such recovery? Third, when may recovery be expected to take place?

Some observers may remark that there has already been substantial recovery of wheat prices in the United States—that Chicago prices averaged almost 30 cents per bushel higher in 1933–34 than in 1932–33. This is true of prices in current United States dollars; in terms of pre-devaluation gold dollars there has been little change. Because of domestic crop disasters, national monetary and exchange developments, and speculative activity based upon these and other less important influences, wheat prices in United States markets have been maintained well above export parity for over a year. Moreover, the assur-

ance of a short domestic crop in 1934 renders probable the continuance of these prices above a world level in nearly all of 1934–35. World wheat prices, however, remained strikingly low during 1933–34. Though somewhat higher now (July 1934) than earlier in the year, they still appear to be considerably below normal. Further advance of United States wheat prices is limited, and prices above export parity in this country are in a sense vulnerable, so long as world wheat prices are low. In the discussion that follows, therefore, we shall speak with reference to world wheat prices, as reflected in the leading international import market, Great Britain.

What is meant by “recovery of wheat prices”? In the mid-’nineties there were many who would have interpreted this to mean re-establishment of the level of prices which had prevailed at the peak in 1891 (Chart 1, p. 289). Yet, in retrospect, those prices appear too high to be considered “normal” for the late ’nineties or early nineteen-hundreds. Today there are some who seem to believe that the average price for 1926 represents the “normal level” of the next few years. In 1926 British import

wheat prices averaged about \$1.70 in terms of pre-devaluation gold dollars; but that figure is well above the average level for several of the post-war years preceding the recent depression, and there is now no good basis for regarding it as a post-depression normal. Indeed, with few countries now on a gold standard, and with monetary conditions and wholesale prices in general apparently unstable, it seems probable that no *one price* may properly be regarded as a post-depression "normal" for British import wheat.

It appears more reasonable now to discuss "recovery of wheat prices" in terms of the relationship of British import wheat prices to some average of British wholesale commodity prices. There is little doubt that during the depression world wheat prices have been abnormally low in relation to commodity prices in general, or that, when wheat supply conditions are once again more normal, wheat prices will rise in relation to indexes of wholesale prices. For the past three or four years, British import wheat prices, deflated by the Sauerbeck-Statist index of wholesale commodity prices (1910-14 = 100) and converted to United States currency at the former par of exchange, may roughly be said to have ranged from about 60 to 80 cents and averaged 70 cents per bushel (Chart 3, p. 291). We think it probable that in the perspective of history these deflated prices will appear well below their long-time trend; and we believe that, in retrospect, the "normal" level of *deflated* British import wheat prices for the present decade will appear appreciably higher—perhaps somewhere around \$1.00 per bushel.

At present no one is in position to predict *when* world wheat prices will recover to an approximately "normal" relationship with commodity prices in general. But in the light of history we can point out certain conditions which we regard as essential to "price recovery" as that term is here used; and we can also indicate what influences are favorable to such "recovery."

In the 'nineties, recovery of wheat prices to what now appears to have been a normal level apparently rested chiefly upon practical disappearance of the world wheat surplus. This, we believe, is the primary essential condition

to full and sustained recovery from current low wheat prices. During the decade 1920-29 a carryover on or about August 1 of around 600 million bushels (as calculated by the Food Research Institute) represented an approximately normal carryover for the world ex-Russia. Since 1929 the carryover, similarly computed, has been 300-500 million bushels above this level. Conceivably the normal carryover for the present decade may be somewhat higher than 600 million bushels.¹ However, it seems to us probable that, so long as world year-end stocks substantially exceed 700 million bushels, complete and sustained recovery of wheat prices is unlikely. On the other hand, marked shrinkage of the wheat surplus, such as appears to be in prospect for 1934-35, is a factor favorable to some (though it may be small) improvement in world wheat prices relative to commodity prices in general.

Jointly an essential condition of sustained wheat price recovery is that disappearance of the surplus carryover be not promptly followed by such large crops, and/or such restraint of consumption, that a big surplus immediately reappears. In the 'nineties, the notably short crop of 1897, which followed virtual elimination of the world wheat surplus, led to reduction of year-end stocks considerably below normal and forced wheat prices above normal. Under these circumstances, the bumper crop of 1898 did not cause extreme depression in wheat prices. The price situation might have been radically different had the big crop of 1898 come a year earlier or had the same 1898 crop been preceded by a crop of normal size or larger in 1897.

A wheat surplus may be eliminated in either or both of two ways: (1) through decreased production, and/or (2) through expansion of consumption. Decreased production may be the result of low average yields per acre and/or of reduced acreage. Low average yields are always attributable mainly to the influence of Nature; but acreage may be reduced either through adverse weather conditions or

¹ Much larger elevator capacity today, with more in prospect in Australia, Argentina, and the Pacific Northwest of the United States, and governmental policies looking toward restriction of average wheat production in the United States, may prove factors operating in this direction.

through human action guided by economic forces or governmental pressure. Even if production should not be reduced, an accumulated wheat surplus of moderate size would normally be absorbed in time through expansion of consumption dependent upon population growth. In addition, in the absence of governmental restraints, wheat consumption is likely to be high relative to trend during a period of surplus when prices are low.

Elimination of the surplus of the early 'nineties was effected primarily through the influence of Nature in restricting acreage and reducing yields and through "normal" increase of world consumption. Of secondary importance were contraction of acreage and expansion of consumption in response to low prices. Governmental action tending to affect wheat production or consumption was unimportant.

In the 'nineties, "normal" world wheat consumption was undoubtedly tending upward at a more rapid rate than has been the case over the past ten years—a factor of some considerable importance in reduction of the wheat surplus then existing. However, there is reason to doubt that world wheat consumption was higher in relation to its trend during 1892–96 than it has been in recent surplus years. In 1892–96 wheat consumption for food was, on the average, higher than normal (trend considered) in Russia, India, and in several European importing countries where per capita wheat consumption was ordinarily low; and wheat was fed to animals more freely than usual in the United States and northwestern Europe, particularly in 1894–95 and 1895–96. In the recent surplus period, larger outlets have existed for low-priced wheat for food in the Orient (especially China) and for feed in North America, Scandinavia, Great Britain, and the Netherlands; but to offset this, consumption has been restrained by governmental measures in importing Europe and Russia.¹

What are the prospects that increased wheat consumption will play a leading part in elimination of the wheat surplus now existing? National policies, adopted in recent years, which have tended to restrict wheat consumption in European importing countries may conceivably be altered; and/or some effective international plan to reduce the wheat surplus

through increased consumption may be accepted and put into force by the countries signatory to the International Wheat Agreement. But the present outlook does not appear to be bright as regards either of these possibilities. Economic nationalism seems for the present to be firmly entrenched in Europe, and significant alterations in existing national policies with respect to wheat appear particularly unlikely so long as the world wheat surplus remains burdensome and international wheat prices remain low. Should European importing countries harvest two short crops in succession, and should they at the time of their second short harvest face improved national financial conditions and a wheat surplus strikingly reduced from the present level, many of the existing restraints on wheat consumption might well be removed. But such developments are not yet clearly in prospect. Nor does there appear to be good reason to believe that effective international action will soon be taken to accelerate disappearance of existing wheat supplies. Effective co-operation among nations for the accomplishment of most economic projects appears notably difficult to secure. Hence, in view of the liberal use of wheat during recent depression years—for food in the Orient and for feed in North America and a few European countries—there seems to be little prospect for further expansion of consumption,² except as growth of population operates in this direction.

If so, the chief hope for readjustment must lie in contraction of production by natural, economic, and/or political means. Of these, Nature, only slightly aided by economic forces, effected the necessary reduction in the 'nineties. Conceivably, Nature again might do the same, if political measures were not so modifying economic forces as to make the task more difficult. However, the surplus carry-over of 1933, and the expected one of 1934, appear roughly twice as large in relation to

¹ See "The World Wheat Problem," *WHEAT STUDIES*, July 1932, Vol. VIII, No. 8; also, Joseph S. Davis, "Wheat, Wheat Policies, and the Depression," *Review of Economic Statistics*, April 15, 1934, XVI, 80–88.

² China's large wheat crop and new protective tariff policy promise to restrict the Oriental outlet in 1934–35 at least. The extent of feed use of wheat will be materially affected by the size of feed crops.

current production as the maximum surplus carryover of the 'nineties. For Nature, unaided, to correct the present surplus condition within a year or two would necessitate notably low yields per acre in practically every important wheat-producing country. In 1929 and again in 1933 Nature was mainly responsible for a low average yield per acre and a small aggregate crop in the major exporting countries; in each of these years, too, the world crop was moderately small (trend considered). But big crops in Europe largely offset the effect of small crops in the major exporting countries; world wheat consumption was decreased; and the world surplus carryover was drawn down by considerably less than the world crop was reduced.

The present outlook is for a world wheat crop in 1934 substantially smaller than that of 1933, with the reduction largely attributable to Nature's influence in cutting yields but partly to governmental measures or pressure for contraction of acreage in exporting countries. In contrast with 1929 and 1933, Europe will have a moderate crop in 1934 instead of a big one. The size of the world crop cannot yet be well predicted. It is pertinent to observe that in practically every year of the past six, forecasts and estimates made in July more or less substantially underestimated the outturn as compared with revised estimates; but it is entirely possible that this year, as in 1897, the error may lie in the opposite direction. Experience of recent years, however, shows that the contractibility of wheat consumption in numerous countries in the face of short crops is such that, if the world wheat crop of 1934 should turn out to be as much as 450 million bushels smaller than that of 1933, it would not follow that a surplus carryover of around 450 million bushels would be used up during the course of 1934-35. Indeed, the prevailing exchange conditions in Europe are such as to make it seem likely that the short 1934 wheat crop in Europe ex-Russia will not be fully compensated for by increased wheat imports

and that European wheat consumption will be lower in 1934-35 than in 1933-34. On the other hand, if our May forecast of world wheat disappearance in 1933-34¹ is not greatly in error, there is apparently less room for reduction in disappearance between 1933-34 and 1934-35 than there has been in a number of other recent years. Moreover, if feed grain crops turn out to be short in 1934 in both Europe and America, it is possible that feeding of wheat will be heavier than in 1933-34.

All present indications support the expectation that surplus world wheat stocks will be materially drawn down during the coming year. Yet, though conceivable, it now seems beyond the bounds of probability that the world wheat carryover will be reduced to 700 million bushels or less by August 1, 1935. A combination of circumstances, such as short crops, a more active European demand, and improvement in European financial conditions, might start world wheat prices upward; the rising prices might induce relaxation of import restrictions in Europe; and consumption would be encouraged. As a result, wheat stocks might be reduced about to normal by August 1, 1935. But such a series of developments is not clearly in prospect: it is possible but we think not probable.

While we regard practical elimination of existing surplus wheat stocks as a condition essential to recovery of British import wheat prices to an approximately normal relationship with commodity prices in general, it is obvious that wheat prices *as currently quoted* may show a tendency to rise if business and financial conditions improve and commodity prices in general tend upward, even if world wheat stocks remain burdensome; but such a rise would not constitute "full recovery" of world wheat prices as that term is here used. Prices in different countries, however, may show different degrees of "recovery."

¹ See "World Wheat Survey and Outlook, May 1934," *WHEAT STUDIES*, May 1934, X, 253.

This study is the work of Helen C. Farnsworth. Other members of the staff of the Food Research Institute contributed valuable suggestions. The charts were drawn by P. Stanley King

APPENDIX

STATISTICAL NOTES

Because of limitations of space, we cannot present here all or even a major part of the data upon which this study is based. The following appendix tables have been constructed with a view to presenting the most important data which are not readily available in convenient published form. Below we list the principal sources where other data that we have used may be found.

1. Wheat production, acreage, and yield per acre in principal producing countries: M. K. Bennett, "World Wheat Crops, 1885-1932," *WHEAT STUDIES*, April 1933, IX, 264-74; "The World Wheat Situation, 1932-33," *ibid.*, December 1933, X, 120-23, "World Wheat Survey and Outlook, May 1934," *ibid.*, May 1934, X, 283.

2. Wheat crop condition in the United States: U.S. Department of Agriculture, *Wheat and Rye Statistics* (Statistical Bulletin No. 12, January 1926), pp. 17-18.

3. Weekly and annual shipments of wheat and flour: various issues of Broomhall's *Corn Trade Year Book* and *Corn Trade News*.

4. British imports of wheat and flour by sources: *Accounts Relating to the Trade and Navigation of the United Kingdom*, Great Britain, Parliamentary Papers.

5. North American visible wheat supplies: data of the Chicago Board of Trade, weekly, from the *Daily Trade Bulletin* (Chicago), or, as of near the first of each month, from U.S. Department of Agriculture, *Wheat and Rye Statistics*, p. 42. These data of the Chicago Board of Trade are available for a longer period, but are less comprehensive, than a series of visibles constructed by the *Daily Trade Bulletin* and published monthly beginning in 1891. The *Daily Trade Bulletin* data are included in the estimates of world visibles given in Table VIII.

6. Farm stocks of wheat in the United States on March 1 and July 1. *Report of the Secretary of Agriculture of the United States*, 1891, p. 298; U.S. Department of Agriculture, *Wheat and Rye Statistics*, pp. 38-41; *Crops and Markets, Monthly*

Supplement, March 1925, p. 80, and July 1925, p. 206.

7. Weekly wheat receipts at United States primary markets: *Daily Trade Bulletin* (Chicago).

8. Monthly average prices of various cereals at Chicago, 1860-1919: Henry A. Wallace, *Agricultural Prices* (Des Moines, Iowa, 1920).

9. Daily wheat futures prices at Chicago and Liverpool: *Daily Trade Bulletin* (Chicago) and Broomhall's *Corn Trade News*.

10. Gold value of United States currency, monthly, 1862-78: George F. Warren and Frank A. Pearson, *Prices* (New York, 1933), p. 351.

11. Wholesale commodity price indexes: The Sauerbeck-Statist index for Great Britain (1867-77 base), from *Journal of the Royal Statistical Society*, 1886, XLIX, 648; 1921, LXXXIV, 260; 1930, XCIII, 279; and subsequent issues; annual index (1910-14 = 100) from Warren and Pearson, *op. cit.*, p. 75. The Warren-Pearson-United States Bureau of Labor Statistics index for the United States (1910-14 = 100) from *ibid.*, pp. 10-13 and 25-27, and currently (1926 = 100) from United States Bureau of Labor Statistics, *Wholesale Prices*.

12. Industrial stock prices at New York: Axe-Houghton index from *The Annalist* (New York), January 16, 1931, p. 177; subsequently, from *ibid.*, the first issue of each month.

13. Indexes of business activity: The Dorothy Thomas index for Great Britain from *Journal of the American Statistical Association*, March 1926, XXI, 60-63; this index is available only for pre-war years. The Cleveland Trust Company index for the United States from Cleveland Trust Company, *American Business Activity since 1790 and Business Bulletin*. For business annals of various countries, see Willard L. Thorp, *Business Annals* (Publications of the National Bureau of Economic Research, No. 8, New York, 1926).

14. Net gold reserves of the United States: *Annual Report[s] of the Secretary of the Treasury of the United States*.

TABLE I.—MONTHLY AVERAGE PRICES OF WHEAT IMPORTED INTO GREAT BRITAIN,
AUGUST 1870–JULY 1919*

(U.S. gold cents per bushel)

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
1870-71	146	137	138	147	149	146	156	152	162	155	156	151	150
1871-72	148	150	159	163	157	155	152	152	152	165	162	159	156
1872-73	158	165	170	168	165	168	167	169	166	170	169	165	167
1873-74	164	174	173	173	175	179	176	172	171	182	168	162	172
1874-75	150	144	135	132	138	135	132	133	133	132	130	135	136
1875-76	147	144	143	141	138	138	138	138	139	140	139	133	140
1876-77	130	126	133	138	143	148	152	152	162	180	171	165	150
1877-78	160	164	164	161	159	159	161	158	155	156	144	133	156
1878-79	136	134	129	126	129	129	127	129	127	125	125	128	129
1879-80	130	136	154	158	160	158	153	158	156	146	147	142	150
1880-81	139	132	135	141	143	139	136	137	138	137	139	138	138
1881-82	144	154	154	151	150	146	147	141	146	145	141	144	147
1882-83	141	136	128	129	129	130	136	135	132	131	127	125	132
1883-84	128	127	122	122	122	119	119	118	116	115	111	113	119
1884-85	110	103	99	96	98	102	103	102	106	104	103	103	102
1885-86	101	100	101	99	99	96	97	100	102	102	100	96	99
1886-87	98	98	95	96	100	105	106	105	105	106	104	100	101
1887-88	96	92	91	94	96	96	96	93	96	94	95	94	94
1888-89	97	104	108	110	108	108	106	106	101	99	94	99	103
1889-90	98	97	99	100	100	100	100	101	102	100	99	100	100
1890-91	102	104	102	104	104	106	105	108	115	119	116	111	108
1891-92	114	117	118	122	120	117	114	111	108	106	105	100	113
1892-93	97	91	89	89	88	88	88	86	87	86	86	86	88
1893-94	84	81	85	78	78	78	76	76	74	72	69	70	77
1894-95	67	67	64	65	68	67	67	70	71	72	77	73	69
1895-96	73	70	70	74	73	74	77	79	79	77	76	73	75
1896-97	74	76	87	94	96	95	94	91	89	88	86	87	88
1897-98	98	110	108	109	107	109	112	110	112	143	121	100	112
1898-99	91	87	90	92	90	90	89	87	87	87	87	87	89
1899-1900	85	86	88	87	86	87	86	86	87	86	87	91	87
1900-01	89	91	92	91	90	89	90	89	88	88	88	85	89
1901-02	85	83	83	84	85	88	87	88	84	90	89	89	86
1902-03	87	86	85	85	87	87	90	90	88	90	88	88	88
1903-04	88	88	89	89	88	88	90	92	90	90	89	88	89
1904-05	91	93	93	94	95	94	94	95	94	94	95	93	94
1905-06	93	93	94	96	97	97	97	94	93	93	92	91	94
1906-07	90	89	88	88	88	89	90	90	90	93	97	100	91
1907-08	101	106	115	116	116	117	112	107	105	108	104	107	109
1908-09	107	111	112	112	114	113	113	116	120	127	128	130	117
1909-10	126	121	115	116	117	118	119	118	117	112	104	104	116
1910-11	107	108	107	103	102	103	103	103	101	101	101	100	103
1911-12	102	105	108	108	107	108	110	112	113	111	110	109	109
1912-13	110	108	113	112	109	110	109	111	110	110	110	109	110
1913-14	108	107	105	103	102	103	103	105	105	106	106	106	105
1914-15	110	114	122	130	136	149	169	180	183	189	178	164	152
1915-16	157	151	148	152	158	171	184	188	187	177	164	155	166
1916-17	172	194	201	211	222	228	235	233	239	242	239	238	221
1917-18	241	231	222	223	224	231	230	230	227	235	234	230	230
1918-19	233	231	232	238	241	238	240	238	234	233	232	224	234
1919-20	212	207	224	220	210	203	186	210	250	250	269	289	227

* Calculated from monthly quantities and declared values of wheat imports, as given in *Accounts and Papers Relating to Trade and Navigation of the United Kingdom*. Conversions to United States currency for pre-war years at par of exchange; for war years at monthly average sterling exchange rates in New York. For post-war data, see *WHEAT STUDIES*, December issues, 1931-33; VIII, 195; IX, 134; X, 141.

TABLE II.—DOMESTIC WHEAT PRICES IN CERTAIN EUROPEAN COUNTRIES, ANNUALLY, 1873-1900*

(U.S. cents per bushel)

Calendar year	England, Wales ^a	France ^b	Prussia ^c	Italy ^d	Holland ^e	Belgium ^f	Norway ^g	Sweden ^h	Denmark ⁱ	Austria ^j	Hungary ^k	Russia ^l
1873.....	170	176	171	194	166	179	154	155	154	175	155	134
1874.....	161	172	156	197	194	167	161	128	115	150	138	118
1875.....	131	124	127	148	133	132	152	121	121	112	102	112
1876.....	134	140	136	155	133	141	152	127	133	126	115	113
1877.....	164	163	149	181	160	164	150	136	122	143	129	88
1878.....	134	157	131	169	160	145	160	113	106	124	105	94
1879.....	127	148	127	168	136	138	142	120	125	129	114	119
1880.....	128	157	142	173	149	144	153	125	121	141	131	121
1881.....	131	151	143	143	146	144	156	134	124	141	134	121
1882.....	131	145	135	138	157	137	151	119	108	127	118	107
1883.....	120	130	120	125	129	123	142	116	103	116	106	102
1884.....	103	121	112	117	124	111	135	98	88	103	96	83
1885.....	95	111	105	116	103	100	123	88	80	95	88	71
1886.....	90	113	102	116	102	95	122	86	87	98	88	86
1887.....	94	120	106	116	103	97	113	78	84	96	86	77
1888.....	92	130	113	116	103	98	112	100	87	86	78	77
1889.....	86	124	119	124	102	93	115	100	85	91	84	74
1890.....	92	130	124	122	102	100	122	101	85	94	87	83
1891.....	107	142	144	133	111	116	126	115	106	113	106	94
1892.....	88	121	122	130	139	98	130	96	80	102	96	72
1893.....	76	110	98	113	93	78	114	88	74	90	84	60
1894.....	66	102	88	101	80	69	106	72	60	81	74	51
1895.....	67	96	91	109	73	70	102	79	65	79	72	57
1896.....	76	97	99	118	86	78	105	91	80	83	77	61
1897.....	87	130	107	137	88	91	111	107	89	114	109	77
1898.....	98	133	121	142	113	104	121	106	82	129	123	86
1899.....	74	102	100	134	93	82	119	103	73	105	96	77
1900.....	78	98	97	135	87	82	112	100	71	91	79	72

* Data for France from *Statistique agricole annuelle*, 1929, pp. 182-84; for Germany from *Statistisches Jahrbuch für den Freistaat Preussen*, 1922, p. 168; for Italy from *Annuario Statistico Italiano*, 1911, p. 141. Data for remaining countries from Parliamentary Papers (Great Britain), 1905, LXXXIV (Cd. 2337), 214-17. Conversions at par.

^a Averages of prices in various markets.

^b Through 1884 simple averages of prices in different departments; after 1885 weighted averages.

^c Averages of prices of first- and second-quality wheat in leading markets.

^d Market prices at Arnhem.

^e Averages of official prices of various districts.

^f Averages of Saturday high prices at Vienna.

^g Average prices at Budapest.

^h Odessa prices to 1895; later, averages for 5 markets.

TABLE III.—RYE, CORN, BARLEY, AND OATS PRODUCTION IN EUROPE AND THE UNITED STATES, 1890-1900*

(Million bushels)

Year	Rye					Corn			Barley			Oats		
	Europe ex-Russia	Russia ^a	Germany ^b	Austria-Hungary	Scandinavia ^c	Europe ^d	Danube countries ^e	United States ^f	Europe ex-Russia ^g	Russia ^h	United States	Europe ex-Russia ⁱ	Russia ^j	United States
1890.....	594	646	266	132	40	326	178	1,650	456	190	73	1,317	639	573
1891.....	506	486	217	106	44	394	240	2,336	498	164	97	1,309	509	840
1892.....	644	628	309	132	46	402	257	1,897	472	210	92	1,243	534	695
1893.....	690	752	352	135	46	418	247	1,900	439	338	84	1,020	763	676
1894.....	671	871	328	141	36	247	123	1,615	479	274	78	1,371	762	716
1895.....	619	784	304	112	40	396	249	2,535	476	247	115	1,351	732	886
1896.....	674	767	336	125	46	378	226	2,671	491	244	99	1,273	729	780
1897.....	601	626	322	99	43	394	231	2,287	421	230	103	1,184	596	791
1898.....	679	714	356	126	38	462	294	2,351	485	299	100	1,426	628	843
1899.....	665	880	342	135	41	340	181	2,646	465	218	117	1,378	909	926
1900.....	630	904	337	97	47	417	257	2,662	453	233	96	1,377	813	914
1890-99 av...	634	715	313	124	42	376	223	2,189	468	241	96	1,287	680	773

* Data from original sources, U.S. Department of Agriculture, *Annuaire statistique de la France*, and partly estimated. Figures in italics are estimated.

^a Sixty-four European provinces.

^b Official data for 1890-92 raised 15.6 per cent. See F. R. Rutter, *Cereal Production of Europe* (U.S. Department of Agriculture, Bureau of Statistics, Bulletin No. 68, 1908), p. 66.

^c Norway, Sweden, Denmark.

^d Hungary, Rumania, Bulgaria, Italy, France, Austria, European Russia.

^e Hungary, Rumania, Bulgaria.

^f Official revisions published in May 1934.

^g Excluding Spain and Serbia.

TABLE IV.—INTERNATIONAL TRADE IN WHEAT AND FLOUR, ANNUALLY 1885-86 TO 1899-1900*

(Million bushels)

A. NET EXPORTS

Aug.-July	Total net exports ^a	United States ^b	Canada ^c	India	Argentina ^d	Australasia ^e	Russia ^f	Hungary ^g	Rumania	Bulgaria	Serbia	Algeria	Egypt	Uruguay ^h
1885-86....	269.9	96.6	4.2	40.8	2.2	...	64.4	34.5	13.6	6.5	.6	5.8	...	.7
1886-87....	329.3	156.8	7.2	35.0	6.8	...	59.6	37.3	14.7	6.3	.6	4.4	...	.6
1887-88....	372.6	122.5	3.4	29.5	7.5	...	127.6	45.1	23.8	7.0	1.7	3.3	...	1.2
1888-89....	353.7	91.0	(.1)	30.4	2.8	4.8	133.6	46.4	32.9	11.7	2.2	2.4	...	.4
1889-90....	355.9	112.5	(.0)	27.1	9.2	9.6	109.0	44.6	35.0	12.7	1.9	3.3	(.1)	.6
1890-91....	371.9	109.1	3.0	40.9	11.9	9.6	112.3	46.3	30.5	11.4	2.5	3.8	1.6	.2
1891-92....	438.2	228.8	10.2	44.6	18.3	4.8	50.4	41.4	26.6	12.2	3.1	2.6	1.6	.0
1892-93....	436.7	195.7	11.0	26.8	30.6	8.6	87.4	39.1	28.2	12.9	3.0	1.4	(.5)	.6
1893-94....	460.5	167.5	11.0	19.6	52.5	8.9	120.2	42.7	26.8	12.0	2.7	.7	(.7)	4.8
1894-95....	480.3	147.7	9.1	16.6	56.2	7.4	153.0	45.2	30.6	12.3	2.0	2.7	(1.1)	4.9
1895-96....	431.6	130.3	10.4	12.6	24.4	.0	133.5	53.8	40.3	18.2	3.0	3.2	(3.0)	1.9
1896-97....	407.0	148.7	9.6	4.4	8.8	.0	127.5	51.8	34.1	17.1	2.5	1.4	(3.5)	1.1
1897-98....	472.4	221.0	24.4	20.1	24.2	.3	132.0	17.8	18.5	9.0	1.6	.8	(2.4)	3.0
1898-99....	443.8	227.3	13.6	29.2	39.5	9.1	73.0	31.9	16.0	6.2	2.5	1.2	(1.8)	3.4
1899-1900..	444.8	190.7	20.0	10.4	80.3	7.1	67.8	47.4	15.1	4.9	3.1	2.5	(2.5)	2.6

B. NET IMPORTS

Aug.-July	European net imports ⁱ	British Isles	France	Germany ^j	Italy ^k	Belgium	Netherlands	Switzerland	Austria	Sweden	Other Scandinavia ^l	Spain	Portugal	Greece
1885-86....	279.7	147.1	18.7	5.2	29.4	17.9	10.9	11.8	25.0	3.1	2.1	4.3	4.2	...
1886-87....	313.7	142.9	41.3	8.4	35.0	19.4	11.3	12.0	24.6	2.9	2.0	9.2	4.7	...
1887-88....	320.3	142.3	36.1	16.1	34.0	21.4	11.7	12.1	26.6	2.9	2.1	10.7	4.3	...
1888-89....	335.7	150.1	60.4	12.8	24.4	21.4	11.6	12.0	26.1	2.9	3.2	7.4	3.4	...
1889-90....	326.0	154.6	30.7	17.9	31.5	22.9	11.6	12.3	29.4	2.9	3.2	5.6	3.4	5.0
1890-91....	357.2	152.8	55.5	24.5	18.1	29.8	13.0	13.2	35.2	3.1	3.4	4.6	4.0	5.0
1891-92....	469.0	178.9	108.9	56.3	15.3	29.3	13.9	13.0	36.1	4.4	3.9	4.8	4.2	4.3
1892-93....	386.0	178.1	32.5	23.5	36.9	25.9	12.5	13.0	37.0	5.8	4.4	11.5	4.9	3.8
1893-94....	419.9	180.0	55.2	30.4	21.0	31.6	14.7	14.0	40.1	6.9	6.1	15.5	4.4	4.6
1894-95....	435.3	197.6	29.3	45.4	20.0	37.8	17.1	15.0	46.2	6.0	6.8	9.5	4.6	5.0
1895-96....	434.3	187.8	15.7	52.5	32.0	39.3	16.5	16.5	53.4	4.7	6.7	4.6	4.6	4.9
1896-97....	382.8	178.7	10.2	47.7	14.2	33.8	14.3	16.3	48.9	4.6	6.2	3.1	4.8	5.0
1897-98....	437.2	170.3	80.0	38.9	34.9	31.0	13.0	14.6	37.5	4.7	6.4	1.9	4.0	5.3
1898-99....	390.6	180.7	16.2	51.9	14.8	35.0	14.3	15.2	36.3	5.8	7.5	9.4	3.5	5.9
1899-1900..	383.5	177.4	5.5	38.3	20.8	34.7	15.4	15.3	46.4	6.4	8.1	10.8	4.4	6.2

* Data, in most cases of general commerce, from official sources or U.S. Department of Agriculture except as noted. Flour converted to wheat on basis of 70 per cent extraction. Figures in italics are partially estimated, usually from calendar year trade data on basis of average seasonal flow of wheat to or from the country specified. Figures in parenthesis under A indicate net imports, under B net exports. Dots indicate that data are not available.

^a Total of figures in following columns excluding Australasia and Egypt.

^b July-June years; flour converted to wheat at 4.75 bushels per barrel.

^c July-June years; flour converted at 4.5 bushels per barrel.

^d July-June years. From 1890-91 official data reported in Broomhall's *Corn Trade Year Book*, 1895, p. 36, and *ibid.*, 1901-02, p. 5.

^e Broomhall's shipments data. Satisfactory trade data for Australia are lacking for most of this period.

^f September-August years. Gross exports of wheat combined with our estimates of crop-year flour exports.

^g Trade in wheat flour estimated from trade in all flour and meal.

^h Gross exports through 1891-92.

ⁱ Total of figures in following columns excluding Greece.

^j July-June years, special commerce, through 1889-90; data for these years may not include trade in flour. From 1890-91 data for August-July years, general commerce; until 1897-98 wheat flour net exports estimated from trade in all flour.

^k Trade in wheat grain only, special commerce; net trade in flour was negligible.

^l Denmark, Norway, Finland. Net exports from Denmark in 1885-86 to 1887-88 (less than 1 million bushels each year) not deducted.

TABLE V.—INTERNATIONAL SHIPMENTS OF WHEAT AND FLOUR (BROOMHALL), 1890-91 to 1900-01*
(Million bushels)

Year	Total	Areas of origin							Areas of destination			
		North America	India	Russia and Black Sea ^a	Russia	Argentina	Australasia	Others ^b	Europe ^c	United Kingdom	Continent	Ex-Europe ^d
1890-91.....	.....	102.2	43.0	123.4	.....	13.4 ^e	9.6 ^e	....	321.6	158.8	160.8	....
1891-92.....	399.0	232.9	51.3	75.1	.....	20.0 ^f	5.3	14.4	380.7	194.1	186.4	18.3
1892-93.....	416.7	209.6	18.1	123.7	.....	29.6	8.6	27.1	396.4	198.5	198.9	20.3
1893-94.....	390.0	157.0	19.2	135.2	102.2	52.5	8.9	17.2	373.3	190.6	181.6	16.7
1894-95 ^g	417.7	143.1	18.4	175.2	134.6	45.6	7.4	28.0	402.3	200.2	201.6	15.4
1895-96.....	383.2	141.9	11.0	190.9	118.3	18.7	.0	20.7	352.2	172.7	181.8	31.0
1896-97.....	368.0	158.0	1.0	183.0	110.6	3.2	.0	22.8	330.9	169.8	160.8	37.1
1897-98.....	460.7	232.2	31.6	153.8	129.2	23.2	.3	19.6	432.3	186.2	246.3	28.4
1898-99.....	410.3	223.9	25.8	95.9	68.6	41.3	9.1	14.3	385.3	195.7	189.2	25.0
1899-1900.....	371.8	188.3	3.8	75.4	59.0	79.4	7.0	17.9	342.2	176.3	165.9	29.6
1900-01 ^h	454.9	249.2	5.1	117.6	77.2	41.0	18.0	24.0	404.8	209.0	195.2	50.1

* Summation of weekly shipments given in *Corn Trade Year Book 1901-02*, and *Corn Trade News*, except as noted.

^a Not including shipments from Austria-Hungary.

^d Difference between shipments to Europe and the total.

^b Difference between shipments from areas specified and the total. Includes Austria-Hungary, Turkey, Chile, Africa, etc.

^e Data from *Corn Trade News*, September 25, 1896, p. 745.

^c Not necessarily the sum of data in next two columns.

^f Approximate, based on total for last 38 weeks.

^g Fifty-three weeks.

TABLE VI.—APPARENT DOMESTIC UTILIZATION OF WHEAT, ANNUALLY, 1885-86 to 1899-1900*
(Million bushels)

Aug.-July	United States ^a	Canada ^a	India ^b	Argentina ^c	Russia ^d	Hungary	Rumania	Bulgaria	Serbia	British Isles	France	Italy	Germany ^a
1885-86.....	335.7	38.6	259.6	13.4	219.7	85.3	29.9	21.1	4.1	229.1	331.7	173.7	111.4
1886-87.....	398.2	31.1	216.0	22.3	206.8	72.6	19.9	20.2	3.9	208.1	344.1	182.6	117.0
1887-88.....	436.3	35.6	212.5	12.9	308.9	110.7	23.7	18.7	3.3	220.7	356.1	189.6	131.3
1888-89.....	425.3	33.1	233.4	10.1	358.9	98.7	25.0	18.4	5.9	226.8	336.0	160.1	115.8
1889-90.....	505.9	30.9	210.8	27.7	209.8	53.1	15.0	22.1	7.3	232.7	336.4	165.7	114.5
1890-91.....	406.6	39.2	201.0	18.4	216.0	111.7	21.5	18.9	4.5	231.0	385.1	180.1	136.2
1891-92.....	558.3	31.9	199.5	21.1	220.4	104.1	21.9	26.3	5.0	255.8	323.9	189.6	137.3
1892-93.....	485.0	37.2	198.3	40.2	321.5	110.1	35.7	27.9	8.0	240.6	343.3	179.4	162.4
1893-94.....	371.9	30.3	261.5	43.2	434.7	126.0	34.0	24.7	6.1	232.4	333.0	187.7	151.8
1894-95.....	486.5	33.5	257.5	0.2	374.9	109.1	13.0	13.8	6.1	260.1	373.6	169.8	165.6
1895-96.....	538.6	30.7	241.4	6.4	333.0	118.2	28.1	13.8	5.8	227.2	355.2	177.1	170.3
1896-97.....	463.9	23.4	197.2	9.3	335.0	109.5	37.1	22.9	5.6	238.7	350.4	193.2	175.1
1897-98.....	464.0	22.7	194.8	47.5	249.5	69.2	17.9	19.9	11.6	228.2	322.1	142.0	157.4
1898-99.....	604.3	49.7	231.2	79.6	442.9	107.7	42.5	27.8	7.0	257.8	381.1	184.0	184.9
1899-1900....	491.5	36.8	236.6	35.6	440.4	102.9	11.0	16.7	8.7	246.6	371.1	190.7	180.5

Aug.-July	Belgium	Netherlands	Switzerland	Austria	Sweden	Denmark	Norway	Finland	Spain	Portugal	Greece	Algeria	Japan
1885-86.....	34.5	17.2	15.9	72.2	7.2	4.1	1.4	1.1	117.8	8.4	....	18.5	12.0
1886-87.....	35.2	16.5	16.1	68.2	6.9	4.0	1.4	1.0	95.2	12.9	....	20.2	16.3
1887-88.....	38.4	18.6	16.2	78.4	7.4	5.2	1.4	1.1	105.7	10.3	....	18.0	15.4
1888-89.....	36.5	16.8	15.6	77.1	6.6	4.2	1.5	1.2	83.3	10.5	....	17.8	15.6
1889-90.....	42.0	18.1	15.9	66.9	6.7	4.9	1.6	1.3	81.2	11.9	11.4	15.8	16.5
1890-91.....	51.1	18.4	17.7	78.1	7.1	4.3	1.9	1.3	80.1	12.2	11.5	24.9	12.8
1891-92.....	45.5	17.4	17.2	75.6	8.9	4.8	2.3	1.4	77.4	11.2	10.9	23.5	18.3
1892-93.....	44.6	17.9	17.3	86.6	10.4	5.0	2.4	1.6	98.8	10.9	10.5	18.4	15.9
1893-94.....	48.5	19.7	17.3	82.8	10.9	6.0	2.3	2.1	109.0	9.9	11.4	19.5	16.8
1894-95.....	55.1	21.3	18.9	93.5	10.3	6.0	2.3	2.2	119.5	13.6	12.0	28.2	20.5
1895-96.....	57.7	20.8	19.9	93.7	8.5	6.0	2.4	2.2	89.1	11.6	11.9	22.9	20.8
1896-97.....	52.2	19.4	19.2	90.7	9.4	5.7	2.4	2.3	82.3	10.4	12.1	21.4	18.9
1897-98.....	46.1	17.3	18.0	72.0	9.4	5.6	2.4	2.5	96.6	12.2	12.6	19.0	20.3
1898-99.....	50.4	19.7	19.2	83.2	10.5	6.0	2.6	2.5	134.5	11.3	13.2	26.0	22.3
1899-1900....	48.7	20.5	19.4	96.6	11.1	6.7	2.8	3.1	108.5	10.8	13.6	19.9	23.4

* Production plus net imports or minus net exports.

^a July-June.

^b April-March.

^c January-December.

^d September-August.

TABLE VII.—TARIFF DUTIES ON WHEAT IN LEADING EUROPEAN IMPORTING COUNTRIES, 1880–1900*

(U.S. cents per bushel)

Year	Germany	France	Italy	Spain	Portugal	Switzerland	Austria-Hungary	Sweden
1880...	6.5 (Jan.)	3.3	7.4	42.0	....^a	1.6	5.5	Free
1881...	6.5	3.2 (May) ^b	7.4	42.0	....^a	1.6	5.5	Free
1882...	6.5	3.2	7.4	{30.6 G} {29.9 C} (Aug.) ^c	....^a	1.6	6.6 (June) ^e	Free (May) ^e
1883...	6.5	3.2	7.4	{30.6 G} {29.9 C}	....^a	1.6	6.6	Free
1884...	6.5	3.2	7.4	{30.6 G} {29.9 C}	....^a	1.6	6.6	Free
1885...	19.5 (Feb.) ^d	15.8 (Mar.) ^b	7.4	{30.6 G} {29.9 C}	29.4 (Oct.) ^e	1.6	6.6	Free
1886...	19.5	15.8	7.4	{30.6 G} {29.9 C}	29.4	1.6	6.6	Free
1887...	32.4 (Nov.)	26.3 (Mar.) ^b	15.8 (Apr.)	{30.6 G} {29.9 C}	29.4	1.6	19.7 (June) ^e	Free
1888...	32.4	26.3	26.3 (Feb.) ^e	{30.6 G} {29.9 C}	{58.2 (May) ^b 29.4 (Nov.) ^e 47.1 (Dec.) ^e }	1.6	19.7	18.2 (Feb.) ^e
1889...	32.4	26.3	26.3	{30.6 G} {29.9 C}	{55.9 (Mar.) ^e Imports prohibited (July) ^f }	1.6	19.7	18.2
1890...	32.4	26.3	26.3	{30.6 G} {29.9 C}	....^f	1.6	19.7	18.2
1891...	32.4	15.8 (Aug.)	26.3	{30.6 G} {29.9 C}	....^f	1.6	19.7	18.2
1892...	{32.4 G} {22.7 C} (Feb.)	26.3 (June)	26.3	42.0 (Jan.) ^e	....^f	1.6	19.7	9.1 (June) ^e
1893...	{32.4 G} {22.7 C}	26.3	26.3	42.0	....^f	1.6	19.7	9.1
1894...	{32.4 G} {22.7 C}	36.8 (Feb.) ^b	{36.8 (Feb.) ^e 39.4 (Dec.) ^e }	42.0	....^f	1.6	19.7	9.1
1895...	{32.4 G} {22.7 C}	36.8	39.4	55.2 (Feb.) ^b	....^f	1.6	19.7	{23.0 (Jan.) ^e 27.0 (Apr.) ^e }
1896...	{32.4 G} {22.7 C}	36.8	39.4	55.2	....^f	1.6	19.7	27.0
1897...	{32.4 G} {22.7 C}	36.8	39.4	55.2	....^f	1.6	19.7	27.0
1898...	{32.4 G} {22.7 C}	{Duty suspended (May) 36.8 (July)}	{26.3 (Jan.) Free (May) 26.3 (July) 39.4 (Aug.)}	{31.5 (Mar.) ^e Free (May) ^e 31.5 (Aug.) ^e}}	....^f	1.6	19.7	27.0
1899...	{32.4 G} {22.7 C}	36.8	39.4	42.0 (Sept.) ^e	....^f	1.6	19.7	27.0
1900...	{32.4 G} {22.7 C}	36.8	39.4	42.0	....^f	1.6	19.7	27.0

* Data from various sources, mainly Great Britain, Parliamentary Papers, 1905, LXXXIV (Cd. 2337); *ibid.*, 1913, LXVIII (Cd. 6894); Frank R. Rutter, *Cereal Production of Europe* (U.S. Department of Agriculture, Bureau of Statistics, Bulletin No. 68, 1908); *Handwörterbuch der Staatswissenschaften*: "Getreidezölle" (3d ed., Jena, 1909); Broomhall's *Corn Trade Year Book 1895*, and 1901–02; Ministère de l'Agriculture de la France, *Culture, production et commerce du blé dans le monde* (Paris, 1912). Conversions at par of exchange. The month named after each duty indicates when the duty was to become effective, unless otherwise noted. G indicates general duty; C, conventional duty. Wheat was imported free of duty into the United Kingdom, Netherlands, Belgium, and Denmark during 1880–1900.

^a Tariff rate not given in any source available.

^b Date of law.

^c Date of tariff.

^d One source reports date as July 1885.

^e Date of decree.

^f Imports prohibited except under special circumstances.

Law of 1889 was amended in August 1891 and July 1899. As

amended in 1899, importation was allowed only if the domestic crop was too small to cover domestic requirements. In such cases, a sliding scale duty was to be enforced with a view to keeping the cost of wheat to millers, including duty, at 60 reis per kilogram (about \$1.75 per bushel).

^e Sources differ as to date of imposition; one source gives date of law as December 1890.

TABLE VIII.—VISIBLE SUPPLIES OF WHEAT IN SPECIFIED POSITIONS, MONTHLY,
AUGUST 1891–JULY 1900*
(Million bushels)

Position and year	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1
Total												
1891-92	117-123 ^a	117-120 ^a	156-157 ^a	179.1	203.3	199.6	197.3	181.5	178.4	161.3	147.8	132.1
1892-93	122.9	145.7	166.3	196.2	231.5	237.5	234.2	229.4	221.7	215.6	205.0	183.7
1893-94	178.3	182.9	195.7	220.7	237.5	232.1	233.0	222.4	216.5	206.9	195.8	172.7
1894-95	174.6	189.5	205.1	220.9	218.8	227.9	223.1	212.5	198.3	186.6	171.1	160.4
1895-96	158.1	152.3	176.6	209.9	218.8	224.8	202.8	191.9	180.6	161.2	147.6	137.5
1896-97	124.3	126.4	151.3	190.6	202.3	184.6	173.5	155.5	139.1	121.5	107.0	88.7
1897-98	77.6	87.1	119.2	139.4	156.0	157.0	151.7	140.6	131.0	111.3	109.8	86.8
1898-99	70.2	66.4	83.0	106.9	136.0	147.1	146.4	151.2	145.0	139.5	136.9	140.4
1899-1900	134.5	142.6	162.8	191.2	203.6	200.3	190.6	181.6	184.3	175.8	159.4	149.9
North America												
1891-92	39-45 ^b	47-50 ^b	60-61 ^b	80.1	91.3	94.4	89.8	83.5	77.0	66.0	53.6	47.6
1892-93	48.2	71.0	91.2	115.6	138.5	149.6	149.2	143.3	135.9	125.7	112.4	95.0
1893-94	90.0	89.5	98.7	118.7	130.7	130.2	128.3	121.2	116.6	107.4	97.2	86.2
1894-95	92.6	112.8	127.9	144.0	148.9	149.4	139.0	129.2	118.5	105.1	85.6	72.0
1895-96	71.3	73.4	87.6	116.7	129.4	135.0	129.0	118.4	111.6	98.1	85.6	76.1
1896-97	76.3	80.2	92.8	111.8	113.1	105.4	96.0	85.3	74.4	65.6	51.5	38.4
1897-98	39.6	44.0	61.9	77.7	85.5	85.4	80.4	71.5	62.0	49.7	42.7	27.4
1898-99	25.3	29.5	43.3	58.0	81.5	85.2	84.7	82.9	77.2	74.0	66.4	70.9
1899-1900	71.0	78.9	96.8	119.6	132.4	132.2	124.5	115.4	109.5	105.6	91.3	85.4
United Kingdom												
1891-92	12.1	9.5	14.0	15.2	20.0	22.7	21.7	20.0	21.5	19.5	20.6	23.6
1892-93	26.0	27.0	27.0	26.3	27.9	28.3	26.8	24.7	20.5	21.1	20.6	21.6
1893-94	24.9	30.1	29.2	30.8	28.6	29.0	25.6	20.4	18.7	17.8	19.2	19.9
1894-95	20.6	22.3	23.6	22.4	15.9	16.3	18.2	15.7	15.6	14.8	14.3	18.1
1895-96	21.6	25.4	28.0	25.2	22.6	19.9	15.6	13.9	15.1	13.2	10.3	13.5
1896-97	14.2	13.4	11.2	10.1	12.0	14.4	15.4	17.3	18.6	15.8	16.1	17.4
1897-98	13.4	9.1	7.3	8.7	11.5	11.1	9.7	8.2	10.2	8.9	7.9	9.6
1898-99	10.6	9.1	7.3	7.3	8.6	8.0	9.0	10.5	11.5	11.1	13.0	14.5
1899-1900	17.0	19.2	18.5	17.9	19.7	19.4	17.6	13.8	11.8	13.6	15.0	18.6
Continent^c												
1891-92	28.0	21.5	44.9	48.3	49.0	47.5	49.5	42.0	41.6	39.0	40.5	30.4
1892-93	24.5	22.3	22.5	22.0	28.8	29.0	30.0	27.4	25.9	24.5	24.0	22.7
1893-94	26.5	27.5	34.4	39.0	40.7	39.9	48.0	50.5	41.7	36.1	31.4	28.3
1894-95	27.1	23.6	27.2	26.9	23.8	29.2	30.9	30.4	25.2	20.3	22.5	27.5
1895-96	28.9	26.1	34.4	41.2	39.6	40.2	32.4	31.2	25.1	21.1	19.9	18.8
1896-97	14.4	11.8	19.6	36.3	42.8	36.4	34.4	30.7	27.5	23.0	19.1	17.9
1897-98	12.2	14.5	23.9	23.2	24.5	26.5	37.8	20.9	18.0	11.7	14.2	17.5
1898-99	12.1	10.2	10.7	17.0	20.6	25.0	23.4	21.5	18.6	14.9	14.8	17.8
1899-1900	15.3	17.7	21.7	27.2	28.1	29.3	28.1	23.1	20.0	16.5	16.9	14.7
Afloat to Europe												
1891-92	38.0	38.8	36.6	35.5	43.0	35.0	36.3	36.0	38.3	36.8	33.1	30.5
1892-93	24.2	25.4	25.6	32.3	36.3	30.6	28.2	34.0	39.4	44.3	48.0	44.4
1893-94	36.9	35.8	33.4	32.2	37.5	33.0	31.1	30.3	39.5	45.6	48.0	38.3
1894-95	34.3	30.8	26.4	27.6	30.2	33.0	35.0	37.2	39.0	46.4	48.7	42.8
1895-96	36.3	27.4	26.6	26.8	27.2	29.7	25.8	28.4	28.8	28.8	31.8	29.1
1896-97	19.4	21.0	27.7	32.4	34.4	28.4	27.7	22.2	18.6	17.1	20.3	15.0
1897-98	12.4	19.5	26.1	29.8	34.5	34.0	33.8	40.0	40.8	41.0	45.0	32.3
1898-99	22.2	17.6	21.7	24.6	25.3	28.9	29.3	36.3	37.7	39.5	42.7	37.2
1899-1900	31.2	26.8	25.8	26.5	23.4	19.4	20.4	29.3	43.0	40.1	36.2	31.2

* Data from Broomhall's *Corn Trade News* and *Daily Trade Bulletin* (Chicago), with minor adjustments in August-October 1891 as noted.

^a Figures adjusted to take account of later increases in the number of North American points reporting.

^b Lower limit suggested by Broomhall; upper limit represents our rough approximation.

^c France, Germany, Belgium, Holland, Russia.

TABLE IX.—ESTIMATED EXCESS OF YEAR-END WHEAT STOCKS ABOVE MINIMUM IN PRINCIPAL WHEAT-CONSUMING COUNTRIES, 1886–1905*

(Million bushels)

About August 1	Total ex-India	British Isles, France	Germany, Italy	Other chief Importers ^a	Danube basin	Argentina, Canada	United States	Russia	Afloat to Europe	India ^b
1886.....	136	18	0	13	14	7	51	20	13	20
1887.....	105	4	0	6	6	7	71	0	11	8
1888.....	203	13	16	14	27	10	99	10	14	0
1889.....	178	6	3	2	31	9	61	54	12	6
1890.....	160	3	0	1	2	8	110	18	18	1
1891.....	137	34	4	6	12	15	37	0	29	0
1892.....	205	28	9	4	12	12	125	0	15	0
1893.....	289	28	18	1	29	23	160	2	28	0
1894.....	313	12	16	5	44	29	121	61	25	20
1895.....	314	42	12	19	27	14	100	73	27	27
1896.....	278	26	13	11	31	13	123	52	9	27
1897.....	195	28	27	6	38	6	47	41	2	8
1898.....	21	0	4	0	0	0	5	0	12	0
1899.....	281	32	7	11	18	34	141	18	20	2
1900.....	257	48	8	1	6	17	132	26	19	10
1901.....	172	31	6	2	1	11	78	15	28	0
1902.....	125	4	9	8	13	7	73	0	11	13
1903.....	171	11	8	16	38	13	53	18	14	0
1904.....	239	46	14	17	39	14	48	35	26	0
1905.....	106	10	4	1	2	4	20	41	24	20

* Estimated mainly on the basis of domestic utilization data of the individual countries. United States carryover figures from 1896 based upon figures in Holbrook Working, "Disposition of American Wheat since 1896," WHEAT STUDIES, February 1928, IV, 180; Russian figures from 1898 based on percentage estimates by P. T. Liaschenko, *Ocherki agrarnoi evoliutsii Rossii* [Essays on the Agrarian Evolution of Russia] (2d ed., Moscow, 1923), p. 204.

^a Belgium, Netherlands, Scandinavia, Spain.

^b About April 1.

TABLE X.—ESTIMATED POPULATION IN PRINCIPAL WHEAT-CONSUMING COUNTRIES AND REGIONS, ANNUALLY, 1885–1905*

(Million persons)

Jan. 1	Total ^a	Europe ex-Russia	European Russia	Russian Empire	Danube	British Isles	France	Germany	Italy	United States	India	Argentina ^b	Australia ^b
1885.....	756.4	247.4	89.1	107.2	27.3	35.9	38.1	46.5	29.1	56.0	266.3	2.9	2.6
1886.....	765.9	249.3	90.5	109.0	27.7	36.2	38.2	46.9	29.3	57.3	269.6	3.0	2.7
1887.....	775.4	251.3	91.9	110.6	28.0	36.5	38.2	47.4	29.5	58.6	272.9	3.1	2.8
1888.....	785.2	253.2	93.3	112.4	28.4	36.7	38.3	47.9	29.7	59.9	276.3	3.2	2.9
1889.....	795.0	255.2	94.7	114.2	28.7	37.0	38.3	48.4	29.9	61.1	279.7	3.3	3.0
1890.....	804.6	257.2	95.1	115.8	29.1	37.3	38.4	49.0	30.1	62.4	283.2	3.4	3.1
1891.....	814.4	259.1	97.5	117.6	29.4	37.6	38.4	49.5	30.3	63.7	286.7	3.5	3.2
1892.....	821.7	261.1	99.0	119.3	29.8	38.0	38.4	50.0	30.5	65.0	287.9	3.6	3.2
1893.....	828.9	263.1	100.5	121.2	30.1	38.3	38.4	50.5	30.7	66.3	288.6	3.7	3.3
1894.....	835.9	265.2	102.0	123.0	30.5	38.7	38.4	51.0	30.9	67.6	289.3	3.9	3.4
1895.....	843.6	267.4	103.6	124.9	30.8	39.0	38.4	51.7	31.1	68.9	290.0	4.0	3.4
1896.....	851.3	269.8	105.2	126.7	31.2	39.4	38.5	52.4	31.4	70.2	290.7	4.1	3.5
1897.....	859.3	272.3	106.8	128.8	31.6	39.8	38.6	53.2	31.6	71.5	291.4	4.2	3.5
1898.....	867.4	274.9	108.4	130.9	32.0	40.2	38.7	54.0	31.8	72.8	292.1	4.4	3.6
1899.....	874.5	277.6	109.9	131.8	32.4	40.6	38.8	54.8	32.0	74.2	292.8	4.5	3.6
1900.....	883.7	280.3	111.6	134.9	32.8	41.0	38.9	55.6	32.2	75.5	293.5	4.6	3.7
1901.....	892.0	282.9	113.3	136.9	33.2	41.4	38.9	56.5	32.4	76.9	294.2	4.7	3.8
1902.....	901.8	285.4	115.0	139.0	33.6	41.7	39.0	57.3	32.6	78.6	296.0	4.9	3.8
1903.....	911.9	288.0	116.7	141.2	34.0	42.1	39.1	58.2	32.8	80.2	298.0	5.0	3.9
1904.....	921.8	290.5	118.4	143.4	34.3	42.4	39.2	59.0	32.9	81.8	300.0	5.1	4.0
1905.....	932.1	293.1	120.2	145.5	34.7	42.8	39.2	59.9	33.1	83.4	302.1	5.3	4.0

* Annual figures from official sources or estimated by us from census figures on the assumption that population increased between each pair of census years at a constant percentage rate.

^a Including the countries listed in the following columns and also Canada, Egypt, Algeria, Tunis, Morocco, Japan, Chosen, New Zealand, Chile, Uruguay, and South Africa.

^b Population as of July 1.