The Tariff on Sugar

by

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—Published by—

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AUTHOR'S ACKNOWLEDGMENTS

The object of this monograph is to determine the effectiveness of the tariff on sugar in increasing the price of sugar in the United States, and to measure the costs or benefits to the various groups of consumers and producers in this country. It seems necessary to precede the actual price analysis with a summary of the world sugar situation, together with an outline of the tariff policies pursued in this country with special reference to sugar. This is followed by a description of the sugar industry of continental United States and a brief explanation of the sugar markets.

It is the desire of the author to acknowledge his indebtedness to Dr. B. H. Hibbard, Head of the Department of Agricultural Economics, Dr. John R. Commons and Dr. Walter A. Morton, Department of Economics, University of Wisconsin, to Miss Jane Greverus and all other members of the staff of the Rawleigh Foundation for their constant counsel and many constructive suggestions while the book was being prepared; to Professor Clement E. Trout, Head of the Department of Publications, Oklahoma A. and M. College, and to Mr. Ben H. Thibodeaux, Assistant Agricultural Economist, United States Department of Agriculture, for reading the original manuscript and offering many constructive criticisms; to Dr. J. C. Muerman, School of Education, Oklahoma A. and M. College, for reading the section dealing with the Philippines and offering suggestions; to all those who have furnished statistical data used throughout the monograph; and to my wife, Mrs. Carleen E. Ellis, for assuming the task of proofreading the entire manuscript.

The author wishes especially to recognize the generosity and spirit of public service displayed by Mr. W. T. Rawleigh, Freeport, Illinois, who made this study possible.

Stillwater, Oklahoma — Lippert S. Ellis

January 1, 1933

DIRECTOR'S PREFACE

The subject of the agricultural tariff schedule is one of unusual interest at the present time and is certain to continue to demand attention in the near future. During recent years an attempt has been made to ease the farmer's difficult position by providing "tariff equality for agriculture" through an increase in the duties levied on a number of agricultural products while instituting or maintaining relatively higher duties on most industrial products. The success of this policy as a means of farm relief is now a question concerning which there is a wide difference of opinion.

There has been an abundance of abstract theorizing about the effectiveness of this program of farm relief and a great deal of statistical and other evidence has been submitted by interested parties for the purpose of bolstering partisan claims or advancing private interests, but there has been too little dispassionate analysis of the concrete effects of particular agricultural duties. Because of the cloud of propaganda which befogs this issue, the public is left largely in the dark with respect to the actual effects of these duties.

Dr. Ellis has sought to disclose the facts and thus to clarify the situation with regard to sugar. In doing this he has attempted to treat the following topics: (1) The past, present, and probable future status of the sugar industry. (2) The relationship of the sugar duty to each of these three phases of the industry. (3) Is the sugar problem a domestic, regional or world problem? (4) Does the duty raise the price of sugar and, if so, how much? (5) Who is benefitted and who is burdened by this price increase? (6) How do the benefits secured compare with the burdens imposed? (7) What public policy is indicated by the effects of the sugar duty? His findings and conclusions are interesting and impressive. It is hoped that they may offer some practical aid to those interested in solving the current farm problem.

Mr. W. T. Rawleigh's interest in public service and his generosity in financing the research and publishing the results have made this study possible. Much credit is also due the Advisory Committee, Dr. John R. Commons, Dr. B. H. Hibbard, and Dr. Walter A. Morton, as well as the many friends and cooperating institutions that have given aid and advice, both to the author and to the Foundation.

Haldor R. Mohat,
Director

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EDITORS' INTRODUCTION

At no time in its history has sugar been subject to greater tariff protection than now, yet the industry has never been in greater distress. While governments throughout the world have levied higher and higher duties, the price of sugar has gone lower and lower, until today virtually the entire industry is operating either without profit or at an actual loss. It has not always been so. Sugar has been called the prince-and-pauper industry, because the sugar cycle gives producers tremendous profits on the upswing and almost demolishes them on the downswing. This cycle does not coincide with the general economic cycle. In 1927, 1928, and 1929, when other industries were making large profits, sugar was already in trouble. Since then it has gone from bad to worse. Concerns operating in Cuba which at first passed common and preferred dividends have since defaulted on their bonds. These bonds are now selling as low as 2 or 3 cents on the dollar. Thanks to the American tariff, the Philippine, Porto Rican, and Hawaiian companies have been able to sell their sugar in the United States at about 2 cents per pound above the world price, and are consequently in better financial condition than the Cubans. It was recently estimated that an original investment of about $800,000,000 in Cuban sugar securities is currently valued in the market at less than $30,000,000, or about 4 per cent. The manufacturers of beet sugar within the United States are showing huge deficits, and plants are being abandoned.

The Sugar Crisis. The sugar crisis is neither local nor Cuban, but world-wide. It is due primarily to world overproduction. The consumption of sugar has expanded at a steady rate, and, unlike the consumption of other commodities the demand for which is dependent upon changes in style or the development of substitutes, is not subject to great fluctuations. In the United States normal consumption appears to be about 100 pounds per capita; in China it is only about 4 pounds per capita. This wide range does not indicate instability; consumption in each country is relatively stable at its own norm. While the depression has to some extent decreased consumption, the crisis is due primarily to no sudden change in the habit of the public, but to a rapid increase in production. This increase is due largely to increased efficiency, over-development, war, tariffs, and other institutional factors.

The cultivation of sugar cane has made notable advances. Experiment stations are maintained by governments, and by private industry, to conduct research in entomology, pathology, agriculture, forestry, technology, and chemistry, as they relate to sugar. Experiments are constantly being made to adapt the cane to soil, climate, or other factors affecting its development. In Java, for example, production of head sugar per acre had been increased about 50 per cent from 1919 to 1930, due chiefly to the introduction and use of a variety, P. O. J. 2878, better adapted to the needs of the region. Disease-resistant types have also been discovered. The technology of soil preparations has been improved, largely through the competition of the American and English manufacturers of sugar machinery. Nearly all the harvesting is still done in the old way, but the centrals have greatly increased their efficiency. New and better mills, crushers, centrifugals, and other machinery have been perfected by the manufacturers. All these things have tended to reduce costs and increase output throughout the world.

During the last decade all raw material industries have shown a tendency to overdevelopment. The enormous profits accruing from temporary high prices of sugar induced the cultivation of new land areas and the use of additional capital. A further cause was the inability to diversify, which has resulted in production unresponsive to changes in price.

The World War brought a slump in the production of beet sugar in continental Europe. In 1913 Europe produced a total of about 8 million long tons (7,967,969 in 1913-14). By 1919 it had dropped to 2½ million long tons (2,604,341 for 1919-20), and then gradually crept up again to 8 million in 1929. During the same period Cuba and other regions increased production, although not enough to make up for the decline in Europe. The return of peace brought European beet production back to normal and accelerated Asian and American production, thereby precipitating overproduction and the world sugar crisis.

The Futility of Tariff Relief. The sugar industry is one in which the laissez-faire philosophy of the nineteenth century has not been taken seriously even by those governments which profess to pursue it in other respects. A recent report estimates that about three-fourths of the world's sugar total is sold in markets where it enjoys preference by tariff or other governmental action. More than 100 countries have set up systems of taxes, duties, excises, and bounties, all calculated to help producers within and penalize those without the national boundaries.

And to what avail? Our high tariff, now equivalent to about 200 per cent ad valorem, was designed to aid the domestic industry, and it has done so. But how? It has maintained the domestic price above the world price, but it has not kept the world price from declining to ever lower levels. Hence the total duty-paid domestic price is not enough to prevent heavy losses to a considerable portion of the domestic industry.

The sugar tariff is an excellent example of the manner in which tariffs can thwart and obstruct international commerce, divert industry from its natural course, twist the channels of trade into tortuous and unwholesome paths, and introduce confusion and uncertainty into international trade to the benefit of no one—not even those for whose protection they are levied. It has stimulated overproduction, encouraged high-cost producers behind its protective wall, made possible long hauls to unnatural markets, and penalized efficient producers on our own shores; but it has brought neither stability nor profit to the sugar industry.

Instead of permitting a natural readjustment to demand after the war, local interests have demanded special protection and encouraged additional expansion. A considerable proportion of Philippine production, for instance, can be attributed to the American tariff. Politicians have been censured for providing tariff incentive to this expansion, but the blame must rest directly upon the business man. He has demanded protection for local interests regardless of its effects upon consumers, international trade, or the health of industry as a whole. He has castigated his competitors, and by legislation has sought to destroy them. But by these efforts he has destroyed himself, a victim of his own myopia, which he mistook for statesmanship.

Producers and Consumers. The United States sugar tariff gives rise to a conflict of interests between consumers and protected producers, and between the protected American and the Cuban producers. The three groups of producers immediately concerned with the American tariff are the continental producers of cane and beet sugar, the American island producers, and the Cubans. Those who may possibly bear the tariff are the sugar refiners, the processors, and the ultimate consumers.

Since each of these groups regards only its own immediate interests, it generally fails to see that the price of sugar is not a purely local, but a world problem. The movement of prices and profits during the last decade ought to prove beyond reasonable doubt that

tariffs alone are not enough to maintain either one. If the producers in the industry were willing to face the fact that their immediate problem is world overproduction, they would cease attempting to injure one another for what is at best a specious benefit.

The continental United States and island producers who seek tariff protection generally argue that the tariff does not burden the consumer, but that they themselves are being injured by Cuban competition. The Cubans, on the other hand, contend that they are being discriminated against in American markets, and that the low prices they are receiving for sugar are due to the American tariff. Each group believes that it will be benefitted by limiting Philippine imports. As will be seen below, the island cane and continental beet producers receive a differential above the world price of sugar, which is determined not alone by Cuban, but by world production. On the other hand, the Cubans would not receive any substantial advantage merely from the repeal of the American tariff, since they would still be obliged to sell their sugar in competition with Java and others in the world market at world market prices. Should the United States duty be repealed, the domestic and island producers would also be paid the world market price, and the consumers would benefit.

The United States and the World Price. Professor Lippert S. Ellis in this monograph has set forth in considerable detail the mechanism of the sugar market and the interrelationship existing between New York, Cuban, and London markets. He has shown how the New York price is contingent not upon local production and consumption, but upon international supply and demand factors. Unfortunately the problem of the sugar industry has ordinarily been looked at in too narrow a setting. It has generally been believed that the American tariff presents a conflict of interests between United States and Cuban producers. But when viewed in the frame of world production and consumption it is seen that a change in American tariff policy can be of only minor benefit to Cuba, and that so long as the world price of sugar remains low the American industry must remain unprofitable, unless the tariff is raised to heights now undreamed-of.

Only about one-half our consumption comes from areas within the United States tariff wall. The remainder comes from Cuba. Through this Cuban portion the price in the New York market and in every city, town, village, and hamlet in the United States is made dependent upon world conditions. The price received by producers within our tariff wall, even though it has the advantage of the tariff

differential, therefore, fluctuates with world conditions. For the price at which raw Cubans sell in New York determines the price paid the island and continental American producers. In turn, this price determines within narrow limits the price at which Cuba will sell in the London market, which fixes the price London will pay for Javanese sugar, and hence limits the price received by Brazil, Peru, and all other shippers to the London market. Due to competition among Javanese producers the net price received by Java in the London market determines the price received in the Indian and Chinese markets. International competition, therefore, makes conditions in Java and the interior of China or India directly influential on the price of sugar in the United States.[1]

Professor Ellis has demonstrated what Thomas Chadbourne and others have recognized: that the American tariff cannot raise the world price of sugar, but rather tends to lower it by stimulating production behind tariff walls. He takes the position that under the conditions existing during the past decade, the American consumer has paid the full amount of the duty, and that practically none of it has been absorbed by Cuba. This view is not generally accepted by the sugar trade, which reasons somewhat as follows: "Cuba has lowered her price progressively until it is now below the cost of production. Consequently she is absorbing the duty." But did the Cuban price fall because of the American tariff, or of world overproduction? And what price would Cuba get for her sugar if the United States tariff were entirely removed? The answer is apparent. Cuba now receives the world price, which is low because of overproduction. If the American tariff were removed the New York price would be approximately on the world level. Cuba would have the alternatives of the London or New York markets at the world price. The United States and island producers would lose the 2-cent per pound tariff differential; the sources of supply in the various markets would be shifted; and only if the readjustment caused a decrease in world production or an increase in consumption would the price be raised. The American consumer, not the producers, would be the direct beneficiary of tariff reduction.[2]

[1] In this analysis it has been assumed that Cuban production and American demand are the "determining" factors. This is by no means true, but it is used merely for convenience in presenting the relation between markets. It is just as true to reverse the process of determination and to say that Java's sugar and Chinese consumption determine the Cuban selling price and the price paid by American consumers. Perhaps the proper, although complex and abstract, method of presenting the above argument is to construct an equation which shows all production and consumption as functionally related to each other in the price-making process.

[2] When the duty on sugar was repealed in 1890, Cuba continued to receive the world price in the American market just as she had while the American duty was in effect. But the Hawaiian planters "had now to accept for their sugar the price of the open market, like the planters of Cuba and Java and Brazil. The price of sugar went down sharply in the islands, it is said to have fallen in a single day after the passage of the tariff act from $100 to $60 a ton." Taussig, F. W., **Some Aspects of the Tariff Question**, Cambridge, Mass., 1915, p. 61.

The Protected Markets. The present tariff insures continental cane and beet, and Hawaiian, Philippine, and Porto Rican producers a price 2 cents per pound above the world level. When raw sugar sells as low as one cent per pound, this is an ad valorem duty of 200 per cent. Not all of these interests are prosperous. The production costs of the island producers vary with extensive and intensive cultivation, labor costs, size of plant, and other factors. Domestic sugar beet production costs are generally higher than those of the island producers. In recent years the latter have made profits when the continental United States producers were operating at a loss, but both continental and island producers have developed a high-cost production which could not survive except for the tariff.

While it is the legislative theory that the tariff should equalize costs of production, it is apparent that the demands of producers for protection have little to do with relative costs. In recent years the price of sugar has been below the cost of production. The domestic beet interests, nevertheless, argued in 1930 that Tariff Commission estimates of costs were unreliable, and that the market price was the best measure of Cuban, although not of their own costs. This sophistry was seriously advanced at the Congressional hearings, despite the obvious and well-known fact that world competition was forcing the Cuban industry to sell below cost, and that the Cubans were being forced into bankruptcy, because of these low prices. Only a few small producers were frank enough to admit that they wanted the government to guarantee them a higher price for sugar. The tariff demands of local interests are a function of price, and the adduction of data regarding costs of production is merely a conventional gesture to theory. When prices are below cost of production the domestic interests realize that the tariff does not insure a profitable price, and some of them have consequently asked for a tariff that would guarantee them a price of 6 cents a pound regardless of the world price. Hence a world price of one cent would require a duty of 5 cents, a world price of 2 cents a duty of 4 cents, a world price of 3 cents a duty of 3 cents, etc. Attempts were made to work out a sliding scale on this principle, but were abandoned as impractical. They were also criticised as "price-fixing." These efforts to maintain a definite domestic price, regardless of world fluctuations, show that the domestic producers now realize that the duty merely raises the domestic above the world price, and that if the world price is abnormally low the domestic industry may suffer even with a high tariff. On the other hand, no rate has the same effect on all pro-

ducers, since one which is high enough to protect high-cost firms will give an immense profit to those producing at low cost. A tariff high enough to enable the Michigan beet industry, for instance, to operate at a profit would give Hawaiian, Porto Rican, and Philippine producers enormous returns.

The effect of differing costs of production is best illustrated by the operating statements of domestic beet and island cane sugar producers. In the years when the beet producers lose money the island cane producers make substantial profits. Both receive approximately the same price for their sugar, so that the difference in net profits is wholly due to differences in costs.

The difference in profits and values which has been created almost wholly by the tariff can be noted by comparing the operating statements of Cuban companies with those of Porto Rico, Hawaii, and the Philippines. These will show that while the Cubans were going into bankruptcy, the island producers (with the aid of the 2-cent advantage given them by the tariff) even during the periods of low prices were making substantial profits, or at least breaking even. The higher profits received by island producers have brought more land into cultivation and raised the intensive margin of existing acreage. Prices paid for the better grades of land have increased. In Porto Rico, prior to the present depression, good cane land sold as high as $500 per acre, a price greatly in excess of prime land in the best agricultural sections of the United States. But the result of the tariff is more striking when Porto Rican prices are compared with those prevailing in Cuba. There land of the same fertility and natural advantages, producing the same products for the same markets, sold at about 10 per cent of the Porto Rican price. The difference between $50 and $500 per acre can be explained only by the American tariff, the advantage of which has accrued primarily to landowners. Since, however, land values are now capitalized, the landlord may be a corporation, and the increment in land values can be found only in net profits. Recent history has illustrated the correctness of the original judgment of Professor Frank W. Taussig regarding the incidence of the American tariff. "So long as some fraction of the supply continues to be steadily taxed—so long as dutiable imports persist,—the whole is raised in price by the full amount of the tax or duty. The producer, domestic or foreign as the case may be, gets the benefit of the remission, not the consumer."[3]

The benefits accruing to the domestic beet and cane industry by virtue of the present duty are estimated by Professor Ellis as $53,-

[3] Tausigg, F. W., **Some Aspects of the Tariff Question**, Cambridge, Mass., 1915, p. 60.

525,394 in 1930. Those accruing to the islands, in 1930, $95,860,-345, are divided as follows: Hawaii, $32,236,918; Porto Rico $31,-199,160; the Philippines, $32,181,930; and the Virgin Islands, $242,337.

Cuba. Cuban producers are being ruined not by our tariff but by world competition. If the American tariff were removed, the American price would fall to the world level, and Cuban as well as all other producers would receive not the present elevated price, but the world price. Nevertheless, Cuba has a just grievance against world-wide tariff barriers which have been put up against her. These have tended to increase supply, and especially in the poorer countries to decrease consumer demand. This in turn has tended to depress the world price, a tendency which could not be overcome simply by a change in the American tariff. It is easy to create excess productive capacity by legislation, but not so easy to destroy that capacity in the same way. The American tariff contributes to but is responsible for only a small portion of world overproduction. The tariff and bounty-protected sugar, which 100 countries throw upon the world market, is helping to ruin it. But even if there had been no increase attributable to tariffs and bounties, the new supplies from Java and Cuba itself would still tend to depress world prices. Cuba's advantage in the American market consists of low freight charges, due to her proximity to our refineries. While, therefore, the remission of the American duty to all the world would not materially benefit Cuba, it would deal a telling blow to our continental beet and cane industry and to at least a portion of the industry in Hawaii, Porto Rico, and the Philippines. The Philippines probably could not compete in the American market at all, but would be obliged to sell their sugar in the Orient in direct competition with Java and India. Hawaii would have the choice of competing in the Orient or shipping to the United States. Porto Rico could probably continue to compete in the American market, but would be obliged to cultivate less intensively, or to cease using inferior lands. It cannot be said with any certainty just what changes would occur in the absolute price paid by the consumer, because the world price is abnormally low at the present time, and fails to cover the cost of production in even the most efficient mills. This situation cannot continue permanently, and over a period of years the world price of sugar will probably rise.

In view of these facts, the contention of the domestic industry that the tariff is being absorbed by Cuba is without foundation. To

say that the Cubans themselves "admit" that they are absorbing the duty does not prove that it is so. It must be shown that if the American tariff did not exist Cuba would be getting the present American duty-paid price rather than the world price. The Chadbourne Plan is a recognition of the fact that tariffs, while they have contributed to Cuba's injury, are not the sole cause of her distressed condition.

The Philippines. Such has been the misunderstanding of price relations between the various groups of producers that both the Cubans and the continental American interests have argued, fallaciously, that their condition would be considerably improved were Philippine sales in the American market restricted, or were those islands made independent and their sugar subjected to the duty. They do not seem to realize that in such a case Cuban sugar which now competes in London and, therefore, indirectly with Java and India in the Oriental markets, would be diverted to the closer American market. But the Philippine sugar now coming to the American market would then go to the Orient to take the place of the Cuban sugar. Our continental beet producers can derive little benefit from a restriction of Philippine production, so long as Cuba is still producing sugar for sale in the world market. Of course, if the diversion of Philippine sugar to the world market should compel a curtailment of Philippine production, it would to that extent tend to raise the world price. But even a 50 per cent decrease in Philippine production would decrease world production by only about one per cent, assuming that no other country increased its production to take the Philippine markets. It is, therefore, manifestly absurd for the domestic beet industry to contend that a mere decrease of Philippine production would appreciably affect the domestic price. The American tariff gives the American industry a 2-cent differential above the world price. That differential can neither be increased nor decreased by regulation of Philippine production. If that production is restricted and Cuban imports consequently increase, the price to the consumer will remain approximately the same; but the contribution of the consumer will be paid to the Treasury of the United States instead of to the Philippine producers. This would, of course, be of no benefit to the domestic industry. The desire for restriction of Philippine production has arisen from an entirely false conception of the competitive problem. Nothing short of a correction of world overproduction can remedy the low price now received by both interests. A mere curtailment of Philippine imports would be futile. It would help the United States Treasury to the extent that it injures

the Philippines, but would benefit neither Cuba nor the domestic industry except by the resulting curtailment of world supplies.

The Consumer. The American purchaser of sugar must pay the world price plus the duty. If the duty were abolished the consumer would pay the world price. Would this price be higher or lower than the present world price? The answer to this question is not simple; it requires a prediction of future production and demand. A removal of the American duty would probably decrease the domestic price by a like amount, and both immediately and in the long run give the consumer cheaper sugar. Present world prices are so low that they will probably rise eventually regardless of tariff action. A remission of the duty would probably force into bankruptcy those domestic and island producers who are surviving only by virtue of the tariff. This would decrease world supplies, and tend to raise the price slightly above present levels. The long run effect of the duty is to encourage high-cost production, which tends to maintain the price at a level higher than it would otherwise be, although during the past 10 years this production has also contributed to weakness in sugar prices. The actual cost of the tariff to consumers is, probably, slightly less than the full amount of the duty.

This cost may not be paid wholly by the ultimate consumer. It may be partially absorbed by the manufacturer and processor. The annual burden of the present tariff to the nation is estimated by Professor Ellis as $268,434,133, which is a maximum figure. About 50 per cent of this goes to the domestic sugar beet and the island cane interests, as explained above, and the balance goes into the United States Treasury. Farmers as a class are losers by the sugar duty, and the gain of beet farmers is probably small in view of their alternative opportunities to produce other crops at substantially the same profit. Since, however, the industry has been built around the tariff, it is doubtful that the duty will be removed, no matter how greatly it burdens the nation. It has often been shown that a bounty to domestic beet raisers would be a cheaper and more efficacious aid to them, but it is opposed because of its high visibility, and its cost to the Treasury, which makes it dependent upon public opinion. A tariff, on the other hand, is collected from the consumer, who does not know that he is paying a tax.[4]

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January 1, 1933

[4] Mr. Morton's description of the methods of investigation, primarily of interest to economists and statisticians, is in the Appendix A, page 161.

Chapter I

THE WORLD SUGAR SITUATION

THE sugar industry of the world, as well as that of the United States, has been suffering in recent years from low prices which have been occasioned by the continued production of a world surplus. The sugar situation in the United States, together with the tariff as an element in that situation, cannot be considered entirely apart from conditions obtaining in the industry throughout the world. It is therefore necessary to precede a discussion of the United States tariff policy with reference to sugar by a brief summary and analysis of conditions existing in the sugar industry of the world. This should bring the domestic situation into relief against a background of world conditions and aid in an interpretation of the problem in this country.

World Production and Consumption

A glance at Figure 1 will reveal the fact that sugar is produced in commercial quantities on every continent. Sugar cane is a tropical plant which can be successfully cultivated anywhere between the isotherms of 20° C., both in the Northern and Southern Hemispheres, provided that there is suitable soil and an annual rainfall of from 50 to 65 inches, or that the equivalent of this may be obtained through irrigation. The sugar beet, on the other hand, is suited to the temperate zones and may be produced throughout a wide range of climatic conditions, although the crop reaches large commercial importance at the present time only in regions where the average temperature during the three summer months ranges from about 63° to 73° F.[1]

Growth in World Production

The world production of sugar has increased quite steadily since 1852 when the world crop was estimated at nearly one and one-half million tons exclusive of that grown in British India. Production increased very rapidly just prior to the World War and, though there was some decrease during and immediately after the War, production has continued to gain since that time. (See Table 1.) The world crop, which was above ten million long tons in 1903-04, had risen to over 18 million long tons at the beginning of the World War, and by 1924-25 it had reached nearly 24 million long tons. Each

[1] Finch, V. C., and Baker, O. E., **Geography of the World's Agriculture**, Government Printing Office, Washington, D. C., 1917, p. 71.

The Sugar-Producing Areas of the World

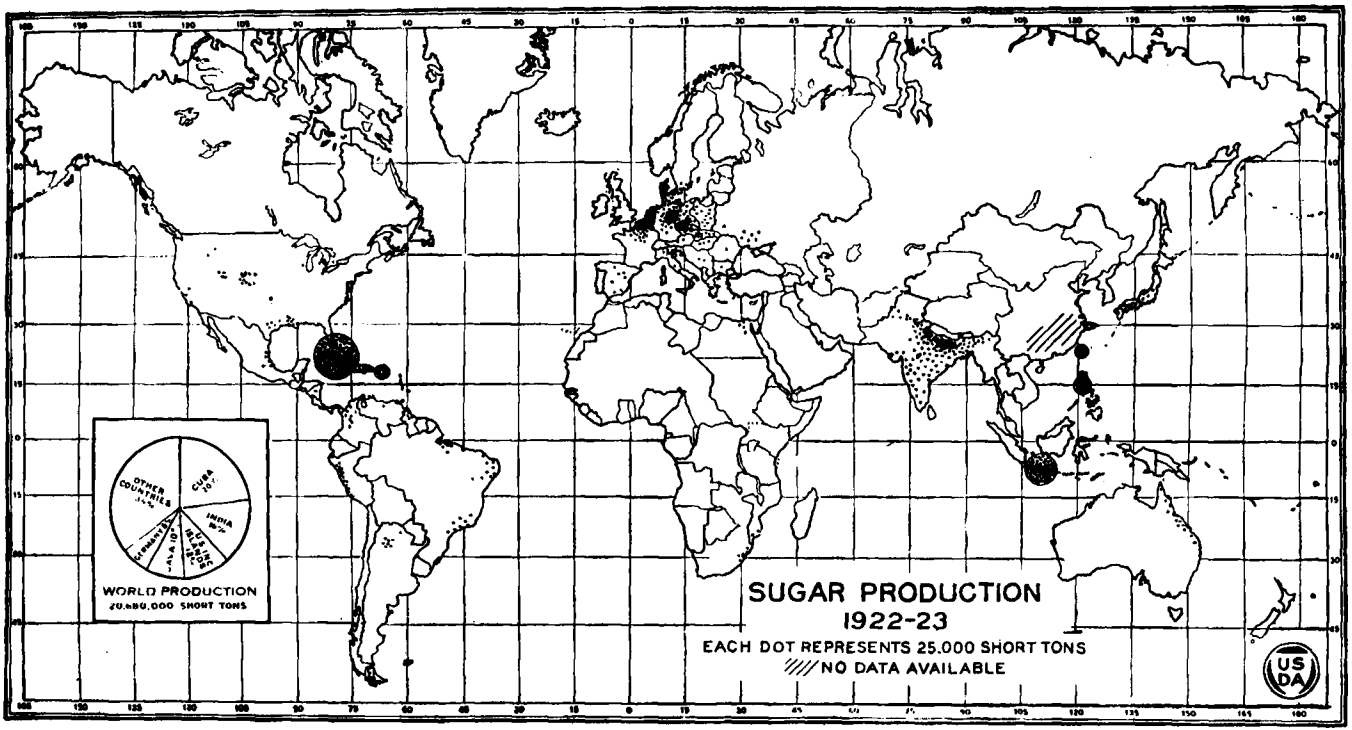

Fig. 1. The sugar crop of the world had increased to about 27,000,000 long tons by 1929-30. During the World War, the production of beet sugar decreased very materially and the production of cane sugar, especially in Cuba and Java, increased rapidly. Production of beet sugar has been on the increase in recent years and accounted for 34 per cent of the sugar crop of the world in 1929-30.

succeeding crop since 1924, with the exception of that of 1926-27, has been larger than the preceding one, and the production in 1928-29 of over 27,554,000 long tons established a new high record. A decrease of nearly 250,000 long tons in the world crop occurred in 1929-30, but recent estimates place the 1930-31 crop at more than 1,200,000 long tons greater than the previous crop. In view of the fact that the stocks of sugar on hand in the principal countries of the world December 1, 1930, were over one million tons greater than on December 1 of the previous year, the outlook for the sugar producers during the 1930-31 season is anything but encouraging, in spite of the efforts which are being made to control the situation artificially.

Consumption Increasing Steadily

At the same time that this enormous growth has been taking place in the sugar crop of the world, the consumption of sugar has been increasing steadily. The real cause of the sugar crisis which has existed for the past few years is the fact that the increase in production has developed more rapidly than the increase in consumption. Observations extending over the past 100 years show that the total world consumption of sugar has increased by about 3 per cent annually. It has been calculated that since 1923-24 the world consumption of sugar has increased at an average rate of 4½ per cent annually.[2] In the United States, alone, observations over the past 108 years show that consumption has made an average annual increase of a little more than 5 per cent. This unusual increase in consumption makes up, in very large measure at least, for the reduced consumption in most parts of the world during the World War and the years immediately following.

It has been estimated that for the nine-year period, 1920-21 to 1928-29, there has been a surplus of about 3,500,000 tons, all of which has accumulated since 1923-24, as there was an actual shortage in 1921-22 and 1922-23.[3]

[2] Mikusch, Dr. Gustav, **Memorandum on Sugar**, prepared for the Economic Committee of the League of Nations, Official No. : C.148.M.57. 1929. II, p. 48.

[3] World Sugar Surplus, 1920-1929 (Thousands of long tons)

Year	Production	Consumption	Surplus	Shortage
Total	170,475	166,949	5,435	1,909
1920-21[a]	14,292	13,330	962	——
1921-22[a]	14,962	16,059	——	1,097
1922-23	14,944	15,319	——	375
1923-24	16,196	16,065	131	——
1924-25	21,283	19,340	1,943	——
1925-26	21,501	20,572	929	——
1926-27	20,743	21,180	——	437
1927-28	22,554	22,084	470	——
1928-29	24,000	23,000	1,000	——

[a] Figures for Russia and British India not included. Data for all other years include these two countries.

Source: Geerligs, Dr. H. C. Prinsen, "Sugar Output, Consumption, Surplus and Shortage in the Various Continents Since 1920," **The Planter and Sugar Manufacturer**, March 16, 1929, pp. 201-202.

TABLE 1

Sugar Crops of the World, 1904-1932

(Chiefly raw sugar in thousands of long tons)

Crop year[a]	World production of sugar			Per cent of total	
	Total	Cane	Beet	Cane	Beet
1903-04	10,457	4,367	6,090	41.76	58.24
1904-05	9,535	4,612	4,923	48.37	51.63
1905-06	13,973	6,756	7,217	48.35	51.65
1906-07	14,631	7,487	7,144	51.17	48.83
1907-08	13,867	6,895	6,972	49.72	50.28
5 yr. av.	12,492	6,023	6,469	48.21	51.79
1908-09	14,315	7,385	6,390	51.59	48.41
1909-10	14,955	8,367	6,588	55.95	44.05
1910-11	17,139	8,579	8,560	50.06	49.94
1911-12	16,000	9,111	6,889	56.94	43.06
1912-13	18,149	9,230	8,919	50.86	49.14
5 yr. av.	16,111	8,534	7,577	52.97	47.03
1913-14	18,467	9,832	8,635	53.24	46.76
1914-15	18,379	10,072	8,307	54.80	45.20
1915-16	17,267	11,012	6,255	63.77	36.23
1916-17	17,287	11,514	5,773	66.60	33.40
1917-18	17,352	12,337	5,015	71.10	28.90
5 yr. av.	17,750	10,953	6,797	61.71	38.29
1918-19	15,384	11,501	3,883	74.76	25.24
1919-20	15,674	12,400	3,274	79.11	20.89
1920-21	16,794	12,085	4,709	71.96	28.04
1921-22	17,747	12,807	4,940	72.16	27.84
1922-23	18,384	13,182	5,202	71.70	28.30
5 yr. av.	16,797	12,395	4,402	73.79	26.21
1923-24	20,302	14,440	5,862	71.13	28.87
1924-25	23,989	15,895	8,094	66.26	33.74
1925-26	24,327	16,037	8,290	65.92	34.08
1926-27	24,117	16,412	7,705	68.05	31.95
1927-28	26,080	17,056	9,024	65.40	34.60
5 yr. av.	23,763	15,968	7,795	67.20	32.80
1928-29	27,535	18,098	9,437	65.73	34.27
1929-30	27,321	18,164	9,157	66.48	33.52
1930-31	28,765	17,111	11,654	59.49	40.51
1931-32	26,173	17,285	8,888	66.04	33.96

[a] The crop year varies in different countries. See Table 28, page 95 for the harvesting periods in the chief sugar-producing countries of the world.

Source: Actual amounts are from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. Data for the years 1922-23 to 1928-29 are from the issue of April 6, 1931, p. 189. Data for the years 1929-30 to 1931-32 are the latest estimates published in the issue of June 16, 1932, p. 286.

Note: The data in this table are Willett and Gray's latest estimates adjusted to cover the change in the Java crop year suggested because of certain regulations under the Chadbourne Plan.

With a reduced crop in prospect for 1929-30, it was reasonable to expect that the industry was on the road to recovery. Prices were so low that an increase in consumption also might have been expected. Nevertheless consumption of refined sugar in the United States alone decreased over 200,000 long tons in 1930. (See Table 45, page 147.) It appears that decreased world consumption during that year just about counterbalanced the decrease in the world crop.

It should be emphasized, however, that the world sugar crisis has been caused by the production of a surplus and not by any slackening in consumption which, on the contrary, has been steadily increasing in spite of a temporary setback during the War. A return of prosperous conditions to the sugar industry of the world is dependent upon holding production down to its present level, thus giving consumption an opportunity of coming more nearly into equilibrium with production.

The Trend in Cane and Beet Sugar Production

The history of the sugar industry reveals a continuous struggle between the producers of sugar cane and of sugar beets. The two groups have never acted in unison, but the beet interests were able on at least one occasion, at the time of the Brussels Convention of 1902, to act in such a manner. In 1852, beet sugar accounted for about 14 per cent of the world's total supply, and during the first four years of the twentieth century, for around 60 per cent. From

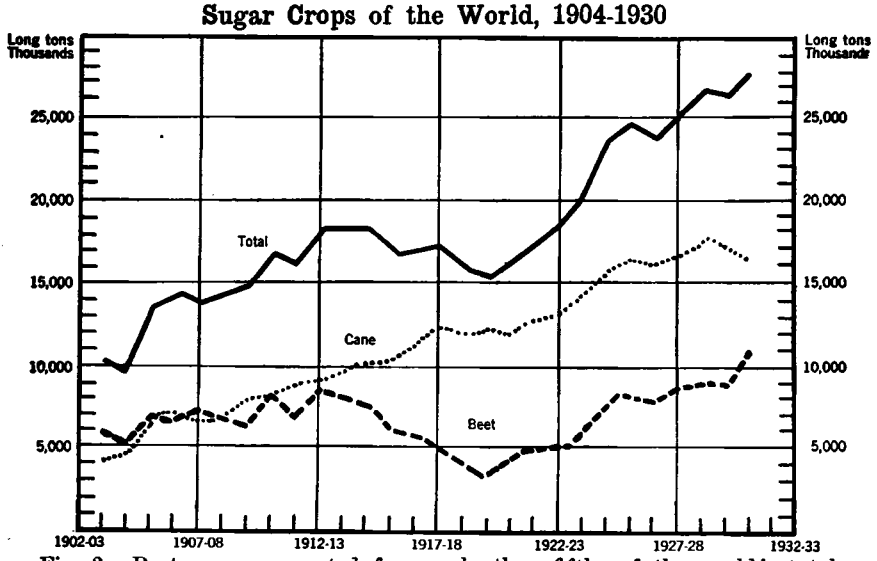

Fig. 2. Beet sugar accounted for nearly three-fifths of the world's total supply in the opening years of the twentieth century; for less than one-half at the beginning of the World War; and in 1930, for about one-third.

then until the beginning of the World War, beet sugar constituted less than 50 per cent of the world's sugar crop. Beet sugar production declined during the War, reaching the low point in 1919-20, when it accounted for only 21 per cent of the world's supply. Today, about one-third of the world's total supply is beet sugar. (See Table 1 and Figures 2 and 3.)

Chief Sugar-Producing Countries of the World, 1926-1930

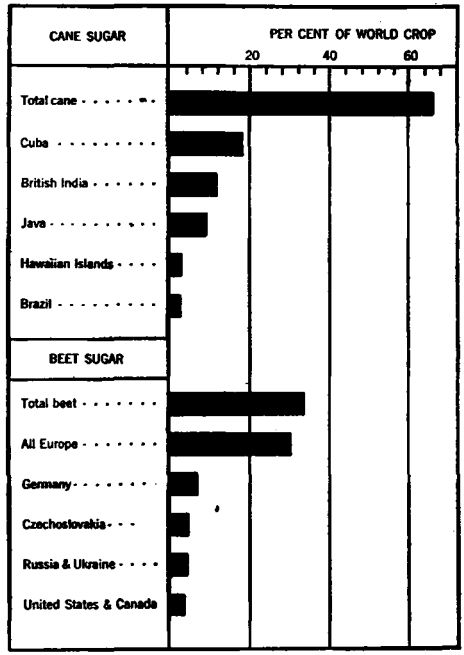

Fig. 3. On an average during the five crop seasons, 1925-26 to 1929-30, beet sugar accounted for approximately 34 per cent of the total world crop. European beet sugar alone accounted for over 30 per cent of the total sugar crop of the world during this period.

The Brussels Convention, a Stimulus to the Cane Industry

This decline in the relative importance of beet as compared with cane sugar has not, however, involved an absolute reduction in production except temporarily during and shortly after the World War. The total world production of beet sugar of 9,437,000 long tons in 1928-29, or the slightly smaller crop of 1929-30, exceeded the previous maximum of about nine million long tons reached just prior to the War. During the period 1895-96 to 1901-02, just preceding the Brussels Convention of 1902,[4] the production of beet sugar increased very materially, but after 1903 the output increased very slowly. The production of cane sugar, on the other hand, increased rather rapidly and by 1908-

[4] From 1830 to the time of the Brussels Convention, a complex system of disguised as well as open bounties, designed for the purpose of encouraging the beet industry, came into being in the various continental countries. A conference of representatives of the leading European countries was called by the Belgian Government in 1898, but this convention failed to accomplish anything of a definite nature. Another conference was held in December, 1901, in Brussels, and it, too, seemed doomed to failure until the British Government declared it would take steps either to prohibit bounty-fed sugar altogether, or take other measures against such sugar. This stand on the part of Great Britain put an end to all opposition, and the articles of the Convention were signed by the representatives of Germany, Austria, Belgium, Spain, France, Great Britain, Italy, The Netherlands, Sweden, and Norway on March 5, 1902. In general, these nations agreed to abolish all direct and indirect bounties on the production or exportation of sugar, and not to grant any new ones during the term of the Convention. The Convention went into force September 1, 1903, for a term of five years. It was amended in certain particulars in 1908 and 1913 when the first and second five-year periods expired. The French Government withdrew in August, 1917, and in 1918 the British Government did likewise. The Belgian Government then proposed to the other nations that the Convention should cease to have effect, and it was brought to an end September 1, 1920.

09 had very definitely passed beet sugar. Some idea of what the signing of the articles proposed by the International Convention relative to bounties on sugar meant to the cane-sugar industry can be gained from the following passage:

"But people [those interested in the cane industry] were set at ease after the Convention had come into force, and they were certain that the European powers had abolished all their bounty systems, and did not entertain the slightest wish to re-introduce them. Everywhere factories were re-installed and new enterprises set on foot, so that from 1st of September, 1903, a new period began for the cane sugar industry."[5]

Effect of World War on Production

In 1908-09, beet sugar accounted for nearly 59 per cent of the annual sugar supply of the world. The relative production of beet and cane sugar was not materially changed until the beginning of the World War when the production of beet sugar dropped very rapidly. The decline continued at a very rapid rate until 1919-20 when but 3,274,000 long tons of beet sugar, amounting to a trifle more than 21 per cent of the world's production, were produced. This great decline in the production of beet sugar, from nearly nine million long tons in 1912-13 to less than three and one-third million long tons in 1919-20, took place almost wholly in European countries where production had been interfered with by the activities growing out of the War. In 1912-13, the European beet-sugar crop furnished over 45 per cent of the world's total supply and in 1919-20, less than 17 per cent, or a decline of slightly more than two and one-half million long tons. (See Table 2.) By 1928-29, the European output of beet sugar again reached the high level of production attained in 1912-13. In the previous year, 1927-28, the beet-sugar production of the world passed its former record which had been attained in 1912-13.

During all of this period the beet-sugar industry has been protected by rather liberal tariffs. Table 3 gives the customs duties on raw and refined sugar in countries producing beet sugar. Many of the countries enacted rate revisions in 1929 and 1930, a large proportion of which were upward. This indicates the almost universal belief of producers that increased tariff rates are a cure for low prices.

Possible Expansion of Production

There are vast areas throughout the world, particularly in Europe and the United States, where the acreage devoted to the

[5] Geerligs, Dr. H. C. Prinsen, **The World's Cane Sugar Industry, Past and Present, Manchester, England, 1912, p. 37.**

TABLE 2

Sugar Crops of the Chief Producing Areas of the World 1903-04 to 1931-32

(Chiefly raw sugar in thousands of long tons)

Year[a]	World	Cuba	Java	Europe	Per cent of world crop		
					Cuba	Java	Europe
1903-04	10,457	1,040	1,009	5,881	9.95	9.65	56.24
1904-05	9,535	1,163	991	4,713	12.20	10.39	49.43
1905-06	13,973	1,179	1,012	6,934	8.44	7.24	49.62
1906-07	14,631	1,428	1,156	6,711	9.76	7.90	45.87
1907-08	13,867	962	1,155	6,532	6.94	8.33	47.10
1908-09	14,315	1,250	1,201	6,490	8.73	8.39	45.34
1909-10	14,955	1,804	1,229	6,137	12.06	8.22	41.04
1910-11	17,139	1,483	1,395	8,105	8.65	8.14	47.29
1911-12	16,000	1,896	1,331	6,339	11.85	8.32	39.62
1912-13	18,149	2,429	1,272	8,283	13.38	7.01	45.64
1913-14	18,467	2,598	1,303	7,968	14.07	7.06	43.15
1914-15	18,379	2,593	1,199	7,646	14.11	6.52	41.60
1915-16	17,267	3,008	1,596	5,457	17.42	9.24	31.60
1916-17	17,287	3,024	1,778	5,026	17.49	10.29	29.07
1917-18	17,352	3,446	1,749	4,321	19.86	10.08	24.90
1918-19	15,384	3,972	1,336	3,186	25.82	8.68	20.71
1919-20	15,674	3,730	1,509	2,604	23.80	9.63	16.61
1920-21	16,794	3,936	1,650	3,705	23.44	9.82	22.06
1921-22	17,747	3,996	1,747	4,010	22.52	9.84	22.60
1922-23	18,384	3,603	1,772	4,574	19.60	9.64	24.88
1923-24	20,302	4,067	1,977	5,058	20.03	9.74	24.91
1924-25	23,989	5,126	2,279	7,083	21.37	9.50	29.53
1925-26	24,327	4,885	1,991	7,453	20.08	8.18	30.64
1926-27	24,117	4,505[b]	2,360	6,872	18.68	9.79	28.49
1927-28	26,080	4,012[c]	2,939	8,032	15.38	11.27	30.80
1928-29	27,535	5,156	2,895	8,469	18.71	10.50	30.73
1929-30	27,321	4,671	2,923	8,227	17.10	10.70	30.11
1930-31	28,765	3,122[c]	2,799	10,537	10.85	9.73	36.63
1931-32	26,173	2,600[d]	2,411	7,814	9.93	9.21	29.86

[a] The crop year varies in different countries. See Table 28, page 95 for the harvesting periods in the chief sugar-producing countries of the world.

[b] 1926-27 Cuban crop limited to 4,500,000 tons by a decree signed December 10, 1926, by President Machado.

[c] 1927-28 Cuban crop limited to 4,000,000 tons by Presidential decree.

[d] Under international agreement.

Source: Actual amounts are from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. Data for the years 1922-23 to 1928-29 are from the issue of April 6, 1931, p. 189. Data for the years 1929-30 to 1931-32 are the latest estimates published in the issue of June 16, 1932, p. 286.

Note: The data in this table are Willett and Gray's latest estimates adjusted to cover the change in the Java crop year suggested because of certain regulations under the Chadbourne Plan.

production of sugar beets could be greatly expanded. That such an expansion of acreage will take place is extremely problematical because the natural advantages enjoyed in the production of sugar cane make it possible for cane sugar to replace beet sugar in many of the markets of the world.[6] Governments may, however, choose for various reasons to protect their beet industries by protective tariffs, bounties, or other forms of subsidies, in which case it will be possible for the beet industry to continue at its present level, or even expand, depending upon the amount of protection received. Very substantial protection is now provided by practically all countries where beets are produced. (See Table 3.)

The production of cane sugar has increased steadily since 1903, and data presented in Figure 2 and Table 1 indicate that the very apparent competitive superiority of cane sugar is not a phenomenon of the post-war years only. It began to make itself felt around 1900 as a result of improved methods of cultivation, the scientific selection of varieties of cane suitable for the varying conditions found in the

TABLE 3

Import Duties on Raw and Refined Sugar in Countries Producing Beet Sugar

(Cents per pound at average exchange rates for October, 1930)

Country	96° centrifugal or equivalent	100° refined or equivalent	Country	96° centrifugal or equivalent	100° refined or equivalent
Greece	6.14	6.14	Rumania	2.41	5.35
Spain	5.29	5.29	Irish Free State	2.20	2.53
Czechoslovakia	4.55	4.55	Italy	2.09	3.14
Austria	3.97	4.79	United States (Cuban rate)	2.00	2.12
Turkey	3.84	5.80			
Hungary	3.32	3.32	Jugoslavia	1.77	2.65
Norway	3.09	3.09	Great Britain	1.76	2.53
Germany	2.92	3.46	Canada	1.29	1.89
			Belgium	1.01	1.01
Finland	2.86	2.86			
Bulgaria	2.61	3.59	Sweden	0.85	1.22
Poland	2.54	3.05	Denmark	0.72	1.21
United States (full rate)	2.50	2.65	Switzerland	0.02	0.62
France	2.43	2.49	Netherlands	free	0.44
			Soviet Russia	80% ad. val.	150% ad. val.

Source: Compiled from various sources. **Duties given are exclusive of excise, consumption, sales, or other internal taxes which are also applied to domestic sugar.**

[6] Data prepared by Messrs. F. O. Licht for the Economic Committee of the League of Nations indicate that, on the average, about 100 per cent more cane than beet sugar is produced per unit of area. Many costs such as labor, land and taxes are generally higher in beet-producing areas as compared with cane-producing areas. (See Licht, Messrs. F. O., **Memorandum on The World Production of Beet Sugar and its Prospects**, prepared for the Economic Committee of the League of Nations, Geneva, April 15, 1929. Official No.: C.148.M.57. 1929. II, p. 24.)

widely scattered areas of production,[7] and the removal of excessive subsidies by the European nations as a result of the Brussels Convention of 1902, mentioned above. The fact that the production of cane sugar more than doubled in the ten years after the Brussels Convention, while the production of beet sugar increased by less than 50 per cent during the same period, is strong evidence that the producers of cane are favored by very real natural advantages. These natural advantages are a longer growing period, cheaper labor available in most of the cane regions, and greater production per acre, all of which tend to reduce the cost of production.

All of the cane-producing countries of the world, except the United States, the Virgin Islands, the French West Indies, and Spain, have increased their output very materially since 1912-13. About 50 per cent of the increase in cane production since the pre-war years, however, can be accounted for by the increased production in Cuba and Java alone. (See Table 2.)

Influence of Protective Measures

Governmental protective measures have played an important role in the trend of production of cane sugar. Most cane-producing countries have tariffs against the importation of sugar (See Table 4), but for the most part these tariffs are unimportant since, with few exceptions, the home markets in these countries are comparatively small. Of far greater importance is the treatment received by these exporting countries in their overseas markets. Porto Rico, Hawaii, the Virgin Islands, and the Philippine Islands are fully within the tariff wall of the United States. and the sugar from these islands has free access to the markets in this country while Cuba is granted a 20 per cent preference. Sugar produced within the British Empire is granted preferential treatment by Canada and Great Britain. Portugal grants a preference to her colonies, while France and Japan exempt their colonies and protectorates from all tariff obligations. Java, due to her favored location with reference to India and to the preferential treatment of Philippine sugar by the United States, has what amounts to a preferential entrance into the Indian market, which normally absorbs a large proportion of the exportable surplus

[7] A striking example is the development of the high-yielding P.O.J. (Pasoeroean Ost Java) canes which are giving such remarkable results. Production of sugar in Java has steadily increased from 965 quintals of cane per hectare, yielding an average of 97.1 quintals of head-sugar, in 1919, to 1,319 quintals of cane per hectare, yielding an average of 151.3 quintals of head-sugar, in 1928. The sugar content of the beets has been increased from about 5 or 6 per cent at the beginning of the nineteenth century to as high as 20 per cent at the present time. The average sucrose content of the beets delivered to factories in the United States in 1927 and 1928 was over 16 per cent and in 1929 nearly 16 per cent. (See Ruegg, S. G., "Java's Development in Cane Sugar Production," **The Planter and Sugar Manufacturer, August 31, 1929.)**

of Java.[8] The production in all of these countries with preferential entrance into various markets of the world has increased tremendously during the past several years.

That the world production of cane sugar will continue to increase seems to be assured. This could very well happen without an increase in the area planted, for practically all cane-producing areas still lag far behind Java in production per unit of area. But there are still vast areas of tropical lands suitable for the growing of sugar cane which can be developed when economic conditions are suitable and the world is in need of more sugar than can be produced profitably on the present area. The trend in cane-sugar production might conceivably be greatly altered by a change in the policies of governments which now grant preferences to the importation of cane sugar from certain areas. For example, if for some reason the Philippine Islands found themselves outside the tariff wall of the United States, it is quite possible that their production would fall very materially until readjustment to new markets had been accomplished. This process might take several years. Likewise, the removal of the Cuban preferential of 20 per cent might have a decided effect upon production in that island. Whatever direction such policies may take it seems

TABLE 4

Import Duties on Raw and Refined Sugar in Countries Producing Cane Sugar

(Cents per pound at average exchange rates for October, 1930)

Country	96° centrifugal or equivalent	100° refined or equivalent	Country	96° centrifugal or equivalent	100° refined or equivalent
Brazil	16.68	16.68	Australia	2.02	2.02
Salvador	15.88	15.88	United States (Cuban rate)	2.00	2.12
Venezuela	10.28	10.28	Nicaragua	1.84	1.84
Peru	6.59	6.59	British India	1.77	1.93
Spain	5.29	5.29			
Honduras	4.82	4.82	Costa Rica	1.73	6.94
Mexico	3.94	3.94	Japan	1.48	1.99
Guatemala	2.72	6.80	Colombia	1.32	2.21
			Dominican Republic	0.91	1.25
Paraguay	2.63	3.28			
United States (full rate)	2.50	2.65	Chile	0.61	1.48
Argentina	2.13	2.92	China	0.42	0.42
Uruguay	2.09	2.48	Cuba	0.40	0.37

Source: Compiled from various sources. Duties given are exclusive of excise, consumption, sales, or other internal taxes which are also applied to domestic sugar.

[8] According to C. Czarnikow, Ltd., **Weekly Price Current**, London, Java exported 847,000 tons of sugar to British India in 1927-28 out of a total of 2,102,400 tons exported that year. The previous year, she exported 803,800 tons to India out of a total of 1,717,900 tons.

clear that an ever-increasing amount of the sugar supply of the world will be furnished by cane produced in tropical areas.[9]

The World Movement of Sugar

The great bulk of sugar entering foreign commerce moves north and west from Java and north and east from Cuba, the two largest sugar-exporting regions of the world. During the past three years, Java has sent over 40 per cent of her exportable surplus to India. Her secondary markets in order of importance have been Japan, China, Hongkong, United Kingdom and Europe, and Egypt. The great bulk of Cuban exports finds its way into the United States.[10] This is due chiefly to the 20 per cent preferential granted to Cuba by the United States and the proximity of this large consuming center. The United States supplements the supply received from Cuba and that produced at home by importations from Hawaii, the Philippine Islands, Porto Rico, and the Virgin Islands. Practically all of the Hawaiian sugar is imported at San Francisco, while most of the Philippine sugar is shipped to Atlantic ports by way of the Panama Canal.[11] The chief remaining exporting countries are Czechoslovakia, Formosa, Brazil, and Peru. A glance at Figure 4 will show how the sugar from these various surplus-producing areas is moving largely into the great consuming centers found in the United States and Canada, the United Kingdom and various continental countries, India, China, and Japan.

The change in the relative position of beet and cane sugar in the world's production has, of course, had an effect upon the usual movement of sugar in international trade which existed just prior to

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[9] Writing on the prospects of increased production of cane sugar, Dr. Geerligs has the following to say:

"It has repeatedly been stated that Cuba or Java or Formosa had reached its peak of production and could never pass the level at which it stood when the opinion was uttered; but in every case the output subsequently rose far above the maximum mentioned. We shall therefore refrain from offering any forecast.

"The possibility of an unlimited expansion for some time to come cannot be regarded as wholly non-existent. In Cuba, the Argentine, India, the Philippines, Queensland, Natal, China, Africa, Brazil, and elsewhere, plenty of land suitable for cane-planting is still available.

"In many countries the sugar yield per unit of area is still so much lower than it might be that an immense increase could be secured by improving the variety of cane, planting equipment, methods of cultivation, manuring, manufacture, etc.

"If in a country like Java, where the cane-sugar industry is already very highly developed, it is possible in the space of a few years to increase by 30 per cent the sugar yield of a given area, the potentialities of countries where efficiency is not yet so high are incalculable."

Geerligs, Dr. H. C. Prinsen, **Memorandum on the Production of Cane Sugar**, prepared for the Economic Committee of the League of Nations, Geneva, April 15, 1929. Official No. : C. 148.M.57. 1929. II, p. 16.

[10] During the period 1923 to 1929, an average of 78.7 per cent of Cuban exports of raw sugar came to the United States. In 1928-29, about 77 per cent of Cuban exports came to the United States, while approximately 21 per cent went to the United Kingdom and the continent of Europe.

[11] The proportion of the Philippine exports shipped to the United States has rapidly increased from 34 per cent in 1917 to 92 per cent in 1927.

The Movement of Sugar in International Trade

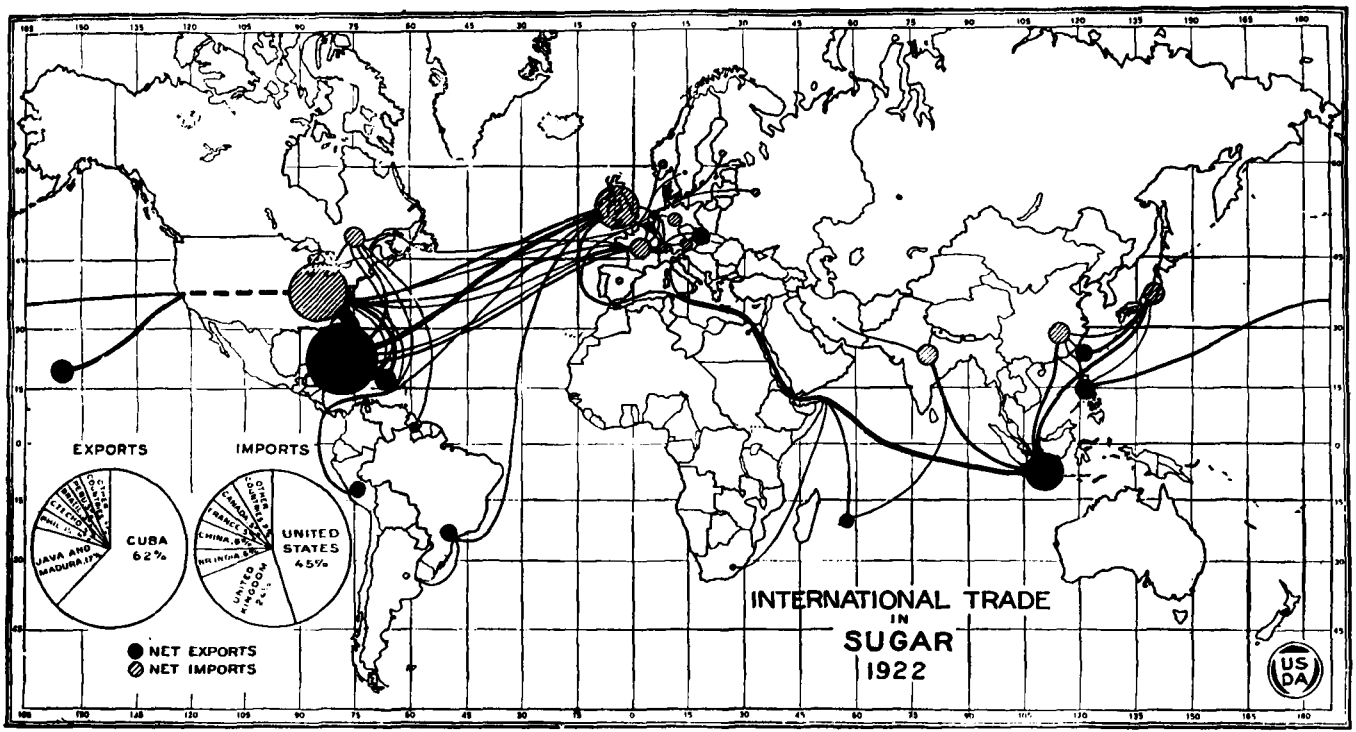

Fig. 4. The great bulk of the sugar moving in international trade moves north and west from Java, and north and east from Cuba, the two leading surplus-producing countries. Secondary sources of supply are Hawaii, the Philippine Islands, Porto Rico, Czechoslovakia, Formosa, Brazil, and Peru. The United States and Canada, the United Kingdom, and western Europe, India, China, and Japan are the chief sugar-importing countries.

the World War. Since Europe had relied so largely upon beet sugar to supply her needs, the sudden change to a cane-sugar basis found the importing countries of Europe lacking in adequate facilities for the refining of the raw product from cane. From 1914 to 1922, and even later, much of the cane sugar destined for European consumption was refined in the United States. Table 5 shows how the refined sugar exports from the United States increased from an average of nearly 38,000 short tons in the period 1909-13 to an average of about 645,000 tons in the years 1919 to 1922. Exports of refined sugar from the United States declined again after 1922 as European beet production began to recover from the effects of the War.

The Trend of Prices and the Sugar Crisis

We have seen that the production of cane sugar has increased 46 per cent during the past decade, stimulated first by the increased prices due largely to the War and secondly by a consequent reduction in the production of beet sugar. The preference given most cane sugar in various markets of the world has been a more or less constant stimulus to production,[12] while the increased efficiency in the production of cane has been of tremendous importance in increasing the output, especially since 1923-24. The production of beet sugar declined from the beginning of the War to 1919-20, but, due partly to the higher prices prevailing between 1919 and 1924 and partly to

TABLE 5

Exports of Refined Sugar from the United States, 1910-1930

(Short tons)

Year	Total	To United Kingdom	Year	Total	To United Kingdom
1910	62,726	51,071	1920	462,098	132,134
1911	27,474	13,735	1921	466,896	181,966
1912	39,797	26,620	1922	918,361	292,852
1913	21,997	253	1923	222,458	99,343
1914	25,448	757	1924	220,243	61,936
1915	274,504	132,422	1925	379,358	187,193
1916	810,075	466,229	1926	106,893	13,399
1917	624,454	99,357	1927	125,323	50,521
1918	288,242	38,856	1928	122,587	28,194
1919	737,704	212,585	1929	102,639	23,952
			1930	77,814	24,057

Source: U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, **Foreign Commerce and Navigation of the United States.**

[12] Mikusch, Dr. Gustav, Memorandum in No. 5 of the **Listz Cukrwarincke and the Czechoslovak Sugar Industry Review**, 1928. In this article, Dr. Mikusch comes to the conclusion that more than three-quarters of the sugar production of the world is consumed in countries where it is either protected by an import duty or enjoys a preference over sugar of other origin. He further concludes that about one-half of the remaining one-quarter is consigned to markets where it in fact enjoys a preference over other sugar, due to favored location or other cause.

a recovery from the disturbances caused by the War, as well as to the breakdown of the Brussels Convention, the amount of beet sugar placed on the world markets steadily increased after 1920. By 1927-28 the pre-war level of production had been reached.

This simultaneous expansion of both beet and cane sugar production resulted in a surplus (see Note 3 above) in spite of the fact that consumption had continued to increase. A very material decline in prices followed (see Table 6) and created what may very properly be called a crisis in the sugar industry. The whole situation was summed up by the Economic Committee of the League of Nations in the following manner:

"The subsidies, the bounties, the protective and the preferential duties or geographical advantages under which seven-eighths of the world sugar supply is produced or marketed have stimulated local production, have diverted and twisted the channels of trade, have built a pyramid of differential prices, but collectively they have done nothing to restrain the forces which are adversely affecting the industry as a whole."[13]

Thus the very measures which were intended to aid the industry and which may have helped it locally for a time, have been instrumental in creating a world sugar crisis. Under conditions of rapidly increasing consumption that have obtained during the past few years, one might reasonably have expected a period of prosperity. As a matter of fact, sugar is being sold below cost of production in many regions of the world.[14]

TABLE 6

Average Annual Price of Raw Cuban Sugar, c & f., New York and c. i. f., London, 1921-1930

(Cents per pound, 96° centrifugal)

Year	c. & f., New York[1]	c. i. f., London[2]	Year	c. & f., New York[1]	c. i. f., London[2]
1921	3.46	3.62	1926	2.59	2.70
1922	3.00	3.09	1927	2.96	2.98
1923	5.22	5.33	1928	2.45	2.51
1924	4.17	4.27	1929	1.98	1.97
1925	2.56	2.65	1930	1.49	1.43
			1931	1.33	1.25

Sources: [1] Average of weekly prices quoted in Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. [2] Average of weekly prices from C. Czarnikow, Ltd., **Weekly Price Current**, London. The London quotations were converted to cents per pound at the current weekly rate of exchange as quoted by C. Czarnikow, Ltd.

[13] **Report by the Economic Committee of the League of Nations, The World Sugar Situation**, Geneva, 1929, Official No. : C. 303.M. 104. 1929. II. p. 11.

[14] **For costs of production in Hawaii, Porto Rico, Cuba and the United States see Sugar**, a report of the United States Tariff Commission to the President, Washington, D. C., 1926, pp. 16-19. Similar figures for the Philippine Islands and Java may be secured from Official No. : C.148.M.57. 1929. II. League of **Nations, Geneva, April 15, 1929, pp. 9-10.**

Possible Remedies

The problem now before the sugar industry is that of finding and applying a remedy for the ills which have become almost chronic. The end sought is a balance between the amount of sugar being produced throughout the world and the amount of sugar that will be consumed. Three types of more or less concerted action on the part of those interested in the trade may improve the situation: (1) an attempt could be made to stabilize the output of sugar at its present level until consumption catches up with production, (2) production might be restricted in order to bring it into balance with consumption more quickly, (3) ways to increase consumption might be found.

There have been some efforts in the direction of restricting output and in other ways attempting to force world sugar prices to higher levels. Mention has already been made of the Brussels Convention which resulted in an agreement among European countries producing sugar beets. (See Note 4, page 28.) The contracting countries bound themselves to abolish all direct and indirect bounties on the production or exportation of sugar, and not to grant any new ones during the term of the Convention. The real effectiveness of the plan ended in 1917 when France withdrew. It should be remembered that this agreement concerned a group of countries which, at the time of its formation in 1902, produced over 50 per cent of the world's crop of sugar. In 1920, when the Convention was brought to an end, Europe was furnishing about 22 per cent of the sugar crop of the world.

Cuban Efforts at Control

Cuba attempted to influence price by limiting her own production, and when that failed attempted to gain the same end by a control over exports to her chief market, the United States. With a breakdown of the second attempt to raise prices, Cuba has taken the lead in a new movement to control production in all of the chief sugar-producing countries of the world.

The Cuban crop of sugar was limited by Presidential decree in 1926-27 to 4,500,000 long tons, and the following season to 4,000,000 long tons. The actual output of the Cuban sugar mills during these two seasons was within a comparatively few thousand tons of the amount set by decree. World production decreased by nearly 900,000 long tons the first year of Cuban restriction, but the next year increased by about 1,500,000 long tons, which brought the world total to some 700,000 long tons above that of the year preceding

governmental action in Cuba. In 1928-29, when Cuban restriction was removed, the world crop again increased by some 1,400,000 long tons compared with the previous crop. It is very apparent that the limitation of production, even on the part of a major producer of sugar, is no guarantee that the world crop will be limited by anything like a similar amount. In this particular case, regulation of production in Cuba seems to have acted as a stimulus to production in other sugar-producing countries.

Cuba's next attempt at price control was the organization of the Cooperative Sugar Export Agency, Inc., which started operations September 1, 1929, and continued to April 14, 1930, when it was voted out by the producers.[15] It soon developed that it was useless for one country only to attempt to control the price situation by regulating the marketing of her crop. While it appeared for a time that Cuba had gained an advantage in the market, the world price of sugar continued to decline and stocks of sugar larger than usual accumulated in Cuba. Refiners in the United States were buying just as much sugar as possible from sources other than Cuba.

Cuba has now taken the lead in a movement to bring about concerted action on the part of the chief sugar-producing countries of the world.[16] Seven countries, which have produced nearly 44 per cent of the annual sugar production of the world during the past five years, have entered an agreement whereby their exports are to be limited to stipulated quotas for a period of five years. Even though the seven countries concerned account for about 70 per cent of the sugar entering international trade, it should be remembered that there are many countries that stand ready to increase their production at the first sign of an improvement in price. Potential resources of land and labor are readily available in some of these countries and it is more than likely that the necessary capital would be forthcoming with an increase in price. The mere extensiveness of the industry, scattered as it is among some 60 nations in all parts of the world, the great diversity of conditions under which it is carried on, and the many different peoples affected, make concerted action on the part of any great number of them very difficult. It should be recognized, however, that the Chadbourne Plan contains provisions designed to prevent a rapid recovery of prices, and to allow for increased exports by the parties to the agreement in case of certain

[15] The Cooperative Sugar Export Agency, Inc., of Cuba was organized in accordance with a decree signed by President Machado, July 26, 1929, for the purpose of controlling the marketing of Cuban sugar. (See Appendix B, page 174.)

[16] The Chadbourne Committee, Thomas L. Chadbourne, chairman, was organized early in August, 1930, for the purpose of holding international meetings to discuss the world sugar situation, and to work out a plan for the stabilization of the industry throughout the world. The Chadbourne Agreement, which is to remain in force until September 1, 1935, was signed in Brussels, May 9, 1931, by representatives of Cuba, Java, Czechoslovakia, Germany, Poland, Belgium, and Hungary. (See Appendix C, page 176, for details of the plan.)

specific increases in price. These provisions will tend to hold prices at relatively low levels and check expansion in countries not parties to the agreement.

The Increase of Consumption

It is evident that there is room for real progress to be made in increasing the consumption of sugar. Table 7 shows some of the possibilities which lie in that direction. There are only seven countries where the per capita consumption has reached 90 or more pounds, while the average for all the countries of Europe is only 40 pounds and that of Asia something more than 15 pounds. It is clear that there are very large centers where consumption is still at a low level and it is not unlikely that the consumption of sugar in

TABLE 7

Per Capita Consumption of Sugar in Various Countries for the Year 1927-28

Country	Pounds per capita	Country	Pounds per capita
Europe		America	
Germany	56.0	United States	109.3
Czechoslovakia	59.5	Hawaii	121.5
Austria	66.1	Porto Rico	76.5
Hungary	29.8	Cuba	97.7
Switzerland	93.7	Canada	89.9
France	52.5	British West Indies, Guiana	25.8
Belgium	58.2	French West Indies	22.0
Netherlands	67.5	Haiti, San Domingo	9.3
Great Britain	98.8	Mexico	29.3
Poland	28.0	Other Central-American Countries	32.0
U. S. S. R.	19.3	Argentina	68.6
Denmark	114.0	Brazil	46.1
Sweden	83.1	Peru	15.7
Italy	20.1	Other South American Countries	21.3
Spain	26.9	Total	76.7
Other European Countries	24.0		
Total	39.9		
Africa		Asia	
Egypt	18.5	China, Hongkong	4.9
Union of South Africa	44.8	British India	29.3
Mauritius	39.7	Japan, Formosa	22.7
Other African Countries	5.5	Java	15.7
Total	9.3	Other Asiatic Countries	10.1
Australasia		Total	15.4
Australia (Continent)	127.9	WORLD CONSUMPTION	29.8
Other Australasian Countries	58.0		
Total	106.3		

Source: The figures in this table were converted from the figures given in Table F, pages 48-49 of Official No.: C.148.M. 57. 1929, II, Economic Committee of the League of Nations, Geneva, April 15, 1929.

these areas can be increased. In Europe, where consumption in many of the countries is not far below that of the United States, the amount used has continued to increase steadily since 1923. What is perhaps of even more significance is the decided tendency for consumption to increase in areas having a large colored population such as Africa, where the per capita consumption has increased from about 6.8 pounds in 1923-24 to 9.3 pounds in 1927-28.

The per capita consumption of sugar in the United States is relatively high. Australia, Hawaii, and Denmark were the only areas with a higher per capita consumption in 1927-28. At the same time it is rather idle to speculate as to the possibility of further increasing consumption in this country although the Sugar Institute, Inc., has launched a rather extensive campaign to secure such an increase.[17] It has been thought repeatedly that per capita consumption in the United States had reached its limit. Yet it has continued to rise steadily from about 84 pounds of refined sugar in 1914 to well over 100 pounds in recent years. Opinion differs a good deal as to the amount of sugar we can stand in our diet but it does not appear that we have reached the limit even though our per capita consumption has apparently become somewhat smaller since 1926. It seems, therefore, that the per capita consumption of sugar could be very materially increased in many countries of the world without adversely affecting health. If this can be accomplished, it would mean that production and consumption could be more quickly brought into equilibrium—the real problem which is facing the sugar industry today.

The Reduction of Tariffs

Still a fourth means of bringing more stability to the sugar industry, the reduction of tariff rates, remains to be tried. It is quite clear that subsidies, bounties and protective and preferential duties have distorted the natural channels of the sugar trade and have affected adversely the entire industry. It is also apparent that these policies have unduly stimulated the production of sugar in certain sections that might otherwise have been content to produce for local or near-by markets. For example, the production of sugar in the Philippine Islands has increased at a tremendous rate since 1909 when Philippine sugar was first admitted into the United States free of duty. Exports to the United States in 1910 were nearly 79,000 long tons, and by 1930 they had reached approximately 671,000 long tons. These shipments travel 13,000 miles to a market into

[17] The Sugar Institute, Inc., was incorporated in New York, January 7, 1928. Its membership now comprises the fourteen cane-sugar refining companies operating throughout the United States. The Institute is a trade association, organized for the purpose of stabilizing the refining industry. Its activities have been chiefly along two lines, namely, putting into effective operation its "code of ethics," and carrying on an advertising campaign designed to place before the public the economic and dietetic value of sugar in cookery and diet. For details of this advertising program see Sugar, Vol. 31, No. 7, July, 1929.

which they have a preferential entrance, while the markets almost at their door in China and Japan are passed by. It may have been impossible for the Philippines to compete with Java in these markets, but the fact remains that production was greatly stimulated in the Philippines and their trade channels influenced, perhaps unduly, by the tariff policy of the United States. This is but one of many cases in which production and trade channels have been and are still being greatly influenced by tariff policies.

It is not our purpose to discuss the merits or demerits of the particular tariff policies that have been pursued by the several nations concerned. It is our purpose merely to point out that it is "self-evident that no policy intended to stimulate production can contribute to alleviate a situation the weakness of which lies in an existing excess of supplies."[18] Bounties, subsidies, and protective and preferential duties do tend to increase production locally, and to the extent that they are successful in accomplishing this, they tend to intensify the sugar crisis which has now been existing for a number of years.

Tariff policies can be altered only by the action of governments and only indirectly by the trade through pressure brought to bear upon legislative bodies. The Brussels Convention of 1902 offers one example of how concerted action has been tried in this matter. There are rumors of an attempt to hold a similar convention. It would appear, however, that such a convention could hardly be successful unless it included both cane- and beet-sugar producing countries. The Chadbourne plan now being sponsored by Cuba, does not seek to alter the tariff rates, preferentials, or bounties now in force.

Summary

The world sugar crisis has grown chiefly out of a situation in which the World War played an important part. The production of beet sugar, which had been furnishing approximately 50 per cent of the world's sugar supply just prior to the War, decreased greatly all during the War years and shortly thereafter, reaching the lowest point in 1920 when beet sugar accounted for little more than 21 per cent of the world's supply. During this same period, the production of cane sugar increased at a tremendous rate, especially in Cuba and Java, and after 1920 the production of beet sugar began again to increase, reaching its former high level by 1928. Cane-sugar output continued to grow and as a result an ever-increasing production has exercised a more and more depressing effect on the markets of the world.

[18] Economic Committee of the League of Nations, Official No. : C.303.M. 104. 1929. II. p. 13.

Consumption, which for over a hundred years had continued to increase at about 3 per cent annually, sagged somewhat during the War, but picked up thereafter and during the past few years has been increasing at about 4½ per cent each year. Under such circumstances, it might have been reasonable to expect fairly prosperous conditions in the sugar industry. As a matter of fact, quite the opposite conditions are found, with many countries selling their sugar below actual cost of production.

The policies adopted by the Brussels Convention in 1902 were finally abandoned in 1920, thus removing all restrictions on the protection of European beet sugar, and further encouraging production. The development of scientific information with special reference to the development of disease-resistant and high sugar-yielding canes has made it possible to secure yields of sugar heretofore thought impossible. This has greatly increased the production of cane sugar especially in Java, but in other cane-growing areas as well. A very large part of the world's crop of cane sugar has had free or preferential entrance into some market of the world. This policy, followed by the United States, Canada, Great Britain, and other countries, has greatly stimulated production in certain areas and distorted the natural sugar trade channels. The cumulative effect of all this has been to force an ever-increasing surplus upon the markets of the world. The result was inevitable. The price of raw sugar at New York City fell from an average of a little over four cents per pound in 1924 to an average of about one and one-half cents per pound in 1930. This decline resulted in nothing less than a crisis in the sugar industry.

Many remedies for the present unsatisfactory conditions have been suggested, the most important of which are the stabilization of production, the restriction of production, campaigns for increasing consumption, and the lowering of tariffs and excise duties on sugar.

Chapter II

SUGAR AND THE UNITED STATES TARIFF POLICY

THE policy of encouraging the continental sugar industry by a protective tariff; the admission of sugar free of duty from Hawaii, Porto Rico, and the Philippine Islands; and later the granting of a 20 per cent preferential duty to Cuba, have materially influenced the production, distribution, and price of sugar. Since these tariff policies of the United States have had such an important bearing on the trend of the sugar industry in this country, they should be given more than cursory mention before taking up a discussion of the industry itself.

The Tariff

An import tariff on sugar has been almost continuous from the time the first tariff law became effective, August 1, 1789. There was complete free trade in sugar only during the period July 1, 1792 to October 1, 1794. Raw sugar was admitted free from April 1, 1891, to August 1, 1894, but during this latter period a bounty of two cents per pound was paid on all sugar produced in continental United States.

Prior to 1890, the sugar tariff was largely a revenue measure and tended to vary with the changing fiscal condition of the United States Treasury. This is clearly shown by the changes which were made in the rates in 1870-71, 1883, and 1890, when there were very large surpluses in the Treasury.[1] It will be noted from Table

[1] The rate on raw sugar was raised in 1864 to three cents per pound on all sugars not above No. 12. In 1871, the rate was fixed at from 1.75 cents to 2.25 cents on sugars not above No. 12. It was increased by 25 per cent in 1875, but was again reduced in 1883 to 1.4 cents per pound. In 1891 the duty on raw sugar was entirely removed. The duties on coffee and tea, which had been large revenue yielders, were removed in 1872. This was in line with a general policy followed after the Civil War of lowering the non-protective or purely revenue duties in order to retain the protective ones.

Writing December 4, 1871, Mr. George S. Boutwell, Secretary of the Treasury, said:

"The revenues for the year 1871, and the receipts since the first of July last, show that the time has arrived when a considerable further reduction in taxes can be made, and yet leave the Government in a position to pay at least fifty millions of dollars annually of the principal of the public debt, including the amount pledged through the sinking fund."

The excess of revenues over expenditures during this period was as follows:

1870	$101,601,916.88
1872	94,134,534.00
1875	13,376;658.26
1882	145,543,810.71
1883	132,879,444.41
1890	105,344,496.03
1897—(deficit)	18,052,454.41

Source: House of Representatives, 42nd Congress, 2nd Session, Ex. Doc. 2, **Report of the Secretary of the Treasury on the State of the Finances for the Year 1871,** Washington, D. C., 1871, p. iii.

TABLE 8

Average Annual Sugar Consumption and Imports of the United States, 1822-1900

(Short tons, refined)

Period	Consumption	Imports	
		Quantity	Per cent
1822-1826	47,333	30,028	63.44
1827-1831	69,885	30,949	44.29
1832-1836	91,461	53,354	58.34
1837-1841	115,880	69,051	59.59
1842-1846	160,118	64,441	40.25
1847-1851	262,650	138,812	52.85
1852-1856	415,157	237,613	57.23
1857-1861	475,114	313,596	66.00
1862-1866	366,904	315,283	85.93
1867-1871	616,298	562,415	91.26
1872-1876	852,992	779,387	91.37
1877-1881	967,592	797,468	82.42
1882-1886	1,439,435	1,220,546	84.79
1887-1891	1,720,925	1,467,212	85.26
1892-1896	2,168,919	1,829,008	84.33
1897-1900	2,344,103	2,021,376	86.23

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

8 that between 1862 and 1900, 85 to 90 per cent of our total consumption was imported sugar subject to the full-rate duty. The small Louisiana industry, and the Hawaiian industry since the reciprocity treaty of 1876, were protected by our tariff and the consumers paid the bill, but this was offset in very large measure by the duties which were being collected by the Government. The duties collected on imports of sugar averaged nearly 43 million dollars annually between 1876 and 1885, while during the next five years they averaged over 53 million dollars. Approximately 85 per cent of the sugar consumed in this country at that time was imported subject to the full rate of duty. Thus only about 15 per cent of our consumption was increased in price without the government at the same time collecting the duty. The situation is quite different at the present time. Since 1922, for example, an average of a little over 55 per cent of our sugar supply has been imported, most of which has been subject to the Cuban rate. (See Table 48, page 151.) In other words, something like 45 per cent of our sugar is now enhanced in price without a corresponding payment in duty to the Government. (See Table 9 for duties collected after 1892.)

TABLE 9

Total Customs Duties and Sugar Duties Collected in the United States, 1893-1931

(Thousands of dollars)

Year	Total duties	Sugar duties		Year	Total duties	Sugar duties	
		Amount	Per cent			Amount	Per cent
1893....	199,144	164	.08	1912....	304,899	50,535	16.57
1894....	129,589	251	.19	1913....	312,510	53,086	16.99
1895....	149,451	15,354	10.27	1914....	283,719	61,440	21.66
1896....	157,014	29,808	18.98	1915....	205,947	49,244	23.91
1897....	172,760	41,254	23.88	1916....	209,726	55,275	26.36
1898....	145,438	29,379	20.20	1917....	221,659	53,971	24.35
1899....	202,072	61,428	30.40	1918....	180,590	50,393	27.90
1900....	229,361	57,418	25.03	1919....	237,457	67,909	28.60
1901....	233,556	62,680	26.84	1920....	325,646	78,663	24.16
1902....	251,453	52,623	20.93	1921....	292,397	70,837	24.23
1903....	280,752	63,215	22.52	1922....	451,356	147,444	32.67
1904....	258,161	57,781	22.38	1923....	566,664	127,475	22.50
1905....	258,426	51,171	19.80	1924....	532,286	135,099	25.38
1906....	293,910	52,440	17.84	1925....	551,853	138,011	25.01
1907....	329,480	60,135	18.25	1926....	590,045	145,428	24.65
1908....	282,583	49,985	17.69	1927....	574,840	130,044	22.62
1909....	294,667	56,213	19.08	1928....	542,270	117,145	21.60
1910....	326,562	52,738	16.15	1929....	584,771	129,526	22.15
1911....	309,966	52,446	16.92	1930....	461,790	115,121	24.93
				1931....	370,771	98,329	26.52

Source: U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, **Foreign Commerce and Navigation of the United States**, Washington, D. C.

Direct Bounty on Sugar

The McKinley Tariff Act of 1890 in contrast with the Act of 1883 definitely followed the protective principle.[2] As previously stated, this act placed raw sugar on the free list, but retained a duty of one-half cent per pound on refined sugar as a means of protecting the refining industry. There was no desire to leave the cane producers unprotected and there was even some disposition to encourage the production of sugar from beets. Accordingly, a direct bounty of two cents per pound was granted on all sugar testing over 90° produced in continental United States. The bounty was to have been in effect until July 1, 1895, but it was repealed by the Act of 1894 and replaced by an ad valorem rate of 40 per cent, which amounted to about one cent per pound.

As shown in Table 10, nearly 30 million dollars was paid to the producers of various kinds of sugar under the bounty law. There were many who contended that the bounty provision of the Act of 1890 was unconstitutional, but the point was never tested in the

[2] The constitutionality of a protective tariff was first passed upon by the Supreme Court of the United States in the case of **J. W. Hampton, Jr. & Company v. United States**, 276 U. S. 394, argued March 1, 1928, and decided April 9, 1928.

TABLE 10

Payments Made from the Treasury of the United States to Sugar Producers under the Bounty Law of 1891

Year and type of sugar	Number establishments receiving payments	Amount	Year and type of sugar	Number establishments receiving payments	Amount
1891-1892			1893-1894		
Cane	727	$7,077,316.21	Cane		
Beet	7	240,098.56	Beet		
Sorghum	6	22,197.28	Sorghum	[a]	[b]
Maple	4,240	2,465.74	Maple		
Total		7,342,077.79	Total		$12,100,208.89
1892-1893			July 1, 1894		
Cane	651	8,763,830.75	to Aug. 28, 1894		
Beet	6	531,363.81	Cane		
Sorghum	2	19,817.00	Beet	[a]	[b]
Maple	6,100	60,119.32	Sorghum		
Total		9,375,130.88	Maple		
			Total		966,185.84
			GRAND TOTAL		$29,783,603.40

[a] Number of establishments not available.

[b] Amounts not available for kinds of sugar.

Source: **Annual Report of the Secretary of the Treasury on the State of the Finances**, for the years 1892, 1893, and 1894, Washington, D. C.

courts. The Supreme Court of the United States evaded the issue in a case tried before it in 1891 and no case involving the constitutionality of a direct bounty such as was contained in the Tariff Act of 1890 has come before the Supreme Court since that time.[3] There are, therefore, no court cases upon which one might base a judgment as to the constitutionality of such a law were it to be enacted today.[4]

Duties from 1897 to 1930

The Act of 1897 greatly increased the rate of the sugar duty and returned it to a specific basis, where it has remained ever since.

[3] In the cases involving **Field v. Clark, Boyd v. United States**, and **Sternbach v. United States**, it was contended that the bounty provision of the Tariff Act of 1890 was unconstitutional. The court handed down its decision February 29, 1892, and evaded this issue in the following manner:

"The court does not decide whether the provision in that Act respecting bounties upon sugar (Schedule E, Sugar, 26 Statute 583) is or is not constitutional, because it is plain from the Act that these bounties do not constitute a part of the system of customs duties imposed by the Act, and it is clear that the parts of the Act imposing such duties would remain in force even if these bounties were held to be unconstitutionally imposed."

[4] An amendment to the sugar schedule calling for a bounty on sugar produced in continental United States was introduced in the Senate in January, 1930, by Senator Howell of Nebraska, but was defeated by a vote of 22 to 54. **Congressional Record**, 71st Congress, 2nd session, January 17, 1930, p. 1864.

TABLE 11

Rates of Duty on Sugar in Tariff Acts of the United States, 1897-1930

(Cents per pound)

Tariff act effective	Duty on 96° centrifugal		Cuban rate, refined [c]
	Full rate [a]	Cuban rate [b]	
July 24, 1897[d]	1.685	1.6850	1.8031
Aug. 6, 1909[e]	1.685	1.3480	1.4425
Mar. 1, 1914	1.256	1.0048	1.0752
May 28, 1921[f]	2.000	1.6000	1.7121
Sept. 22, 1922	2.206	1.7648	1.8885
June 18, 1930[g]	2.500	2.0000	2.1402

[a] Sugar from Hawaii admitted free since September 9, 1876.

[b] Under the terms of the reciprocity treaty effective December 27, 1903, Cuba was given a 20 per cent preference.

[c] Approximately 93.45 pounds of refined sugar are secured from 100 pounds of 96° centrifugal sugar.

[d] Sugar from Porto Rico admitted free since July 25, 1901.

[e] Sugar from the Philippine Islands admitted free since August 6, 1909.

[f] Sugar from the Virgin Islands admitted free since March 3, 1917.

[g] A joint resolution (H. J. Res. 486) to amend Paragraph 501 of the Tariff Act of 1930 was introduced in the House of Representatives, January 28, 1931. A report from the U. S. Tariff Commission pointed out that the Act of 1930 did not give the same degree of protection to the refiner as the Act of 1922. By Presidential proclamation, February 5, 1931, the rate on maple sugar was reduced from eight cents per pound to six cents per pound, and the rate on maple syrup was reduced from five and one-half cents per pound to four cents per pound.

(See Table 11.) The duty was lowered by the Acts of 1909 and 1914, but raised in each of the three subsequent acts. The tariff act which became effective March 1, 1914, provided that sugar was to be placed on the free list May 1, 1916, but an amending act of 1916 provided for the retention of the duty prescribed in the original act. These facts make it evident that sugar has enjoyed very liberal protection in this country from the beginning of our protective system in 1789, a period of 142 years.

Our Insular Policies

The sugar tariff, especially since 1890, has had for its chief purpose the protection of the sugar industry of this country. The revenue aspect has been secondary. The policy followed in our dealings with Hawaii, the Philippine Islands, Porto Rico, and the Virgin Islands has made it possible for ever-increasing amounts of cane sugar to come into our markets and compete on an equal basis with the cane and beet sugar produced in continental United States. These two policies can not be readily separated since they are, in

very large measure, one policy, although they have produced very different results. An appreciation of their influence upon production both in the islands and in continental United States is essential to an understanding of our sugar tariff problem.

Hawaiian Islands

Although Captain Cook discovered the Hawaiian Islands in 1778 and found sugar cane growing there, the real history of the sugar industry in the Islands dates from 1876, when the reciprocity treaty signed by the United States and Hawaii became effective. The treaty, which provided for the reciprocal free admission into the United States and Hawaii of certain commodities, of which sugar was the only item of any considerable importance, became effective September 9, 1876. Political and military considerations, rather than purely commercial ones, appear to have led to the signing of the treaty.[5] It is interesting to note, however, that one of the things which hastened the signing of the treaty was an attempt to send the entire Hawaiian sugar crop of 1876-77 to Australia, in the hope that Hawaii might some day become independent of the United States, and perhaps become a British Colony.[6] But the Hawaiian effort to develop markets outside the United States was stopped at the very start by giving Hawaiian goods preferential entrance into the United States.

The events of the following twenty years finally led to the signing of a treaty with Hawaii, June 16, 1897, annexing the Hawaiian Islands and their dependencies to the United States under the name of the Territory of Hawaii. The treaty was approved by Congress the following year. By the terms of the treaty and the organic act passed by Congress, the Islands were made an integral part of the United States, and citizenship was extended to their people.[7] No tariff, therefore, can be levied upon Hawaiian products.

There has been some question, however, as to whether or not the Hawaiian planters could be excluded from the benefits of a direct bounty. A memorandum prepared on this question for the United States Senate, setting forth some of the questions involved, leaves the impression that discrimination against Hawaii in this respect would be perfectly legal, since "not only is there no express constitutional limitation requiring uniformity in the exercise of the

[5] See Taussig, F. W., **Some Aspects of the Tariff Question**, 4th ed., Harvard University Press, Cambridge, Mass., 1924, Chapter V.

[6] Geerligs, H. C. Prinsen, **The World's Cane Sugar Industry, Past and Present**, Manchester, 1912, p. 349.

[7] "The Hawaiian Islands were annexed by a joint resolution of Congress approved July 7, 1898; and their admission is based on the organic act of April 30, 1900, which erected them into a territory and created a complete system of government. . . The provisions of the Constitution and laws of the United States, applicable to local conditions, were extended to Hawaii; and American citizenship was conferred upon all persons who were citizens of the republic of Hawaii on August 12, 1898."—Beard, Charles A., **American Government and Politics**, 3rd Edition, The Macmillan Company, New York, 1920, Chapter XX, p. 434.

power of appropriation but, in practice, that power has not been exercised with geographical uniformity."[8]

Production and Exports to the United States

The treaty which became effective in 1876 proved to be a powerful stimulus to the Hawaiian sugar industry, since it gave the planters the irrevocable advantage of the American price, which was higher than the world price by virtually the full amount of the tariff. Exports of sugar from Hawaii were first mentioned in 1837 when less than two long tons were shipped from the Islands. This figure had grown to nearly 12,000 long tons by 1876. The output increased with great rapidity after the American market was opened to the island planters, and had doubled by 1879, again by 1882, and still again by 1888. Production grew a little less rapidly during the next 20 years, but reached 223,000 long tons in 1897, and by 1908 it had increased to 465,000 long tons. Table 12 shows the increasing amounts of sugar that have been shipped to continental United States since 1900.

TABLE 12

Production and Exports of Hawaiian Sugar to the United States, 1900-1931

(Long tons)

Year [a]	Production, raw	Exports to U. S., refined	Year [a]	Production, raw	Exports to U. S., refined
1900	258,521	225,318	1916	529,895	507,661
1901	321,461	308,429	1917	580,165	592,088
1902	317,509	321,675	1918	512,373	429,771
1903	391,062	345,904	1919	537,241	514,824
1904	328,103	328,791	1920	508,469	390,552
1905	380,576	371,751	1921	504,073	482,322
1906	383,225	333,305	1922	502,194	461,490
1907	392,871	366,524	1923	479,463	459,849
1908	465,288	481,058	1924	626,279	505,968
1909	460,000	456,636	1925	692,804	636,477
1910	462,613	495,801	1926	705,350	618,098
1911	506,096	451,435	1927	724,403	635,765
1912	531,480	538,154	1928	807,180	683,487
1913	488,213	484,537	1929	844,462	774,939
1914	550,925	497,657	1930	825,891	672,443
1915	577,186	571,814	1931	889,544	806,916

[a] Production data are for crop years beginning November of the previous year. Shipments are for calendar years.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, except shipments to the United States from 1900 to 1916, inclusive, which were furnished by the U. S. Sugar Association, New York.

[8] Lee, Frederic P., Legislative Council, United States Senate, "Memorandum upon the constitutionality of legislation excluding Hawaii from benefits of a sugar bounty," **Congressional Record**, 71st Congress, 2nd Session, January 17, 1930, p. 1861.

An average of about 11 per cent of our total sugar consumption has come from Hawaii since 1922, but the free entry of this sugar to our markets has not been responsible for low prices of sugar in this country except as the increased production in the Islands has been a factor in depressing the world price. The sugar coming into our markets free of duty sells at virtually the same price as sugar paying a duty. To the ultimate consumer it sells for exactly the same price even though, at times, the price of duty-free raw sugars may be slightly under that of sugars subject to the duty. The consumers of this country have, therefore, gained little or nothing, so far as the price of sugar is concerned, by the free entry of Hawaiian sugar to our markets.

Conditions Affecting the Production of Sugar

The Hawaiian Islands are located in the Pacific Ocean approximately 2,400 miles from San Francisco. They lie in the path of the northeast trade winds, and consequently the heaviest rain is on the east and northeast coasts. The winds are, however, seldom violent, and hurricanes, which do great damage in other cane-producing regions, are practically unknown. The Islands are rather mountainous, volcanic in origin, and the rich, alluvial soils found for the most part on the coast are largely used for cane growing. Cane is likewise grown under irrigation on the eastern and western slopes. These latter areas make up well over one-half of the total area planted to cane. Irrigation is also practiced on a large scale in Oahu, Maui, and Kawai. The cane is ripened by withholding the irrigation water for about 60 days before harvest. In 1929, an average of 8.10 tons of sugar was produced on 73,650.31 acres, 57,317.95 of which were irrigated. The non-irrigated areas yielded an average of 5.25 tons of sugar in the same season.[9]

It is rather difficult to compute the yield of sugar per unit of area in Hawaii inasmuch as the growing season is longer than one year and the per cent of the area harvested each year varies a good deal. Most authorities, however, place Hawaii next to Java in amount of sugar produced per unit of area. On a basis of the area actually harvested, Dr. Prinsen Geerligs calculated that Java produced an average of 15.0 tons of sugar per hectare in 1928 and that in 1927 Hawaii produced an average of 14.3 tons per hectare.[10] Thus Hawaii is one of the most efficient producers of sugar in the

[9] U. S. Department of the Interior, **Annual Report of the Governor of Hawaii to the Secretary of the Interior for fiscal year ended June 30, 1929**, Washington, D. C., page 3.

[10] League of Nations, Sugar, Official No.: C.148M.57. 1929. II, pp. 13-15.

"Such data as are available indicate that this year's crop in Hawaii will average seven tons of sugar per acre, and that of Java the same, while that of Porto Rico will average three tons. It must be borne in mind that the Hawaiian crop averages nearly two years in the making, while both Java and Porto Rico produce a crop each year or a little over." Waterhouse, John, "Hawaiian Sugar Industry," **Sugar, June, 1929.**

world, although costs are apparently somewhat higher than in several other regions.[11]

The temperature in the Islands is decidedly cool for the tropics, averaging from 72° to 74° F. The minimum, so far as is known, has never been below 52° F., and the maximum is under 90° F. According to one authority, "cane growth starts at a mean temperature of about 68° F. and increases progressively with the gradual rise, reaching its maximum at a mean of about 88° F."[12] So far as temperature is concerned, Hawaii is, therefore, very favorably situated for the production of sugar cane.

The Labor Problem

The labor problem is a serious one in Hawaii, since Japanese laborers may no longer be imported and wages are higher than in any of the other important cane-producing countries.[13] Filipino laborers have gradually been replacing the Japanese during the past decade. In 1918 there were 17,797 more Japanese than Filipinos on sugar plantations, but at the close of 1927 the number of Filipino laborers exceeded the number of Japanese by 12,910.[14] During the past ten years, the Hawaiian Sugar Planters' Association has been responsible for bringing more than 65,000 Filipinos into the Islands as plantation laborers. If the workers stay three years, they and their families receive free transportation back to the Philippines.

Integrated Nature of the Industry

The Hawaiian sugar industry is a completely integrated enterprise, combining the agricultural phases with the manufacture of raw sugar and the manufacture and distribution of refined sugar. The industry of the Island includes some 45 separately organized companies, each owning its mill and transportation system. With few exceptions, all of them cultivate their own cane land. Almost all of

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[11] See U. S. Tariff Commission, **Sugar**, Report of the United States Tariff Commission to the President of the United States, Washington, D. C., 1926, pp. 15-19.

[12] K. Krishnamurthi Rao, Assistant Sugarcane Expert, Imperial Sugarcane Station, Coimbatore, India. "Factors Influencing the Growth and Sugar Contents of Cane," **The Planter and Sugar Manufacturer**, July 6, 1929.

[13] Waterhouse, John, "Hawaiian Sugar Industry," **Sugar**, June, 1929, p. 237. Mr. Waterhouse who is president of the Hawaiian Sugar Planters' Association quotes the following average daily wages paid for unskilled labor in various cane-producing countries:

Java	$0.20
Philippine Islands	0.35
Natal	0.40
Mauritius	0.65
Cuba	1.25
Hawaii	1.50 (excluding bonus)

These figures represent rough averages only, but they permit the drawing of broad comparisons.

[14] **Sugar**, January, 1929, p. 17.

the companies are administered from Honolulu agencies, five of which control companies that account for about 95 per cent of the total annual sugar output of the Islands. These agencies market the sugar, maintain relations with the mainland refineries, purchase supplies, and manage the financing and other services incident to general administration. Most of the companies are members of the Hawaiian Sugar Planters' Association, a cooperative organization which operates an experiment station and a labor bureau. All of the sugar exported from the Hawaiian Islands is marketed in the United States. The great bulk of this sugar is refined at the Crockett Refinery, located near San Francisco and owned by Hawaiian sugar interests.

Expansion of Area Unlikely

Most of the land suitable for sugar-cane production in the Islands is already being utilized. According to some authorities, sugar-cane cultivation has been extended to lands not well suited to that purpose and would decrease with any downward revision of our tariff rate. In other words, indications are that Hawaii has about reached her limit in the expansion of area devoted to the cultivation of sugar cane and that the area so used would contract under conditions of free trade. This does not mean that Hawaii has reached the peak of her production. Production per acre has already reached a very high level compared with other areas, but, in the light of all the progress that has been made in Java and Hawaii in recent years, it would be folly to say that the limit had been even closely approached. Conditions differ a good deal in the Islands and costs vary accordingly, but it is quite evident that those who are most favorably located are able to compete successfully in the sugar markets of the world and would undoubtedly be able to survive even under conditions of free trade. There is much land in Hawaii which is well adapted to sugar production, and which will always enable Hawaii to compete successfully with other areas in the production of sugar cane, but any increase in production in the future will more than likely come through increased yield per acre rather than by an extension of the area devoted to cane production.

The Philippine Islands

The Philippine Islands were definitely transferred to the United States by the treaty with Spain signed at Paris on December 10, 1898. The exact legal status of the Islands was left to be determined

by Congress.[15] Our tariff policy with the Islands has varied a good deal, being at first one of concession and later one of absolute freedom from import duties. Until the passage of the so-called Philippine Act of March 2, 1902, sugar and other products of the Philippine Islands entering the United States were assessed the same rates of duty as like products coming from other countries. In this act they were given a rate of three-fourths the full duty on all products. In 1909 the same rate was continued, but with the proviso that 300,000 gross tons of sugar might be imported free. This amounted to duty-free sugar, since importation from the Islands always fell far short of 300,000 tons. In 1913 even this nominal limitation was removed. Thus, all Philippine sugar has entered the United States markets free of duty since the Tariff Act of 1909 went into effect.

Production and Exports to the United States

Magellan found a sugar industry already in existence when he discovered the Philippine Islands in 1521, but the small, primitive industry was of no great importance until after 1849. The industry grew rather rapidly during the last years of Spanish rule, reaching its greatest output, 261,686 tons, in 1893.[16] Due to a variety of causes, chief among which were a financial crisis and generally unsettled conditions arising in part from the continued free entry of Spanish ships to Philippine ports, the industry declined in importance during the first ten years or so of American occupation. Exports to all countries had declined to an extremely low level by 1903 (see Table 13), but increased very materially during the next two or three years, with shipments going mainly to Hongkong, Japan, and China.

Consignments to the United States were of no great importance until after 1909 when the duty on Philippine sugar was removed entirely. Apparently the remission of only 35 per cent of the duty had not been a sufficient inducement to attract large amounts of Philippine sugar to our markets. Since 1910, however, with the ex-

[15] "In the court decisions of the so-called insular cases, viz.: the De Lima v. Bidwell, the Fourteen Diamond Rings case, the Downes v. Bidwell case, and the case of the U. S. v. Bull, are found the bases for the tariff relations between the Philippines and the United States to the effect that Porto Rico (and therefore inferentially the other insular possessions) is not 'a foreign country within the meaning of the tariff laws but a territory of the United States. . . .,' defining a foreign territory as 'one exclusively within the sovereignty of a foreign nation and without the sovereignty of the United States.' These cases therefore rendered inoperative the duties imposed under the Dingley Act of 1897. Notwithstanding the fact that in the De Lima v. Bidwell case it was decided that an insular possession of the United States is not a foreign country within the meaning of the tariff laws but a territory of the United States, in the Downes v. Bidwell case the court held that section prescribing uniformity of imposts, duties, and excises to be operative only within the several states and declared Porto Rico (and inferentially the Philippines) to be, although not a foreign territory within the meaning of the general tariff laws, one that was merely appurtenant to, and not a part of the United States within the meaning of the revenue clauses of the Constitution." Philippine Sugar Association, **Facts and Statistics about the Philippine Sugar Industry,** Manila, August, 1928, p. 43.

[16] Geerligs, H. C. Prinsen, **The World's Cane Sugar Industry, Past and Present.**

TABLE 13

Production and Exports of Philippine Sugar to the United States, 1900-1931

(Long tons)

Year [a]	Production, raw	Exports to U. S., refined	Year [a]	Production, raw	Exports to U. S., refined
1900	64,160	5,937	1916	332,158	137,000
1901	97,038	5,100	1917	202,655	72,839
1902	55,974	2,550	1918	216,260	46,587
1903	34,750	29,947	1919	195,289	72,511
1904	85,677	22,100	1920	209,336	114,048
1905	106,784	44,841	1921	255,843	131,168
1906	127,408	[b]	1922	338,160	214,449
1907	125,895	8,700	1923	263,437	197,926
1908	142,448	45,089	1924	372,332	265,394
1909	127,284	41,730	1925	581,064	404,876
1910	116,114	82,715	1926	436,705	312,723
1911	205,000	186,161	1927	584,238	434,542
1912	190,702	131,029	1928	622,704	476,071
1913	155,201	30,266	1929	740,987	604,501
1914	232,761	168,000	1930	773,674	671,296
1915	207,679	84,000	1931	782,322	679,968

[a] Production data are for crop years starting in November of the previous year. Exports are for calendar years.

[b] Data not available.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

ception of the period 1915 to 1919, the great bulk of the Philippine exports of sugar has come to the United States. During the past few years over 90 per cent of such exports have reached this country.

From 1922 to 1928 slightly more than 6 per cent of our total sugar consumption has come from the Islands. The free importation of this relatively small amount of sugar has had no measurable effect upon the price paid for sugar by the consumers of this country. The price was still determined by Cuban sugar which made up the bulk of our consumption. Here again our tariff policy toward an insular territory tended to stimulate production and shipments to the United States without affecting the retail price in this country, except as the increased production may have been a factor in decreasing the world price of sugar or holding it at a relatively low level.

Two types of sugar are still produced in the Philippines. Muscovado, a low-grade sugar, is produced in the older and more primitive mills, and is largely used locally or shipped to China and Japan. In recent years most of these older plants have been replaced by modern centrifugal-sugar centrals which produce a higher grade of sugar, testing around 96° by the polariscope. In 1929 there were

36 of these modern centrals in the Philippines with a combined capacity of about 600,000 tons. Practically the entire industry is under the control of Filipino, American, and Spanish capital. The Filipinos, alone, control over 49 per cent of the entire output of centrals, American capital about 26 per cent, and Spanish capital about 24 per cent.[17]

Conditions in the Islands

The Philippine Islands consist of a group of several thousand islands lying some 900 miles off the east coast of Indo-China. Manila is 6,221 nautical miles from San Francisco, 10,793 miles from New Orleans, and 11,364 miles from New York City. The average sailing time from Manila to San Francisco is 28 days, and to New York, via the Suez Canal, 48 days. No passenger steamers run between Manilla and New York via the Panama Canal, but cargo making this voyage requires about 55 or 60 days.[18]

The land area, 114,400 square miles, is about twice that of Java or Cuba, but 94 per cent of the land is contained in the eleven largest islands of the group. The largest two islands, Luzon and Mindanao, contain about 68 per cent of the total land area. The rainfall is abundant in most parts of the Islands, ranging from 98 to 157 inches annually. There is a rather well-defined wet and dry season, although in some sections there are two wet and two dry seasons annually. The average annual temperature ranges from 79.8° F. in the south to 78.44° F. in the north, the maximum generally being no greater than 101° F. and the minimum about 21° F. These conditions, together with soils that range from clay loams to silts and sandy loams, are quite favorable to the production of sugar cane. It should be remembered, however, that the Philippine Archipelago stretches over 17° of latitude, and that sugar cannot be grown in all parts of the Islands. There are two seasons of prevailing winds in the Philippines, the first, lasting from about June to October, when the prevailing winds are from the west and southwest, and the second, lasting from about November to May, when they are from the east and northeast. It is usually during the period of the northeast monsoons that the typhoons, or hurricanes, occur. These storms are frequently very destructive, as was the case of the typhoon which occurred late in 1928. This storm destroyed about 12 per cent of the sugar crop and 70 per cent of the rice crop on the Island of Negros.

Labor Situation

Much has been said concerning the lack of sufficient laborers in the Philippines, and a recent writer states that "the insufficient

[17] Philippine Sugar Association, **Facts and Statistics about the Philippine Sugar Industry**, Manila, August, 1928, Appendix Table IV.

[18] U. S. Department of Commerce, **The Philippine Islands, A Commercial Survey**, Trade Promotion Series No. 52, Washington, D. C., 1927, pp. 1, 38 and 39.

labor supply does not permit increase in one crop without corresponding decrease in the acreage of the others, which is very unlikely."[19] This statement, however, seems to require explanation in view of the fact that rather large numbers of Filipino laborers emigrate to Hawaii annually to work in the cane fields there. An explanation is, however, contained in the following quotation: "The insular bureau of labor contends that the supply of labor is more than ample and that the difficulties encountered were the results of various factors, among which were the lack of method and organization in recruitment, the low standard of wages offered, and the unsatisfactory terms and conditions imposed by landowners upon the laboring class."[20] On the other hand, the operator is faced with certain social and religious customs which interfere with the regular employment of Filipino labor. The Bureau of Labor of the Island reported in 1927 that 74 per cent of the laborers in agriculture received less than one peso (equal to 50c in United States currency) per day, while the United States Department of Commerce reported a range of 27 to 65 cents per day for unskilled agricultural laborers. During the period 1909 to 1925, nearly 75,000 Filipinos emigrated to Hawaii while still others came to the United States and other countries. It would appear, therefore, that there is an ample supply of laborers in the Philippines to supply present needs, if the inducements are made sufficiently attractive.

Possibility of Increased Production

Sugar production in the Philippines increased from a little over 338,000 long tons in 1922 to 762,000 long tons in 1930 (see Table 13), but even with this increase there is probably very little more land planted to cane today than there was in 1922. The increased output was made possible by replacing the old muscovado mills by modern centrifugal plants, which recover a much larger percentage of the sugar content of the cane, and by an actual increase in production per acre.[21] The extent to which the production of sugar can

[19] Alunan, Rafael R., Secretary of Agriculture and Natural Resources, Philippine Government, "Sugar Production in the Philippines," **The Planter and Sugar Manufacturer**, May 25, 1929, p. 405.

[20] U. S. Department of Commerce, **The Philippine Islands, A Commercial Survey**, Trade Promotion Series, No. 52, Washington, D. C., 1927, p. 119.

[21] "The increase in the yields of recent years in the Philippines has been largely due to the fact that the small antiquated muscovado mills have been replaced by modern methods of sugar production and manufacture whereby the low-grade muscovado sugars, restricted to the Chinese and Japanese markets and penalized elsewhere, were replaced by centrifugal sugars. This change, which stimulated the introduction of better methods of cane cultivation, followed the abolition of duties between the Islands and the United States and resulted in the substitution of from 1,500 to 2,000 muscovado mills producing 300,000 tons, by 36 modern centrals of a combined capacity of 600,000 tons. In the old muscovado mills only 50 to 75 per cent of the sucrose content of the cane could be extracted and barely one picul of sugar could be produced per ton of cane. Now over 90 per cent of the sugar is recovered and 1½ to 2 piculs (in some cases over 2 piculs) of sugar are produced per ton of cane, demonstrating the fact that the

(Continued on next page)

be expanded by these means is, of course, unknown. However, the replacement of the remaining muscovado mills by modern centrals will result in the recovery of much sugar now lost, and experimentation by the Philippine Department of Agriculture is giving very satisfactory results in the development of new varieties of cane of high adaptability and yield.[22]

It should be pointed out, however, that the long-time trend of expansion of sugar production in the Philippines has by no means been as rapid as it has often been pictured. From 1874 to 1899, exports were well over 100,000 long tons a year, and in many years were much higher. The peak was reached in 1895, when more than 336,000 long tons were exported, and that figure was not again reached until 1922. When comparisons are made between figures for the past decade with some low year a little earlier, startling rates of increase may be arrived at, but the increase from 1922 to 1930 would not be enough to supply the average biennial increase in consumption in this country. (See Table 13.)

The undeveloped area in the Islands is still very great, and part of this area, at least, seems to be suitable for the production of sugar. A survey of the Philippine Islands made in 1927 by the United States Department of Commerce showed that only 12.5 per cent of the total land area of the Islands was under cultivation, and annual reports of the Governor General indicate that "the development of agriculture on the Islands is yet in its infancy." Likewise, trade magazines voice the opinion that there are districts adapted to cane culture which have not yet been developed.[23] It seems clear that there are very real possibilities for the profitable expansion of sugar production in the Philippines, and the industry will probably continue to grow under the protection of our tariff wall. Exports

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sugar mills in the Philippines compare favorably with the modern mills in other sugar-producing countries. . . .

"Moreover, the increase in the sugar production of the Islands in the last twenty years was to a great extent due to the increase in yield per hectare from about 25-30 piculs in 1898 to about 75 piculs in 1925. There was a relatively small increase in the area cultivated to cane, since there is only one Central, erected by the Mindoro Sugar Co. at San Jose, Mindoro, in an undeveloped and unpeopled district not previously devoted to cane cultivation. The increase in yield per hectare is due to the better methods of cultivation, the introduction of modern implements and machinery which replaced the antiquated methods and implements, the wooden plow and carabao." The Philippine Sugar Association, **Facts and Statistics about the Philippine Sugar Industry**, Manila, August, 1928, p. 48.

[22] See **Sugar**, Vol. 31, No. 1, January, 1929, p. 6.

[23] "There are districts which are particularly adapted to cane culture but at the present time are undeveloped. The San Carlos district, parts of the island of Mindanao and the island of Negros and also the island of Panay are particularly adapted to sugar culture through the even distribution of rainfall and a lime soil. These districts can yield a profit with scientific cultivation. They are not developed at present. Irrigation and fertilization will, however, increase yields in many districts now devoted to cane culture, but with the developments of these districts particularly adapted to cane culture through soil and weather conditions these islands can produce sugar in competition with other districts of the world." **The Planter and Sugar Manufacturer**, Vol. 82, No. 17, April 27, 1929, p. 335.

from the Philippines will continue to come to the markets of this country so long as they can enter free of duty. Under ordinary circumstances, the price of sugar in this country is determined by the Cuban f.o.b. price plus transportation and insurance charges plus the tariff rate to which imported Cuban sugar is subject; but the Cuban price is determined by conditions in the London or world market where sugars from a large number of countries compete. Therefore, so long as Cuba continues to furnish a large part of the sugar consumed in this country, our domestic price will be determined by conditions in the world market rather than by the actual shipments of duty-free sugar from our insular territories.[24]

Porto Rico

Porto Rico, like the Philippine Islands, became a United States territory in 1898 as a result of the Spanish War. Definite transfer of the Island took place July 25, 1898, after which it was under military government for two years, but the organic act of Congress, July 25, 1901, erected a civil government. The Constitution has never been extended in toto to the Island, so that within the meaning of the revenue acts, the status of Porto Rico is like that of the Philippines; i. e., a tariff may be levied by Congress upon products imported into the United States from Porto Rico. [25] Nevertheless, the Island has been treated as an integral part of the United States, and sugar shipped to the States has been admitted free of duty since July, 1901.

Production and Exports to the United States

The production of sugar in this small island had reached 112,000 tons annually by 1853, but during the following twenty years stood at about 70,000 tons. Production increased somewhat between 1870 and 1885, but did not again reach 100,000 tons until 1904, after the Island had been taken over by the United States and a protected market supplied for her sugar. Since that time the output has increased quite steadily, with certain exceptions due chiefly to adverse weather conditions, and reached its highest point in 1930 with a production of over 773,000 long tons. (See Table 14.)

[24] Production in the Philippine Islands does, of course, affect the world price just as production in any other country has an influence upon the world price. Practically all Philippine sugar is, however, marketed in the United States. The most direct way in which this sugar affects the world price is by forcing Cuba to market a greater proportion of her crop in markets outside the United States, chiefly in London.

Duty-free sugars shipped uncontrolled to our markets do, occasionally, depress prices on a particular day. Porto Rican sugar, however, has given more trouble in this respect than Philippine sugar. Practical elimination of Porto Rican distress parcels was accomplished in the early part of March, 1930, as a result of shippers combining together and making full cargoes. This is a very sound development and should be of great value in helping to obtain the general price level.

[25] See footnote 15.

TABLE 14

Production and Exports of Porto Rican Sugar to the United States, 1900-1931

(Long tons)

Year [a]	Production, raw	Exported to U. S., refined	Year [a]	Production, raw	Exported to U. S., refined
1900	[b]	33,216	1916	431,335	360,958
1901	80,000	63,605	1917	448,567	431,202
1902	85,000	82,827	1918	413,958	331,524
1903	85,000	71,651	1919	362,618	286,880
1904	130,000	82,748	1920	433,825	334,936
1905	155,000	94,594	1921	438,494	373,762
1906	213,000	166,044	1922	362,442	311,171
1907	210,000	121,921	1923	338,456	251,217
1908	200,000	141,425	1924	399,975	341,816
1909	255,000	172,846	1925	589,760	503,634
1910	308,000	192,619	1926	541,485	459,684
1911	295,000	174,944	1927	562,679	482,469
1912	367,145	185,810	1928	670,831	582,937
1913	355,359	261,935	1929	530,116	383,940
1914	325,021	225,938	1930	773,310	650,796
1915	308,178	250,541	1931	703,388	624,431

[a] The campaign period in Porto Rico usually starts in January. Hence the production and export data are for calendar years.

[b] Data not available.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

Of course, practically all of the exportable surplus is shipped to the United States, where it has a tariff advantage over Cuban sugar. During the period 1922 to 1929, an average of nearly 8 per cent of the total United States consumption of sugar came from Porto Rico. In other words, for some years this small island shipped more sugar to the United States than was imported from the Philippines. However, this situation changed in 1929 when the Philippines furnished 10.4 per cent of our supply, while only 6.6 per cent came from Porto Rico.

Expansion of Area Unlikely

The Island of Porto Rico is very mountainous except for a comparatively narrow border of flat coastal plain where most of the sugar cane is grown. The average annual rainfall is about 57 inches, most of which falls during the wet season between April and November. The trade winds blowing from the east drop most of their moisture on the northern and eastern slopes and, consequently, the southern half of the Island is deficient in rainfall. This deficiency is corrected to some extent by a government irrigation system in southern Porto

Rico where the cane-growing area has been extended in recent years. In general, the soil is very fertile and well adapted to the production of cane.

Very real progress is being made by the experiment station, established in 1900, in developing new types of high-yielding, disease-resistant canes. It is from increased production per acre that any increase in total output is likely to come in the future. According to the director of the Porto Rican Experiment Station, "the lands that are more productive are already devoted to cane" and "the growing of sugar cane increases by planting the hill lands when prices indicate a profit."[26] Little or no expansion of the cane-producing area will take place except under the stimulus of very high prices. Under such circumstances, the production of sugar in Porto Rico will increase only very slowly, and it is unlikely that the total production will ever go beyond a million tons.

Virgin Islands

This group of islands, with a total area of 132 square miles and with 26,000 inhabitants, was transferred to the United States by Denmark on March 31, 1917. We paid $25,000,000 for these islands with the intention of using them as a naval base designed for the defense of the Panama Canal. The growing of sugar cane and the manufacture of sugar are the major industries of the Virgin Islands, and in the Island of St. Croix an export tax of six dollars per ton has been the principal source of revenue to the government. Sugar from the Islands, of course, enters the United States free of duty.

As a competitor of the United States in the production of sugar, the Virgin Islands hardly need mentioning. During the past seven years, only one-tenth of one per cent of our total sugar supply has come from that source. The acreage planted to sugar cane has dwindled from 27,000 acres in 1796 to as little as 3,300 acres in 1930. (See Table 15.)

There are several contributing reasons for this great decline. The rainfall is inadequate and too irregular to make sugar cultivation anything better than a gamble. Due to the high rate of evaporation, at least fifty inches of rain are needed to produce a good crop of sugar cane in the Islands. The range in precipitation has been from 26 inches to 65 inches. The abolition of slavery caused a very great reduction in acreage after 1850, and at the present time the scarcity of labor is a real handicap to the sugar industry. In 1928, the Governor of the Islands said in a general report that the

[26] From a letter received from Dr. D. W. May, Director of the Porto Rican Experiment Station, under date of May 8, 1929.

TABLE 15

Acreage, Production, and Exports of Virgin Island Sugar, 1912-1931

(Production and exports in long tons)

Year	Acres taxed for cane [1]	Production, raw [2]	Exports to U. S., refined [2]	Year	Acres taxed for cane [1]	Production, raw [2]	Exports to U. S., refined [2]
1912	13,397	7,074	8,050	1922	9,662	5,000	4,736
1913	12,744	6,699	334	1923	9,014	1,739	1,409
1914	11,898	5,800		1924	9,208	2,332	2,169
1915	12,474	4,500	3,178	1925	9,585	7,200	8,491
1916	12,220	14,750		1926	9,196	5,664	5,080
1917	12,627	17,787	5,084	1927	9,250	7,077	5,466
1918	12,718	5,400	3,693	1928	8,340	10,562	9,152
1919	12,498	9,000	8,286	1929	8,135	3,796	3,344
1920	12,847	12,400	10,490	1930	3,300	5,736	5,055
1921	11,854	4,500	5,170	1931	3,800	1,800	1.613

Sources: [1]U. S. Navy Department, **The Virgin Islands of the United States**, a general report by the Governor, 1928, Government Printing Office, Washington, D. C., p. 83. Acreage figures for 1928 to 1931, inclusive, were secured direct from the U. S. Department of the Interior, Washington, D. C. The figures for 1930 and 1931 are the acreages actually planted to cane.

[2]Willett and Gray's **Weekly Statistical Sugar Trade Journal**; 1912-1916 from U. S. Department of Commerce, **Foreign Commerce and Navigation of the United States.**

production of sugar would have stopped during the World War had it not been for the change in sovereignty. The tariff protection of the United States, together with legislative appropriations, makes it possible for the industry to persist. Some increase in acreage planted to cane may be expected in St. Croix, but even at maximum production the Virgin Islands could furnish the United States with only an insignificant amount of her sugar.[27]

Cuba

It should be remembered that sugar from the four groups of islands we have been considering enters the United States free of duty. In a tariff discussion, therefore, sugar from these islands may very properly be treated as a domestic product. The only foreign sugar which influences our market to any appreciable extent is that imported from Cuba. It will be seen from Tables 16 and 17 that in recent years an average of about 54 per cent of our total supply of sugar has come from Cuba, while less than one per cent, subject to the full-rate duty, has come from other foreign countries. (See Table 2, page 30.) For this reason, the preferential duty granted on sugar imported from Cuba, amounting to 20 per cent less than the full-rate duty, has been an important factor in determining the price of sugar in this country.

[27] A very interesting description of the agricultural possibilities of the Virgin Islands is given in an article entitled, **The Virgin Islands of the United States, A General Report by the Governor**, issued by the Navy Department, 1928.

TABLE 16

Sugar Consumption in the United States and Importations from Cuba, 1900-1931

(Long tons, refined)

Year	Total consumption	Cuban sugar consumed		Year	Total consumption	Cuban sugar consumed	
		Quantity	Per cent			Quantity	Per cent
1900	2,219,847	[a]	.....	1916	3,658,607	1,666,548	45.55
1901	2,372,316	[a]	.....	1917	3,657,086	1,506,876	41.20
1902	2,566,108	[a]	.....	1918	3,466,101	1,881,244	54.27
1903	2,549,643	[a]	.....	1919	4,033,577	2,067,051	51.25
1904	2,767,162	857,460	30.99	1920	4,067,577	2,133,699	52.46
1905	2,632,216	1,101,611	41.85	1921	4,105,054	1,866,153	45.46
1906	2,964,013	1,165,994	39.34	1922	5,092,758	2,890,571	56.78
1907	2,993,979	1,340,400	44.77	1923	4,780,684	2,648,223	55.42
1908	3,185,789	916,742	28.78	1924	4,854,479	2,824,155	58.18
1909	3,257,660	1,427,531	43.82	1925	5,510,060	2,909,036	52.79
1910	3,350,355	1,640,182	48.96	1926	5,671,335	3,291,297	58.03
1911	3,351,391	1,409,259	42.05	1927	5,297,050	2,912,898	54.99
1912	3,504,182	1,664,863	47.51	1928	5,542,636	2,607,509	47.04
1913	3,743,139	1,990,831	53.19	1929	5,810,980	3,014,594	51.88
1914	3,760,827	2,018,854	53.68	1930	5,599,377	2,457,808	43.90
1915	3,801,531	1,841,602	48.44	1931	5,475,204	2,036,217	37.19

[a] Cuban imports reported with all other foreign sugar subject to the full duty.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

TABLE 17

Sugar Consumption in the United States and Importations from Countries Paying Full Duty, 1900-1931

(Long tons, refined)

Year	Total consumption	Full-duty sugar consumed		Year	Total consumption	Full-duty sugar consumed	
		Quantity	Per cent			Quantity	Per cent
1900	2,219,847	1,544,530	69.58	1916	3,658,607	14,941	.41
1901	2,372,316	1,551,881	65.42	1917	3,657,086	5,475	.15
1902	2,566,108	1,694,141	66.02	1918	3,466,101	19,303	.56
1903	2,549,643	1,508,819	59.18	1919	4,033,577	57,738	1.43
1904	2,767,162	645,733	23.33	1920	4,067,577	554,019	13.62
1905	2,632,216	438,382	16.65	1921	4,105,054	26,729	.65
1906	2,964,013	535,870	18.71	1922	5,092,758	37,366	.74
1907	2,993,979	355,296	11.86	1923	4,780,684	124,438	2.61
1908	3,185,789	684,625	21.49	1924	4,854,479	86,839	1.79
1909	3,257,660	100,221	6.15	1925	5,510,060	33,810	.61
1910	3,350,355	72,393	2.16	1926	5,671,335	39,782	.70
1911	3,351,391	199,062	5.94	1927	5,297,050	5,566	.11
1912	3,504,182	106,350	3.04	1928	5,542,636	29,424	.53
1913	3,743,139	17,558	.47	1929	5,810,980	14,687	.25
1914	3,760,827	48,058	1.28	1930	5,599,377	25,471	.45
1915	3,801,531	20,729	.55	1931	5,475,204	33,445	.61

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

Tariff Concessions Granted Cuba

The concessions granted to Cuba have been of a different nature from those granted to our various insular territories. Until 1903 all sugar imported from Cuba was subject to the full-rate duty, but under the terms of the reciprocity treaty which became effective December 27, 1903, the United States conceded to Cuba a 20 per cent reduction of its regular tariff rates.[28] The treaty left each party free to change its tariff rates at will, with the exception that neither might later impose duties upon products of the other then entering free of duty. Cuba's chief concession was likewise 20 per cent of her tariff rates, although concessions of 25, 30, and 40 per cent were made on certain items specifically mentioned in the treaty.

By far the most important concession made by the United States in the treaty was the reduction of 20 per cent in the rates of duty on Cuban sugar. The full-rate duty on sugar in the Tariff Act of 1897 was 1.685 cents per pound on 96° centrifugal. This rate was, of course, in effect on Cuban sugar until 1903, but after that year the rate was 1.348 cents, the reduction amounting to .337 cent per pound. Since the same rate was retained in the Act of 1909, this reduction in favor of Cuban sugar was effective until March 1, 1914. The changes made in the next four tariff acts are given in Table 11, and show that the concession on Cuban sugar varied from .2512 cent per pound in the Act of 1914, to .5 cent per pound in the Act of 1930.

Cuban Exports to the United States

Prior to the reciprocity agreement with Cuba, practically all of the Cuban exports of sugar went to the United States. (See Table 18.) This was essentially the situation until 1911, but since that year very substantial amounts of sugar have been exported to markets outside the United States. Even without special treatment, Cuban sugar, because of the proximity to the United States, naturally found its way to our markets. Thus, it will be seen that this new arrangement with Cuba created no new source of supply for the United States, nor did it result in diverting any sugar to this country which would have gone elsewhere under the necessity of paying the full duty.

During the early years of our reciprocity treaty with Cuba, that is, until 1908, we continued to import large amounts of sugar subject to the full-rate duty. (See Table 17.) The importations of such sugars amounted to over 21 per cent of our total consumption in 1908, and even during the four years following a good deal of sugar

[28] For text of the treaty, see U. S. Tariff Commission, **Effects of the Cuban Reciprocity Treaty**, Washington, D. C., 1929, p. 172.

was imported from countries subject to the full-rate duty. Since that time, however, with the exception of the year 1920, our imports of full-duty sugar have been very small indeed. During the early years of reciprocity when substantial amounts of full-duty sugar were still being imported into the United States, the Cuban producers (or the various Cuban middlemen) reaped the benefit of the 20 per cent reduction, or, at least, a very substantial part of it. This is clearly

TABLE 18

Production and Exports of Raw Cuban Sugar, 1900-1931
(Long tons)

Year	Production [1]	Total exports [2]	Exports to U. S.	
			Quantity [2]	Per cent
1900	283,651	286,917	286,856	99.98
1901	612,775	589,159	589,116	99.99
1902	863,792	795,278	795,055	99.97
1903	1,003,873	945,633	923,190	97.63
1904	1,052,273	1,097,821	1,097,776	99.99
1905	1,183,347	1,070,411	1,068,717	99.84
1906	1,229,736	1,169,762	1,166,998	99.76
1907	1,443,310	1,286,496	1,280,486	99.53
1908	969,275	878,394	878,329	99.99
1909	1,521,818	1,431,537	1,431,533	100.00
1910	1,804,349	1,725,777	1,632,132	94.57
1911	1,483,451	1,399,596	1,394,296	99.62
1912	1,895,984	1,892,479	1,773,266	93.70
1913	2,428,537	2,411,287	2,129,748	91.13
1914	2,597,732	2,454,336	2,160,264	88.02
1915	2,592,667	2,523,596	2,148,576	85.13
1916	3,007,915	2,889,327	2,153,439	74.53
1917	3,023,720	2,827,658	2,022,653	71.53
1918	3,446,083	3,201,392	2,246,946	70.19
1919	3,971,776	3,950,929	3,116,225	78.87
1920	3,730,077	3,072,658	2,334,249	75.97
1921	3,936,040	2,816,956	2,336,072	82.93
1922	3,996,387	4,898,238	3,916,693	79.96
1923	3,602,910	3,408,976	3,053,793	89.58
1924	4,066,642	3,906,439	3,360,533	86.02
1925	5,125,970	4,932,663	3,473,735	70.42
1926	4,884,658	4,666,779	3,749,527	80.34
1927[a]	4,508,521	4,131,842	3,140,273	76.00
1928[b]	4,037,833	4,011,698	2,873,611	71.63
1929	5,156,315	4,771,211	3,670,455	76.93
1930	4,671,260	3,393,566	2,630,078[c]	77.50
1931	3,122,186	2,652,536	2,075,051	66.46

[a] 1926-1927 crop limited to 4,500,000 tons by Presidential decree signed December 10, 1926, by President Machado.

[b] 1927-1928 crop limited to 4,000,000 tons.

[c] Estimated.

Sources: [1]Willett and Gray's **Weekly Statistical Sugar Trade Journal.** [2]United States Sugar Association, 1900-1924; Czarnikow-Rionda Company, New York, 1925-1929; 1925, from U. S. Sugar Association; 1930 and 1931, from C. Czarnikow, Ltd., **Weekly Price Current**, London, January 8, 1931, January 7, 1932, and January 21, 1932.

shown by the relationship existing between the price of 96° centrifugal sugar at New York City and the price of 88 per cent analysis beet sugar, f. o. b. Hamburg.[29] Prior to the reciprocity agreement of 1903, the New York price was on a par with or above the Hamburg price, while after 1903 the New York price fell below the Hamburg parity, especially during the first half of the year when Cuban sugar dominated the American market. During the latter half of the year, when the full duty sugars were entering our markets, the New York price rose in reference to the Hamburg price. As imports of full-duty sugar decreased, the period in which the New York price was high with respect to the Hamburg price, became shorter and shorter each successive year until 1913, when it remained considerably below all the year. It will be remembered from Table 17 that in 1913 the imports of full-duty sugar practically disappeared. Beet sugar in large amounts was being imported into the United States during the period under discussion (1903 to 1912), with the New York price based on the Hamburg price which in reality was based on the London or world market. Under such conditions the New York price was normally equal to Hamburg parity at New York City. But, since the freight from Cuba to New York was less than the freight from Cuba to London, the New York bid for Cuban sugar f. o. b. Cuba would be higher than the London bid for the same sugar, when the New York price was equal to the Hamburg parity.

Thus Cuba reaped some benefit from the 20 per cent preference granted to her by the treaty of 1903 as long as there was any substantial amount of full-duty sugar coming to our markets. This condition lasted until 1913. The American consumers gained little or no benefit from the reciprocity agreement until 1913. The domestic and insular producers, however, were protected by approximately the full-rate duty. Prices and trade channels alike were so distorted during the war years that no analysis of that period will be attempted. The relationship prevailing between the London and New York markets since 1922, however, should be of some significance.

New York and London Markets Equally Profitable to Cuban Producers

The average difference between the c. i. f. price of 96° centrifugal Cuban sugar at London and the c. & f. price of 96° centrifugal Cuban sugar at New York City was .0713 cent per pound during the period 1922-1929, inclusive. (See Table 34, page 109.) Cuban sugar sold, on an average, for about seven cents more per hundred

[29] For a detailed description of the relationship between these two prices during the period 1899 to 1914, see U. S. Tariff Commission, **Effects of the Cuban Reciprocity Treaty**, Washington, D. C., 1929, pp. 64-78.

pounds on the London market than on the New York market, a spread, in the main, equal to the difference in transportation costs between Cuba and London and Cuba and New York City.[30] This indicated that the two markets were on a parity, transportation costs considered, so far as Cuba was concerned. It was just as profitable for Cuba to sell her sugar in one market as the other, although she would, of course, want to sell as much of her sugar as possible in the American market because of the special treatment received there and also in order to avoid depressing the price on the London market.

In the latter months of 1927 and 1929 and the early months of 1930, the New York price rose considerably in comparison with the London price. Rumors of restriction of the 1927-28 Cuban crop to 4,000,000 long tons were the chief factors in the rise of the New York price over the London price in late 1927. Reports to this effect started as early as the last week in June, 1927, and persisted from then on to January 20, 1928, when President Machado of Cuba signed the Official Decree limiting the 1927-28 crop to 4,000,000 long tons.[31] These rumors held the New York market in a very firm position and even sent prices upward at times. On October 3, 1927, President Machado signed the much-discussed Sugar Defence Law, which gave the Cuban President power to restrict the Cuban crop for the next six seasons.[32]

The period just preceding October 3 had been one of "extreme dullness" as expressed by the trade at the time, but immediately following the signing of this law a rather sharp advance occurred in the American market. On October 13 the Cuban Commission sold 150,000 tons of the current crop to United Kingdom refiners at 11s 7½d c. i. f. for shipment during the next three months. This price was approximately 46 points below the values ruling on the New York market.

In addition, Colonel Tarafa, Chairman of the National Commission for the Defence of Sugar in Cuba, went to Europe and held conferences at Paris the first week of November with representatives from Germany, Czechoslovakia, and Poland. The following week he conferred in Amsterdam with representatives of the Dutch and Javanese sugar industries.[33] The action taken in these meetings

[30] The item of insurance, which is included in the London price but not in the New York price, is so small that for all practical purposes it may be disregarded.

[31] The Official Decree allocated the available Cuban supplies as follows:
150,000 tons for local consumption in Cuba
600,000 tons for countries outside the United States
200,000 tons to be held in reserve
3,050,000 tons for the United States.
The carryover of 250,000 tons from the 1926-27 crop was also allocated to the United States.

[32] C. Czarnikow, Ltd., **Weekly Price Current**, London, October 6, 1927. The Sugar Defence Law of Cuba gave the President power to fix the amount of sugar to be made in any campaign, the President's decision to be made not later than November 30 of each year.

[33] C. Czarnikow, Ltd., **Weekly Price Current**, London, November 17, 1927.

had a favorable influence on the sugar markets both in New York and London.

The chief factor causing the wide divergence between the London and New York prices during the last five months of 1929 and the first three and one-half months of 1930 was the formation and operations of the Cuban Cooperative Sugar Export Agency, Inc., which has been alluded to previously. This agency, known as the Cuban Single Seller, controlled all of the Cuban sugar destined for export, and operated from September 1, 1929 to April 14, 1930. Its avowed purpose was to secure at least 25 points of the Cuban preferential of 44 points. At times the sales to the United States markets were small, but practically all sales made during the last few months of 1929 and the early part of 1930 showed that Cuba was getting a very substantial part of the difference between the Cuban preferential duty and the full-rate duty which, at that time, amounted to .4412 cent per pound. It was possible for Cuba to do this, first, because of the centralized control over exports, second, because the sugar requirements of the United States could not be fully satisfied by the island territories and continental United States producers, and, third, because the freight from Cuba to United States refining centers was less than the freight from other possible sources of sugar subject to the full-rate duty.[34]

Cuba Benefits Little by Preferential Duty

With the few exceptions mentioned above, the Cuban producers have received little benefit from the 20 per cent preference granted her except that they have been guaranteed a market in this country in preference to other foreign countries from which we might buy. The Cuban preferential tariff rate has been our effective rate on sugar since 1913, and the consumers have reaped the real benefit of our preferential treatment of Cuba. Likewise, the continental and insular producers have been protected by the amount of the Cuban rate only.

Though enjoying preference, Cuban sugar has not entirely displaced, in the American market, sugar produced in continental United States or the non-contiguous territories. The United States has, however, offered Cuba an expanding market for her sugar. Also, as pointed out earlier in this chapter, imports of sugar from the island territories have continued to increase ever since tariff concessions were made to them. Since 1900 imports from Hawaii have more than trebled, while imports from the Philippine Islands and

[34] See pages 127 and 128 for further explanation of the influence of the operation of the Single Seller on the New York price. See also Appendix B, page 174.

Porto Rico have increased from less than 100,000 tons to nearly 700,000 tons during the same period. The production of sugar in continental United States has likewise continued to grow and has increased more than four times since 1900. (See Table 19.)

As has been seen from Table 18, Cuban production has increased with great rapidity since 1903, when production was slightly over one million long tons. The 1929 crop was well over five mil-

TABLE 19

United States Consumption of Continental Cane and Beet Sugar, 1900-1931

(Long tons, refined)

Year	Total consumption	Domestic sugar consumed			
		Cane		Beet	
		Quantity	Per cent	Quantity	Per cent
1900	2,219,847	174,450	7.86	82,736	3.73
1901	2,372,316	292,150	12.31	124,859	5.26
1902	2,566,108	296,000	11.53	148,526	5.79
1903	2,549,643	292,800	11.48	247,563	9.71
1904	2,767,162	323,649	11.70	170,134	6.15
1905	2,632,216	334,522	12.71	220,722	8.39
1906	2,964,013	267,947	9.04	300,317	10.13
1907	2,993,979	264,968	8.85	375,410	12.53
1908	3,185,789	390,888	12.27	493,200	15.48
1909	3,257,660	409,960	12.59	434,000	13.32
1910	3,350,355	333,006	9.94	457,000	13.64
1911	3,351,391	288,074	8.60	506,825	15.12
1912	3,504,182	257,194	7.34	427,565	14.75
1913	3,743,139	207,708	5.55	625,314	16.70
1914	3,760,827	143,996	3.83	624,298	16.60
1915	3,801,531	224,768	5.91	769,257	20.24
1916	3,658,607	224,978	6.15	700,256	19.14
1917	3,657,086	258,443	7.07	785,079	21.46
1918	3,466,101	226,275	6.53	527,704	15.22
1919	4,033,577	154,034	3.82	872,253	21.62
1920	4,067,577	75,387	1.85	454,446	11.17
1921	4,105,054	272,773	6.64	946,977	23.07
1922	5,092,758	272,971	5.36	897,629	17.63
1923	4,780,684	215,603	4.51	879,928	18.41
1924	4,854,479	81,648	1.68	744,670	15.34
1925	5,510,060	124,954	2.27	887,324	16.10
1926	5,671,335	70,259	1.23	872,815	15.39
1927	5,297,050	38,597	.73	780,362	14.73
1928	5,542,636	115,749	2.09	1,037,241	18.71
1929	5,810,980	157,573	2.71	856,640	14.74
1930	5,599,377	164,678	2.94	951,830	17.00
1931	5,475,204	171,796	3.14	1,120,818	20.47

Source: Willett and Gray's Weekly Statistical Sugar Trade Journal, New York.

lion long tons, and the 1930 crop was nearly 4,700,000 long tons. It has been pointed out that as late as 1911 Cuba shipped 99 per cent of her exportable surplus to the United States. Since 1915 from 20 to 30 per cent of the Cuban sugar exports have been sent to markets outside the United States. This sugar has weighed heavily upon the world markets and has been one of the main factors in the decline in prices which has depressed the sugar industry throughout the world. Cuba has tried crop limitation, but without the cooperation of other producing areas these efforts have had little influence on the general world situation. Now Cuba is cooperating with eight other important sugar-producing countries under the terms of the Chadbourne Agreement in an effort to stabilize the sugar industry throughout the world by a limitation of production and exports.

Production Conditions in Cuba

Conditions are particularly favorable for the production of sugar cane in Cuba. The climate is almost ideal, the soil is wonderfully fertile, and on the average six very satisfactory ratoon (growth from the root without replanting) crops are secured from one planting; in fact, as many as twelve to fifteen ratoon crops have been secured. New lands are being constantly cleared of timber and brought into sugar production, and even now only about 14 per cent of the lands available for sugar in the Island are planted to cane. Cuba could undoubtedly produce as much sugar as is now being produced by the rest of the world, but it is quite unlikely that there will be any great expansion in the area devoted to cane in the near future, because of the extremely low price of sugar.

Cuba is essentially a one-crop country, and the trend has been more in that direction since 1913. In the opinion of many of those conversant with conditions in Cuba, the country would be benefited by more diversification of production. There are many other crops which can be produced, but shifting from sugar to other crops and back again is very difficult. The possibilities for diversification include bananas, pineapples, and other tropical fruits, off-season vegetables, and tobacco. In addition, there is room for the expansion of the livestock industries, especially beef and pork production, and dairying.[35]

[35] The following quotation from **Sugar** for August, 1928, gives some indications of the possibilities and the results of diversification in Cuba.

"Offsetting the unfavorable conditions on the Island as a whole is the fact that the extreme ends of the Island are prosperous. Reports from the province of Oriente indicate an increased distribution of all kinds of merchandise, including many luxury items. Oriente is a heavy sugar producer, and some of the best managed centrals on the Island are in that province. It has more diversification, however, than elsewhere, and the large American fruit plantations, rapidly increasing coffee production, cattle raising and dairying, and production of tobacco, iron ore, copper, and lumber serve to support its economic life. In Pinar del Rio and in parts of the province of Havana, the year has been a fairly good one in the more eastern regions."

The average annual rainfall on the Island is approximately 50 inches and it has been found by experimentation that yields may be more than doubled by the addition of irrigation water up to 100 or 110 inches. Experiments have not gone far enough to make possible positive assertions as to the increased yields obtainable through irrigation, but in all cases where it has been tried greatly increased yields have been secured.[36] New varieties of cane, resistant to mosaic and giving higher yields, are being developed and some increase in production may be looked for from this source.

The lack of labor in Cuba has always been something of a problem with the planters. The labor requirements are very great during the grinding season which in recent years has lasted from January 15 to sometime in May or June. On December 22, 1928, Haiti raised the embargo on the emigration of Haitian laborers to Cuba, and this has relieved the situation somewhat.[37] However, an effort was being made in Cuba in the spring of 1932 to pass a bill prohibiting all immigration of field hands. Any increase in production in Cuba, therefore, may be expected to come first from increased output per unit of area rather than from any actual expansion of acreage. Diversification is likely to find some favor among the planters, but conditions are so nearly ideal for sugar production that it will be given up only very reluctantly.

The tenacity with which those interested in the production of sugar hold to that one crop is indicated by the increase in the production of sugar in the face of the decline and even disappearance of profits. Cuban production fell in 1927 and 1928, due to crop restriction, but recovered in 1929 when government restrictions were removed. The cane which was left standing during the years of restriction was ground in 1929, which meant that the sugar was stored in the cane left standing in the fields, rather than in warehouses.

The sugar industry in Cuba is on a large-scale basis involving the investment of large sums, much of which has been furnished by Americans.[38] The raw sugar is produced at large centrals, or sugar mills, to which the cane is shipped from the surrounding area. About three-fourths of the cane land is owned by the "colonos," or inde-

[36] **Facts About Sugar**, Vol. 25, No. 4, January 25, 1930, p. 77.

[37] "**Heraldo de Cuba** is informed by the Haitian Minister that pressure of planters and sugar enterprises led him to request his Government to cancel the order prohibiting emigration of Haitian harvest hands to Cuba, and the request has been granted, on condition that emigrants have signed contracts with their employers. Sixteen thousand Haitians are said to have already signed such contracts." **Cuba To-Day**, Havana, Cuba, December 22, 1928.

[38] "An estimate of American investments in Cuba in 1927 places their amount at about one and one-half billion dollars, which is even somewhat greater than a recent estimate of American investments in Mexico. According to estimate, these investments in Cuba are distributed approximately as follows: Sugar companies, $800,000,000; railroads, $120,000,000; public utilities, $110,000,000; Government loans, $109,000,000; manufacturing, $50,000,000; tobacco, $50,000,000; other lands and properties, $150,000,000; merchandising, $40,000,000; mining, $35,000,000; banking, $25,000,000; miscellaneous, $15,000,000." U. S. Tariff Commission, **Effects of the Cuban Reciprocity Treaty**, Washington, D. C., 1929, pp. 3-4.

pendent Cuban farmers, leaving about 25 per cent in the hands of the sugar companies. These companies thus raise a good deal of cane on their own land. The colono delivers his cane to the nearest central and usually secures 55 per cent of the income from the sugar made from his cane, while the other 45 per cent goes to the sugar company. According to a report by the United States Tariff Commission, expenditures for purchased cane, during the five-year period 1918 to 1922, represented 47.8 per cent of the cost of the raw sugar, f. o. b. mill, excluding investment and marketing costs, and 38.83 per cent when these costs were included.[39] It is apparent, therefore, that as the price of raw sugar declines, the cost to the mills of the 75 per cent of the cane which is grown by the colonos will automatically be reduced. This is one reason why the production of raw sugar in Cuba has continued to increase in the face of declining prices. A further explanation of this situation lies in the fact that extremely large profits were made during and immediately after the War and those in the industry are holding on in the hope that prosperous conditions will again return.

Summary

The domestic sugar industry has been protected almost continuously by our tariff policy since the passage of the first tariff act, August 1, 1789. The rate of duty on sugar has varied a good deal, but the amount of protection has been large. Coupled with this policy of protective duties on sugar, the admission of sugar free of duty from Hawaii, the Philippine Islands, Porto Rico, and the Virgin Islands has been a factor of major importance in shaping the sugar trade of this country. And, in addition to these concessions, Cuban sugar has been allowed to enter our ports at a duty 20 per cent less than the full rate since the signing of the reciprocity treaty of 1903.

The imports from these islands have increased to such an extent that practically all other foreign sugars have been excluded from our markets. The price of sugar was not lowered in this country in relation to the world price when we admitted sugar free of duty from these various island territories. The United States consumers continued to buy sugar at a price higher than the world price by virtually the amount of our sugar duty, at first the full-rate duty, and later the Cuban rate. In general, the island producers have reaped the benefit while the Government has lost correspondingly in revenue. In other words, the consumers of this country continued to pay the equivalent of the preferential duty, but it went in part to the island producers instead of into the Treasury of the United States.

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[39] U. S. Tariff Commission, **Sugar, A Report to the President**, Washington, D. C., 1926, pp. 39-40.

Under our protective system, the production of sugar in the insular territories has grown enormously, and increasingly large amounts of sugar have been sent to United States markets. Total production in this country has in general increased, although the production of cane sugar has decreased since 1904-05. Imports from Cuba have increased at the same time. The price of sugar in this country has been determined chiefly by Cuban sugar and this will continue to be the case so long as such a large proportion of our total supply comes from Cuba. Except in an indirect and incidental manner, imports of sugar from the insular territories have not influenced prices in the United States. An ever-increasing amount of Cuban sugar has been forced upon the world market where it has undoubtedly been a very real factor in depressing prices to the low levels now prevailing in all markets. In spite of these low prices, however, Cuban production, with the exception of years when crop restrictions were in force, continued to increase until 1930, when a substantial reduction was registered.

The expansion of sugar production will undoubtedly continue in our insular territories and Cuba. Further expansion of area, however, in Porto Rico, Hawaii, or the Virgin Islands is quite unlikely; in fact, there may even be some contraction of area planted to sugar in these regions. Any increased production in these islands will probably, therefore, come as a result of increased yield per acre and increased sugar content as well as a greater percentage of recovery on the part of the sugar mills. The situation is somewhat different in the Philippines, where there are still large areas to which the production of sugar may be extended, and it is reasonable to expect that there will be a considerable expansion of the area planted to cane there.

Cuba will undoubtedly continue to furnish the United States with the bulk of her sugar. Production can be increased in Cuba both by increasing efficiency and by increasing the area under production. Cuba would undoubtedly be better off if her agriculture were more diversified, but sugar production is so much a part of her economic system that a change, if it comes at all, will probably come very slowly. As production increases in our insular territories or in continental United States, more and more Cuban sugar will be forced upon the world market. In this connection it may be added that Cuba is not likely to gain much from a program of restriction of production without the cooperation of other important producing areas, including the insular territories.

Chapter III

THE SUGAR INDUSTRY OF CONTINENTAL UNITED STATES

FACTS presented in the last chapter indicate that Cuban and insular sugars have supplemented and not directly replaced sugar produced in continental United States. The imposition of a tariff against Philippine or Porto Rican sugar similar to that imposed against the Cuban product would not directly benefit the domestic industry if these islands continued to produce and market the same amount of sugar in this or other markets. A tariff would probably exclude some insular sugar from our markets and shunt it off to the world market; however, the deficit in this country would be supplied not by our continental producers but by Cuban producers, who would ship to the United States some of the sugar they now sell in the world market. Under the present tariff rate, only a world curtailment of production can help American producers to secure the higher prices for which they hope. A tariff against insular sugar might force the high-cost producers on the islands to go out of the sugar business, if they could not compete in the world markets against other more efficient producers; thus, world production might be decreased and the world price raised. The tariff can only bring about a differential above the world market; it cannot raise the world price unless it brings about curtailed world production.

Diverse Interests Represented in the Continental Sugar Industry

The refiners do not have the same interest in an import duty as do the domestic cane and beet producers. The producers have a very definite interest in higher duties on sugar, providing, of course, that the higher duties mean higher prices. Primarily the producers desire higher prices, and only incidentally a tariff which may be responsible for higher prices. In a situation where a very large proportion of the total supply is imported, the domestic price is likely to be above the world price by virtually the amount of the duty, but an effective duty does not necessarily result in prices absolutely higher than those existing before its passage. All of the important nations of the world have imposed duties or granted preferences of varying amounts for the avowed purpose of increasing prices and encour-

aging the production of sugar within their own territory. We have seen that this policy has resulted in prices which have gone to ruinously low levels in recent years. It may be emphasized, therefore, that the primary concern of the producer is the price of his product, and this may have only an incidental connection with the tariff. An importing country like the United States can protect its producers from declining world prices for a time at least by increasing the duty. An exporting country like Cuba, on the other hand, can escape from declining world prices only by reducing production and shifting to the production of some other product or products in the hope that the world price of sugar will thereby be strengthened.

It can hardly be said, however, that the interest of the refiners in the duty on sugar is largely negative. The domestic refiners who are financially interested in the production of raw sugar abroad would like to see a tariff policy inaugurated which would permit such sugar to be imported without the payment of a duty. The refiner is, however, interested in a duty which will protect him from the competition of foreign refiners who might, under free trade, ship the refined product to this country. In one sense, then, the duty makes little difference to the refiner of imported raw cane sugar, but since beet sugar supplies part of the market, the refiner will favor a lower tariff in so far as it will be a factor in removing a competitor from the field. However, the interests of all domestic refiners are not the same. We have seen previously that the attitude of the refiners of Hawaiian sugar at San Francisco toward the sugar tariff is directly opposed to that of the other seaboard refiners.

It is clear that the domestic industry is composed of groups whose interests diverge greatly, and that some knowledge of the continental sugar industry is, therefore, essential to a complete understanding of the tariff problem. A brief discussion of the various phases of the sugar industry of this country follows.

The Cane-Sugar Industry

The production of cane for sugar in the United States has always been confined to well-defined areas in south central Louisiana, southeastern Texas, and southern Florida, Louisiana dominating with approximately 95 per cent of the total production. (See Figure 5.) Sugar cane appears to have been introduced into Louisiana by the Jesuits as early as 1737, but the sugar industry reached no commercial importance there until the close of the century. As shown by Figure 6, production continued to increase up to the Civil War

Distribution of Sugar Crops in the United States

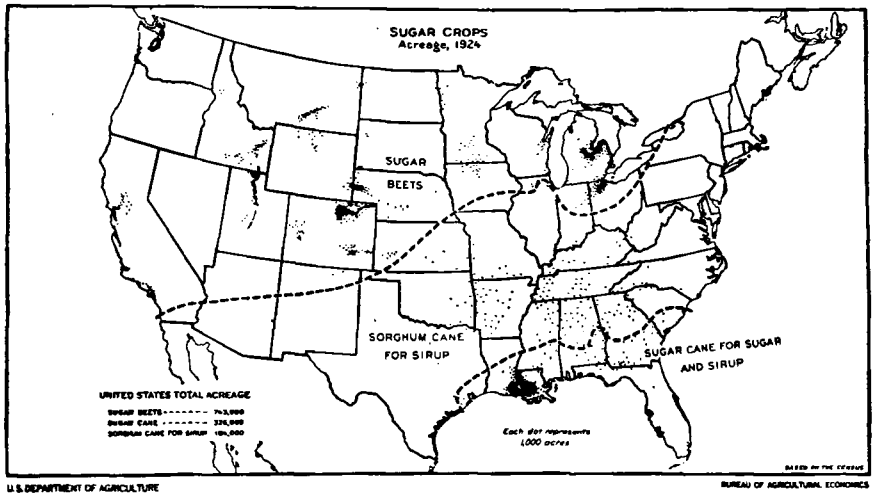

Fig. 5. Approximately 95 per cent of the cane sugar produced in continental United States has come from Louisiana. The acreage of cane for sugar, which since 1910 has been declining, although there has been a good deal of fluctuation, reached the low point of 73,000 acres in 1927. Colorado is the leading beet-producing state with 210,379 acres out of a total of 693,141 acres in 1929-30.

Sugar Production in Continental United States, 1823-1930

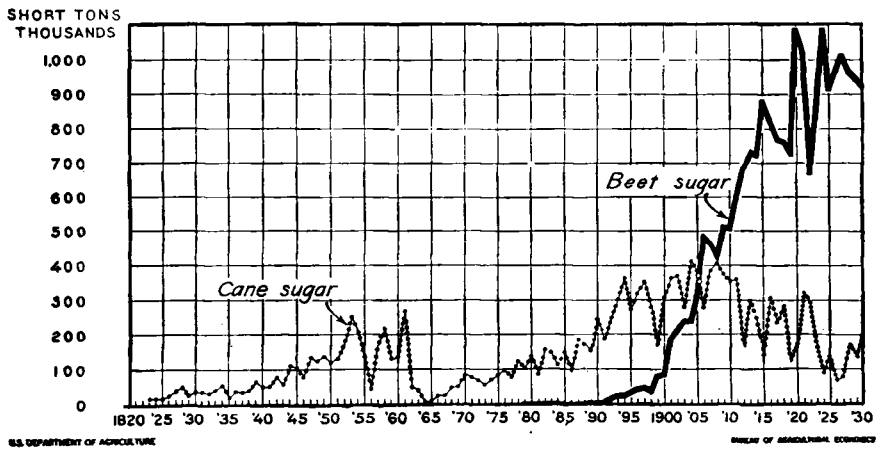

Fig. 6. Sugar cane was probably introduced into Louisiana by the Jesuit Fathers about 1737, but the sugar-cane industry was of no importance until the early years of the nineteenth century. Sugar beets were introduced as early as 1830, but were unimportant until after 1890.

period, when it received a very severe setback. It began to recover, however, soon after the close of hostilities and continued to increase until 1904-05, when something over 400,000 short tons of raw sugar were produced. Since that time, the trend of production of cane sugar in the United States has been generally downward, although it has varied a good deal from year to year. (See Table 19, page 69.)

Even in 1909, when production was at its height, cane sugar produced in Louisiana and Texas furnished less than 13 per cent of our total sugar supply, as shown by Table 19, and since that time the proportion has constantly decreased until in recent years only about 2 or 3 per cent of our total sugar supply has been furnished by domestic cane. It will be noted from the table that the absolute amount produced has decreased greatly. An unusually low level of production was reached in 1927 when less than 39,000 long tons of refined sugar were produced. Production, however, is again on the increase and it is likely, barring any decrease in the tariff rate, that the output will continue to increase materially.

Conditions in Louisiana

Even in these restricted areas the climate is the chief obstacle with which the cane producer has to contend, and it puts the American producer at a very real disadvantage as compared with producers in other cane areas. Cane grown in the United States is produced somewhat beyond its natural climatic zone. There is a growing season of twelve months in practically all cane-producing areas of the world outside the United States. The frost-free season in Louisiana is over 250 days, but the crop is often caught by an early frost, and the cane is always cut before maturity so that the sugar content is lower than in other regions. This climatic handicap is partly overcome in the lower Mississippi Delta, the chief cane-producing region of the United States, by the excellent soils which are found there. These soils are easily drained, and irrigation would not be a difficult task. Indeed, since many of the crop failures in this region are due to drought, it seems that irrigation could be very profitably practiced.[1]

With the exception of the period 1921 to 1923, inclusive, the production of cane sugar declined at an alarming rate between 1918 and 1927. This decrease in production has been due to several factors, chiefly the mosaic disease, the storms of 1926, and the serious flood of 1927. Still another factor which has tended to reduce the acreage of cane for sugar is the change in economic conditions, which has rendered it impossible for the farmer to make a satisfac-

[1] A more complete discussion of the various factors which influence the production of sugar in southern United States will be found in the U. S. Department of Agriculture's **Yearbook of Agriculture, 1923**, pp. 158-164.

tory profit from his crop.[2] Planters are paid by the mills for sugar cane on a basis of the price of sugar in the New Orleans market. For example, with raw sugar selling at four cents per pound, cane usually sells at four dollars per ton. Usually, the planter guarantees 10.5 to 11.5 per cent sucrose in the juice. For all above 12 per cent sucrose he is paid a premium, and for all below the guarantee, the buyer deducts from the price. It can readily be seen that anything which affects the price of raw sugar affects the price of cane at the loading point. But, in spite of the low prices which have prevailed, acreage and production have been increasing each year since the flood of 1927. (See Tables 19 and 20.)

The increase in both acreage and production in Louisiana during the last three years has been stimulated primarily by the development of varieties of cane which are resistant to the mosaic disease. Experiments conducted by the United States Department of Agriculture and the Louisiana Experiment Station have shown that certain new varieties of cane developed in Java are suited to conditions in this country and are proving to be distinctly superior to varieties previously planted in Louisiana.[3] The highest yield secured from P. O. J. (Pasoeroean Ost Java) 36 in 1928 was 4,817 pounds of 96° centrifugal sugar per acre at Cypremort plantation, Louisa, Louisiana. The average yield in Java is about 10,000 pounds and in Hawaii about 6,000 pounds. Unofficial estimates place the additional lands in Louisiana suitable for cane culture at from 400,-

TABLE 20

Acres of Cane for Sugar and Sugar Factories in Louisiana, 1911-1930

Year	Acres of cane for sugar	Factories operated	Year	Acres of cane for sugar	Factories operated
1911	310,000	188	1921	226,366	124
1912	197,000	126	1922	241,433	112
1913	248,000	153	1923	217,259	105
1914	213,000	149	1924	163,000	82
1915	183,000	136	1925	190,000	91
1916	221,000	150	1926	128,000	54
1917	244,000	140	1927	73,000	46
1918	231,200	134	1928	115,000	55
1919	179,900	121	1929	156,000	65
1920	182,843	122	1930	149,000	61
			1931	154,000[a]	[b]

[a] Preliminary.

[b] Not available.

Source: U. S. Department of Agriculture, **Yearbook of Agriculture, 1932**, Washington, D. C., p. 677.

[2] Morse, Irving H., "The Possible Expansion of the Louisiana Sugar Industry," **The Planter and Sugar Manufacturer**, New Orleans, September 14, 1929, Vol. 83, No. 11, p. 201.

[3] U. S. Department of Agriculture, **Variety Tests of Sugarcanes in Louisiana During the Crop Year 1927-28**, Circular No. 88, Washington, D. C., November, 1929.

000 to 500,000 acres. One writer places the possible area for expansion at about 1,500,000 acres in the 21 parishes of the sugar belt of Louisiana.[4]

Possible Expansion in Texas and Florida

Cane sugar was formerly produced in the southern coastal regions of Texas. Available statistics indicate that from 1903-04 to 1910-11 production varied from a maximum of 22,176 tons to a minimum of 11,200 tons. Production decreased rapidly after 1910-11, until in 1923-24 only 2,800 tons were produced. No data are given for production after that year. A combination of unfavorable economic conditions and the use of varieties of cane not well suited to conditions in the area appear to be the chief reasons for the discontinuance of the industry in Texas. No estimates are available regarding the acreage of potential sugar-cane lands, but such lands undoubtedly exist, and it is probable that with suitable varieties of cane and under satisfactory economic conditions the industry could be reestablished and expanded to a considerable extent.

Cane sugar was produced on a commercial basis in Florida prior to the Civil War, but the industry collapsed shortly thereafter and later attempts to revive it, extending to about 1890, were unsuccessful. An attempt which is now being made to establish the cane industry in the Everglades area along the southern shore of Lake Okeechobee seems to give some promise of success. The big problem in this area is drainage, but even so it may be desirable to practice some irrigation since a large and constant supply of moisture is necessary to keep the plants growing rapidly. It has been estimated that 870,000 acres in this region are favorably located for the production of sugar cane. Of this total, from 100,000 to 150,000 acres are the type of land best adapted to sugar-cane production.[5]

It appears, therefore, that there are large areas of land in Louisiana, Texas, and Florida suitable, as viewed in this country, for the production of sugar cane which are not now being used for that purpose. The industry seems to be recovering in Louisiana, and very real development is taking place in Florida. It is reasonable to expect that some further expansion will take place as improvements are made in varieties of cane suited to varying conditions in the several areas mentioned. It must be remembered, however, that southern United States has a tremendous climatic handicap to overcome with a growing season of only a little more than eight months at best as compared with twelve months in most cane-producing areas of the world.

[4] See Note 2 above.

[5] A description of the agricultural conditions and possibilities in the Everglades around Lake Okeechobee, Florida, is given in House Document No. 47, 71st Congress, 2nd Session. This Document includes a "Memorandum Regarding Agricultural Conditions in the Everglades of Florida and the Effect on those Conditions of Proposed Navigation and Flood-Protection Improvements" prepared by an interbureau committee appointed by the Secretary of Agriculture, and transmitted to the House of Representatives, January 21, 1930.

The Beet-Sugar Industry

The history of the beet-sugar industry of the United States extends over hardly more than 40 years. (See Figure 6.) Although many attempts were made to establish the industry prior to 1890, production in this country did not attain any great importance until after that date. (See Table 21.) The industry experienced a phenominal growth after 1892-93, but it was not until 1906 that domestic beet sugar accounted for as much as 10 per cent of our total consumption. The proportion continued to increase until 1921, when it reached its peak of 23 per cent, and then dropped steadily to 17 per cent in 1930. (See Table 19.)

The beet-sugar industry in this country was given an impetus by the bounty law which became effective April 1, 1891, in connection with the Tariff Act of 1890. Under the terms of this act, a direct bounty of two cents per pound was paid to sugar producers. (See Table 10, page 47, for amounts actually paid.)

TABLE 21

Progress of the Beet-Sugar Industry in the United States, 1888-89 to 1931-32

Year [a]	Refined sugar produced (long tons)	Factories operated	Year [a]	Refined sugar produced (long tons)	Factories operated
1888-89	1,861	2	1910-11	455,220	63
1889-90	2,203	2	1911-12	541,101	67
1890-91	3,459	3	1912-13	624,064	73
1891-92	5,356	6	1913-14	655,298	71
1892-93	12,018	6	1914-15	646,257	60
1893-94	19,550	6	1915-16	779,756	67
1894-95	20,092	5	1916-17	734,577	74
1895-96	29,220	6	1917-18	682,867	91
1896-97	37,586	7	1918-19	674,892	89
1897-98	40,399	9	1919-20	652,957	90
1898-99	32,471	15	1920-21	969,419	97
1899-1900	72,944	31	1921-22	911,190	92
1900-01	76,859	34	1922-23	615,936	81
1901-02	163,126	39	1923-24	787,217	89
1902-03	195,463	44	1924-25	974,185	91
1903-04	208,135	53	1925-26	804,439	88
1904-05	209,722	51	1926-27	801,246	79
1905-06	283,717	53	1927-28	965,241	82
1906-07	433,010	63	1928-29	938,640	83
1907-08	440,200	63	1929-30	901,713	79
1908-09	384,010	63	1930-31	1,075,688	78
1909-10	450,595	65	1931-32	1,010,719	65

[a] The crop year is from July to January, inclusive.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. The production for 1931-32 is the latest estimate, published January 14, 1932.

Probably no less effective than the bounty was the attention devoted to beet culture by the United States Department of Agriculture. A special sugar agent was appointed to keep in touch with the farmers and manufacturers; and at least three bulletins dealing with the beet-sugar industry had been issued by the Department prior to 1890, the first having appeared in 1880. Some 20 additional bulletins, setting forth the advantages of beet growing and giving minute directions on methods of cultivation, were distributed among farmers between 1890 and 1900. "The result was familiarity with the possibilities throughout the country, the removal of all obstacles from inertia and ignorance, and a rapid development in all regions where there was a promise of profits."[6]

The individual states were likewise active in promoting the beet-sugar industry. In the last five years of the nineteenth century, sugar, bounty laws were passed in some states and defeated in others. State bounties for the production of beet sugar were paid in Minnesota, Michigan, and New York. Such bills failed of enactment in Illinois, Wisconsin, Pennsylvania, and Ohio.

Area of Production

The sugar beet flourishes over a very wide area, but a bulletin issued by the United States Department of Agriculture in 1908 states that the zone in which the sugar beet may be expected to "attain its highest development" is a belt 200 miles wide, starting at the Hudson River and sweeping across the country as far west as the Dakotas, southward through Colorado, New Mexico, and Arizona, and then west and northwest through California, Utah, Idaho, and the Columbia Valley. The beet-sugar industry of the United States today is confined to this area. (See Fig. 5.) Practically all of the beet-sugar factories of this country are found between the isotherms of 67° and 72° F. summer temperature, an area roughly coincident with the belt described above.

One may distinguish three well-defined beet-producing areas in the United States: the Pacific Region, including California and Washington; the Mountain Region, including Colorado, Wyoming, Montana, Utah, Idaho, and Nevada; and the Central Region, including Ohio, Indiana, Michigan, Illinois, Wisconsin, Iowa, Minnesota, and Nebraska.

Climatic Advantages of Western States

Colorado has been the chief producing state for some time, while Michigan, with less than half the acreage, ranks second. The

[6] Taussig, F. W., **Some Aspects of the Tariff Question**, 4th ed., Harvard University Press, 1924, p. 81.

TABLE 22

Sugar-Beet Acreage Harvested, by States, 1923-1930
(Thousands of acres)

State	1923	1924	1925	1926	1927	1928	1929	1930
Total	657	815	647	677	721	646	693	794
Ohio	41	50	43	35	37	38	16	24
Michigan	109	134	99	100	99	65	62	95
Wisconsin	15	21	15	17	11	8	[a]	[a]
Nebraska	58	64	60	79	82	88	90	80
Montana	[a]	31	30	32	32	29	[a]	[a]
Wyoming	[a]	25	29	36	37	45	[a]	[a]
Idaho	43	40	36	18	29	26	49	43
Colorado	164	222	130	211	218	179	210	243
Utah	83	80	69	51	55	53	43	44
California	61	84	76	46	59	52	43	65
Other states	83	64	60	52	62	63	180	200

[a] Reported with "other states."

Source: Figures for 1923 are from U. S. Department of Agriculture, **Yearbook of Agriculture, 1924**, Washington, D. C., p. 798. Figures for the period 1924-1928 are from the **Yearbook of Agriculture, 1928**, p. 875. Figures for 1929 and 1930 are from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, issues of March 27, 1930, and March 19, 1931, respectively.

total acreage has just about held its own in recent years, but there has been a very decided decline in acreage in the Central States and an increase in the Mountain States, as is clearly evident from Table 22. This shift in acreage has been caused largely by the extremely low prices for sugar which have not enabled the Central States to compete on favorable terms with the producers in the Western States. The climatic conditions are very much more favorable for beet production in the Mountain Region than in the Central States. There is, in the Mountain States, an abundance of sunlight and the water supply is controlled by irrigation. These are the two most important factors in securing a high yield of sugar. Some idea of the relative climatic advantages of the Mountain States in beet-sugar production may be gathered from Table 23, which shows the average production of sugar per acre by states for the crop year 1929-30. Two of the Central States, Ohio and Michigan, show an average production of less than nine-tenths long ton of refined sugar per acre. In contrast with this, the range in yield for the Western States is from 1.39 long tons for Nebraska to 1.71 for California. This difference is of great importance to the economic well-being of the industry in the two areas, and is emphasized by the cost and return figures secured by the United States Tariff Commission in its study of the cost of producing sugar beets in 1921, 1922, and 1923. Part of the results

TABLE 23

Beet Factories, Acreage of Beets, and Production of Beet Sugar, by States, 1929-30

State	Factories operated	Factories idle	Acreage harvested	Refined sugar produced (long tons)	
				Total	Average per acre
Total	79	24 [a]	693,041	901,713	1.30
Ohio	4	1	16,130	14,316	.89
Nebraska	7	....	89,777	124,728	1.39
Michigan	9	7	61,576	51,689	.84
Colorado	17	2	210,379	311,149	1.48
Utah	10	6	42,990	68,724	1.60
Idaho	8	1	48,699	70,204	1.44
California	5	3	43,297	74,194	1.71
Indiana [b]	1	....	.....	.....	.....
Wisconsin [b]	3	1	.....	.....	.....
Iowa [b]	2	1	.....	.....	.....
Minnesota [b]	2	....	.....	.....	.....
Montana [b]	4	....	.....	.....	.....
Kansas [b]	1	....	.....	.....	.....
Wyoming [b]	4	....	.....	.....	.....
Washington [b]	1	....	.....	.....	.....
So. Dakota [b]	1	....	.....	.....	.....
All other	....	....	180,193	186,709	1.04

[a] One factory in Nevada and one in New Mexico not operated, 1929-30.

[b] Data for acreage harvested and refined sugar produced included in "all other."

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, March 27, 1930, p. 165.

TABLE 24

Weighted Average Costs of Production and Returns to Growers from the Sale of Sugar Beets, 1921-1923

(Per acre of beets harvested)

State	Average cost [a]	Average returns	Excess of returns over costs
United States	$70.79	$87.88	$17.09
Michigan	67.01	69.99	2.98
Ohio	58.71	73.45	14.74
Nebraska	66.44	95.87	29.43
Colorado	72.44	91.19	18.75
Utah	80.18	95.55	15.37
Idaho	81.73	106.00	24.27
Wyoming	72.20	83.22	11.02
Montana	69.25	101.80	32.55
California	65.67	87.43	21.76

[a] No allowance made for land rental and interest on capital.

Source: U. S. Tariff Commission, **Cost of Producing Sugar Beets, Part X—United States**, Washington, D. C., 1928, p. 40.

secured in this study are summarized in Table 24, which indicates very low returns per acre in Michigan and Ohio, the only Central States shown. It is clear that the Pacific and Mountain States can produce beet sugar more economically than is possible in the Central States.

Freight Protection

The peculiar competitive position of domestic beet sugar is still another factor which has undoubtedly played an important part in the shift in acreage from the Central to the Western States. About 80 per cent of our total sugar supply is shipped to this country in the form of raw cane sugar and landed at various Atlantic, Pacific, and Gulf refining centers. Thus, beet sugar produced in the interior of the country has a natural freight advantage, so far as local markets are concerned, over the cane sugar landed at the seaboard ports. (See Table 25.) For example, the all-rail rate on sugar from Fort Morgan, Colorado, to St. Paul, Minnesota, is 56 cents per 100 pounds and the all-rail rate from New York City to St. Paul is 69 cents, which gives the Colorado beet-sugar producers a 13 cent freight advantage over the New York refiners in the St. Paul market. Sugar may, however, be shipped over the barge line from New Orleans to St. Paul at a rate of 56 cents per 100 pounds. This rate must, of course, be met by the eastern refiners if they are to compete in the St. Paul market. Western beet sugar would be on an equal basis in the St. Paul market (so far as freight is concerned) with cane sugar shipped from New Orleans, but the western beet producers would have a freight advantage in markets west of St. Paul.

On the other hand, the all-rail rate from New Orleans to Denver is 102 cents per 100 pounds, and the river and rail rate is 92 cents. The Colorado producers therefore secure substantial freight protection in their local markets. A complete schedule of freight rates from all producing centers to all consuming centers would be required to determine accurately the exact amount of freight protection afforded to any producing area, but it is evident that the Mountain States producers have a real advantage in the matter of freight rates over imported cane sugar. It should be added, however, that, under the present market set-up, it is easier for the seaboard refiners to invade western markets than for the beet-sugar producers to invade eastern markets. Prices throughout the country are based upon the New York price plus transportation costs. It is evident that beet sugar shipped east must pay increasing freight costs and yet sell at lower and lower prices as it proceeds toward the Atlantic seaboard to

compete with cane sugar, whereas cane sugar shipped west receives a price equivalent to the New York price plus freight costs to its destination. This means that the beet-sugar producers who are operating on the margin cannot afford to pay the cost of shipping their sugar east, and are, for the most part, kept out of the eastern markets. But they are protected in their local markets by the cost of

TABLE 25

Freight Rates on Sugar, January 1, 1932

(Cents per 100 pounds)

From	Route [a]	Chicago	St. Louis, Mo.	Madison, Wis.	St. Paul, Minn.	Omaha, Nebr.
Cane Sugar						
New York, N. Y.	A. R.	53	58	59.5	69	77.5
	R. L.	51.5	62	64	60.5	75.5
Philadelphia, Pa.	A. R.	51	56	57.5	67	75.5
	R. L.	49.5	60	62	58.5	73.5
Baltimore, Md.	A. R.	49	54	56.5	66	74.5
	R. L.	48.5	59	61	57.5	72.5
New Orleans, La.	A. R.	54	50	56.5	66	65
	M. R. & R.	44	40	46.5	56	55
San Francisco, Cal.	A. R.	84	84	86.5	85	84
Beet Sugar						
Ogden, Utah	A. R.	69	69	71	69	68
Ft. Morgan, Colo.	A. R.	56	56	58	56	55
Scotts Bluff, Neb.	A. R.	56	56	58	56	55
Idaho Falls, Idaho	A. R.	69	69	71	69	68

From	Route [a]	Kansas City, Mo.	Denver, Colo.	Ogden, Utah	San Francisco, Cal.
Cane Sugar					
New York, N. Y.	A. R.	77.5	139	181	181
	R. L.	75.5	147	179	179[b]
Philadelphia, Pa.	A. R.	75.5	137	179	179
	R. L.	73.5	145	177	177[b]
Baltimore, Md.	A. R.	74.5	136	178	178
	R. L.	72.5	144	176	176[b]
New Orleans, La.	A. R.	65	102	128	128
	M. R. & R.	55	92	123	168[b]
San Francisco, Cal.	A. R.	84	84	84	
Beet Sugar					
Ogden, Utah	A. R.	68	56		112
Ft. Morgan, Colo.	A. R.	55	27.5	83.5	128
Scotts Bluff, Neb.	A. R.	55	45	91.5	128
Idaho Falls, Idaho	A. R.	68	56	57	147

[a] Route: A. R., all rail; R. L., rail-lake; M. R. & R., Mississippi River and rail.

[b] The following charges are in addition to the rates shown: 15 cents per ton, 2000 lbs., for California state toll; if handled by steamship companies at San Francisco, a charge of 80 cents per hour; about ⅜ of 1 per cent ad valorem to cover approximate cost of marine insurance.

Note: On and after January 4, 1932, shipments under the above rates will be subject to an additional emergency charge of two cents per 100 pounds until March 31, 1933.

Source: Interstate Commerce Commission, Section of Tariffs, Rate Branch, Washington, D. C.

shipping cane sugar west, and can operate profitably so long as there are markets in areas close to the producing region large enough to absorb their sugar.

Size of Western Market Important

In a very real way, the extent of the markets for sugar west of Chicago will determine the extent to which the beet-sugar industry may expand in the Mountain States. The all-rail freight rate from Fort Morgan, Colorado, and Scotts Bluff, Nebraska, to Chicago is 56 cents per 100 pounds; the all-rail rate from New York City to Chicago is 53 cents per 100 pounds; and the all-rail rate from New Orleans to Chicago is 54 cents per 100 pounds. However, the rate over the Mississippi Barge Line and rail route between these latter two points is 44 cents. In spite of the handicap of the slow movement of cargoes, which gives the all-rail route an important advantage, the Federal Barge Line operating on the Mississippi River continues to carry increasingly large amounts of sugar. Table 26 shows the sugar shipments handled by the Barge Line, and Figure 7 indicates the area over which these shipments were distributed.

A study of the freight rates given in Table 25 and the distribution of the Barge Line cargoes in Figure 7 will indicate the difficulties that western beet sugar must face in competition with imported cane sugar in the area immediately west of Chicago. However, north and west of this territory beet sugar produced in the Mountain States enjoys a real freight advantage. The extent of the demand for sugar within this area will, therefore, be an important limiting factor in the production of beet sugar.

TABLE 26

Sugar Handled by the Federal Barge Line on the Mississippi River, 1918-1931

(Short tons)

Year	Quantity	Year	Quantity
1918[a]	6	1925	192,574
1919	18,436	1926	309,289
1920	1,249	1927	376,303
1921	19,426	1928	337,401
1922	148,733	1929	461,572
1923	131,262	1930	369,825
1924	150,028	1931	398,367

[a] Three months only.

Source: Figures for 1918 to 1927, inclusive, from Mississippi-Warrior Service, Federal Barge Line, **Memorandum No. 2-F**, New Orleans, La. Figures for 1928 to 1931, inclusive, by letter from the Inland Waterways Corporation, New Orleans, La.

Upbound Movement of Sugar on the Mississippi River

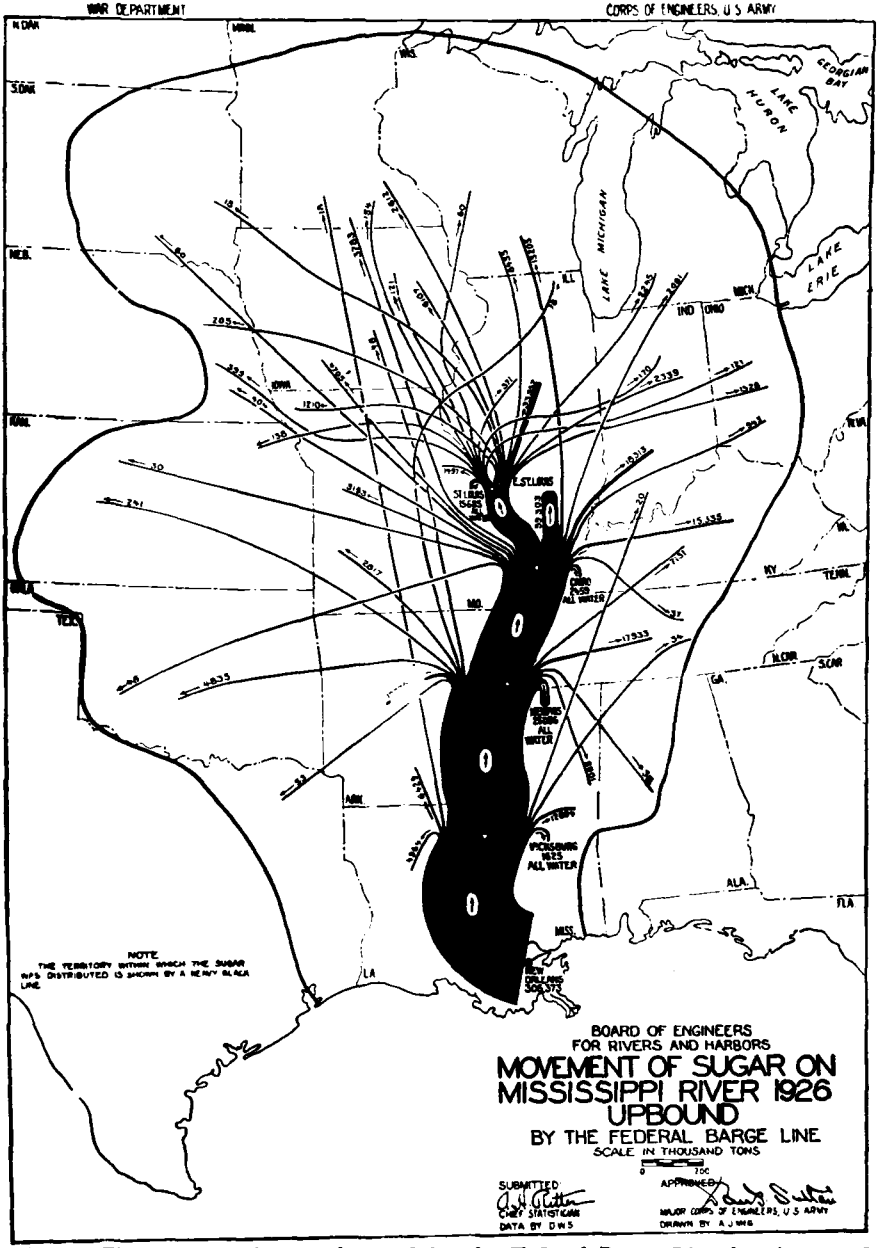

Fig. 7. The amount of sugar handled by the Federal Barge Line has increased rapidly since 1919, when less than 19,000 tons were carried. This transportation route offers an economical though somewhat slow means of reaching the middle-western markets from New Orleans and is being utilized more and more by shippers, as is shown by the fact that nearly 400,000 short tons of refined sugar moved over the Barge Line in 1931.

The data presented in Table 27 show that 26.92 per cent of our total supply of sugar was distributed to states west of the Mississippi River in the twelve months from November, 1917, to October, 1918.[7] In 1920, this same area contained 30.81 per cent of our population. After allowance is made for territory in the Far West supplied from the two California refineries and some territory just west of the Mississippi River in which western sugar cannot compete due to the Barge Line rates, it appears that beet sugar produced in the western areas has a preferential freight access to less than 20 per cent of the sugar market of the United States. This means that, on a basis of the total consumption in recent years, the western producers would have a preferential market for about one million tons of sugar, if all the sugar consumed in these markets were beet sugar. This is, of course, contrary to the facts. In this connection, it would appear that the beet producers could well afford some expense in educating the people in their territory to the use of beet sugar, which is just as good as cane sugar for household or other uses, assuming, of course, that it is equally well refined.

A much more careful and exhaustive study of the freight situation with reference to beet and cane sugar would be required to justify any final conclusions as to the real position of the Mountain States producers. It would seem worth while, however, for the beet producers to make such a study with an eye to securing the greatest possible benefit from the natural protection afforded them by their location in the interior of the country.

Crop Competition

Crop competition is still another factor which has been of major importance in the abandonment of beet acreage, especially in the Central States. A beet-sugar factory in southern Wisconsin bought sugar beets from Minnesota growers during the 1929 season because sufficient acreage could not be secured in the territory adjacent to the factory. Aside from the comparatively low price of sugar, the manager of this factory gave two reasons for the very evident lack of interest in the production of sugar beets in southern Wisconsin.

The first was the difficulty of the work required in producing beets and the undesirability of the laboring class that had to be brought into the community to do that work. The cultivation of sugar beets involves an extremely large amount of painstaking manual labor. The great bulk of this manual labor must be done by slow, tedious, back-breaking methods. The beets must be blocked, thinned, hoed, pulled and piled, topped, and loaded at the farm by

[7] Confidential information secured from private sources indicates that the distribution of sugar over the United States in 1928 was very similar to the distribution in 1918.

TABLE 27

Distribution of Sugar Consumption, 1918, and Percentage Distribution of Population, 1920, by States

State	Sugar consumption[1] (short tons)		Population, (per cent of total)[2]	State	Sugar consumption[1] (short tons)		Population, (per cent of total)[2]	State	Sugar consumption[1] (short tons)		Population, (per cent of total)[2]
	Quantity	Per cent			Quantity	Per cent			Quantity	Per cent	
New England	277,770	7.79	7.00	East North Central	812,273	22.82	16.79	West South Central	231,400	6.49	10.51
Maine	21,164	.59	.70	Wisconsin	80,411	2.26	2.49	Oklahoma	40,603	1.14	5.45
Vermont	14,701	.41	.33	Michigan	125,648	3.53	3.47	Arkansas	29,614	.83	1.66
New Hampshire	10,398	.29	.42	Illinois	310,418	8.72	6.14	Texas	102,276	2.87	1.70
Massachusetts	172,265	4.84	3.64	Indiana	89,007	2.50	2.77	Louisiana	58,907	1.65	1.70
Connecticut	39,508	1.11	1.31	Ohio	206,789	5.81	1.92	Mountain	89,148	2.50	3.16
Rhode Island	19,734	.55	.57	East South Central	153,043	4.30	11.13	Montana	14,277	.40	.52
Middle Atlantic	1,018,935	28.62	21.07	Kentucky	47,219	1.33	2.29	Idaho	10,245	.29	.41
New York	569,702	16.00	9.83	Tennessee	57,694	1.62	2.21	Wyoming	4,739	.13	.18
Pennsylvania	344,225	9.67	8.25	Mississippi	18,079	.51	4.41	Nevada	1,598	.04	.07
New Jersey	105,008	2.95	2.99	Alabama	30,051	.84	2.22	Utah	15,849	.45	.42
South Atlantic	340,396	9.55	13.23	West North Central	409,869	11.51	11.86	Colorado	26,789	.75	.90
Maryland	71,012	1.99	1.37	North Dakota	11,352	.32	.61	Arizona	9,011	.25	.32
Delaware	8,184	.23	.21	South Dakota	12,069	.34	.60	New Mexico	6,640	.19	.34
West Virginia	38,840	1.09	1.39	Minnesota	88,020	2.47	2.26	Pacific	228,616	6.42	5.28
Virginia	71,401	2.00	2.18	Nebraska	40,180	1.13	1.23	Washington	50,556	1.42	1.30
North Carolina	27,358	.77	2.42	Iowa	86,163	2.42	2.27	Oregon	29,894	.84	.74
South Carolina	21,446	.60	1.59	Kansas	47,778	1.34	1.67	California	148,166	4.16	3.24
Georgia	64,984	1.82	2.74	Missouri	124,307	3.49	3.22	GRAND TOTAL	3,561,450	100.00	100.00
Florida	19,097	.54	.92								
Dist. of Columbia	18,074	.51	.41								

Sources: [1]**A Statistical Survey of the Sugar Industry and Trade of the United States,** by Joshua Bernhardt, in charge Sugar Section, Statistical Division, United States Food Administration, and Chief, Statistical Department, United States Sugar Equalization Board, Inc., Washington, D. C., 1920, p. 91.

[2]U. S. Department of Commerce, **Statistical Abstract of the United States,** 1928, Washington, D. C., p. 7.

hand. Cultivation in the early part of the season, lifting the beets, hauling to the railroad, and loading on cars are the only tasks that can be satisfactorily accomplished by the use of horse or mechanical power.

The second reason was the competition of other crops and livestock enterprises. In Wisconsin, tobacco, canning peas, alfalfa, corn and other feed crops, and dairying compete directly with beet raising, and the trend of acreage in recent years indicates that these enterprises are winning out against beets. Within the past few years particularly, they have proved more attractive to the farmer than the production of sugar beets. The choice has been between relatively high prices for dairy products or relatively low prices for sugar beets. Corn in Illinois, Indiana, Iowa, and to a lesser extent in Ohio, competes directly with beets, but seems to have a comparative advantage. Since there is a machine for nearly every operation, corn can be cultivated and harvested with a minimum of hand labor. Corn is, moreover, very important in the cattle-feeding and dairy industries which have grown up in the Central States.

It has been stated time and time again that the production of beets is beneficial to the soil and that larger yields of other crops are secured when planted after beets. The statement is true, but its truth is due to the special care and fertilization generally given to beets rather than to any good inherent in the crop itself. Beans, which compete with beets, particularly in Michigan, leave the land in a condition just as good as or better than beets do, since the bean plant is a legume and adds nitrogen to the soil. Although beet growing does not in itself add to the fertility of the soil, the intelligent methods of farming generally practiced by beet growers do improve it.

Crop competition is not so keen in certain sections of the Mountain States. In Montana, for example, because of high altitude and with a relatively short growing or frost-free season, the farmers are confined to a rather limited group of cultivated crops. In the beet-producing areas of Montana, corn, beans and potatoes are the chief competing crops, and according to the state agronomist the acreage of these crops has about reached the saturation point. Data presented in Table 22, however, indicate that farmers in Montana are not turning to beets very rapidly; in fact, the acreage has declined slightly since 1923. In Wyoming, where the situation is quite similar, there was a decided increase in acreage during the period 1923 to 1930. It appears that the natural advantages of climate and situation with reference to markets, though they be somewhat limited, will

enable the Mountain States to produce beet sugar in competition with the cane sugar shipped from the seaboard.

The Labor Situation

By far the greater part of the laborers needed to do the large amount of hand work in the beet fields each season are recruited from the industrial centers or imported from foreign countries. As a general rule, the farmer and his family do very little if any of the hand labor incident to the cultivation, pulling, and topping of the beets. In Michigan, Ohio, Wisconsin, and other Central States, large numbers of Polish and Bohemian families from the large cities go to the beet sections for employment during the growing and harvesting season. Chinese, Japanese, and Mexicans are used to a large extent in the western beet regions. The influx of foreign labor at the beginning of the season and the exodus after the harvest is over are frequently undesirable from the point of view of the community, and the apparent necessity of employing such labor for the production of beets constitutes a drawback of major importance tending to hold static or even reduce the beet acreage in certain sections of the country.

So long as beets are grown, laborers must be imported into the community. The choice is between beets with the imported labor necessary for their production, and some other crop or livestock enterprise which can be produced by family or local labor. No satisfactory native American labor can be secured to do the hand work incident to the production of sugar beets; so, if beets are to be grown in this country those in the local areas must bring to their communities German-Russians, Poles, Japanese, or Mexicans who will do this hard, hand labor. In this connection the following paragraphs from a recent publication are significant.

"The reasoning of the farmers, then, runs about as follows: the Mexicans are undesirable, but so is any lower class which would provide this type of labor. The Mexicans are necessary in the beets; they are the only labor available and we must have beets; therefore, we must accept the Mexicans.

"The objections to the Mexicans as laborers are clearly diminishing. They are establishing themselves as a more stabilized laboring class and are slow to rise from this class. They thus fill a demand for hand labor in an intensive crop, and have not moved up the scale to compete as tenants or owners with American farmers. But it is amply clear from observation in the field, from statements already quoted, and from others like them, that the same gulf of language,

culture, and race between Mexicans and Americans prevails in the valley of the South Platte as in the Imperial Valley. The fact that a large part of the socially ostracized group, although not born in the beet area, is native to the United States, affects its social status very little. An element of tolerance in the individual relationship between Americans and Mexicans arises from the continuous contact of individual farmers with individual Mexicans which is more general than in Imperial Valley where gang labor is the rule. In neither area does the prejudice against the Mexicans have the sharpness, rigidity, or intensity of the attitude of whites toward the negro. But in both areas there are few avenues of intimate contact and the line of cleavage is marked by the coincidence of barriers of class, culture, language, and consciousness of race."[8]

Organization of the Industry

The beet-sugar companies, to a very large degree, control the agricultural phase as well as the manufacturing phase of the industry. The company makes arrangements for supplying sugar-beet seed and the extra labor needed by the growers, and takes an active interest in the cultural methods used on the farms. The growers, in turn, sign a contract early in the year agreeing to plant a specified number of acres of beets and to deliver the beets to the sugar factory or some loading point along the railroad.

The contract specifies a flat minimum price to be paid for the beets regardless of the price of sugar or the sugar content of the beets, except that the company usually reserves the right to reject beets having less than 12 per cent sugar. The price above the minimum, paid by the western companies, which may be and frequently is changed from season to season, usually varies with the price received for sugar and the sugar content of the beets. For example, one western company paid a minimum price of $7.00 per ton for the 1929 beet crop. If, however, the company had sold its sugar at 6 cents per pound, and the grower had delivered beets containing 16 per cent sugar, the grower would have received $8.16 per ton for his beets. With sugar at the same price, but with beets testing 18 per cent sugar, $9.28 per ton would have been paid. For the most part, however, the selling price of sugar must be five cents or more per pound before extra payments are made on a basis of the sliding scale of prices. In the case of beets testing 15 per cent sugar, no premiums are paid until the price of sugar reaches about 5.5 cents per pound. No such price as this has been received by beet-sugar companies for their sugar in recent years.[9]

[8] Taylor, Paul S., **Mexican Labor in the United States, Valley of the South Platte, Colorado,** University of California Press, Berkeley, California, 1929, p. 235.

[9] The sale price referred to here is the average net return per 100 pounds received by the company for sugar sold during the period from October 1, 1929, to September 30, 1930, after certain costs of marketing have been deducted from the gross price received.

Sugar-Beet Prices and the Tariff Act of 1930

With sugar selling around $4.70 per 100 pounds no extra payments would have been made during the 1929 season to any producers except possibly those delivering beets testing 18 per cent or more. A great deal of sugar was moved at prices below this figure during 1929 and it was only in the early months of 1930 that prices were much above $4.50 per 100 pounds. An increase in the Cuban tariff rate from 1.7648 to 2.00 cents per pound on 96° centrifugal sugar was being proposed during the latter part of 1929 and the early months of 1930. As it turned out, this was the rate finally written into the new tariff act which became effective June 18, 1930. Assuming that the new duty would be completely effective in increasing the price of sugar by the full amount of the increase in duty (.2352 cent on a refined basis), sugar would have sold for around five cents per pound during the latter part of 1929 and the early months of 1930, so that under the terms of the 1929 contract, only those delivering beets testing 17 per cent or more would have secured a price above the minimum. The average sugar content for beets delivered to factories in the United States during the five-year period, 1923 to 1928, was just under 16 per cent. Under such circumstances, an increase of a quarter of a cent in price in 1929 would have meant little or nothing to the great bulk of sugar-beet producers. On the basis of the contract used by some of the factories in the Central States there would have been still less opportunity of securing an immediate benefit from such a small increase in the tariff rate. In these contracts, the minimum price for beets was $7.00 per ton when sugar was selling for 7 cents or less per pound. In other words, under these terms the net cash selling price of beet-sugar would have to go above 7 cents per pound before a grower could receive more than $7.00 per ton for his beets. The price of sugar has been nowhere near this level since 1924.

The above analysis assumes that no alteration was planned in existing contracts. Insofar as the minimum price and sliding scale in these contracts are based upon the price of sugar, the tariff is a factor in determining the minimum price fixed in the scale. For instance, it is quite obvious that if a tariff did not exist at all and the beet-sugar manufacturers received the world price, they would be obliged to reduce the minimum to the beet farmer. It appeared that the 1929 contracts were actually resulting in losses for the beet-sugar factories. The increased duty may help to eliminate these losses and provide a profit. But the minimum price paid to farmers for beets was reduced the next season even in the face of the increased tariff

rate. In this sense it can, therefore, be said that the increase in duty is redounding to the direct benefit not of the farmer, but of the factory. On the other hand, it might be said with equal reasonableness that without the increased duty the factories would be obliged to lower the minimum price sooner, and lower it further.[10]

More Than Higher Tariff Necessary

The increase in rates in the Tariff Act of 1930 was of small significance to the beet producers in that year. On March 13, 1930, the western producers quoted $4.80 per 100 pounds for refined beet sugar. On June 19, 1930, the day after the new rate went into effect, western producers were listing beet sugar at $4.50 per 100 pounds, and on August 21 and September 25 a price of $4.15 per 100 pounds was in force. Toward the close of the year the price rose to $4.35. It is plain that a quarter of a cent increase in the previous tariff rate on sugar did not bring prosperity to the beet-sugar industry. An improvement in the world price is a condition antecedent to the prosperity of the continental producer. The price of sugar must be increased beyond what it has been in recent years if the industry in the Central States is even to survive. A higher American price is, however, contingent upon a higher world price which in turn depends upon an effective control of world production. Most of the companies in the Central States have had deficits during the past three years and two of the largest companies operating in Michigan and Ohio have recently been petitioned into receivership, due to prevailing unsatisfactory conditions. At the same time, the beet industry of the Western States has been more prosperous and some of the companies paid regular dividends on common and preferred stock up to and including 1929, although in 1930 even some of the most efficient of these companies operated at a loss. Clearly, climatic and other conditions in the Central States are not well suited to the production of sugar beets.

Seasonal Character of the Industry

The beet-sugar industry in this country, like the sugar industry throughout the world (except the refining industry), is seasonal. The harvesting period in most sections of the United States is generally less than 100 days, and the average working season for all beet-sugar factories during the past eight years has been about 70 days. Sugar beets will keep without deterioration if frozen but they must be worked up before they thaw, and this compels a short manufacturing

[10] Contracts for 1930-31, in both the Central and Western States, have been reduced from a minimum of $7.00 to as low as $5.50 per ton.

period. The heavy investment in plant and equipment is thus idle for nearly three-quarters of the year, a situation which inevitably results in high overhead costs. And this is not the only problem presented by the seasonal nature of the industry. It also involves a disorganization of the labor force during the greater part of the year, carrying with it the problem of recruiting a force at the beginning of each new harvest.

Sugar cane or sugar beets are being harvested in some country of the world throughout the year. Sugar in the United States is, for the most part, produced in two distinct seasons. The harvesting season in continental United States for both cane and beets is from late summer or early fall to January, and the harvesting of cane and the production of raw sugar are carried on in our insular territories and Cuba during the first six months of the year. (See Table 28.)

It has often been argued that we should foster a domestic sugar industry in this country to prevent Cuba from monopolizing the United States sugar market and forcing prices to exorbitant levels. There has been no monopoly of the United States raw sugar market by Cuba or any other country. The Cuban producers have been competing among themselves to such an extent that they have not even been able to secure the benefit of the 20 per cent preference given them by our Government. This condition has existed since 1912, when we stopped importing large amounts of full-duty sugar. A recent attempt by the Cuban Single Seller to secure this preference of .4412 cent per pound ended in failure and such an attempt is not likely to be made again in the very near future.[11]

Even were the Cuban producers and exporters able to cooperate in the matter of marketing their exportable surplus, it is extremely

TABLE 28

Harvesting Periods in Various Sugar-Producing Countries of the World

Country	Harvesting period
United States, beet	July to January
Europe, beet	September to January
United States, cane	October to January
Philippine Islands, cane	November to June
Porto Rico, cane	January to June
Hawaii, cane	November to June
Virgin Islands, cane	January to June
Cuba, cane	December to June
Java, cane	May to November

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

[11] The operations of the Cooperative Export Agency, Inc., of Cuba which started September 1, 1929, came definitely to a close on April 14, 1930. During most of this period, the Agency was able to secure a large portion of the 20 per cent preference due to the centralized control of exports. See Appendix B, p. 174, for further details.

difficult to see how they could maintain a monopoly price which would be much above the world price plus the United States' full-rate duty on sugar. An excess of sugar is pressing upon practically all the markets of the world, and in such a situation sugar subject to the full-rate duty will be shipped to our markets as soon as the price is high enough to include the duty and transportation charges. Such shipments of full-duty sugar in all probability would prevent any one country from maintaining a monopoly price in this country which would be above the world price plus our full-rate duty. The domestic production has little if any direct effect upon the price in the United States. Basically the price of sugar in this country is determined by world conditions. Production in continental United States is only one very small factor in the world situation. It should be emphasized, therefore, that when sugar is being produced in a great many different countries at all times of the year, and when there is competition among numerous sellers, there is little possibility of long maintaining in one country a price, transportation and tariffs, of course, considered, which is obviously out of line with the price in other consuming centers.

Outlook for Sugar-Beet Production

The total area devoted to the production of sugar beets in continental United States has reached 800,000 acres only once in the past seven years, and in two years only has it exceeded 700,000 acres. There are approximately 190,000,000 acres of crop land in the seventeen states where some beets are generally grown for sugar. Less than one-half of one per cent of the area suitable for crop production in these states is now devoted to the production of sugar beets. Not all of this vast land area, of course, is suitable for beet production, but the agronomic possibilities for extending sugar-beet culture in these states are very great.

The natural conditions of the soil and climate are clearly not the limiting factors tending to hold down the acreage of beets for sugar. These limiting factors appear rather to be economic ones. Competition of tropical cane sugar, labor supply, market price, in which the tariff is a factor of importance, and crop competition are among the more important factors which will govern the production of sugar beets in continental United States.

Summary

The cane-sugar industry of the United States is a comparatively old industry, having attained a position of commercial importance

toward the close of the eighteenth century. The industry reached its height in 1909, when a little more than 400,000 long tons of cane sugar were produced, which supplied less than 13 per cent of our total needs that year. Production declined until 1927 when less than 39,000 long tons were produced, accounting for less than one per cent of our total supply. The introduction of new, disease-resistant, and high-yielding varieties of cane has started the industry upward again in Louisiana. Development in Florida has been going on since 1922 and a good deal of progress is being made. It is an unquestioned fact that there are areas in Louisiana, Texas, and Florida where cane can be grown satisfactorily. The industry in these states, however, has a tremendous climatic handicap to overcome; so it is unlikely that the industry will develop rapidly under present conditions of surplus production and low prices throughout the world. The growing season in most cane-producing countries of the world is twelve months, while in Louisiana it is little more than eight months. This disparity is a handicap of major importance to the industry in southern United States.

The beet-sugar industry of continental United States is comparatively young, having developed almost entirely since 1890. The growth of the industry was extremely rapid until 1920, since which time production has fluctuated a good deal from year to year, almost reaching the high point of 1920 again in 1927. Climate and competition from imported cane sugar are handicaps against the beet industry of the Central States, and the acreage in these states is on the decline. On the other hand, the climate is much more favorable to the production of sugar beets in the Mountain and Far Western States, and there is evidence that the industry is growing, though not rapidly, in this section of the country. Beet sugar produced in this Western Region has the added advantage of freight protection. There are vast areas of land in the United States which are suitable for the production of sugar beets, but economic factors, such as competition from imported cane sugar, our tariff policy, labor supply, and the smallness of the market for sugar in the freight-protected area, constitute factors of major importance tending to limit the size of the industry in this country.

Chapter IV

THE SUGAR MARKET

FROM the time the grower takes his cane to the mill until refined sugar reaches the consumer through the retail dealer, cane sugar may pass through as many as seven hands. In this long line of progress toward the final consumer, there are many factors which may influence the price of the product. The effect of the tariff on prices can be determined only by making allowance for the other price-determining or price-influencing factors. An acquaintance with the various elements which determine the price of sugar, as well as a knowledge of the market mechanism through which these factors operate, is necessary in making this allowance. As a foundation for a discussion of the effect of the tariff on prices, it is the purpose of this chapter to give a description of the sugar market, and to note some of the factors which are responsible for the constantly fluctuating prices and the changes in spread between certain sets of prices.

Sugar Refining

Well over 80 per cent of the sugar consumed in the United States arrives at the refineries in the form of raw or centrifugal sugar. Raw sugar is produced at local mills by boiling the juice of the cane and revolving it in a centrifugal machine at a high rate of speed. This process separates the sugar crystals from the molasses. The sugar is generally shipped in 300-pound bags, and, on landing at a refinery dock, is tested and weighed by United States customs officials as well as by public samplers and weighers.

At the refinery, the raw sugar is washed in tanks of hot water. After it is melted and clarified with lime, the liquor is purified and decolored by filtering through cotton bags and bone charcoal. This liquor is boiled in vacuum pans until sufficient crystals have formed, when the mass is spun in a centrifugal machine and the crystals separated from the liquor. The crystals are dried and turned out as granulated sugar, while the liquor is reboiled and yields the soft or brown sugars. The granulated sugar may be sold as such or further processed into loaf, powdered, or other forms of hard sugar. The refining process is simply the removal of impurities from the raw sugar, necessarily involving a loss in weight. It requires about 107 pounds

of raw sugar testing 96° by the polariscope to produce 100 pounds of refined granulated sugar. A portion of this seven-pound loss is, however, recovered as molasses which is manufactured as a by-product of the refining process.

New York City, the Dominant Sugar Market in the United States

The receipts of raw sugar by New York City refineries in 1930 amounted to 1,239,818 long tons, which was almost twice the amount received at either San Francisco, Philadelphia, or New Orleans, the next most important refining centers in the United States.[1] The receipts at New York alone during that year represented nearly 29 per cent of all the sugar imported into this country by the various refineries. On an average during the period 1928 to 1931 more than 50 per cent of the raw sugar imported into this country has been refined at the four Atlantic seaboard centers, New York, Boston, Philadelphia, and Baltimore. Over 95 per cent of the sugar refined at these centers is shipped from Cuba, Porto Rico, and the Philippine Islands. In 1929, 71 per cent, and in 1930 over 55 per cent of the raw sugar imported at these four points was from Cuba alone. These data indicate the importance of the Atlantic seaboard refining centers in the refining industry of the United States, and the importance of Cuban raw sugar in the total supply shipped to these centers. But it should be remembered that New York City alone accounts for over 50 per cent of the refining business on the Atlantic seaboard, and well over one quarter of the total refining business of the country as a whole.

Price Quotations

The location of the Coffee and Sugar Exchange at New York is another factor which accounts for the dominant position of that

[1] The following table gives the receipts at the various ports for 1930.

Receipts of Raw Sugars at United States Ports, 1930
(Long tons)

Port	Amount	Per cent	Port	Amount	Per cent
New York	1,239,818	28.58	San Francisco [a]	751,119	17.31
Boston	318,465	7.34	New Orleans [a]	613,913	14.15
Philadelphia	707,489	16.31	Savannah and Galveston [a]	277,364	6.39
Baltimore	316,477	7.29	Norfolk [a]	97,826	2.25
All Atlantic Ports	2,582,249	59.52	All U. S. Ports	4,338,240	100.00

[a] Receipts are for the period January 1 to December 27, 1930.
Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, December 31, 1930, p. 638, and January 15, 1931, p. 27.

city among the sugar markets of this country. Dealings at New York are on both a "spot" and "future" basis, and the prices on the New York market, with some modifications including allowance for transportation costs, automatically become the prices throughout the country. The great bulk of the imported sugar is 96° centrifugal, although large quantities of sugar testing higher and lower are imported annually.[2] The price of 96° sugar, however, determines the price of all the other sugars in accordance with a sliding scale. The most important raw-sugar quotations on the New York market are (1) 96° centrifugals, c. & f., and (2) 96° centrifugals, duty paid. The c. & f. (cost and freight) or the c. i. f. (cost, insurance, and freight) price of such sugars is the price landed at New York City before the duty is paid.

The duty-paid price includes the import duty in addition to the several items contributing to the c. & f. price. Theoretically, one would expect the duty-paid price to vary from the c. & f. price by virtually the amount of the duty, and as will be shown later this is actually the case.

In addition to these quotations on 96° centrifugal sugar, two quotations on refined sugar are of particular interest in this study: (1) the price of refined granulated sugar for domestic use, and (2) the f. a. s. (free along ship) price of refined granulated sugar for export.

The quotations on refined granulated sugar are the prices at which it is sold to the trade by the refiners through the medium of a broker, who is paid directly by the refiner for his services.[3] The basis quotation of refined granulated sugar for domestic use at New York City is the price of refined granulated cane sugar loose in 100-pound bags, and this price, plus transportation costs, becomes the price throughout the United States. There are, however, exceptions and modifications to this general statement which make it difficult to trace the exact relationship existing between the New York price and the price in other sections of the country. If, for example, stocks are accumulating at San Francisco and movements are slow at the current prices based on New York quotations, the San Francisco refinery will be inclined to shade prices somewhat in order to move its stocks. Another variation from the general situation is the fact that beet sugar sells at a price somewhat below that of cane. This is a trade practice, established by custom, that is based partly on a prejudice against beet sugar which grew out of the failure during the

[2] Of the 7,333,487,932 pounds of dutiable sugar imported in 1929, 2,618,526,092 pounds tested 95° and 3,742,010,344 pounds tested 96° by the polariscope.

[3] The refiner pays the brokerage when the business is handled by a broker, but it has generally been considered an unethical procedure in the sugar business for a manufacturer to allow a direct buyer a brokerage. One large buyer told the writer that he received such a concession prior to 1925, acting as the company's broker, but that since 1925 the company has refused to allow any such concession. The apparent reason for the concession in this case was to enable the company to secure business in an entirely new territory.

early years of beet-sugar making to refine the product perfectly, and partly on the fact that beet sugar is generally manufactured only in the form of refined granulated. Cane sugar, on the other hand, is manufactured in many forms such as granulated, powdered, and loaf, and a dealer prefers to place his order with a firm which can deliver all the varieties required by his trade.[4] All price quotations, both for cane and beet sugar, are subject to 2 per cent discount for cash in seven days. There is also in operation in this country a system of freight equalization on the part of the refiners by which the freight charge from competing refining centers is put somewhat upon a parity.[5] Another difficulty in tracing the exact relationship between the New York City price and the price in other sections of the country is the fact that the local jobbers' price does not always correspond directly with the price quoted by the New York refiners. The local price may be based on previous purchases made at a lower or higher price than the current quotations of the refiners.[6] As previously mentioned, local conditions of supply of both raw and refined sugar also tend to influence local prices in one direction or another from the price quoted at New York City.

Another quotation on the New York market is the f. a. s. price of refined granulated sugar for export. There is no regular or organized market for export sugar in the same sense that there is for refined granulated for domestic use. However, sales for export are recorded, and the trade papers carry f. a. s. quotations, although not as regularly as the domestic prices. This f. a. s. price might naturally be expected to be lower than the domestic wholesale price of granulated sugar by virtually the amount of the tariff.[7]

With the exception of the f. a. s. price, all of the above-mentioned prices, together with the price of 96° centrifugal sugar in Cuba and the retail price of granulated sugar in New York City, are shown in Figure 8. (See Tables 29 to 33, inclusive, pp. 103 to 107.)

[4] The price of beet sugar was quoted at 20 cents per cwt. below the price of cane sugar at Madison, Wisconsin, during October, 1929. This same differential existed on the Chicago market during the week of March 12, 1931, and at Detroit the week of December 31, 1931.

[5] In October, 1929, the all-rail freight rate to Madison, Wisconsin, from New York City was 69 cents per cwt., from Philadelphia, 67, and from New Orleans, 56.5. The actual freight charge made to the jobbers in Madison by the New York area refiners was, however, 58.2 cents per cwt. One jobber told the writer that this same charge had been in force for about ten years.

[6] Early in October, 1929, the wholesale price of refined granulated sugar at New York advanced to $5.50 per cwt., but the jobbers at Madison, Wisconsin, maintained their former price, which was based on purchases made at $5.15 per cwt. Another example: Refined granulated was quoted at 5.20 cents per pound at New York City during all of January, 1930. In the early part of February, the price dropped to 5 cents and later to 4.95. On February 14, all of the refiners issued notices quoting refined at 4.95 cents less a cash discount of 2 per cent. This offer was made retroactive to cover all contracts booked on and after January 6, 1930.

[7] Section 313 of the Tariff Acts of 1922 and 1930 states, in part, "that upon the exportation of articles manufactured or produced in the United States with the use of imported merchandise, the full amount of the duties paid upon the merchandise so used shall be refunded as drawback, less 1 per centum of such duties . . . ."

Sugar Prices in New York and Cuba, 1921-1930

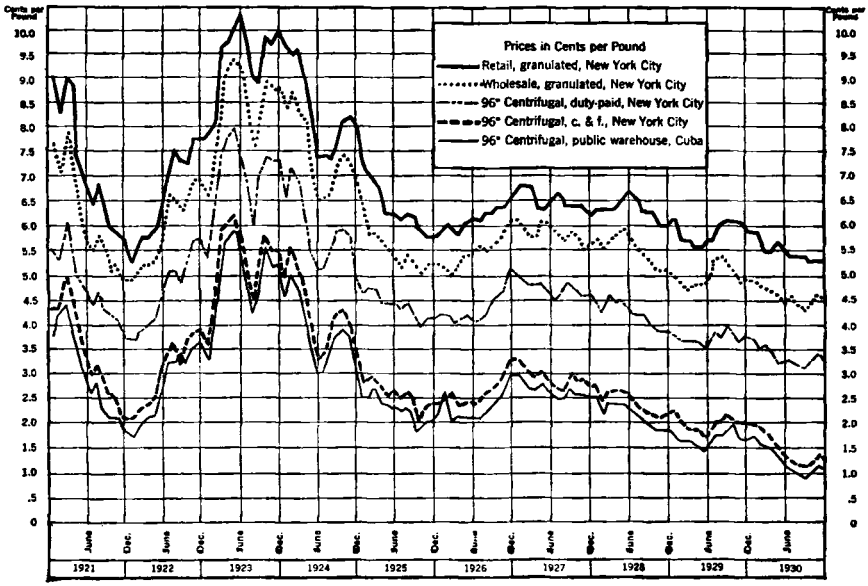

Fig. 8. The three raw sugar prices show a very high degree of harmony in their fluctuations. The wholesale price of granulated sugar fluctuates rather closely with the price of raw sugar, while the retail price of refined sugar appears to lag somewhat.

TABLE 29

Monthly Price of Raw Sugar in Public Warehouses, (Cuba promedios) Cuba, 1912-1931

(Cents per pound, 96° centrifugal)

Month	1912	1913	1914	1915	1916	1917	1918
Average	**2.583**	**1.917**	**2.52**	**3.21**	**4.44**	**4.72**	**4.21**
January	2.897	1.924	1.80	2.51	3.10	3.62	4.32
February	3.092	1.873	1.87	2.96	3.42	3.57	4.21
March	2.929	1.960	1.75	3.40	4.07	3.95	4.21
April	2.583	1.823	1.74	3.18	4.52	4.58	4.21
May	2.385	1.738	2.02	3.54	4.92	4.57	4.21
June	2.304	1.763	2.15	3.65	4.84	4.51	4.16
July	2.322	1.916	2.11	3.56	4.96	5.00	4.20
August	2.490	2.208	4.00	3.37	4.87	5.86	4.20
September	2.746	2.160	4.31	2.97	4.70	5.42	4.20
October	2.518	1.904	3.08	2.80	4.84	5.52	4.20
November	2.417	2.049	2.71	3.31	4.99	5.48	4.20
December	2.312	1.688	2.71	3.32	4.05	4.54	4.20

Month	1919	1920	1921	1922	1923	1924	1925
Average	**5.50**	**11.44**	**3.03**	**2.77**	**4.98**	**3.85**	**2.27**
January	5.04	10.83	3.71	[b]	3.24	4.47	2.47
February	5.04	10.26	4.27	1.67	4.49	5.12	2.53
March	5.04	10.57	4.41	1.97	5.21	4.83	2.66
April	5.04	15.08	3.83	2.09	5.71	4.23	2.41
May	5.04	19.43	3.44	2.14	5.89	3.54	2.29
June	5.04	18.20	[a]	2.63	5.69	3.04	2.33
July	5.04	15.22	2.59	3.21	4.85	3.03	2.20
August	5.04	10.95	2.83	3.19	4.23	3.26	2.28
September	5.04	[a]	2.25	3.33	4.64	3.73	2.19
October	5.04	6.70	2.11	3.23	5.58	3.90	1.82
November	5.04	5.15	2.09	3.46	5.10	3.78	1.97
December	10.50	3.49	1.90	3.57	5.17	3.30	1.99

Month	1926	1927	1928	1929	1930	1931
Average	**2.30**	**2.67**	**2.20**	**1.73**	**1.25**	**1.12**
January	2.07	2.97	2.48	1.78	1.74	1.15
February	2.68	2.86	2.22	1.68	1.60	1.10
March	2.01	2.73	2.43	1.67	1.58	1.07
April	2.08	2.69	2.39	1.61	1.46	1.11
May	2.12	2.77	2.41	1.54	1.25	1.00
June	2.09	2.60	2.32	1.49	1.13	1.11
July	2.07	2.48	2.24	1.83	1.05	1.27
August	2.15	2.46	2.14	1.80	.99	1.20
September	2.31	2.74	2.04	1.93	.91	1.19
October	2.43	2.59	1.93	1.97	1.08	1.19
November	2.56	2.58	1.89	1.71	1.18	1.14
December	2.98	2.52	1.94	1.71	1.08	0.91

[a] Data not available. [b] No sales.

Source: **Industria Azucarera and Revista Azucarera de Cuba** (H. A. Himley). **Figures were averaged from quotations for various sections of Cuba.**

TABLE 30

Monthly Price of Raw Cuban Sugar, c. & f., New York, 1912-1931

(Cents per pound, 96° centrifugal)

Month	1912	1913	1914	1915	1916	1917	1918 [a]
Average	2.81	2.16	2.87	3.63	4.76	5.34	5.00
January	3.07	2.18	1.99	3.05	3.63	4.22	4.98
February	3.28	2.14	2.09	3.69	3.92	4.16	4.98
March	3.11	2.20	2.73	3.76	4.63	5.58	4.98
April	2.78	2.04	1.98	3.79	5.14	5.19	4.98
May	2.62	1.97	2.25	3.83	5.41	5.06	4.98
June	2.53	1.99	2.33	3.89	5.30	5.02	4.98
July	2.55	2.20	2.27	3.84	5.30	5.02	4.98
August	2.75	2.39	4.68	3.77	4.56	6.33	4.98
September	2.95	2.37	4.78	3.26	4.53	5.94	4.98
October	2.74	2.15	3.48	3.09	5.22	5.87	4.98
November	2.70	2.27	2.88	3.74	5.19	5.87	4.98
December	2.60	2.00	2.94	3.81	4.30	5.32	5.21

	1919 [a]	1920	1921	1922	1923	1924	1925
Average	6.36	11.96	3.46	3.00	5.22	4.17	2.56
January	5.88	12.00	4.34	2.05	3.52	4.94	2.82
February	5.88	10.34	4.25	2.14	4.38	5.45	2.84
March	5.88	10.81	4.95	2.31	5.50	5.12	2.96
April	5.88	16.60	4.41	2.39	6.03	4.59	2.67
May	5.88	19.25	3.83	2.44	6.23	3.85	2.54
June	5.88	18.62	3.43	2.98	5.66	3.31	2.64
July	5.88	16.50	3.00	3.54	5.16	3.34	2.51
August	5.88	12.31	3.19	3.56	4.28	3.61	2.58
September	5.88	9.65	2.93	3.17	5.19	4.17	2.49
October	5.88	7.25	2.56	3.64	5.81	4.25	2.01
November	5.88	5.75	2.50	3.83	5.50	4.03	2.27
December	11.58	4.38	2 11	3.91	5.53	3.36	2.36

	1926	1927	1928	1929	1930	1931
Average	2.59	2.96	2.45	1.98	1.49	1.34
January	2.40	3.28	2.75	2.03	1.99	1.35
February	2.45	2.15	2.48	1.95	1.95	1.30
March	2.56	3.02	2.73	1.93	1.82	1.29
April	2.33	3.03	2.69	1.88	1.70	1.29
May	2.42	3.06	2.72	1.82	1.48	1.16
June	2 37	2.86	2.56	1.74	1.36	1.31
July	2.38	2.76	2.45	2.04	1.26	1.49
August	2.46	2.74	2.39	2.04	1.19	1.48
September	2.66	3.02	2.24	2.19	1.14	1.40
October	2.80	2.91	2.16	2.15	1.27	1.42
November	2.93	2.88	2.09	1.96	1.40	1.36
December	3.33	2.81	2.17	2.00	1.27	1.15

[a] Prices under government control.

Source: Data for 1912 and 1913 from Czarnikow-Rionda Co. leaflets, New York. Data for all other years from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

TABLE 31

Monthly Price of 96° Centrifugal Sugar, Duty Paid, New York, 1905-1930

(Net cash price[a], cents per pound)

Month	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
Average	**4.279**	**3.687**	**3.748**	**4.066**	**4.002**	**4.194**	**4.463**	**4.162**	**3.518**	**3.868**	**4.619**	**5.766**	**6.160**
January	5.060	3.637	3.532	3.852	3.706	4.074	3.584	4.418	3.530	3.317	4.059	4.634	5.155
February	5.048	3.395	3.425	3.744	3.649	4.210	3.606	4.689	3.488	3.442	4.658	4.933	5.142
March	4.976	3.478	3.485	4.106	3.844	4.368	3.842	4.455	3.545	2.980	4.787	5.595	5.482
April	4.795	3.465	3.684	4.398	3.928	4.324	3.871	4.111	3.390	2.980	4.739	6.256	6.209
May	4.460	3.450	3.844	4.308	3.912	4.262	3.860	3.952	3.322	3.262	4.816	6.398	6.128
June	4.328	3.480	3.795	4.330	3.898	4.222	3.928	3.882	3.338	3.334	4.912	6.307	6.172
July	4.100	3.710	3.864	4.328	3.939	4.330	4.372	3.931	3.554	3.278	4.750	6.262	6.649
August	4.031	3.870	3.915	4.046	4.088	4.412	5.009	4.111	3.737	5.700	4.710	5.471	7.317
September	3.875	4.058	3.935	3.948	4.204	4.346	5.846	4.298	3.715	5.798	4.317	5.552	6.940
October	3.601	4.012	3.930	3.988	4.268	3.912	5.751	4.092	3.625	4.464	4.043	6.315	6.720
November	3.482	3.828	3.825	3.942	4.382	3.872	5.091	4.050	3.622	3.908	4.781	6.151	6.005
December	3.592	3.858	3.738	3.805	4.209	3.991	4.794	3.952	3.354	3.956	4.853	5.322	6.005

	1918[b]	1919[b]	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Average	**6.463**	**7.693**	**13.015**	**4.777**	**4.642**	**7.013**	**5.919**	**4.339**	**4.339**	**4.726**	**4.218**	**3.766**	**3.370**
January	6.005	7.280	12.772	5.192	3.663	5.338	6.627	4.608	4.170	5.032	4.518	3.814	3.750
February	6.005	7.280	11.303	5.295	3.713	6.438	7.235	4.663	4.204	4.918	4.297	3.736	3.540
March	6.005	7.280	11.987	6.092	3.880	7.295	6.896	4.722	4.035	4.790	4.564	3.708	3.610
April	6.005	7.280	17.155	5.500	4.002	7.782	6.341	4.412	4.119	4.759	4.460	3.658	3.450
May	6.005	7.280	21.685	4.916	4.086	7.978	5.532	4.369	4.201	4.828	4.459	3.588	3.230
June	6.005	7.280	19.288	4.577	4.644	7.446	5.137	4.414	4.135	4.607	4.342	3.537	3.280
July	6.005	7.280	17.555	4.469	5.094	6.851	5.125	4.270	4.144	4.533	4.156	3.924	3.250
August	6.005	7.280	14.098	4.634	5.065	6.000	5.390	4.364	4.240	4.568	4.152	3.805	3.170
September	7.280	7.280	10.150	4.196	4.827	7.083	5.911	4.182	4.469	4.800	3.970	3.997	3.140
October	7.280	7.280	8.392	4.110	5.411	7.360	5.930	3.855	4.550	4.667	3.902	3.913	3.330
November	7.280	7.280	6.625	4.110	5.715	7.323	5.770	4.072	4.701	4.615	3.889	3.730	3.410
December	7.280	12.236	5.165	3.565	5.610	7.261	5.137	4.133	5.097	4.600	3.909	3.776	3.290

[a] Quoted price less 2 per cent for cash in seven days. [b] Prices under government control.

Source: Averages of weekly or daily quotations in Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

TABLE 32

Monthly Wholesale Price of Granulated Sugar, New York, 1905-1930

(Net cash price [a], cents per pound)

Month	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
Average	5.266	4.513	4.652	4.954	4.760	5.032	5.339	5.047	4.342	4.725	5.491	6.753	7.674
January	5.820	4.430	4.592	4.860	4.495	4.860	4.650	5.341	4.498	3.920	4.900	5.770	6.615
February	5.925	4.325	4.562	4.650	4.438	4.925	4.550	5.586	4.177	3.920	5.292	6.051	7.023
March	5.900	4.425	4.550	4.975	4.600	5.175	4.725	5.488	4.190	3.822	5.782	6.524	7.595
April	5.900	4.430	4.600	5.310	4.820	5.900	4.733	5.047	4.106	3.718	5.782	7.121	8.208
May	5.675	4.388	4.750	5.262	4.788	5.162	4.802	4.937	4.915	3.972	5.880	7.425	7.840
June	5.538	4.425	4.850	5.225	4.712	5.062	4.900	4.974	4.140	4.165	5.806	7.326	7.472
July	5.120	4.530	4.780	5.230	4.710	5.075	5.174	4.880	4.469	4.204	5.660	7.497	7.634
August	5.088	4.700	4.650	4.975	4.825	5.112	5.782	4.912	4.606	6.492	5.537	7.026	8.183
September	4.888	4.700	4.650	4.950	4.912	5.050	6.554	4.986	4.532	6.799	4.871	6.370	8.232
October	4.510	4.650	4.650	4.850	4.880	4.860	6.556	4.812	4.185	5.929	5.145	7.048	8.183
November	4.375	4.550	4.625	4.612	4.988	4.550	6.027	4.802	4.214	4.924	5.635	7.350	8.183
December	4.450	4.602	4.562	4.550	4.950	4.650	5.611	4.802	4.077	4.831	5.896	6.868	7.987

Month	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Average	7.785	9.158	11.797	6.140	5.925	8.408	7.392	5.452	5.484	5.809	5.508	4.995	4.599
January	7.644	8.820	[b]	7.562	4.861	6.644	8.367	6.194	5.159	6.113	5.659	5.008	4.924
February	7.301	8.820	[b]	7.130	4.998	7.437	8.648	5.831	5.096	5.896	5.537	4.802	4.851
March	7.301	8.820	[b]	7.922	5.208	8.568	8.330	5.782	4.963	5.798	5.651	4.728	4.753
April	7.301	8.820	[b]	7.080	5.194	9.179	8.056	5.649	5.218	5.831	5.831	4.802	4.704
May	7.301	8.820	[b]	6.311	5.321	9.432	7.115	5.467	5.439	6.076	5.904	4.778	4.606
June	7.325	8.820	[b]	5.586	5.806	9.188	6.475	5.427	5.414	6.027	5.831	4.826	4.459
July	7.350	8.820	[b]	5.549	6.625	8.350	6.497	5.227	5.586	5.815	5.586	5.268	4.606
August	7.350	8.820	16.366	5.831	6.517	7.507	6.615	5.380	5.537	5.562	5.439	5.390	4.373
September	8.085	8.820	13.860	5.504	6.248	8.180	7.178	5.178	5.635	5.782	5.292	5.292	4.312
October	8.820	8.820	11.515	5.145	6.554	8.885	7.350	4.949	5.700	5.684	5.120	5.145	4.459
November	8.820	8.820	9.391	5.194	6.909	8.765	7.236	5.145	5.962	5.537	5.096	4.900	4.655
December	8.820	12.871	7.852	4.867	6.860	8.755	6.840	5.194	6.100	5.586	5.145	4.998	4.492

[a] Quoted price less 2 per cent for cash in seven days.

[b] No open market quotations named by refiners from January 1 to August 11, 1920, inclusive, refiners disposing of their products by allocation to their regular trade.

Source: Averages of weekly or daily quotations in Willett and Gray's Weekly Statistical Sugar Trade Journal, New York. During 1918 and 1919 prices were under government control.

TABLE 33

Monthly Retail Price of Granulated Sugar, New York, 1910-1930

(Cents per pound)

Month	1910	1911	1912	1913	1914	1915	1916
Average	**5.4**	**5.9**	**5.7**	**4.98**	**5.27**	**5.92**	**7.48**
January	5.3	5.4	6.0	5.1	4.7	5.2	6.3
February	5.3	5.4	6.5	4.9	4.5	5.6	6.4
March	5.3	5.4	6.6	4.8	4.5	5.8	6.9
April	5.4	5.3	5.3	5.7	4.4	6.0	7.3
May	5.4	5.3	5.6	4.8	4.4	6.1	7.9
June	5.4	5.3	5.5	4.8	4.5	6.3	8.0
July	5.4	5.4	5.5	4.9	4.6	6.3	7.9
August	5.4	5.8	5.5	5.0	7.1	6.1	8.0
September	5.4	7.0	5.5	5.1	7.1	5.9	7.2
October	5.4	7.3	5.5	4.9	6.6	5.4	7.4
November	5.4	6.9	5.5	4.9	5.4	5.9	8.0
December	5.4	6.4	5.4	4.9	5.4	6.4	8.4

	1917	1918	1919	1920	1921	1922	1923
Average	**8.82**	**9.42**	**10.38**	**17.80**	**7.21**	**6.55**	**9.41**
January	7.4	9.7	10.1	17.3	9.0	5.2	7.7
February	7.6	9.1	9.9	17.9	8.2	5.4	8.0
March	8.4	8.8	9.9	17.3	9.0	5.7	9.6
April	8.7	8.8	10.0	19.1	8.9	5.7	9.8
May	9.1	8.8	9.9	23.0	7.3	5.8	10.3
June	8.4	8.8	10.0	25.3	6.9	6.3	10.4
July	8.4	8.8	10.0	25.2	6.3	7.0	9.6
August	9.0	8.8	10.6	21.7	6.9	7.6	9.0
September	9.2	9.8	10.6	17.3	6.5	7.3	8.9
October	9.7	10.6	10.8	13.1	6.0	7.2	9.9
November	10.0	10.6	10.8	11.9	5.8	7.7	9.7
December	9.9	10.4	11.9	9.7	5.7	7.7	10.0

	1924	1925	1926	1927	1928	1929	1930
Average	**8.36**	**6.36**	**6.12**	**6.50**	**6.33**	**5.9**	**5.50**
January	9.6	7.3	5.8	6.8	6.3	6.1	5.9
February	9.5	7.0	6.0	6.8	6.3	5.7	5.9
March	9.6	6.9	5.9	6.7	6.3	5.7	5.5
April	9.1	6.7	5.8	6.3	6.4	5.6	5.5
May	8.3	6.2	6.0	6.3	6.5	5.6	5.7
June	7.4	6.2	6.1	6.5	6.7	5.7	5.5
July	7.4	6.1	6.1	6.7	6.6	5.7	5.4
August	7.3	6.2	6.2	6.6	6.3	6.0	5.4
September	7.8	6.2	6.2	6.4	6.3	6.1	5.4
October	8.1	5.9	6.4	6.4	6.2	6.1	5.3
November	8.2	5.8	6.4	6.3	6.0	6.1	5.3
December	8.0	5.8	6.5	6.2	6.0	5.9	5.3

Source: U. S. Department of Labor, Bureau of Labor Statistics, **Monthly Labor Review.** Quotations on the 15th of each month. During the years 1918 and 1919 prices were under government control.

The Cuban Market

In recent years Cuba has sent more than 75 per cent of her total sugar exports to the United States (see Table 18, page 65) and her exports to this country, England, and the Continent of Europe account for all but a very minor portion of her total exports of raw sugar.[8] The preferential tariff rate granted Cuba assures her a market in this country for the great bulk of her sugar exports, and the major portion of the surplus above the requirements of this country are shipped to the English market, where they compete with sugar from a large number of countries. The full-rate duty on 96° centrifugal sugar under the Tariff Act of 1930 is 2.5 cents per pound, or .5 cent per pound above the preferential Cuban rate, and is, under normal circumstances, the limiting factor which prevents other foreign sugars from being imported into the United States. It has already been shown (see Chapter II, pp. 64 to 70, and Table 34), however, that the Cuban exporters ordinarily sell their sugar for the same price, transportation charges considered, in both the New York and the London markets. The price in the United States is determined by the London price plus the Cuban tariff rate. For that reason, the Cubans will be interested in shipping as little sugar as possible to that market since receipts there will tend to lower the world price, the base upon which the price in this country is established.

The London Market

The prices prevailing in the London market reflect world conditions better than those of any other single market, and, therefore, the quotations on that market may be taken as the best instance of a

[8] The following table shows the distribution of Cuban exports among the various importing countries.

Cuban Exports by Countries, 1928-29 and 1929-30
(Long tons, raw basis)

Country	1929-30		1928-29	
	Amount	Per cent	Amount	Per cent
Total	3,051,674	100.00	4,666,944	100.00
United States	2,068,642	67.79	3,583,553	76.79
England and the Continent of Europe	842,107	27.59	979,252	20.98
Russia	48,254	1.58	10,554	.23
Australia	42,143	1.38	27,314	.58
Canada	21,020	.69	31,075	.67
China and Japan	19,765	.65	33,230	.71
Other	9,743	.32	1,966	.04

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, **January 15, 1931, p. 29.**

TABLE 34

Differential Between the Prices of Raw Cuban Sugar, c. i. f., London, and c. & f., New York, 1922-1931

(Cents per pound, 96° centrifugal)

Month	1922			1923			1924			1925			1926		
	c.i.f. London[1]	c.&f. N.Y.[2]	Differential	c.i.f. London[1]	c.&f. N.Y.[2]	Differential	c.i.f. London[1]	c.&f. N.Y.[2]	Differential	c.i.f. London[1]	c.&f. N.Y.[2]	Differential	c.i.f. London[1]	c.&f. N.Y.[2]	Differential
Average	**3.09**	**3.00**	**.09**	**5.33**	**5.22**	**.11**	**4.27**	**4.17**	**.10**	**2.65**	**2.56**	**.09**	**2.70**	**2.59**	**.11**
January	2.12	2.05	.07	3.68	3.52	.16	5.06	4.94	.12	2.98	2.82	.16	2.47	2.40	.07
February	2.33	2.14	.19	4.36	4.38	—.02	5.72	5.45	.27	3.01	2.84	.17	2.56	2.45	.11
March	2.47	2.31	.16	5.75	5.50	.25	5.38	5.12	.26	3.10	2.96	.14	2.35	2.56	—.21
April	2.66	2.39	.27	6.48	6.03	.45	4.86	4.59	.27	2.88	2.67	.21	2.47	2.33	.14
May	2.64	2.44	.20	6.61	6.23	.38	4.17	3.85	.32	2.56	2.54	.02	2.54	2.42	.12
June	3.06	2.98	.08	5.98	5.66	.32	3.57	3.31	.26	2.60	2.64	—.04	2.51	2.37	.14
July	3.54	3.54	.00	5.00	5.16	—.16	3.83	3.34	.49	2.63	2.51	.12	2.54	2.38	.16
August	3.78	3.56	.22	4.14	4.28	—.14	3.78	3.61	.17	2.66	2.58	.08	2.56	2.46	.10
September	3.51	3.17	.34	5.53	5.19	.34	4.16	4.17	—.01	2.30	2.49	—.19	2.82	3.66	.16
October	3.72	3.64	.08	5.75	5.81	—.06	3.74[a]	4.25	—.51	2.20	2.01	.19	2.97	2.80	.17
November	3.62	3.83	—.21	5.38	5.50	—.12	3.56[a]	4.03	—.47	2.42	2.27	.15	3.10	2.93	.17
December	3.60	3.91	—.31	5.32[a]	5.53	—.21	3.44	3.36	.08	2.47	2.36	.11	3.48	3.33	.15
	1927			1928			1929			1930			1931		
Average	**2.98**	**2.96**	**.02**	**2.51**	**2.45**	**.06**	**1.97**	**1.98**	**—.01**	**1.43**	**1.49**	**—.06**	**1.25**	**1.34**	**—.09**
January	3.42	3.28	.14	2.69[a]	2.75	—.06	2.10	2.03	.07	1.71	1.99	—.28	1.29	1.35	—.06
February	3.32	3.15	.17	2.58	2.48	.10	2.04	1.95	.09	1.69	1.95	—.26	1.32	1.30	.02
March	3.20	3.02	.18	2.74	2.73	.01	2.05	1.93	.12	1.61	1.82	—.21	1.33	1.29	.04
April	3.12	3.03	.09	2.86	2.69	.17	1.99	1.88	.11	1.64	1.70	—.06	1.38	1.29	.09
May	3.18	3.06	.12	2.84	2.72	.12	1.89	1.82	.07	1.50	1.48	.02	1.33	1.16	.17
June	2.92	2.86	.06	2.71	2.56	.15	1.80	1.74	.06	1.44	1.36	.08	1.39	1.31	.08
July	2.82	2.76	.06	2.59	2.45	.14	2.08	2.04	.04	1.31	1.26	.05	1.42	1.49	—.07
August	2.81	2.74	.07	2.51	2.39	.12	1.92	2.04	—.12	1.24	1.19	.05	1.33	1.48	—.15
September	2.90[a]	3.02	—.12	2.34	2.24	.10	1.97[a]	2.19	—.22	1.18	1.14	.04	1.19	1.40	—.21
October	2.63[a]	2.91	—.28	2.17	2.16	.01	1.98[a]	2.15	—.17	1.26	1.27	—.01	1.17	1.42	—.25
November	2.64[a]	2.88	—.24	2.15[a]	2.09	.06	1.89	1.96	—.07	1.29	1.40	—.11	1.06	1.36	—.30
December	2.81[a]	2.81	.00	2.18[a]	2.17	.01	1.88	2.00	—.12	1.30	1.27	.03	1.03	1.15	—.12

[a] Whenever the price of Cuban/Domingos was reported as "nominal," the price of Perus was used, since the two prices were generally the same.

Sources: [1] C. Czarnikow, Ltd., **Weekly Price Current**, London. [2] Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

world price. There are two reasons which contribute to make London a barometer of world sugar conditions. In the first place, sugars from a great many countries, representing widely scattered areas of production, compete in the London market. There are daily quotations, before the payment of duty, on cane sugar from Brazil, Peru, Cuba, and the Dominican Republic, and, as shown by Table 35, raw sugar from some 20 other countries is shipped to the London market. In recent years, however, Cuba has furnished over one-third of the United Kingdom imports. Sugars, both beet and cane, from all parts of the world are found competing on the London market, and the resulting price is the best available measure of the world sugar situation. The cane-sugar quotations are on a basis of 96° centrifugal sugar c. i. f. United Kingdom. A second factor which makes London a world market is the fact that many of the Continental and

TABLE 35

Imports of Raw Sugar into the United Kingdom

(Long tons)

Country of origin	1930	1929	1928	1913
Total	1,852,654	2,047,029	1,709,146	1,046,715
Poland	46,097	57,192	22,765	.....
Germany	57,828	33,261	460	472,026
Czechoslovakia	607	20,067	21,330	160,858[a]
Russia	.....	.....	6,388	.....
Holland	631	2,296	11,665	.....
Cuba	740,772	696,149	704,393	224,227
San Domingo	237,439	184,454	208,971	9,412
Peru	118,754	124,217	100,299	27,487
Java	406	168,197	8,106	99
Brazil	72,643	11,527	18,017	5,133
Venezuela	130	350	3,309	.....
Honduras	8,109	.....	12,395	.....
Argentine	.....	.....	14,097	.....
Mozambique	2,410	23,124	200	.....
Mexico	60	.....	.....	4,134
Hayti	8,367	2,548	4,658	.....
Dutch Guiana	3,277	2,728	5,013	4,606
British India	.....	.....	255	3,850
Mauritius	136,072	275,030	184,062	20,075
British West Indies	80,498	92,414	138,414	47,736
Natal	105,713	97,383	71,484	.....
Australia	185,220	211,961	151,450	.....
Fiji	12,204	12,343	6,655	.....
Ecuador	.....	5,250	.....	.....
U. S. (Cubas)	12,524	10,400	13,976	.....
Others	22,893	16,138	784	67,072

[a] Austria-Hungary.

Source: C. Czarnikow, Ltd., **Weekly Price Current**, London, Thursday, January 15, 1931, p. 18.

Eastern dealers have their offices in London. Thus, much of the sugar business of Europe and the Orient is transacted in London.

It will be the purpose of the next chapter to analyze the price relationships existing between the three markets which have just been briefly described, and in that way determine the effect of the United States sugar duty on the price of sugar in this country. It has been shown that the bulk of Cuban sugar finds its way to the refining centers in Eastern United States, and that a large part of the remainder is shipped to the London market where it competes with sugar from a large number of countries. It has likewise been shown in previous chapters that, as a greater proportion of the sugar supply of the United States is furnished by the island territories or produced in continental United States, an increasing amount of Cuban sugar is shipped to the London market. This has a depressing effect upon prices in the London market, which in turn is reflected in the Cuban and New York markets.

Factors Influencing Prices

There are two general types of transactions on the New York and London markets, namely, "spot" and "future" transactions. The "spot" market is rather indefinite and vague, for the reason that the terms of a spot transaction may vary in a number of respects. Such a contract may differ as to terms of payment, shipment, loading, or clearance dates. Again, such contracts may be based on c. & f., c. i. f., ex-ship, f. o. b., ex-warehouse, duty-paid, or in-bond quotations for 96° centrifugal sugar. On the other hand, the term "futures" refers specifically to a transaction on the floor of the New York Coffee and Sugar Exchange, or the London Terminal Market in the case of the English market, in accordance with the rules set up by these organizations.[9] The spot and future markets are really one, since the dealer who may be considering a transaction in either one of these markets must have regard for both the spot and the future prices. There is generally a rather definite relationship between these two markets, but actually, as the markets operate, there are frequently wide deviations from the relationship naturally expected. One might normally expect the future price to vary from the spot price by virtually the amount of the carrying charges, but in reality one finds extremely wide variations from such a condition. Sugar is being produced in widely scattered areas, and, since all traders are not aware of all the facts concerning production and supplies, they cannot be expected to act in a purely rational manner. To a very large degree current prices arise out of the present appraisal of

[9] The reader is referred to a series of articles written by John C. Gardner, Futures Department of Lowry and Company, Inc., New York City, on "Trading on the New York Coffee and Sugar Exchange" for a more detailed description and explanation of transactions on the New York sugar market. These articles appeared in the following issues of **Facts About Sugar:** March 12, 1927. May 18, 1929, June 8, 1929, July 20, 1929, August 24, 1929, and October 26, 1929.

future conditions. Future events are constantly being discounted in one way or another by the traders in the market. All traders do not have access to the same facts, and even the same facts are not given equal weight by all of them. This discounting of future events or influencing factors frequently results in a spread between spot and future prices which, on the surface at least, appears abnormal.

The price of spot sugar is being constantly influenced by an almost innumerable variety of factors. In the first place, the mere number and variety of traders in the market, who quite naturally appraise varying situations differently, precludes the possibility of any great degree of stability or regularity in the markets. Refiners, jobbers, wholesalers, manufacturers, exporters, producers, and speculators all have different interests in the markets and likewise all have different ideas of what future conditions, and hence prices, are likely to be. Each buyer or seller in the market may put a different interpretation upon various pertinent factors at any particular time.

Another group of factors which influence the current price of sugar are those connected with the production of sugar throughout the world. Sugar cane or beets are being harvested in some part of the world during every month of the year. Reports of production and planting are constantly going out to the trade, and these reports are being interpreted in various ways by the different individuals in the market. Some are led to sell, some to buy, depending upon their appraisal of the future in the light of the facts which they have at hand. Crop estimates, output reports, floods, droughts, cyclones, all have their effect upon the actions of those buying and selling sugar on the various markets. Consequently, we find prices going up and down with the varying optimism and pessimism of traders in proportion as they are influenced by various facts and rumors. The most important factors which influence the price of sugar in the cash market, then, are the existing and anticipated supply and demand for sugar. We have seen how world supply and anticipated production are constantly changing, consequently, it is not strange that the cash market price should also change frequently. Sudden and unexpected demands for refined or raw sugar will influence prices, as will also the accumulation of stores in Cuba or the United States. Likewise, "distress" shipments of sugar arriving on the New York market may influence prices for a short period.

A further factor which tends to influence price is that of governmental control. The way in which prices were affected by the actual formation and the rumors preceding actual operation of the

Single Seller of Cuba has been pointed out in another connection in Chapter II. The price on the New York City market fluctuated a good deal as Congress considered various tariff rates on sugar during the debate on the Tariff Act of 1930. For example, when on January, 16, 1930, the vote in the Senate was 48 to 38 for retaining the tariff rate of 1922, the market weakened and more sugar was forthcoming at the basis of 3.77 cents. When, on March 5, 1930, the vote was revised to 47 to 39 for an increase in duty, the market took on a firmer aspect, as was evidenced by the following quotation from Willett and Gray: "On Wednesday the tariff question was an important factor in influencing the market as the Senate voted to increase the duty on 96° Cuban raws from 1.7648 cents to 2.00 cents per pound. The market became much firmer and higher prices were paid for duty frees, 3.61 cents being paid for Porto Ricos today."[10] Rumors that certain Cuban newspapers were asking for the dissolution of the Cuban Single Seller sent future prices down to what was then a new all-time low level on February 27, 1930, when the price of March futures fell to 1.54 cents on the New York Coffee and Sugar Exchange.[11] Again on March 19, 1930, the futures market closed nine to thirteen points lower in an effort, no doubt, to discount the dissolution of the Single Seller. It is apparent that prices are turned in one direction or the other by governmental action or even by rumors regarding action to be taken. A further illustration of this is the course which prices followed preceding definite announcement by the Cuban Government regarding their policy of crop restriction in 1926-27 and again in 1927-28.

Thus, there are a great many factors constantly influencing the spot and future prices as well as the spread between the two. This spread varies a good deal and is sometimes more, though frequently less, than the full amount of the carrying charges. It cannot be said that the spot price determines the future price nor that the future price determines the spot price. Certainly the spot price is one factor in the determination of the price on the futures market, but there are different factors influencing each market which at times distort the normal relationships. The futures market acts as a means of relating the present and the future prices of sugar by making it possible to sell futures against present stocks or to buy futures against the expected supply. The only more or less definite relation between spot and fu-

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[10] Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, March 6, 1930, p. 126.

[11] "The pressure being brought to bear by planters and newspapers of Cuba to dissolve the single selling agency started the declines on Wednesday. The likelihood that the opponents of the agency will accomplish their set purpose is the general belief of traders here, as reflected in the selling of Wednesday and the continued selling yesterday, which drove prices to new lows." **The Journal of Commerce**, New York, February 28, 1930, p. 18.

ture prices is that the premium cannot for long remain above the amount of the storage charges.[12]

It should be clear that there are normally a large number of factors which influence prices. The constant and varied interaction of these numerous factors results in ever-changing sugar prices both in the spot and future markets. The tariff is only one of these factors, and for this reason care should be exercised in attempting to isolate and evaluate the effect which this single factor has upon prices. Due to certain characteristics of the sugar industry, it is undoubtedly easier to trace the influence of the tariff on sugar with assurance than in the case of almost any other agricultural commodity. The statistics of production, consumption, and prices are readily available and are very reliable. The price quotations in various markets such as Cuba, London, and New York, as well as other markets in the United States, are of such a nature as to make it possible to trace with a good deal of accuracy exactly what is taking place in the trade and to gain some idea of what effect various factors are having on prices. The price of the great bulk of the sugar sold on the important markets of the world is based on the price of 96° centrifugal sugar. The problem of finding comparable grades is, therefore, eliminated. In contrast with this, one of the chief obstacles in the way of tracing the effect of a duty on corn, wheat, wool, and a great variety of other farm products by a price analysis is the difficulty of finding grades of the product in both the exporting and importing country that are absolutely comparable.

Summary

Over 80 per cent of the sugar consumed in the United States arrives at the refineries in the form of raw sugar, the great bulk of which tests 96° by the polariscope. It is this grade of sugar which is used as a basis for raw sugar quotations in the chief sugar markets of the world. It requires about 107 pounds of this grade of raw sugar to produce 100 pounds of refined sugar. New York City is the dominant sugar market in this country because more than a quarter of the refining business of the country is carried on there and because the New York Coffee and Sugar Exchange is located in that city. The London Market is the best instance of a world market since sugar from a large number of countries is found competing there, and, also, because many Continental and Eastern dealers have their offices in London. Cuba ships her sugar to both the New York and the London markets, but during the period 1922 to 1930 Cuba

[12] There are several reasons why the relationship between these two prices is not more regular. The carrying charges on sugar stored by producers, which is less than for those on the exchange, the dislocation of supply on the spot market, the general shortage of supplies during the last three months of the year, and the future discount of government action or crop prospects all tend to prevent a regular premium between spot and future prices. See, also, an article by John C. Gardner, "Prices on the Sugar Exchange," in **Facts About Sugar**, March 12, 1927.

shipped over 75 per cent of her sugar to the United States, chiefly New York. It is the purpose of the following chapter to show the price relationships between these three markets, and it will be seen that Cuban sugar normally sells at the same price, transportation costs considered, in both the London and New York markets. The factors influencing the price of sugar are numerous and complex. Neither the prices in the "spot" market nor the prices in the "future" market determine the prices in the other. The markets are more or less interdependent, although there are factors which tend to affect the one without affecting the other. To a very large degree, current prices arise out of the actions of a large number of individuals in the market who act according to their present appraisal of future conditions. Crop prospects, future demand, and governmental action are more specific factors which are constantly influencing prices in one direction or the other.

Chapter V

THE EFFECT OF THE SUGAR DUTY ON PRICES

THE sugar industry of continental United States has been protected by an import duty or bounty continuously for 142 years. Before considering the effect of the duty on prices, it may be worth while to point out very briefly some of the purposes which the proponents of the duty have had in mind in advocating a sugar duty over this long period.

Perhaps the chief purpose of the duty on sugar as stated by its advocates is to encourage the production of sugar in continental United States so that we can be more or less self-sufficient so far as sugar is concerned. Incidentally, this would develop a use for some of our agricultural land, give employment to many workers, and result in the accrual of profits to beet and cane growers and manufacturers of refined sugar. Farm relief and the protection of vested interests seem to have been uppermost in the minds of those asking for an increase in the duty in the Act of 1930. We have seen that under protection the cane industry of the South prospered for many years, and in 1890 the beet industry of this country received its impetus. More recently, cane production in continental United States has declined, domestic beet production has continued to grow, although slowly in recent years, and the industry in our insular territories has continued to expand under our protective tariff. It may be said, therefore, that the tariff has been effective in building up a domestic industry. It cannot be said that we have even approached a condition of self-sufficiency so far as sugar is concerned. Only about 18 per cent of our total consumption is produced in continental United States, and we still import well over 50 per cent of our supply from foreign countries.

At times in our history the chief purpose of the sugar duty has been to provide revenue for the Federal Government. So long as we continue to import a large proportion of our total supply, the duty will yield large amounts of revenue and to that extent will reduce the amount of the taxes to be raised from other sources. On an average during the period 1923 to 1930, nearly 555 million dollars of customs duties were collected annually, and approximately one-fourth of this amount was from sugar. The total amount of customs duties collected will, of course, decline as sugar production back of our tariff wall increases.

If the domestic industry is to grow and we, therefore, become more or less self-sufficient, it is assumed, of course, that imports must be restricted. To be effective, then, a duty on sugar must hold importations in check. The domestic industry is interested in the tariff very largely with respect to its effect upon price. Hence a further purpose of the tariff is to raise domestic prices above what they would be under conditions of free trade. It is also hoped that the sugar duty will create work for our laborers and encourage diversification of our industries and agriculture. Both of these purposes have been accomplished to a minor extent, but foreign labor is still imported to work in the beet fields, and the income from the sugar crops of the country represents only about one per cent of the total cash farm income of the United States.

It will be seen that these various purposes conflict at many points. The high prices necessary to develop a domestic industry may not be consistent with the best interests of the consumers as a whole. Even though a small group of farmers are aided by the duty, it does not follow that agriculture as a whole is benefited. All of these phases must, however, be considered in an appraisal of the sugar duty, or any duty for that matter.

It is the purpose of this chapter to determine the effect of the sugar duty on the price of sugar in this country. This will be done by analyzing the price relationships existing between the New York, Cuban, and London markets.

Methods of Measuring the Effect of a Duty on Price*

There are at least three methods which are commonly used in attempting to measure the effect of a specific duty upon the domestic price of a given commodity. The simplest method, and yet the most naive and fallacious one, which may be designated as the propaganda or the before- and- after method, is that of merely comparing prices before and after a given duty is enacted. Anything may be proved by this means, the only requirement being that the dates on which the price comparisons are made be selected with some little care.

The Tariff Act of 1922 increased the duty on 96° centrifugal sugar from 1.6 cents per pound to 1.7648 cents. The net cash price, duty-paid, of 96° centrifugal sugar at New York City during the last weeks of July and the early part of August, 1922, was well over 5 cents per pound; for example, it was 5.36 cents from July 25 through August 15. The new and higher duty went into effect on September 20, 1922, and the duty-paid price of 96° sugar was 4.77 cents on September 25, 4.87 cents September 28, and from September 29 to Oc-

* For a further discussion of this question see Appendix A, page 161.

tober 2 the price stood at 4.96 cents. It is obvious from these figures that the duty-paid price of raw sugar dropped very appreciably after the higher duty became effective.

It is, however, a comparatively simple matter to show, by this method, that exactly the opposite reaction took place after the passage of the 1922 act. During the last week of August, 1922, the price of 96° sugar, duty-paid, was just under 5 cents per pound for the most part, but going as low as 4.61 cents per pound on September 19. The average prices for November and December of the same year were 5.72 and 5.61 cents, respectively. Thus, by the simple expedient of changing dates, it can be shown that the price of sugar increased very materially after the new and higher duty became effective. It is obvious that such a method of price comparison is anything but scientific. The fundamental weakness of this method is that it disregards the influence which factors other than the tariff have upon prices. For the most part, it has been used for purposes of propaganda.

Equilibrium Method

The equilibrium method is one of the scientific methods used in measuring the effect of the duty on price. It has been fully set forth by Professor Henry Schultz of the University of Chicago in "Statistical Laws of Demand and Supply with Special Reference to Sugar" and in "The Meaning of Statistical Demand Curves." The data used in these analyses are for the period 1890 to 1914. Due to the complications brought on by the World War and other circumstances, this method has not been applied for the years since 1914. Professor Schultz has attempted to discover the supply and demand curves applicable to sugar and from them to compute the degree to which the duty has raised the price to the American consumer and has decreased that paid the foreign producer.[1]

By this method Professor Schultz undertakes to measure the precise effect of a large number of extremely complex factors upon a division of the differential, which is caused by the tariff on Cuban sugar, between the foreign and domestic prices of sugar. He does this by throwing all factors together in his coefficients of elasticity of the foreign and domestic supply and demand. After the World War the European sugar-beet industry practically started afresh; production in Cuba has been subject to legislative control; production in Java and other cane-producing areas has been increased tre-

[1] In his study Professor Schultz reached the conclusion "that under such average conditions of demand and supply as had prevailed during the five years before the War, the increase in price due to a tariff on sugar would be approximately 86 per cent of the duty, the remaining 14 per cent being borne by the foreign exporters." Schultz, Henry, **Statistical Laws of Demand and Supply with Special Reference to Sugar**, the University of Chicago Press, Chicago, Illinois, 1928, p. 204. For a non-technical explanation of this method, see Wright, Philip G., **Protection, Benefits and Burdens**, published by W. T. Rawleigh, Freeport, Illinois, 1930, pp. 16-23.

mendously through the development of new, improved varieties; war prosperity in the sugar industry was followed in turn by a depression, a short-lived prosperity, and another still-existing depression during which all relation between cost and market price seems to have disappeared and the industry has gone into bankruptcy on a large scale; severe monetary disturbances have occurred in several important countries; tariffs, bonuses, bounties, and special privileges of all kinds have been granted the sugar industry throughout the world; and Russia has been accused of dumping sugar on the world markets without regard to costs or profits. These are only a few of the most outstanding factors which have had a bearing on the production and consumption of sugar and consequently upon prices. Accurate conclusions regarding the movement of actual prices must be based upon an analysis which weighs the significance of each of these factors. This, of course, has never been done, and the author questions the possibility of doing it with present statistical tools with the exactness claimed by Professor Schultz.

Price Differential Method

In the present study, a comparison of the prices inside and outside the tariff wall will be used as a basis for calculating the benefits and burdens of the sugar duty. This may be called the differential method. This method avoids most of the errors of the before-and-after or propaganda method, though it lacks some of the preciseness claimed for the equilibrium method. A price differential merely measures the spread between two sets of prices. The spread may be caused by the two price series moving in opposite directions, moving in the same direction but at different rates, or by one of them remaining at a constant level while the other changes in either direction. Frequently the spread or differential is the result of factors which affect only one of the price series at least in a direct manner. The same factors may affect the second series in an indirect manner. This appears to be true in the case of a tariff. It has a very direct effect on the price in one market, but has only an indirect or roundabout effect on the price in another market.

The differential between the New York duty-paid and London c. i. f. sugar prices, allowing for other factors, shows the extent to which the tariff causes the spread between the London and New York prices at any given time. It was found that in this case the New York price was higher than the London price by the amount of the United States duty on Cuban sugar.

Other than the tariff, the most important factors in the size of the differential between London and New York are transportation, insurance, and other handling charges incident to the transfer of sugar between the markets. Occasionally there are factors operating temporarily, but they are of such a transitory nature that they cannot be given any specific weight. A comparison of prices shows that the differentials between the various sugar markets are fairly constant, although the actual prices are subject to violent fluctuations. (See Figure 9.)

The differential method, however, has its limitations. It shows concretely the actual amount paid by American buyers above the world price at any given time; it does not reveal what absolute changes may have taken place in actual prices. A differential in the case of sugar, for example, does not indicate to what extent the world price of sugar may have been reduced due to increased production back of our tariff wall, or due to possible decreased consumption in this country. Neither does it explain what may happen to actual world prices if these factors, as for example the tariff, are removed. Hence, it makes no attempt to explain actual changes in price due to the tariff,

Price of 96° Centrifugal Cuban Sugar, Duty Paid at New York City, and c. i. f. London, 1922-1930

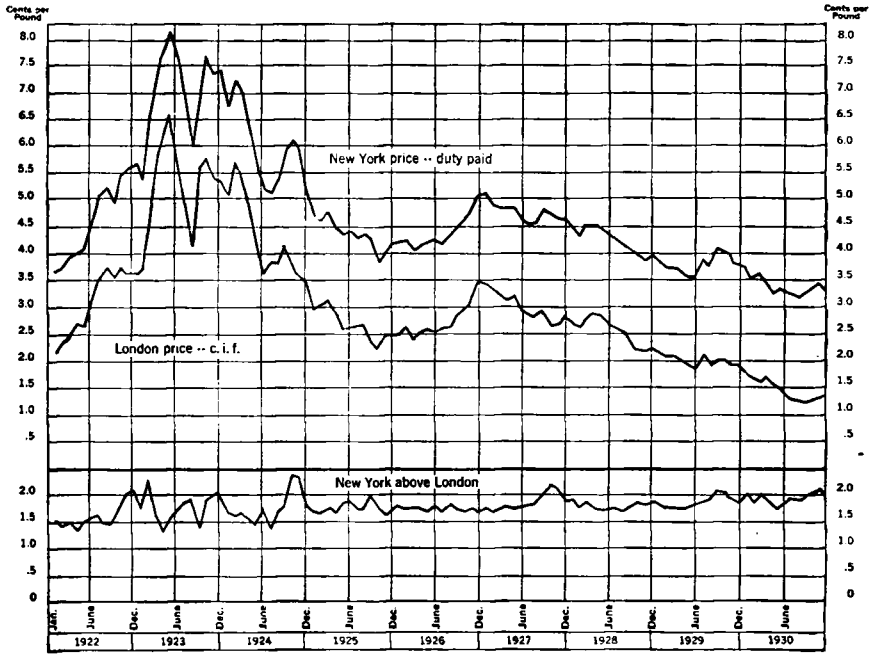

Fig. 9. Since 1924, when the price of sugar ceased its violent fluctuations, the differential between the New York and London prices has remained fairly constant. A sudden drop in the London price in 1927 threw the differential out of line, and in 1929 and 1930 the differential was increased by the operations of the Cuban Single Seller and the increased tariff rate which became effective June 18, 1930.

nor does it attempt to weigh any or all other factors causing price fluctations. The differential method does measure the effectiveness of tariffs and transportation costs in raising the domestic price above the world price under the conditions existing on any given date. An analysis of the price relationship between various sugar markets will be used to measure the benefits and burdens to producers and consumers accruing from our tariff on sugar.

New York and London Prices

It has been shown (Chapter IV) that London is the outstanding world sugar market for competing sugars from a large number of countries. Daily quotations on 96° centrifugal Cuban sugar before the payment of any duty are available in both New York and London. Prices on the same grade of sugar after the payment of the duty are also available on the New York market.[2] A comparison of the price of 96° Cuban sugar c. i. f. London, and duty-paid New York, reveals the fact that the price of raw sugar inside the tariff wall at New York was above the London price by virtually the amount of the Cuban tariff rate from 1922 to 1930, inclusive. These data are presented in Figure 9 and in Table 36.

Since Cuba ships sugar to both the London and New York markets one might, a priori, expect, assuming perfect competition on both of these markets, that the differential between the New York duty-paid price, and the London c. i. f. price, would be equal to the Cuban tariff rate less any difference in transportation charges between Cuba and New York and Cuba and London, respectively. An examination of the price differentials shows this actually to be the case.

Ocean freight rates vary a good deal from time to time, depending on the season of the year, the current demand of shippers, and the type and amount of available tonnage. This variation makes it difficult to calculate the exact difference between Cuba-to-New York and Cuba-to-London shipping costs, but the Cuba-to-London freight rates are higher than the Cuba-to-New York rates. It will be seen from Tables 37 and 38 that the difference between the two rates varies a great deal. It should also be noted from Figure 9 that the differential between the New York and London price also fluctuated considerably between 1922 and 1924. However, to measure the exact difference between the prices on these two markets, allowance should be made for the difference between Cuba-to-London and Cuba-to-New York transportation charges. The difference in these costs from 1922 to 1929 covered a wide range, but rarely went below

[2] The prices for the London market are published by C. Czarnikow, Ltd., London, in their **Weekly Price Current**, while the duty-paid prices on the New York market are published by the Standard Statistics Company, Inc., New York, in their **Standard Trade and Securities Service**, and by Willett and Gray, New York, in their **Weekly Statistical Sugar Trade Journal.**

TABLE 36

Differential Between the Prices of Raw Cuban Sugar, Duty Paid, New York, and c. i. f., London, 1922-1931

(Cents per pound, 96° centrifugal)

Month	1922			1923			1924			1925			1926		
	Duty paid N. Y.[1]	c.i.f. London[2]	Differential	Duty paid N. Y.[1]	c.i.f. London[2]	Differential	Duty paid N. Y.[1]	c.i.f. London[2]	Differential	Duty paid N. Y.[1]	c.i.f. London[2]	Differential	Duty paid N. Y.[1]	c.i.f. London[2]	Differential
Average	4.64	3.09	1.55	7.05	5.33	1.72	5.95	4.27	1.68	4.33	2.65	1.68	4.35	2.70	1.65
January	3.60	2.12	1.48	5.34	3.68	1.66	6.66	5.06	1.60	4.61	2.98	1.63	4.17	2.47	1.70
February	3.71	2.33	1.38	6.61	4.36	2.25	7.28	5.72	1.56	4.61	3.01	1.60	4.21	2.56	1.65
March	3.95	2.47	1.48	7.27	5.75	1.52	6.97	5.38	1.59	4.74	3.10	1.64	4.02	2.35	1.67
April	3.95	2.66	1.29	7.75	6.48	1.27	6.33	4.86	1.47	4.46	2.88	1.58	4.12	2.47	1.65
May	4.09	2.64	1.45	8.11	6.61	1.50	5.56	4.17	1.39	4.35	2.56	1.79	4.17	2.54	1.63
June	4.56	3.06	1.50	7.63	5.98	1.65	5.18	3.57	1.61	4.40	2.60	1.80	4.20	2.51	1.69
July	5.07	3.54	1.53	6.83	5.00	1.83	5.12	3.83	1.29	4.26	2.63	1.63	4.16	2.54	1.62
August	5.20	3.78	1.42	6.01	4.14	1.87	5.32	3.78	1.54	4.34	2.66	1.68	4.29	2.56	1.73
September	4.90	3.51	1.39	6.80	5.53	1.27	5.89	4.16	1.73	4.23	2.30	1.93	4.46	2.82	1.64
October	5.44	3.72	1.72	7.60	5.75	1.85	6.05	3.74[a]	2.31	3.84	2.20	1.64	4.57	2.97	1.60
November	5.59	3.62	1.97	7.31	5.38	1.93	5.86	3.56[a]	2.30	3.96	2.42	1.54	4.74	3.10	1.64
December	5.65	3.60	2.05	7.39	5.32[a]	2.07	5.19	3.44	1.75	4.15	2.47	1.68	5.06	3.48	1.58
	1927			1928			1929			1930			1931		
Average	4.75	2.98	1.77	4.22	2.51	1.71	3.77	1.97	1.80	3.37	1.43	1.94	3.33	1.25	2.08
January	5.09	3.42	1.67	4.50	2.69[a]	1.81	3.81	2.10	1.71	3.75	1.71	2.04	3.37	1.29	2.08
February	4.92	3.32	1.60	4.24	2.58	1.66	3.73	2.04	1.69	3.54	1.69	1.85	3.31	1.32	1.99
March	4.84	3.20	1.64	4.50	2.74	1.76	3.73	2.05	1.68	3.61	1.61	2.00	3.28	1.33	1.95
April	4.81	3.12	1.69	4.51	2.86	1.65	3.68	1.99	1.69	3.45	1.64	1.81	3.29	1.38	1.91
May	4.82	3.18	1.64	4.45	2.84	1.61	3.58	1.89	1.69	3.23	1.50	1.73	3.18	1.33	1.85
June	4.61	2.92	1.69	4.35	2.71	1.64	3.53	1.80	1.73	3.28	1.44	1.84	3.32	1.39	1.93
July	4.52	2.82	1.70	4.24	2.59	1.65	3.88	2.08	1.80	3.25	1.31	1.94	3.49	1.42	2.07
August	4.54	2.81	1.73	4.13	2.51	1.62	3.77	1.92	1.85	3.17	1.24	1.93	3.47	1.33	2.14
September	4.82	2.90[a]	1.92	4.01	2.34	1.67	4.02	1.97[a]	2.05	3.14	1.18	1.96	3.41	1.19	2.22
October	4.72	2.63[a]	2.09	3.92	2.17	1.75	4.00	1.98[a]	2.02	3.33	1.26	2.07	3.41	1.17	2.24
November	4.65	2.64[a]	2.01	3.88	2.15[a]	1.73	3.80	1.89	1.91	3.41	1.29	2.12	3.35	1.06	2.29
December	4.60	2.81[a]	1.79	3.95	2.18[a]	1.77	3.75	1.88	1.87	3.29	1.30	1.99	3.13	1.03	2.10

[a] Whenever the price of Cuban/Domingos was reported as "nominal," the price of Perus was used, since the two prices were generally the same.

Sources: [1] **Standard Trade and Securities Service**, Standard Statistics Company, Inc., 47-49 West Street, New York. Original source: **Journal of Commerce**. Prices for 1930 from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. [2] Average of weekly prices from C. Czarnikow, Ltd., **Weekly Price Current**, London.

TABLE 37

Freight Rates on Sugar from the North Coast of Cuba to New York or Philadelphia, 1921-1931

Date	Cents per 100 pounds	Date	Cents per 100 pounds
1921		1927	
February 3	20 - 25	June 23	14 - 15
February 17	20	August 11	11 - 12
November 5	16	August 27	14 - 15
December 15	15 - 16	September 1	13 - 14
1922		September 15	14 - 15
January 22	17 - 18 - 19	September 29	14½- 15½
February 11	16 - 17	November 3	13½- 14½
May 11	14 - 16	November 23	11½- 12½
1923		December 8	11 - 12
January 13	15 - 16	December 15	11½- 12½
February 3	14 - 15	1928	
June 2	14½- 15½	January 12	12½- 13½
September 8	20	January 26	12 - 13
October 27	18 - 20	February 9	13 - 14
November 24	15 - 16	February 16	11½- 12½
1924		February 23	11 - 12
January 26	17 - 18	March 1	10 - 11
April 5	15 - 16	March 13	12½- 13½
September 13	16 - 17	March 15	13 - 14
1925		March 22	13½- 14½
June 13	13½- 15	May 3	12 - 13
1926		May 17	13 - 14
March 11	12 - 13	May 24	12½- 13½
September 16	18 - 18½	May 31	12 - 13
September 23	19 - 20	July 5	10 - 11
October 7	22 - 23	July 19	11 - 12
October 23	22 - 24	August 9	12 - 13
October 28	18½- 25	August 30	13½- 14½
November 18	18	December 6	14 - 15
November 27	20 - 22	1929	
December 11	18 - 20	January 17	15 - 16
December 16	16 - 17	May 23	14 - 15
December 30	17 - 18	August 8	14½- 15½
1927		November 7	14 - 15
January 8	15 - 16	December 26	12 - 13
January 27	15½- 17	1930	
February 17	16 - 17	January 2	11½- 12½
March 10	15 - 16	April 3	9½- 10½
March 24	14½- 15½	April 24	13 - 14
April 7	13½- 14	May 15	11 - 12
April 21	13½- 14½	July 24	9 - 10
May 5	14 - 15	August 14	12 - 13
May 19	13 - 14	September 11	9 - 10
June 2	15½- 16½	1931	
June 16	15 - 16	January 22	10½- 11
		March 5	11½- 12½

Source: Rates for 1921-1929, inclusive, furnished by the U. S. Tariff Commission, as reported by Mr. Himely in various publications. Rates for 1930 and 1931 from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York. All rates two cents higher from the south coast of Cuba.

TABLE 38

Freight Rates on Sugar from the North Coast of Cuba to the United Kingdom, 1921-1931

Date	Cents per 100 pounds (charters)	Date	Cents per 100 pounds (charters)
1921		1928	
December 15	25.78 to	January 26	18.50 to 19.58
1922		March 13	19.06 " 20.15
March 9	22.32 " 24.55	May 21	17.71 " 18.25
1923		June 21	16.88 " 17.97
January 13	21.39 " 22.95	August 30	17.87 " 18.96
February 3	19.84 " 20.36	December 6	20.57 " 22.74
June 2	23.25 "	1929	
September 1	19.78 "	March 7	20.58 " 21.12
October 27	20.08 "	May 23	19.48 " 20.03
November 24	22.43 " 23.40	August 8	18.95 " 20.58
1924		1930	
January 26	21.72 " 22.67	January 2	16.89 " 17.42
1926		April 3	12.51 " 13.06
March 11	16.28 " 17.36	April 24	14.10 " 15.17
October 28	54.10 "	May 15	14.09 " 16.28
November 18	27.07 "	July 24	13.04 " 15.18
December 16	23.83 " 26.00	August 14	14.66 " .....
1927		September 11	14.10 " 14.64
April 7	23.31 "	1931	
August 11	17.90 " 18.45	January 22	13.01 " 14.08
November 23	18.23 " 19.05	March 5	15.16 " 15.74

Source: Figures for 1921-1929, inclusive, furnished by the U. S. Tariff Commission. Data for 1930 and 1931 from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

4.00 cents per hundred pounds in favor of New York; it was more generally near 5 cents and frequently went up to 7 cents per hundred pounds; occasionally it was as much as 9 or 10 cents. The amount of this difference, whatever it was, should be added to the actual differential between the New York and London price to show the true price relation so far as the Cuban shipper, who was selling in both markets, is concerned.

When the differential between the New York and London prices shows the New York price to be 1.71 cents per pound above the London price, as was the case in January, 1929, (see Table 36, p. 122) and with the difference in freight costs ranging between .07 and .08 cent per pound, as it did at that time, the real difference between the two prices is 1.78 to 1.79 cents per pound. The difference in transportation costs must be added to the New York price or subtracted from the London price to show the true relationship on an

f. o. b. Cuban, basis. The actual average differential between the two markets from 1922 to 1929, inclusive, was 1.695 cents per pound. When a freight differential of from four to seven cents per hundred-weight is added to this amount, the figure is increased from 1.739 to 1.765 cents per pound, which was equal to approximately the full amount of the Cuban tariff rate of 1.7648 cents.

Imports of sugar subject to the full-rate duty, temporary dislocation of stocks in reference to demand, the natural shortage of supplies which is likely to prevail in the United States late in the year before the new crop comes on the market, concerted action on the part of the Cuban sellers, and variations in ocean freight rates, all act to move the differential up or down from that normally expected. The importation of even relatively small amounts of sugar subject to the full-rate duty, especially late in the summer and fall when stocks of Cuban, insular, and domestic sugars are low, tends to bolster up prices for short periods. There is evidence of this action in 1923 and 1924 when somewhat more full-duty sugar than usual was imported. The great fluctuations during this period were also due to the dislocation of supplies and the apparent shortage of sugar which was facing this country, especially in 1923. The deviation of the differential from that expected in 1927 was due more to a sudden drop in the London price than to any change in the New York price.

The very definite increase in the differential during the last half of 1929 and the early months of 1930 was due to the activities of the Cuban Single Seller in controlling exports to United States markets and in attempting to secure a portion of their tariff preference of .4412 cent per pound. It should be noted that the London price remained at substantially the same level during the last half of 1929, and that the entire increase in the differential was due to an increase in the New York price over the world or London price. During the last half of 1930, the situation was complicated by the new tariff rate of 2.00 cents, which became effective June 18.

It is evident from the previous discussion that the duty-paid price of sugar at New York City has been above the world or London price by approximately the full amount of the duty on Cuban sugar from 1922 to 1930. During the period 1922 to 1924, when prices were fluctuating rather widely, the differential also fluctuated widely. It was sometimes more and sometimes less than the full amount of the Cuban duty. Since 1924, however, the New York price, with very few exceptions, has been above the London price by an amount equal to or greater than the American duty on Cuban sugar.

New York and Cuban Prices

It was shown in Chapter II that Cuba has always sent the bulk of her sugar to the United States. (See Table 18, p. 65.) Since 1922, Cuba has shipped from 70 to 90 per cent of her total sugar exports to this country. It was likewise shown that an extremely small amount of sugar from foreign countries other than Cuba has been imported into the United States since 1909. (See Table 17, p. 63.) The factor limiting our importations of other foreign sugars to such trifling amounts is the full-rate tariff duty. Under the Tariff Act of 1930, this rate is 2.50 cents per pound of 96° centrifugal sugar, or .50 cent per pound above the Cuban rate of 2.00 cents per pound. Cuba thus has a preferential market in the United States, and quite naturally sends only her surplus sugar to other markets.

Total World Supply Focused on London Market

As production in continental United States and the island territories has increased, Cuba has been forced to send an increasingly large proportion of her sugar to the English market. Until 1911, Cuba shipped practically all of her exportable surplus to the United States, while in recent years approximately 25 per cent of such surplus has been shipped to other countries. Most of these exports have been shipped to the London market to compete with sugar produced in all parts of the world. Thus the total world supply of sugar is brought to a focus on the London market. Much of the surplus sugar produced in Australia, Peru, Mauritius, San Domingo, Poland, Germany, Natal, and a large number of other countries finds its way to the London market and these shipments are the limiting price factors in that market.

The price of sugar inside the tariff wall at New York is determined by the world or London price plus our duty, chiefly the Cuban rate, and the difference in transportation costs to New York from Cuba and the other producing areas. The factors which tend to prevent the Cubans from securing the benefit of their preference are competition among themselves and competition from the insular producers who are within the tariff wall of the United States. Competition from insular producers is unimportant; it is ordinarily unnecessary for the insular producers to cut under the Cuban price, since it is known that the United States markets will take all of the insular sugar and must in addition always secure some 50 per cent of her sugar from Cuba.

Cuban Exporters Ordinarily Sell for Same Price in New York and London Markets

It was pointed out in Chapter II that, so long as we continued to import substantial amounts of foreign sugars subject to the full-rate duty, Cuba was able to take advantage of the preference granted her by the reciprocity treaty of 1903. Such a condition existed until 1912. (See Table 17, p. 63.) After 1912, our imports of foreign sugars (other than Cuban) fell to almost nothing (except for the year 1920) and the preference granted Cuba merely assured her a near-by market for a very large proportion of her sugar. Before 1912 the Cuban producers or middlemen reaped the benefit of the 20 per cent preference. From 1912 to the middle of 1929, the Cubans were unable, as a rule, to secure any price benefit from the preferential duty.

An analysis of the prices of raw Cuban sugar in Cuba, London, and New York for the period from 1922 to 1930 shows that the New York and London markets were equally profitable to the Cuban exporters except during part of 1929 and 1930, when the Single Seller of Cuba was in operation.[3] It has already been shown that the differential between the c. i. f. price of Cuban sugar at London and the c. & f. price of Cuban sugar at New York was .0713 cent per pound from 1922 to 1929, inclusive. (See Chapter II, p. 66 and Table 34, p. 109.) In other words, Cuban sugar sold, on an average, for .0713 cent per pound more in London than in New York. This difference is just about equal to the difference in transportation costs. In any case, an analysis of the data presented in Tables 29 and 30 and Footnote 3 shows that Cuban exporters were selling for practically the same price (transportation charges considered) in the two markets during most of the period under consideration.

[3] The following table shows the relationship existing between the price of Cuban sugar in Cuba, London, and New York from 1922 to 1930, inclusive. All figures in cents per pound.

Year	Price of 96° centrifugal Cuban sugar			Differential between markets		
	c. i. f. London	c. & f. New York	Public warehouses Cuba	London above Cuba	New York above Cuba	London above New York
1922	3.09	3.00	2.77	.32	.23	.09
1923	5.33	5.22	4.98	.35	.24	.11
1924	4.27	4.17	3.85	.42	.32	.10
1925	2.65	2.56	2.27	.38	.29	.09
1926	2.70	2.59	2.30	.40	.29	.11
1927	2.98	2.96	2.67	.31	.29	.02
1928	2.51	2.45	2.20	.31	.25	.06
1929	1.97	1.98	1.73	.24	.25	--.01
1930	1.43	1.49	1.25	.18	.24	--.06

Source: The basic data for this table will be found in Table 29, page 103, and Table 34, page 109.

See also discussion in Chapter II, pp. 66 to 70.

Influence of the Single Seller

Conditions were very materially changed during the summer and fall of 1929. Previously to that time the various Cuban producers and exporters had been selling on their own account both in the New York and London markets. In other words they were competing against one another on both of these markets. Such competition prevented any of the Cuban exporters from securing a part of the Cuban preference which, since September, 1922, had amounted to .4412 cent per pound on 96° sugar. During the last five months of 1929, without any further decline in the London price, the differential in favor of the New York price increased very materially. (See Figure 9.) This increase in the differential was brought about by the formation of the Single Seller of Cuba to eliminate competition among Cuban sellers. During the latter part of 1929 and the early months of 1930, the Single Seller was able to secure from 25 to 30 cents more per hundred for sugar on the New York market than on the London market. The Cubans, in other words, obtained a part of the 20 per cent preference granted to them.

One concrete example will suffice at this point to illustrate what was happening in the markets. On January 29, 1930, 60,000 tons of "February Cubas" were sold to American refiners at 2.00 cents per pound c. & f. New York City. At the same time, the Single Seller sold 20,000 "February" in a market outside the United States at 1.50 cents f. o. b. Cuba. Since the freight from Cuba to New York was about .13 cent per pound, the f. o. b. price on the sales to the New York market was 1.87 cents. On these particular sales, therefore, the Single Seller was able to secure .37 cent of the .4412 cent of her preference. This amount varied a good deal and even declined some, due to the competition of duty-free sugars, so that during the week of March 6, 1930, the Single Seller was able to secure only about .14 cent of the preference. The operations of the Single Seller came definitely to a close on April 14, 1930. (See Appendix B, p. 174.)

The Cuban Price and the Tariff

The Cuban "colono," or farmer, is paid for his sugar on the basis of the official promedio quotations, which are, substantially, average prices f. o. b. Cuban ports, during the fortnight of delivery. If the Cuban paid the increase in tariff, the promedio price in Cuba would be correspondingly reduced and the price for cane reduced proportionately. A glance at Figure 10 will show that the price of 96° centrifugal sugar in public warehouses in Cuba did not go down immediately after the passage of the Tariff Act of 1922. On the

Price of 96° Centrifugal Cuban Sugar in Cuba and at New York City, 1912-1930

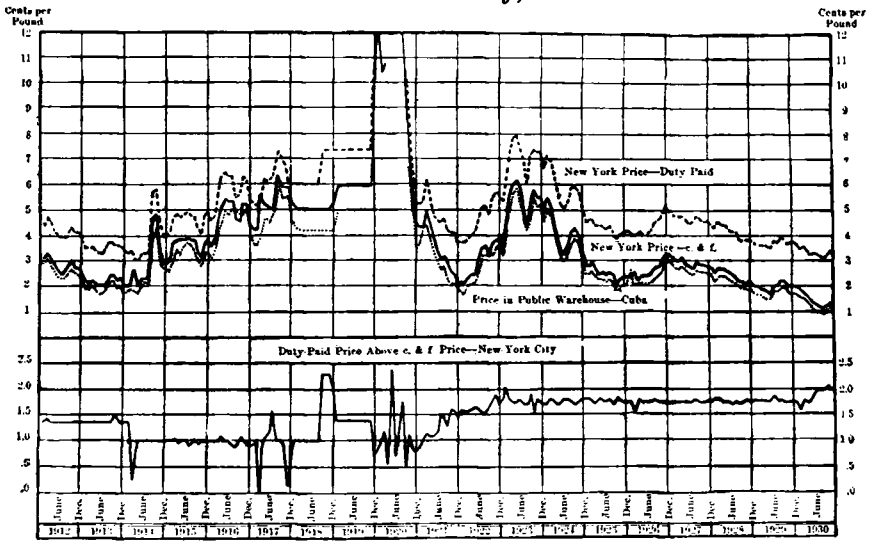

Fig. 10. The price of Cuban sugar, outside our tariff wall, did not decline after the new tariff of 1922 became effective. The spread between the c. & f. price and the duty-paid price did increase following the passage of the new rates, in September, 1922, and June, 1930. Data for this chart are in Tables 29 and 39, pp. 103 and 131, respectively.

contrary, it rose very materially two or three months before the new duty went into effect and stayed up for two and one-half years before again settling back to a figure somewhat higher than it had been just prior to the World War, but going to still lower levels in 1929, 1930, and 1931. It is obvious that the imposition of a higher tariff rate did not immediately lower the price paid to the Cuban producer. It should not be inferred, however, that the Cuban price might not have been still higher in the absence of a duty or under a continuance of the old rate.

The sharp increase in price during 1923 was due, in large part at least, to factors other than the tariff. Heavy sales in 1922 eliminated any Cuban carryover into 1923, and allowed Cuban producers to enter 1923 in a strong marketing position. In addition the greatly reduced crops in all of the countries shipping significant amounts of sugar to the United States aided Cuba in her favorable marketing position.

It has been shown that the Cuban exporters ordinarily sell their sugar for the same price on the New York and the London markets. The tariff preference granted to Cuba assures her a market in this country for a large part of her total production, but under the pres-

ent market situation it does not allow her to secure a higher price in New York than in London. In fact if the American duty on all sugar were removed, it does not follow that Cuba would be able to secure a higher price in this country than in the world market. Under such circumstances, it is more likely that the American price would fall by the amount of the duty or somewhat less, while the London price would remain stable or rise slightly. There are at least three reasons for believing that the world price would rise a little in the absence of an American sugar duty. In the first place, a fall in the American price might be expected to increase consumption somewhat. Secondly, production in continental United States as well as in the island territories might be expected to decline in the absence of tariff protection. In the third place, and as a result of the preceding factors, the market for Cuban sugar in this country would be enlarged, which in turn would decrease Cuban shipments to other markets and tend to increase the world price.

Influence of Tariff on Domestic Prices

It has been shown that Cuban sugar sells for the same price on both the New York and the London markets. It has likewise been shown that the duty-paid price at New York is higher than the world (London) price by virtually the full amount of our Cuban tariff rate. It remains to be seen whether the full amount of the tariff is reflected in the price of refined granulated sugar in this country.

Figure 10 shows the differential between the price of 96° Cuban sugar c. & f. at New York and the duty-paid price of that sugar in the same market. These data are also shown in Table 39. The average spread between these two price series from 1922 to 1929, inclusive, was 1.755 cents or slightly less than the full amount of the Cuban rate of 1.7648 cents per pound. The average differential for the period 1923 to 1929 was 1.771 cents, or slightly more than the amount of the Cuban rate. The old rate of 1.60 cents per pound under the Emergency Tariff Act of 1921 was in force until September 22, 1922, which accounts for the smaller differential during that year.

It should be noted from Figure 10 and Table 39 that the differential between the c. & f. price and the duty-paid price changed with each change in the tariff rate. Prices rose for about eight months after the 1922 rate became effective and remained at relatively high levels for about one and one-half years. The cause of this rise was independent of the tariff and has been mentioned previously. However, the spread between the two sets of prices did increase immedi-

TABLE 39

Differential Between the Prices of Raw Cuban Sugar, Duty Paid, and c. & f., New York, 1912-1931

(Cents per pound, 96° centrifugal)

Month	1912			1913			1914			1915			1916		
	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential
Average	**4.16**	**2.81**	**1.35**	**3.52**	**2.16**	**1.36**	**3.87**	**2.87**	**1.00**	**4.62**	**3.63**	**.99**	**5.77**	**4.76**	**1.01**
January	4.42	3.07	1.35	3.53	2.18	1.35	3.31	1.99	1.32	4.06	3.05	1.01	4.63	3.63	1.00
February	4.69	3.28	1.41	3.49	2.14	1.35	3.44	2.09	1.35	4.66	3.69	.97	4.93	3.92	1.01
March	4.46	3.11	1.35	3.55	2.20	1.35	2.98	2.73	.25	4.79	3.76	1.03	5.60	4.63	.97
April	4.11	2.78	1.33	3.39	2.04	1.35	2.98	1.98	1.00	4.74	3.79	.95	6.26	5.14	1.12
May	3.95	2.62	1.33	3.32	1.97	1.35	3.26	2.25	1.01	4.82	3.83	.99	6.40	5.41	.99
June	3.88	2.53	1.35	3.34	1.99	1.35	3.33	2.33	1.00	4.91	3.89	1.02	6.31	5.30	1.01
July	3.93	2.55	1.38	3.55	2.20	1.35	3.28	2.27	1.01	4.75	3.84	.91	6.26	5.30	.96
August	4.11	2.75	1.36	3.74	2.39	1.35	5.70	4.68	1.02	4.71	3.77	.94	5.47	4.56	.91
September	4.30	2.95	1.35	3.72	2.37	1.35	5.80	4.78	1.02	4.32	3.26	1.06	5.55	4.53	1.02
October	4.09	2.74	1.35	3.63	2.15	1.48	4.46	3.48	.98	4.04	3.09	.95	6.32	5.22	1.10
November	4.05	2.70	1.35	3.62	2.27	1.35	3.91	2.88	1.03	4.78	3.74	1.04	6.15	5.19	.96
December	3.95	2.60	1.35	3.35	2.00	1.35	3.96	2.94	1.02	4.85	3.81	1.04	5.32	4.30	1.02
	1917			1918			1919			1920			1921		
Average	**6.16**	**5.34**	**.82**	**6.46**	**5.00**	**1.46**	**7.69**	**6.36**	**1.33**	**13.02**	**11.96**	**1.06**	**4.78**	**3.46**	**1.32**
January	5.16	4.22	.94	6.01	4.98	1.03	7.28	5.88	1.40	12.77	12.00	.77	5.19	4.34	.85
February	5.14	4.16	.98	6.01	4.98	1.03	7.28	5.88	1.40	11.30	10.34	.96	5.30	4.25	1.05
March	5.48	5.58	–.10	6.01	4.98	1.03	7.28	5.88	1.40	11.99	10.81	1.18	6.09	4.95	1.14
April	6.21	5.19	1.02	6.01	4.98	1.03	7.28	5.88	1.40	17.16	16.60	.56	5.50	4.41	1.09
May	6.13	5.06	1.07	6.01	4.98	1.03	7.28	5.88	1.40	21.69	19.25	2.44	4.92	3.83	1.09
June	6.17	5.02	1.15	6.01	4.98	1.03	7.28	5.88	1.40	19.29	18.62	.67	4.58	3.43	1.15
July	6.65	5.02	1.63	6.01	4.98	1.03	7.28	5.88	1.40	17.56	16.50	1.06	4.47	3.00	1.47
August	7.32	6.33	.99	6.01	4.98	1.03	7.28	5.88	1.40	14.10	12.31	1.79	4.63	3.19	1.44
September	6.94	5.94	1.00	7.28	4.98	2.30	7.28	5.88	1.40	10.15	9.65	.50	4.20	2.93	1.27
October	6.72	5.87	.95	7.28	4.98	2.30	7.28	5.88	1.40	8.39	7.25	1.14	4.11	2.56	1.55
November	6.01	5.87	.14	7.28	4.98	2.30	7.28	5.88	1.40	6.63	5.75	.88	4.11	2.50	1.61
December	6.01	5.32	.69	7.28	5.21	2.07	12.24	11.58	.66	5.17	4.38	.79	3.57	2.11	1.46

TABLE 39, continued

Month	1922			1923			1924			1925			1926		
	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential	Duty paid	c. & f.	Differential
Average	4.64	3.00	1.64	7.01	5.22	1.79	5.92	4.17	1.75	4.34	2.56	1.78	4.34	2.59	1.75
January	3.66	2.05	1.61	5.34	3.52	1.82	6.63	4.94	1.69	4.61	2.82	1.79	4.17	2.40	1.77
February	3.71	2.14	1.57	6.44	4.38	2.06	7.24	5.45	1.79	4.66	2.84	1.82	4.20	2.45	1.75
March	3.88	2.31	1.57	7.30	5.50	1.80	6.90	5.12	1.78	4.72	2.96	1.76	4.04	2.56	1.48
April	4.00	2.39	1.61	7.78	6.03	1.75	6.34	4.59	1.75	4.41	2.67	1.74	4.12	2.33	1.79
May	4.09	2.44	1.65	7.98	6.23	1.75	5.53	3.85	1.68	4.37	2.54	1.83	4.20	2.42	1.78
June	4.64	2.98	1.66	7.45	5.66	1.79	5.14	3.31	1.83	4.41	2.64	1.77	4.14	2.37	1.77
July	5.09	3.54	1.55	6.85	5.16	1.69	5.13	3.34	1.79	4.27	2.51	1.76	4.14	2.38	1.76
August	5.07	3.56	1.51	6.00	4.28	1.72	5.39	3.61	1.78	4.36	2.58	1.78	4.24	2.46	1.78
September	4.83	3.17	1.66	7.08	5.19	1.89	5.91	4.17	1.74	4.18	2.49	1.69	4.47	2.66	1.81
October	5.41	3.64	1.77	7.36	5.81	1.55	5.93	4.25	1.68	3.86	2.01	1.85	4.55	2.80	1.75
November	5.72	3.83	1.89	7.32	5.50	1.82	5.77	4.03	1.74	4.07	2.27	1.80	4.70	2.93	1.77
December	5.61	3.91	1.70	7.26	5.53	1.73	5.14	3.36	1.78	4.13	2.36	1.77	5.10	3.33	1.77
	1927			1928			1929			1930			1931		
Average	4.73	2.96	1.77	4.22	2.45	1.77	3.77	1.98	1.79	3.37	1.49	1.88	3.33	1.33	2.00
January	5.03	3.28	1.75	4.52	2.75	1.77	3.81	2.03	1.78	3.75	1.99	1.76	3.37	1.35	2.02
February	4.92	3.15	1.77	4.30	2.48	1.82	3.74	1.95	1.79	3.54	1.95	1.59	3.31	1.30	2.01
March	4.79	3.02	1.77	4.56	2.73	1.83	3.71	1.93	1.78	3.61	1.82	1.79	3.28	1.29	1.99
April	4.76	3.03	1.73	4.46	2.69	1.77	3.66	1.88	1.78	3.45	1.70	1.75	3.29	1.29	2.00
May	4.83	3.06	1.77	4.46	2.72	1.74	3.59	1.82	1.77	3.23	1.48	1.75	3.18	1.16	2.02
June	4.61	2.86	1.75	4.34	2.56	1.78	3.54	1.74	1.80	3.28	1.36	1.92	3.32	1.31	2.01
July	4.53	2.76	1.77	4.16	2.45	1.71	3.92	2.04	1.88	3.25	1.26	1.99	3.49	1.49	2.00
August	4.57	2.74	1.83	4.15	2.39	1.76	3.81	2.04	1.77	3.17	1.19	1.98	3.47	1.48	1.99
September	4.80	3.02	1.78	3.97	2.24	1.73	4.00	2.19	1.81	3.14	1.14	2.00	3.41	1.40	2.01
October	4.67	2.91	1.76	3.90	2.16	1.74	3.91	2.15	1.76	3.33	1.27	2.06	3.41	1.42	1.99
November	4.62	2.88	1.74	3.89	2.09	1.80	3.73	1.96	1.77	3.41	1.40	2.01	3.35	1.36	1.99
December	4.60	2.81	1.79	3.91	2.17	1.74	3.78	2.00	1.78	3.29	1.27	2.02	3.13	1.15	1.98

Source: Average of weekly or daily quotations in Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, except c. & f. quotations for 1912 and 1913 which are from Czarnikow-Rionda Co. leaflets.

ately after the new rate went into effect. The same was true in 1930 when the rate of 2.00 cents per pound became effective. The following quotations throw an interesting light on just what was happening during the period just prior to and just after the Tariff Act of 1922 went into effect.

"In the week prior to the enactment of the Tariff Act of 1922, raw sugars were firm at 3 cents, sales being made at 3 cents, c. & f. (4.61 duty paid), sales at this price being made on September 18, 19, and 20. On September 22, the day on which the new tariff rate went into effect, a sale was again made at 3 cents, c. & f., so that there was no change in the Cuban price of raw sugar immediately following the establishment of the new rate. The Cuban producer did not absorb the increase in the tariff. On September 28, the c. & f. quotation mounted to 3.09 cents and thereafter mounted to higher levels following cabled reports showing an European beet-sugar crop less than previously estimated. American refiners made no purchase of raws for a few days after the new rate was established. They were unwilling to pay the increased duty, while the Cubans were unwilling to offer raw sugars at a concession equivalent to the increase established in the act."[4]

"This condition obtained until Monday, when the National Refinery decided, in their opinion, that there was no indication of Cuban sellers considering prices below 3 cents, c. & f., so they purchased some 8,000 tons of sugar, part from store and part afloat, at this quotation, establishing the duty-paid quotation, under new tariff conditions, at 4.77 cents. Since that time the market has remained steady at the 3-cent c. & f. basis."[5]

It is clear that the Cuban price did not fall immediately after the duty went into effect. The price of Cuban sugar delivered at New York, outside the tariff wall, did not go down after the new rate become effective. The c. & f. price did not go below what it had been prior to the change in the duty, but on the contrary, it actually went up. The great increase in price after that date was due to factors other than the tariff, to which reference has already been made. The immediate effect of the tariff was to increase the differential between the c. & f. price and the duty-paid price at New York City from an average of a little more than 1.6 cents per pound to an average of nearly 1.79 cents during the next three months. The average differential between the c. & f. and the duty-paid price during the entire period 1923 to 1929, inclusive, was 1.77 cents or just barely over the amount of the Cuban duty.

[4] U. S. Tariff Commission, **The Relation of the Tariff on Sugar to the Rise in Price of February-April, 1923**, Washington, D. C., 1923.

[5] Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York, September 28, 1922, p. 462.

The description of the behavior of prices given above is interesting as an example of immediate price behavior, but does not prove anything as to the general or long-time effects of the tariff on the world price. The long-time effect of an increase in the American tariff rate, according to economic theory, has been (1) to depress the foreign price and reduce the foreign marginal cost of production, and (2) to raise the American price and increase the American marginal cost of production, other things remaining equal.[6]

Refiners' Margin

The increase in sugar duty, as we have seen, was immediately reflected in higher prices for raw sugar to the refiners. It remains to be seen whether the refiners absorbed this increase or passed it along to the consumers. An answer to this question will be sought in an analysis of the refiners' margin or the difference between the duty-paid price of raw sugar to refiners and the net cash price received for granulated sugar. The dangers involved in making such an analysis are fully recognized. It is probably impossible to learn the exact weighted average refiners' margin because varying amounts of raw sugar are purchased at different prices and varying amounts of refined sugar are sold at different market quotations. The difference between the raw and refined quotations on a given date does not in all likelihood represent the actual refiners' margin because the raw sugar used may have been purchased months before at a price very different from that current when the refined product is sold.

The point is very well illustrated by what took place in the refined market on Friday, March 7, 1930. The market had remained for a time unchanged at a 4.95-cent basis until Tuesday, March 4, when the price was reduced, first by the Revere Refinery of Boston and later by all the other refiners, to 4.85 cents. The movement of sugar at these prices was light. On Friday, March 7, the keen competition resulted in a further decline to 4.70 cents. This extremely low price brought in such a heavy demand for refined sugar that all the refiners, with the exception of the Revere, advanced their basis to 5 cents at the opening on Saturday, March 8. Close to 1,000,000 tons of refined sugar, or a 60-day supply, were purchased at the 4.70-cent basis. On Friday, Porto Rican and Philippine raw sugars were available at 3.64 cents. Allowing for the 2 per cent cash discount on refined sugar, the refiners' margin on that day ranged from .996 cent to .966 cent per pound. The following day the margin was 1.260 cents per pound, but no sales took place on this basis. Furthermore, the margin of .996 cent to .966 cent, mentioned above,

[6] For an analysis of this tendency see Wright, P. G., **Sugar in Relation to the Tariff**, McGraw-Hill Book Company, Inc., New York, 1924, pp. 119-130.

may not have represented the refiners' actual margin at all, since the raw sugar used in making the refined sugar sold on March 7 was probably purchased several weeks before at a price very different from that existing on March 7.

In spite of the difficulty in following the exact margin which refiners are able to secure, a comparison of actual prices in the markets should be of value in indicating whether or not the increased duty on raw sugar was absorbed by the refiners. The United States Tariff Commission, in its report to the President previously referred to, came to the conclusion that "no increase was made, however, subsequently by the refiners during 1922 in the price of granulated to cover the increase in the price of raws of 16 cents per 100 pounds, due to the new tariff. In 1923, however, under the influence of a strong demand for sugar, refiners were enabled by the beginning of March to pass this increase along."[7] It is evident from Table 40, which gives the daily price changes of duty-paid raw and refined sugar, together with the differential or so-called refiners' margin for 1922, that the margin was lower immediately after September 22, when the new rate became effective, than it had been in the weeks just prior to the passage of the new law. It is rather dangerous to draw final conclusions from the trend over so short a period, especially since prices had fluctuated violently in the preceding weeks, and margins are not reliable in periods of extreme fluctuations. Again, a comparison of prices over so short a period is inadequate because a good deal of sugar had been imported and stored previous to September, 1922. Some of this was undoubtedly purchased at the relatively low prices which prevailed during the first three months of 1922. In such a case, the actual margins at the time the refined sugar reached the market might have been very much greater than those indicated in the table.

Figure 11, charted from data given in Table 41, page 138, shows the differential between the duty-paid price of raw sugar and the net cash price of granulated sugar by months from 1921 to 1930, inclusive. This is the so-called refiners' margin, but, as pointed out, it probably does not always represent the actual working margin of the refiners. This chart indicates a fall in the margin just after the rate of September, 1922, became effective, but by the close of the year it was back to the level it had attained in the early months of 1922, and, in general, above what it had been during the last half of 1921. The margin was decidedly higher in 1923 and 1924, slumped in 1925, 1926, and 1927, but recovered again in 1928, 1929, and 1930. (See Table 42 for average annual data.) The refiners' mar-

[7] U. S. Tariff Commission, **The Relation of the Tariff on Sugar to the Rise in Price of February-April, 1923**, Washington, D. C., 1923, p. 12-13.

TABLE 40

Differential Between the Price of Raw Sugar, Duty Paid, and Refined Sugar, New York, 1922

(Cents per pound)

Date	Wholesale granulated [a]	Duty paid raw [b]	Differential	Date	Wholesale granulated [a]	Duty paid raw [b]	Differential
Jan. 3	4.704	3.42	1.284	May 1	.....	4.01	1.135
6	.....	3.48	1.224	4	.....	3.98	1.165
9	.....	3.54	1.164	9	5.194	.....	1.214
16	.....	3.61	1.094	10	5.243	.....	1.263
18	.....	3.64	1.064	11	.....	4.04	1.203
19	4.802	3.73	1.072	16	5.292	.....	1.252
20	4.900	3.79	1.110	23	5.390	.....	1.350
23	.....	3.86	1.040	24	.....	4.17	1.220
25	4.998	.....	1.138	26	.....	4.23	1.160
26	.....	3.79	1.208	31	5.488	.....	1.258
27	.....	3.67	1.328				
30	4.900	.....	1.230	June 1	5.586	.....	1.356
31	.....	3.73	1.170	2	.....	4.30	1.286
				5	.....	4.36	1.226
Feb. 2	.....	3.67	1.230	8	5.684	4.61	1.074
6	.....	3.70	1.200	12	5.880	.....	1.270
8	.....	3.67	1.230	14	.....	4.48	1.400
9	.....	3.61	1.280	16	.....	4.61	1.270
14	.....	3.67	1.230	20	.....	4.73	1.150
16	.....	3.73	1.170	22	6.076	4.86	1.206
17	.....	3.79	1.110	23	.....	4.83	1.246
18	.....	3.86	1.040	26	.....	4.77	1.306
20	4.998	.....	1.138	27	.....	4.73	1.346
23	.....	3.70	1.298	30	.....	4.80	1.276
27	.....	3.73	1.268				
				July 6	6.370	4.99	1.380
Mar. 1	.....	3.79	1.208	7	.....	5.05	1.320
3	5.047	3.73	1.317	11	.....	4.99	1.380
6	.....	3.79	1.257	12	.....	4.93	1.440
8	.....	3.86	1.167	13	.....	4.89	1.480
9	5.096	.....	1.236	15	.....	4.92	1.450
10	5.194	3.92	1.274	18	.....	5.11	1.260
16	.....	3.98	1.214	19	6.468	5.24	1.228
17	5.292	4.11	1.182	20	6.664	5.33	1.334
18	5.390	.....	1.280	21	6.760	5.22	1.540
24	5.292	3.86	1.432	25	.....	5.36	1.400
29	5.145	.....	1.285	26	6.860	.....	1.500
Apr. 3	.....	3.98	1.165	Aug. 15	.....	5.30	1.560
4	.....	4.04	1.105	16	.....	5.25	1.610
5	.....	4.11	1.035	18	6.615	5.15	1.465
6	5.243	.....	1.133	21	.....	5.11	1.505
10	.....	3.86	1.383	22	.....	5.01	1.605
13	.....	4.04	1.203	23	.....	4.88	1.735
17	.....	3.98	1.263	24	6.370	4.80	1.570
19	.....	3.92	1.323	28	.....	4.92	1.450
20	.....	3.98	1.263	29	.....	4.99	1.380
25	5.145	.....	1.165	30	6.468	.....	1.478
27	.....	4.11	1.035	31	6.615	5.24	1.375

TABLE 40, continued

Date	Wholesale granulated [a]	Duty paid raw [b]	Differential	Date	Wholesale granulated [a]	Duty paid raw [b]	Differential
Sept. 7	6.370	4.99	1.380	16	6.762	.....	1.232
14	6.125	4.86	1.265	27	.....	5.65	1.112
15	.....	4.73	1.395	30	.....	5.53	1.232
19	.....	4.61	1.515				
25	.....	4.77	1.355	Nov. 22	.....	5.65	1.112
28	.....	4.87	1.255	23	6.860	.....	1.210
29	.....	4.96	1.165	25	.....	5.78	1.080
				27	6.958	.....	1.178
Oct. 2	.....	5.15	.975				
3	6.370	5.28	1.090	Dec. 14	.....	5.53	1.428
10	.....	5.34	1.030	26	6.860	.....	1.330
11	6.468	5.40	1.068	27	.....	5.65	1.210
13	6.615	5.53	1.085	31	.....	5.65	1.210

[a] Net cash price. [b] 96° centrifugal sugar.
Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

Price of Raw and Refined Sugar at New York City, 1921-1930

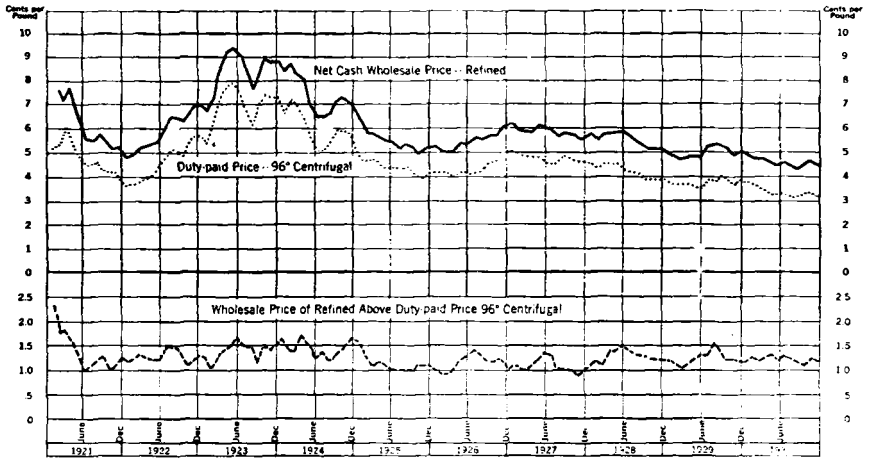

Fig. 11. The lower line on the chart indicates the so-called refiners' margin. The difference between the net cash wholesale price of refined granulated sugar and the duty-paid price of 96° centrifugal sugar is not necessarily a true measure of the actual refiners' margin, but under conditions of fairly stable prices, the difference between these two prices probably approximates the actual margin rather closely. Data for this chart are in Table 41, page 138.

TABLE 41

Differential Between the Prices of Granulated Sugar, Wholesale, and Raw Sugar, Duty Paid, New York, 1921-1930

(Cents per pound)

Month	1921			1922			1923			1924			1925		
	Wholesale granulated[a]	Duty paid raw[b]	Differential	Wholesale granulated[a]	Duty paid raw[b]	Differential	Wholesale granulated[a]	Duty paid raw[b]	Differential	Wholesale granulated[a]	Duty paid raw[b]	Differential	Wholesale granulated[a]	Duty paid raw[b]	Differential
Average	6.140	4.777	1.363	5.925	4.642	1.283	8.408	7.013	1.395	7.392	5.919	1.473	5.452	4.339	1.113
January	7.562	5.192	2.370	4.861	3.663	1.198	6.644	5.338	1.306	8.367	6.627	1.740	6.194	4.608	1.586
February	7.130	5.295	1.835	4.998	3.713	1.285	7.437	6.438	.999	8.648	7.235	1.413	5.831	4.663	1.168
March	7.922	6.092	1.830	5.208	3.880	1.328	8.568	7.295	1.273	8.330	6.896	1.434	5.782	4.722	1.060
April	7.080	5.500	1.580	5.194	4.002	1.192	9.179	7.782	1.397	8.056	6.341	1.715	5.649	4.412	1.237
May	6.311	4.916	1.395	5.321	4.086	1.235	9.432	7.978	1.454	7.115	5.532	1.583	5.467	4.369	1.098
June	5.586	4.577	1.009	5.806	4.644	1.162	9.188	7.446	1.742	6.475	5.137	1.338	5.427	4.414	1.013
July	5.549	4.469	1.080	6.625	5.094	1.531	8.350	6.851	1.499	6.497	5.125	1.372	5.227	4.270	.957
August	5.831	4.634	1.197	6.517	5.065	1.452	7.507	6.000	1.507	6.615	5.390	1.225	5.380	4.364	1.016
September	5.504	4.196	1.308	6.248	4.827	1.421	8.180	7.083	1.097	7.178	5.911	1.267	5.178	4.182	.996
October	5.145	4.110	1.035	6.554	5.411	1.143	8.885	7.360	1.525	7.350	5.930	1.420	4.949	3.855	1.094
November	5.194	4.110	1.084	6.909	5.715	1.194	8.765	7.323	1 442	7.236	5 770	1.466	5.145	4.072	1.073
December	4.867	3.565	1.302	6.860	5.610	1.250	8.775	7.261	1.494	6.840	5.137	1.703	5.194	4.133	1.061
	1926			1927			1928			1929			1930		
Average	5.484	4.339	1.145	5.809	4.726	1 083	5.508	4.218	1.290	4.995	3.766	1.229	4.599	3.370	1.229
January	5.159	4.170	.989	6.113	5.032	1.081	5.659	4.518	1.141	5.008	3.814	1.194	4.924	3.750	1.174
February	5.096	4.204	.892	5.896	4.918	.978	5.537	4.297	1.240	4.802	3.736	1.066	4.851	3.540	1.311
March	4.963	4.035	.928	5.798	4.790	1.008	5.651	4.564	1.087	4.728	3.708	1.020	4.753	3.610	1.143
April	5.218	4.119	1.099	5.831	4.759	1.072	5.831	4.460	1.371	4.802	3.658	1.144	4.704	3.450	1.254
May	5.439	4.201	1.238	6.076	4.828	1.248	5.904	4.459	1.445	4.778	3.588	1.190	4.606	3.230	1.376
June	5.414	4.135	1.279	6.027	4.607	1.420	5.831	4.342	1.489	4.826	3.537	1.289	4.459	3.280	1.179
July	5.586	4.144	1.442	5.815	4.533	1.282	5.586	4.156	1.430	5.268	3.924	1.344	4.606	3.250	1.356
August	5.537	4.240	1.297	5.562	4.568	.994	5.439	4.152	1.287	5.390	3.805	1.585	4.373	3 170	1.203
September	5.635	4.469	1.166	5.782	4.800	.982	5.292	3.970	1.322	5.292	3.997	1.295	4.312	3.140	1.172
October	5.700	4.550	1.150	5.684	4.667	1.017	5.120	3.902	1.218	5.145	3.913	1.232	4.459	3.330	1.129
November	5.962	4.701	1.261	5.537	4.615	.922	5.096	3.889	1.207	4.900	3.730	1.170	4.655	3.410	1.245
December	6.100	5.097	1.003	5.586	4.600	.986	5.145	3.909	1.236	4.998	3.776	1.222	4.492	3.290	1.202

[a] Net cash price in barrels or 100-pound bags. [b] 96° centrifugal sugar.

Source: Averages of weekly or daily quotations from Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

TABLE 42

Differential Between the Yearly Average Prices of Raw and Refined Sugar, New York, 1915 to 1931

(Cents per pound)

Year	Granulated [a]	Duty paid raw [b]	Differential	Year	Granulated [a]	Duty paid raw [b]	Differential
1915	5.559	4.642	0.917	1923	8.441	7.020	1.421
1916	6.862	5.786	1.076	1924	7.471	5.964	1.507
1917	7.663	6.228	1.435	1925	5.483	4.334	1.149
1918	7.834	6.447	1.387	1926	5.473	4.337	1.136
1919	9.003	7.724	1.279	1927	5.828	4.730	1.098
1920	[c]	12.326	[c]	1928	5.540	4.229	1.311
1921	6.207	4.763	1.444	1929	5.025	3.769	1.256
1922	5.904	4.632	1.272	1930	4.634	3.387	1.247
				1931	4.425	3.329	1.096

[a] Net cash price.

[b] 96° centrifugal sugar.

[c] Average impossible owing to absence of open market quotations of granulated, January 1 to August 11, 1920.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

gin actually rose in the early part of 1923, just a few months after the passage of the higher duty; so it can be said with a good deal of assurance that the refiners did not absorb the increase in the duty, but passed it on to the consumers. Many other factors had set in by 1925, when there was a decided sag in the refiners' margin, and it would be difficult, if not impossible, to determine to what extent the lower margin was caused by the tariff and to what extent by increased efficiencies on the part of the refiners. The latter seems the more likely explanation since profits in the refining business showed remarkable improvement in 1925 after a very decided slump in 1923 and 1924, and in general continued upward through 1929, with the exception of a slight decline in 1927 from the 1926 level.

Refined Sugar for Export

Further statistical evidence concerning the relation of the sugar duty to the domestic price of sugar is afforded by an analysis of the domestic price of granulated sugar for export. It was pointed out earlier (see discussion and Table 5, page 36) that rather large amounts of refined sugar have been exported from the United States with the benefit of the drawback.[8] Such sales reached their height in 1922, when over 900,000 short tons of refined sugar were exported. Exports of refined sugar declined rapidly after the World War and

[8] See footnote 7, Chapter IV, page 101.

have been a little over 100,000 short tons each year since 1925, when nearly 380,000 short tons were exported. When it is recalled that we consume over 5,000,000 long tons of refined sugar annually in this country, one will realize that no great weight can be given to prices of refined sugar for export, especially since 1922. In that year the exports of refined sugar represented a very substantial proportion of the total consumption of sugar in this country. Our total consumption of refined sugar in 1922 was 5,092,758 long tons, and exports amounted to 819,965 long tons (918,361 short tons), or 16.1 per cent of our total consumption.

An analysis of these f. a. s. prices, representing refiners' prices for refined sugar for export, especially for 1922, should, however, throw some light on the relation of the sugar duty to the domestic price of refined sugar. Table 43 gives a comparison of domestic and export prices for 1922. The spread between these two prices from day to day was irregular, sometimes being less than the amount of the tariff and sometimes materially greater. One would ordinarily expect the domestic price to be above the export price by the amount of the tariff, plus the loss due to refining. Under the rate in the Tariff Act of 1922, this amounts to 1.8885 cents per pound and under the Emergency Act of 1921, to 1.7121 cents per pound. During the last four months of 1921 the spread between these prices went below 1.70 cents on only two days, and from the middle of November on it was above 1.75 cents, and even went as high as 1.95 cents on several occasions. During the first six months of 1922 the spread was rather low, but after the new rate became effective in September the differential increased very materially, being above 2 cents much of the time. This situation continued well into 1923. Since exports were substantial during 1922, the increase in the price spread after September indicates that the full amount of the tariff had been passed along to the purchasers of refined sugar.

F. a. s. prices are not available for the years 1923 to 1926, inclusive, but Table 44, page 143, gives these prices by months for 1927 to 1930, inclusive. Prices for these latter years indicate that the refiners were selling sugar for export at a sacrifice. The drawback is the only regular influence in determining the export price of refined sugar. The export price is the result of a good deal of bargaining on the part of the refiner and the exporter. A spread between the domestic and export price of an amount greater than the Cuban tariff rate suggests that the refiners are exporting some sugar at a loss in order to protect their large domestic market or to keep their plants running more efficiently. In other words, if the re-

TABLE 43

Comparison of Domestic and Export Prices for Refined Sugar, New York, 1922

(Cents per pound)

Date	F. a. s.	Domestic [a]	Differential
January 5	2.85	4.70	1.85
12	3.00	4.70	1.70
19	3.20	4.80	1.60
February 2	3.30–3.35	4.90	1.55–1.60
9	3.25	4.90	1.65
16	3.20–3.25	4.90	1.65–1.70
23	3.35–3.45	5.00	1.55–1.65
March 2	3.50	5.05	1.55
9	3.50	5.10	1.60
16	3.60–3.75	5.29	1.54–1.69
23	3.80–3.85	5.29	1.44–1.49
30	3.65	5.15	1.50
April 6	3.80–3.85	5.24	1.39–1.44
12	3.70–3.75	5.24	1.49–1.54
20	3.75	5.24	1.49
27	3.65–3.70 3.75	5.15	1.40–1.50
May 4	3.75–3.80	5.19	1.39–1.44
11	3.70–3.85	5.24	1.39–1.54
18	3.70–3.80	5.29	1.49–1.59
25	3.85–3.90	5.39	1.49–1.54
June 1	4.00	5.59	1.59
8	4.25	5.64	1.39
15	4.15	5.88	1.73
22	4.15–4.25	6.08	1.73–1.83
29	4.35	6.08	1.63
July 6	4.35–4.40	6.37	1.86–2.16
13	4.60	6.66	2.06
20	4.45–4.50	6.76	2.26–2.31
27	5.00–5.10	6.86	1.76–1.86
August 3	5.10	6.86	1.76
10	5.10	6.86	1.76
17	4.725	6.62	1.89
24	5.00	6.37	1.37
31	4.55–4.60	6.62	2.02–2.07
September 7	5.00	6.37	1.37
14	4.65	6.13	1.48
21	4.45–4.50	6.13	1.63–1.68
28	4.25	6.13	1.88
October 5	4.60	6.37	1.77
11	4.70–4.80	6.47	1.67–1.77
19	5.00	6.76	1.76
26	5.00	6.76	1.76

TABLE 43, continued

Date	F. a. s.	Domestic a	Differential
November 2	5.00	6.76	1.76
9	4.60–5.00	6.76	1.76–2.16
16	4.60–5.00	6.76	1.76–2.16
23	5.00	6.86	1.86
29	5.20	6.96	1.76
December 7	4.75–5.10	6.96	1.76–2.21
14	4.75–4.85	6.96	2.11–2.21
21	4.70	6.96	2.26
28	4.70–4.75 4.90–5.00	6.86	1.86–2.16

a Net cash price.

Source: **Relation of the Tariff on Sugar to the Rise in Price of February-April, 1923, U. S. Tariff Commission, Washington, D. C., 1923.**

finer is in need of business on account of accumulated stocks, he will quote the exporter a more liberal price than he would if there were a demand for domestic refined that taxed the melting capacity of his plant. If the refiner is anxious for business because the movement of domestic refined is slow and his stocks have accumulated, he would quote a liberal export price in order to keep his refinery running at capacity.

Because of the smallness of refined sugar exports and because of the other factors which may influence the differential between the domestic and export prices of refined sugar, a mere comparison of the two would not enable us to reach any conclusions as to the effect of the tariff on domestic prices. The comparison does, however, offer additional evidence that the domestic price of sugar has been above the world price by the full amount of the Cuban tariff rate from 1922 to 1930.

Conclusions as to the Effect of the Sugar Duty on Prices

An analysis of the differentials existing between sugar prices in New York, London, and Cuba from 1922 to 1930 have shown that:

1. The duty-paid price of 96° centrifugal sugar at New York (transportation costs considered) was above the c. i. f. price of 96° sugar at London by approximately the full amount of the Cuban tariff rate on sugar. The actual spread for the period 1922 to 1929, inclusive, was 1.695 cents per pound, which is equal to the Cuban tariff rate when the difference between Cuba-to-London and Cuba-to-New York transportation costs are considered.

2. Under ordinary circumstances, the Cuban exporters sell for the same price in both the London and the New York markets; that

is these two markets are normally equally profitable to the Cuban exporter. During the period 1922 to 1929, Cuban sugar sold, on an average, for .0713 cent per pound more in London than in New York. In the main, this difference is just about equal to the difference in transportation costs.

3. The differential between the c. & f. price of 96° Cuban sugar and the duty-paid price of the same grade of sugar at New York from 1922 to 1929 was 1.755 cents per pound, or approximately the full amount of the Cuban tariff rate.

4. The refiners apparently absorbed at least a part of the increase in the duty in 1922 for a short time, but after April, 1923, the

TABLE 44

Differential Between the Wholesale Prices of Granulated Sugar for Domestic Use and for Export, New York, 1927-1930

(Net cash price,[a] cents per pound)

Month	1927			1928		
	f. o. b. domestic use	f. a. s. for export	Differential	f. o. b. domestic use	f. a. s. for export	Differential
Average	**5.81**	**3.85**	**1.96**	**5.51**	**3.21**	**2.30**
January	6.11	4.29	1.82	5.66	3.60	2.06
February	5.90	4.05	1.85	5.54	3.21	2.33
March	5.80	3.91	1.89	5.65	3.35	2.30
April	5.83	3.85	1.98	5.83	3.46	2.37
May	6.08	3.93	2.15	5.90	3.47	2.43
June	6.03	3.80	2.23	5.83	3.36	2.47
July	5.82	3.64	2.18	5.59	3.29	2.30
August	5.56	3.50	2.06	5.44	3.19	2.25
September	5.78	3.84	1.94	5.29	3.01	2.28
October	5.68	3.86	1.82	5.12	2.85	2.27
November	5.54	3.78	1.76	5.10	2.81	2.29
December	5.59	3.69	1.90	5.15	2.89	2.26
	1929			1930		
Average	**5.00**	**2.74**	**2.26**	**4.60**	**2.20**	**2.40**
January	5.01	2.75	2.26	4.92	2.61	2.31
February	4.80	2.70	2.10	4.85	2.41	2.44
March	4.73	2.70	2.03	4.75	2.38	2.37
April	4.80	2.59	2.21	4.70	2.35	2.35
May	4.78	2.58	2.20	4.61	2.25	2.36
June	4.83	2.50	2.33	4.46	2.10	2.36
July	5.27	2.84	2.43	4.61	2.08	2.53
August	5.39	2.88	2.51	4.37	1.97	2.40
September	5.29	2.85	2.44	4.31	1.94	2.37
October	5.15	2.94	2.21	4.46	2.01	2.45
November	4.90	2.79	2.11	4.66	2.18	2.48
December	5.00	2.71	2.29	4.49	2.09	2.40

[a] Quoted price less 2 per cent for cash in seven days.

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

full amount of the increase in the duty was passed on to the consumer.

5. The price of refined sugar for export was less than the domestic price of refined sugar by more than the full amount of the Cuban rate (duty on 96° sugar reduced to a refined basis).

6. All of these differentials indicate that the price of sugar in this country at any given time is higher than the world price by the full amount of the Cuban tariff rate on sugar. On a refined basis this amounted, while the 1922 duty was in force, to 1.8885 cents per pound.

This analysis of differentials shows concretely how much more than the world price American buyers actually paid. The analysis does not show to what extent the duty has curtailed consumption, affected domestic or foreign production, or changed the world price. It makes no attempt to explain actual changes in price due to the tariff. The differential merely measures the spread between different prices at any given time. It shows, for example, that during January, 1929, the price of raw sugar at New York averaged 1.71 cents per pound above the London price. It does not indicate whether either the New York or the London price was higher or lower than it would have been without the American sugar tariff. Accurate conclusions regarding these questions must be based on an analysis which gives due weight to all factors affecting production, consumption, and price. This has, of course, never been done, and the present writer does not feel that he could make a satisfactory analysis of the effect of the almost innumerable number of factors on the world price of sugar from 1922 to 1929, and isolate the exact effect of any one of those factors. Moreover, it does not seem that such ultra-refinements are worth much, even granting their feasibility. The question is whether or not producers get a real margin of advantage from a given tariff; not whether they secure a 100 per cent margin or only a 90 per cent margin.

The differential between the price of sugar in this country and the London or world price will, therefore, be used in calculating the benefits and burdens of the sugar tariff. Calculations based on such a figure will naturally be approximations. When it is said that the tariff burden on the consumer is 1.8885 cents per pound, it should be understood that this means that the American consumer, because of the tariff, is paying 1.8885 cents per pound more than the world price. It does not mean that in the absence of a tariff he would be paying that much less for his sugar. The figure given should be considered as a maximum one and is subject to modification by further

statistical methods. It is even doubtful that calculations such as those of Professor Schultz previously referred to contain a smaller degree of error than the world price differential here used. Since the primary object here is to approximate the benefits and burdens of the sugar duty for purposes of determining public policy, it should be clear that substantially the same results will follow whether the tariff be 86 or 100 per cent effective in raising the American price.

Summary

The chief purpose of our tariff on sugar during the 142 years of its existence in this country has been to encourage the production of sugar. Diversification of agriculture and industry, employment of American labor, and the furnishing of revenue for the Federal Government have also been hoped for from the sugar tariff. These aims have been attained in varying degrees. Of the three most common methods used in measuring the effect of a specific duty upon the domestic price of a commodity—the before-and-after, or propaganda, the equilibrium, and the differential methods—the differential method was chosen as being the most practical one for present purposes. It was shown that from 1922 to 1930 the price of sugar in this country was higher than the world or London price by virtually the full amount of the Cuban tariff rate. The method does not pretend to show to what extent our sugar tariff may have decreased the world price. It is believed that it does approximate the benefits and burdens with a sufficient degree of accuracy to serve as a basis for determining public policy.

Chapter VI

COSTS AND BENEFITS OF THE SUGAR DUTY

THUS far it has been the aim of this work to determine the effect of the United States sugar tariff on the price of sugar in this country. It has been shown that the Cuban tariff rate is the really effective one, and that the price of sugar in this country on a given date is above the world price by approximately the full amount of the Cuban tariff rate, or 1.8885 cents per pound of refined sugar.[1] It is the purpose of this chapter to calculate the cost of the sugar tariff to the various consumers in this country and to indicate the size of the benefits accruing to the island as well as to the continental producers of sugar cane and sugar beets.

Sugar Consumption in the United States

On an average during the past 109 years, the total consumption of sugar in the United States has increased nearly five per cent annually.[2] It will be noted from Table 45 that there were considerable variations from year to year as, for example, an increase of nearly 24 per cent in 1922 and a decline of over six per cent the year following. Again in 1925 total consumption increased 13.5 per cent above what it had been the previous year. The total consumption of sugar was just a little over four million long tons annually in 1919, 1920, and 1921. In 1929 a little over 5,800,000 long tons were consumed in this country. Thus, in eight years, the total annual consumption of sugar increased by approximately 1,800,000 long tons. (See Table 45.) Per capita consumption of sugar has likewise increased, mounting from about 85 pounds per year in 1919, 1920, and 1921 to an average of approximately 106 pounds in the five-year period 1925-1929. In 1930 and 1931, per capita consumption fell again to less than 100 pounds. The source of the sugar consumed in this country is given in Tables 46 and 47, and is shown graphically in Figure 12.

Wholesale purchasers of this sugar are, in general, of two classes: manufacturers who purchase large amounts of sugar to be used in the production of another commodity, and wholesale dealers who supply the retailers. On a basis of the sugar certificates issued by the food administration to various classes of industries and dealers during the five-month period July-November, 1918, it was estimated that

[1] See Table 11, p. 48.

[2] Willett and Gray's **Weekly Statistical Sugar Trade Journal, New York, January 14, 1932, p. 19.**

under normal conditions the sugar-using industries took about 24 per cent of all the sugar consumed in this country.[3]

There has undoubtedly been some increase in the amount of sugar used by various industries, though how much no one seems to know. No detailed study of the situation has been made since the United States Food Administration secured complete information

TABLE 45

Sugar Consumption in the United States, 1910-1931

Year	Total consumption (long tons)	Per cent increase or decrease from previous year	Wholesale price refined sugar (cents per pound)	Pounds per capita
1910	3,350,355	2.85	5.03	81.60
1911	3,351,391	.03	5.34	79.20
1912	3,504,182	4.56	5.05	81.30
1913	3,743,139	6.82	4.34	85.40
1914	3,760,827	.47	4.73	84.29
1915	3,801,531	1.08	5.49	83.83
1916	3,658,607	-3.76	6.75	79.34
1917	3,683,599	.68	7.67	78.58
1918	3,495,606	-5.10	7.79	73.36
1919	4,067,671	16.37	9.16	85.43
1920	4,084,672	.42	11.80	86.56
1921	4,107,328	.56	6.14	84.47
1922	5,092,758	23.99	5.93	103.18
1923	4,780,684	-6.13	8.41	95.63
1924	4,854,479	1.54	7.39	95.90
1925	5,510,060	13.51	5.45	107.50
1926	5,671,335	2.93	5.48	109.30
1927	5,297,050	-6.60	5.81	100.95
1928	5,542,636	4.64	5.51	104.27
1929	5,810,980	4.84	5.00	108.13
1930	5,599,377	-3.64	4.60	99.37
1931	5,475,204	-2.22	4.43	98.47

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

[3] "Thus, even on the basis of the restricted household consumption of 2 to 3 pounds per capita per month, the dealers selling for direct household consumption required from a minimum of 66.5 per cent of the total supply in October to a maximum of 73 per cent of the total in July. For the five months combined, out of a total distribution of sugar of 1,217,453 short tons, 843,063 tons, or 69.2 per cent, went into the households of the country. The 'non-essentials' absorbed 151,071 tons, or 12.4 per cent of the total, although they were restricted to 50 per cent of the 1917 usage, while the essentials required only 104,508 tons, or 8.6 per cent, although they were entitled to 100 per cent of their requirements. The implication of these figures is that the so-called 'non-essentials' consume in normal times somewhat over 300,000 tons in the five months from July through November, a monthly average of 60,000 tons, or around 700,000 short tons of refined sugar per year, while the so-called 'essentials' consume normally about 240,000 tons per year. The normal quantity of sugar consumed per annum by the various industries, essentials and non-essentials, may therefore be set at about 1,000,000 short tons of refined sugar, or approximately 24 per cent of the total annual consumption. This result coincides practically with that obtained by the United States Bureau of Labor in its 1901 investigations, when it was found that 27.5 per cent of the total annual sugar consumption was outside the household." **A Statistical Survey of the Sugar Industry and Trade of the United States** by Joshua Bernhardt, in Charge Sugar Section, Statistical Division, United States Food Administration, and Chief, Statistical Department, United States Sugar Equalization Board, Inc., 1920, p. 103.

for the period in 1918 referred to above. (See also Appendix D, p. 183.) On a basis of their consumption in 1918, the sugar-using industries would have consumed 1,452,745 long tons of sugar in 1929. This would have left 4,358,235 long tons for direct consumption, or a per capita consumption of 81 pounds. From information secured in various surveys made in recent years, it appears that the direct per capita consumption of sugar is near the 80-pound mark.[4] For the purpose of this study it will be assumed that 75 per cent of the sugar consumed in this country is purchased from retail dealers and consumed directly by the final consumer. This assumption seems justified for both rural and urban conditions.

Total Cost of Sugar Duty

The conclusion was reached in Chapter V that the price of sugar in this country on a given date was above the world price by approximately the full amount of the Cuban tariff rate or 1.8885 cents per pound of refined sugar. The extra cost of sugar, due to the tariff, to the wholesale purchasers of sugar in the United States while the Tariff Act of 1922 was in force, was $225,035,915 annu-

TABLE 46

Source of the Sugar Supply of the United States, Average 1922-1929, and 1929

(Long tons, refined)

Source of supply	Average 1922-1929		1929	
	Amount	Per cent	Amount	Per cent
Continental United States:				
Cane	134,657	2.53	157,573	2.71
Beet	869,576	16.34	856,640	14.74
Other (maple, etc.)	1,569	.04	762	.02
Total, U. S.	1,005,815	18.91	1,014,975	17.47
Non-contiguous territories:				
Hawaii	597,009	11.22	774,939	13.33
Porto Rico	414,609	7.79	383,940	6.61
Philippines	363,810	6.84	604,501	10.40
Virgin Islands	4,981	.10	3,344	.06
Total	1,380,409	25.95	1,766,724	30.40
Foreign countries:				
Cuba (preferential)	2,887,285	54.27	3,014,594	51.88
Other	46,489	.87	14,687	.25
Total	2,933,774	55.14	3,029,281	52.13
Total U. S. consumption	5,319,998	100.00	5,810,980	100.00

Source: Table 51, page 149.

[4] See surveys conducted by Dr. E. L. Kirkpatrick and others of the Division of Rural Life, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

TABLE 47

Relative Importance of the Sources of Supply of Sugar Consumed in the United States, 1917-1930

(Long tons, refined basis)

Source of Supply	1917	1918	1919	1920	1921	1922	1923
Continental United States: Cane	258,443	226,275	154,034	81,625	272,773	272,971	215,603
Beet	785,079	527,704	872,253	454,446	946,977	897,629	879,928
Other (maple, etc.)	26,513	29,505	34,094	17,095	2,274	2,375	2,091
Total	1,070,035	783,484	1,060,381	553,166	1,222,024	1,172,975	1,097,622
Non-contiguous territories: Hawaii	592,088	429,771	514,824	390,552	482,322	461,490	459,849
Porto Rico	431,202	331,524	286,880	334,936	373,762	311,171	251,217
Philippines	72,839	46,587	72,511	114,048	131,168	214,449	197,926
Virgin Islands	5,084	3,693	8,286	10,490	5,170	4,736	1,409
Total	1,101,213	811,575	882,501	850,026	992,422	991,846	910,401
Foreign: Cuba (preferential)	1,506,876	1,881,244	2,067,051	2,127,461	1,866,153	2,890,571	2,648,223
Other	5,475	19,303	57,738	554,019	26,729	37,366	124,438
Total	1,512,351	1,900,547	2,124,789	2,681,480	1,892,882	2,927,937	2,772,661
TOTAL U. S. CONSUMPTION	3,683,599	3,495,606	4,067,671	4,084,672	4,107,328	5,092,758	4,780,684

	1924	1925	1926	1927	1928	1929	1930
Continental United States: Cane	81,648	124,954	70,259	38,597	115,749	157,573	164,678
Beet	744,670	887,324	872,815	780,362	1,037,241	856,640	951,830
Other (maple, etc.)	1,820	1,458	1,597	1,385	1,066	762	.....
Total	828,138	1,013,736	944,671	820,344	1,154,056	1,014,975	1,116,508
Non-contiguous territories: Hawaii	505,968	636,477	618,098	635,765	683,487	744,939	672,443
Porto Rico	341,816	503,634	459,684	482,469	582,937	383,940	650,796
Philippines	265,394	404,876	312,723	434,542	476,071	604,501	671,296
Virgin Islands	2,169	8,491	5,080	5,466	9,152	3,344	5,055
Total	1,115,347	1,553,478	1,395,585	1,558,242	1,751,647	1,766,724	1,999,590
Foreign: Cuba (preferential)	2,824,155	2,909,036	3,291,297	2,912,898	2,607,509	3,014,594	2,457,808
Other	86,839	33,810	39,782	5,566	29,424	14,687	25,471
Total	2,910,994	2,942,846	3,331,079	2,918,464	2,636,933	3,029,281	2,483,279
TOTAL U. S. CONSUMPTION	4,854,479	5,510,060	5,671,335	5,297,050	5,542,636	5,810,980	5,599,377

Source: Willett and Gray's **Weekly Statistical Sugar Trade Journal**, New York.

ally; for the single year 1929 the total cost on a basis of the consumption for 1929 was $245,804,454; and on a basis of the new rate in the Tariff Act of 1930 and the consumption for 1930, the total cost to the country was $268,434,133 in that one year. (See Tables 48, 49, and 50.) These figures are based on the assumption that the full amount of the Cuban rate on sugar, but no more, is paid by someone in this country on all the sugar consumed. When the duty on Cuban 96° centrifugal sugar was raised from 1.7648 cents to 2.00 cents per pound, the burden to the American consumer was increased by slightly more than .25 cent per pound of refined sugar, or a total of more than 30 million dollars. These are maximum figures, and it should be understood that they do not allow for any reduction in the world price, as explained in Chapter V. The full amount of the duty was paid by the wholesale purchasers in the first instance. The relation between the wholesale and retail prices of sugar shows clearly that the full amount of the duty was passed on to the ultimate consumers in the case of the sugar purchased directly by them, which amounted to 75 per cent of the total consumption. The tariff cost on this direct consumption sugar amounted to an annual average of $168,776,958 for the period 1922-1929, $184,353,341 for 1929 alone, and $201,325,612 for 1930.

It is practically impossible to ascertain just how any addition to a manufacturer's cost affects the price of his product. For example, according to testimony presented before the Finance Committee of the Senate, about .8 ounce of sugar is used in making a bottle of

Source of Sugar Consumed in Continental United States, Average 1922-1929

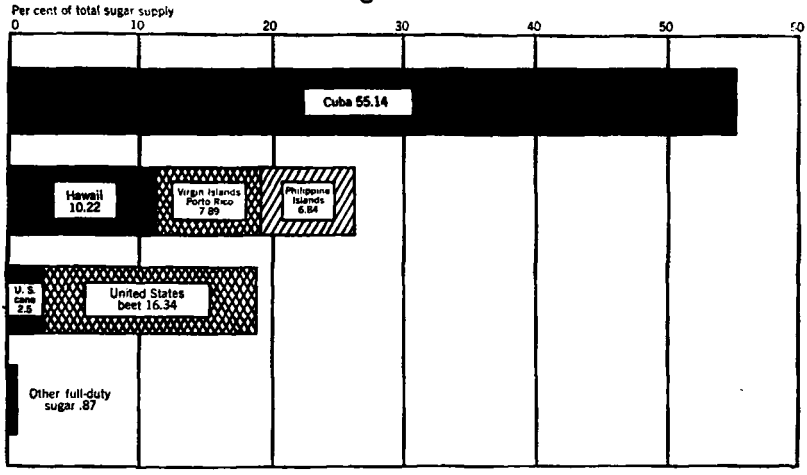

Fig. 12. The great bulk of the sugar supply of the United States has always come from Cuba, and averaged less than 50 per cent in only one year since 1918. Except in 1920, the amounts of full-duty sugar imported have been extremely small since 1912.

TABLE 48

Distribution of the Average Annual Benefits of the Sugar Duty, 1922-1929

Cost to all U. S. consumers, 5,319,998 long tons refined sugar @ 1.8885c per lb. (1.7648c, 96° basis) or $42.30 per long ton		$225,035,915
Customs revenue collected, average 1923-1928	$127,847,868	
Benefits to U. S. beet and cane growers and refiners of domestic sugar, 1,005,815 long tons @ $42.30	42,545,974	
Benefits to insular growers and manufacturers, 1,380,409 long tons @ $42.30	58,391,301	
Hawaii, 597,009 tons	$25,253,481	
Porto Rico, 414,609 tons	17,537,961	
Philippines, 363,810 tons	15,389,163	
Virgin Is., 4,981 tons	210,696	
Unaccounted for [a]		3,749,228
Total	$228,785,143	$228,785,143

[a] It is practically impossible to compile a set of figures of this sort that will balance perfectly. The figures are brought together from different sources, and the revenue figures are averages for the full years in which the Tariff Act of 1922 was in force, while the consumption figures are averages for the entire eight-year period. For present purposes the discrepancies are of no significance.

TABLE 49

Distribution of the Benefits of the Sugar Duty, 1929

Cost to all U. S. consumers, 5,810,980 long tons refined sugar @ 1.8885c per lb. (1.7648c, 96° basis) or $42.30 per long ton		$245,804,454
Customs revenue collected, 1929	$129,526,461	
Benefits to U. S. beet and cane growers and refiners of domestic sugar, 1,014,975 long tons @ $42.30	42,933,442	
Benefits to insular growers and manufacturers, 1,766,724 long tons @ $42.30	74,732,425	
Hawaii, 774,939 tons	$32,779,920	
Porto Rico, 383,940 tons	16,240,662	
Philippines, 604,501 tons	25,570,392	
Virgin Is., 3,344 tons	141,451	
Unaccounted for [a]		1,387,874
Total	$247,192,328	$247,192,328

[a] Since the figures are from different sources, it is practically impossible to balance them accurately.

pop.[5] The increase in the sugar duty from 1.8885 cents to 2.1402 cents meant an increase in cost of about .02 cent per bottle. It is more than likely that such an increase in cost would have to be borne by the manufacturer or by the retail dealers, since it is admittedly difficult to increase the price to the consuming public above the five-cent level. The situation is not so clear in the case of such products as ice cream, candy, bakery goods, and other food products in the preparation of which sugar is used. The prices of these products vary a good deal and the public is not, therefore, nearly so critical of small increases in prices as in the case of certain other products like pop and chewing gum. Then, too, the quality of the products may be changed; certain substitutes for sugar may be used; or the size of the unit sold at a given price may be reduced. This has happened in the case of ice cream, as indicated by the changing size of ice cream dippers during and after the War. Any increased cost, such as an increase in the sugar duty, may be borne entirely by the manufacturer for a short or long period, depending upon the nature of the product and the general circumstances surrounding the mar-

TABLE 50

Distribution of the Benefits of the Sugar Duty, 1930

Cost to all U. S. consumers, 5,599,377 long tons refined sugar @ 2.1402c per lb. (2.00c, 96° basis) or $47.94 per long ton			$268,434,133
Customs revenue collected, 1930		$115,121,253	
Benefits to U. S. beet and cane growers and refiners of domestic sugar, 1,116,508 long tons @ $47.94		53,525,394	
Benefits to insular growers and manufacturers, 1,999,590 long tons @ $47.94		95,860,345	
Hawaii, 672,443 tons	$32,236,918		
Porto Rico, 650,796 tons	31,199,160		
Philippines, 671,296 tons	32,181,930		
Virgin Is., 5,055 tons	242,337		
Unaccounted for [a]		3,927,141	
Total		$268,434,133	$268,434,133

[a] It is practically impossible to compile a set of figures of this sort that will balance perfectly since the figures are brought together from different sources. The total cost to the country is calculated on a basis of the new rate contained in the Tariff Act of 1930, while the total revenue collections are based on two rates, the 1922 rate until June 18, 1930, and the 1930 rate thereafter. This would, of course, cause some discrepancy in the two figures given in the table.

[5] Tariff Act of 1929, Hearings before a Subcommittee of the Committee on Finance, United States Senate, 71st Congress, first session, Volume V, Schedule 5, p. 273.

keting of the product. It may be that increased costs which cannot be reflected in higher prices will be overcome by an increase in efficiency. The man who stays in business will ultimately either have to pass any increased cost along to the consumer, be satisfied with lower profits, reduce other costs such as labor, lower the quality, or increase his efficiency enough to cover the increased cost. But these facts do not alter the conclusion that the American public, whether individuals, firms, or corporations using sugar, is obliged to stand the cost of any increase in the price of sugar due to the tariff. The extra cost of the 25 per cent of our sugar consumption used in various industries may be passed on immediately, passed on at some future time, or never passed on, depending upon the nature of the product and competition.

Distribution of Total Costs Between Urban and Rural Population

Between 1922 and 1929 the farm population of the United States was nearly one-quarter of our total population. On this basis, applying the average per capita direct-consumption of sugar for the country as a whole to the farm population, the sugar duty cost the farmers an average of $42,194,240 a year from 1922 to 1929. In 1929 alone this burden was $42,401,268, and in 1930 under the new rate, and with some increase in farm population, the cost rose to $50,331,400.[6] The rest of the total cost of the sugar tariff was paid by the urban consumers. During the period 1922-1929, this amounted to $126,582,718 annually, in 1929 to $141,952,073, and in 1930 to $150,994,200.

Beneficiaries of the Sugar Duty

The costs cited above are paid by all the consumers of sugar in this country. They are offset, in part, by the collection of customs revenue on imported sugar. The rest of the costs go as benefits, in the form of higher prices, to a relatively small number of beet and cane producers in the island territories and continental United States. (See Tables 48, 49, and 50 for a distribution of the benefits.) It will be noted from the tables that the benefits accruing to the insular territories have been greater than those received by the continental industry. Under the Tariff Act of 1922, for example, the growers and refiners of domestically produced sugar received average annual benefits of approximately 43 million dollars. During the same pe-

[6] The farm population as used here includes "all persons living on farms and also the members of farm laborers' families living in the country but not on farms." The farm population represented approximately 25 per cent of the total population during the period 1922-1929, and the cost of the sugar tariff was divided between the city and farm population on this basis. The farm population represented 23 per cent of the total in 1929, and 25 per cent in 1930. (See Table 51.) The cost figures are based on the proportion of our direct-consumption sugar used by the farm population.

riod, the producers and manufacturers in the four island territories received average annual benefits of over 58 million dollars. The obvious reason for this situation, of course, is that the island territories have been shipping more sugar to the United States than is produced within our continental borders. It is also obvious that as production increases in the island territories the benefits secured by the island producers will increase. This is shown in Table 50, which gives the figures for 1930. Production in the islands had increased to such an extent that the benefits secured in that year, under the new tariff rate, amounted to nearly 96 million dollars, as compared with less than 54 million dollars received by the continental producers.

Benefits to United States Producers

The benefits of the sugar duty which accrue to domestic producers are divided in some unknown manner between the farmers who produce sugar beets and sugar cane, the owners of beet-sugar factories, and the manufacturers of raw cane sugar. The price paid to producers of sugar cane varies directly with the price of raw sugar at New Orleans. It would appear, therefore, that an increase in price, due to any cause, would be reflected almost immediately in the price paid producers for their cane. The situation is not so clear in the case of beets, but the same undoubtedly holds true there also, since it is so difficult to secure sufficient acreage in some localities that every inducement possible must be held out to the farmers.[7]

TABLE 51

Total Population and Farm Population of the United States, 1922-1930

(Thousands)

Year	Total[1]	Farm[2]	Farm, per cent of total
Average 1922-1929	115,655	28,751	24.86
Average 1922-1930	116,446	28,907	24.82
1922	109,854	30,200	27.49
1923	111,511	29,800	26.72
1924	113,169	29,400	25.98
1925	114,826	28,982	25.24
1926	116,483	28,541	24.50
1927	118,141	27,892	23.61
1928	119,798	27,699	23.12
1929	121,455	27,491	22.63
1930[a]	122,775	30,158	24.56

[a] Issued by the Bureau of the Census, August 24, 1931.

Sources: [1]U. S. Department of Commerce, **Statistical Abstract of the United States, 1930**, p. 3. As of June 15. [2]U. S. Department of Agriculture, **Yearbook of Agriculture, 1931**, p. 1031. As of January 1.

[7] See pp. 78 and 92 for a description of the methods followed in buying sugar cane and sugar beets from farmers.

A director of the Mountain States Beet Growers' Marketing Association is of the belief that the grower gets practically all of the tariff benefits, and that with the sliding scale of payments he cannot receive less than one-half.[8] It should be remembered, however, that, under the terms of the 1929 contracts, only those farmers producing beets with a sugar content above the average could have received any benefit from the increase in duty under the Tariff Act of 1930. As pointed out in Chapter II, before a grower could receive more than the minimum contract price for his beets, the net cash selling price of beet sugar would have had to go above seven cents per pound, a price which has not been approached since 1924.

The sugar duty does make it possible for more sugar to be produced in the United States than would otherwise be possible, although some sugar would undoubtedly be produced even though the duty were removed.[9] The proportion of the industry which could survive under free trade would depend upon conditions in the United States and in the countries shipping sugar to this country. The fact remains, however, that a portion of the industry is ordinarily absolutely dependent upon the tariff and that the entire continental sugar-beet and sugar-cane industries are aided by the sugar duty. The exact division of the benefits of the duty between the growers and manufacturers is another question, and no detailed attempt is made to answer it. For the purposes of this study, it is assumed that the full benefit of the sugar duty is passed on to the producers of sugar beets and sugar cane.

Net Benefit to Farmers in the United States

It has been shown that the farmers of the United States paid, in the aggregate, an average of $42,194,240 more for their sugar annually from 1922 to 1929 due to the tariff. In 1929 the burden amounted to $42,401,268 and rose to $50,331,400 in 1930 under the new tariff rate. The benefits received by the beet and cane industries in this country during the same periods were $42,545,974, $42,933,442, and $53,525,394, respectively. Thus, balancing the extra costs due to the tariff against the benefits accruing to the beet and cane growers, we find that from 1922 to 1929, the comparatively few beet and cane growers received average annual benefits which amounted to $351,734 more than the cost to all farmers. On a basis,

[8] From a personal letter dated April 23, 1929.

[9] The amount of the domestic sugar industry which would survive free trade has been variously estimated by different men at different times. The United States Tariff Commission estimated that 56.8 per cent of the beet-sugar industry of continental United States would have survived free trade in 1916, but that none of the Louisiana cane industry would have survived had the duty been removed at that time. On a basis of costs secured in 1917-1918, the Commission came to the conclusion that 82 per cent of the beet industry and 11.9 per cent of the cane industry of this country would have survived free trade. P. G. Wright in his book, **Sugar in Relation to the Tariff**, concluded in 1924 that 66 per cent of the beet-sugar industry of the United States and 42 per cent of the cane industry of Louisiana could survive free trade.

of production and consumption in 1929, the benefits to the few amounted to $532,174 more than the cost to all farmers. In 1930, the benefits were $3,193,994 more than the cost to all farmers. It should be remembered that these calculations of net benefits and net costs are based on the assumption that the consumers pay the cost of the tariff only on the 75 per cent of the sugar which is consumed directly in the household. It should, likewise, be remembered that the total benefits to producers have been calculated on the assumption that the full amount of the duty is passed on to the producers. This is undoubtedly not true especially in the case of beet producers. Without doubt, consumers pay all or at least a large part of the extra cost due to the tariff on sugar used in the various industries. If the calculations had been made on that basis, a net cost would have been shown each year when comparing the cost to all farm consumers with the benefits to the sugar-beet and sugar-cane producers. Thus it will be seen that the sugar tariff is of very material aid to the 2.3 per cent of our farmers who raise beets and cane for sugar. (See Table 52 below.) It makes possible the use of some 900,000 acres in the production of sugar beets and sugar cane, whereas a much smaller acreage would be so used under free trade. It is significant that the income from the area devoted to the production of beets and cane at the present time accounts for less than one per

TABLE 52

Number of Farms in the United States Reporting Specified Crops and Classes of Livestock, 1925

Commodity	Number of farms	Per cent of total	Commodity	Number of farms	Per cent of total
Total	6,371,640	100.00	Apples	2,982,226	46.80
Cotton and seed	1,931,307	30.31	Sheep	430,738	6.76
Dairy products	3,728,587	58.52	Calves[a]		
Hogs	3,618,624	56.79	Wool	430,738	6.76
Beef and beef cattle	2,061,925	32.36	Sugar and syrup crops	146,786	2.30
Wheat	1,300,492	20.41	Legume seeds[a]		
Corn	4,195,922	65.85	Oranges	57,065	.90
Eggs	5,505,617	86.41	Other fruits		
Truck crops[a]			Grapes	1,459,218	22.90
Tobacco	396,352	6.22	Flax	104,405	1.64
Potatoes	2,323,810	36.47	Barley	357,521	5.61
Farm forest products[a]			Rice	11,476	.18
			Rye	230,196	3.61
Hay	3,588,209	56.32	Nuts	231,171	3.63
Oats	2,172,229	34.09	Grapefruit	21,865	.34
Poultry	5,505,617	86.41	Lemons	15,852	.25

[a] Not reported separately.

Source: U. S. Department of Commerce, Bureau of the Census, **United States Census of Agriculture**, 1925.

TABLE 53

Estimated Annual Average Cash Income from Farm Production in the United States, 1926-1928

(Thousands of dollars)

Commodity	Farm income	Per cent of total	Commodity	Farm income	Per cent of total
Total	**9,917,681**	**100.00**	Oats	126,713	1.28
Dairy products	1,446,072	14.58	Legume seeds	124,984	1.26
Cotton and seed	1,397,658	14.09	Oranges	120,949	1.22
Hogs	1,277,042	12.88	Wool and mohair	103,003	1.04
Cattle and calves	1,015,760	10.24	Nursery & greenhouse plants	97,271	.98
Wheat	821,107	8.28	Berries	96,321	.97
Eggs	532,170	5.37	Sugar and syrup crops	81,999	.83
Corn	360,324	3.63	Barley	64,696	.65
Potatoes	348,544	3.52	Grapes	55,483	.56
Truck crops	284,881	2.87	Rice	39,580	.40
Poultry	271,981	2.74	Flaxseed	39,134	.39
Tobacco	256,675	2.59	Rye	29,453	.30
Hay	186,806	1.88	Nuts	21,631	.22
Farm forest products	181,388	1.83	Grapefruit	16,393	.17
Sheep and lambs	156,189	1.57	All others	76,812	.77
Apples	149,238	1.50			
Other fruits	137,421	1.39			

Source: U. S. Department of Agriculture, **Crops and Markets**, Washington, D. C., September, 1929, Vol. 6, No. 9, p. 373.

cent of the total farm income of the United States. (See Table 53, above.) To guarantee this one per cent of our farm income, all the consumers of the country pay more for their sugar, and the extra cost to the farm population alone is undoubtedly greater than the benefits secured by the small groups of beet and cane producers.

If the tariff were removed, it is probable that some of the sugar-beet and sugar-cane producers would turn to the production of other crops of varying degrees of profitableness as compared with beets or cane. It is impossible, of course, to say how far such substitutions might go. Some producers might turn to other pursuits only very slightly less profitable than beets are even with the tariff. But a full consideration of these alternatives is not a simple matter of price comparison under present conditions. If any considerable number of farmers should turn from beets to other products, this might result in the production of alternative crops becoming less profitable. However, the beet grower would not necessarily lose the full benefit of the tariff if sugar were no longer protected, since the advantage beets may have had over alternative crops may have been only a fraction of the full duty on sugar.

Revenue Aspect of the Sugar Duty

The cost of the duty to consumers does not represent a net loss. A portion of it is offset by the customs duties which the Government collects on sugar imported chiefly from Cuba. The amounts collected in this way reduce the total amount to be collected from other sources to carry on the functions of the Federal Government. Since about 50 per cent of our total supply of sugar has come from Cuba and other foreign countries in recent years, the duties collected amount to approximately 50 per cent of the total cost to the country as a whole. (See Table 9, p. 46, for duties collected annually since 1893.) From 1922 to 1929, the revenue collected on imported sugar amounted to 56.81 per cent of the total extra cost to consumers due to the tariff; in 1929, to 52.69 per cent; and, in 1930, to 42.89 per cent. (See Tables 48, 49, and 50.)

At best this would seem a very inefficient means of meeting Government expenditures. The tax falls alike on rich and poor, and constitutes a very real burden on some classes. The revenues collected on imported sugar, will, of course, tend downward as the duty becomes more effective in increasing production in our insular territories and in continental United States. This tendency is apparent in the data presented in Table 50. In other words, to the extent that the sugar duty accomplishes its chief purpose of encouraging the domestic industry, the revenues from the duty will decline. The price of sugar in this country will remain higher than the world price by the amount of the Cuban tariff rate until the proportion of our sugar supply furnished by the island territories and domestic producers increases materially. So long as a large part of our sugar is imported from Cuba, the price of the entire supply will be above the world price by the full amount of the Cuban rate.

One means of avoiding the very obvious burdens of the sugar duty, and at the same time accomplishing the building up of the domestic industry, would be the payment of a direct bounty to the producers of sugar cane and sugar beets. Various phases of the sugar bounty question were discussed more fully in Chapter II. Such a bounty would find its way direct to the producers; it would cost the country very much less than the present tariff arrangement; and it would constitute a very real stimulus to the continental industry.

However, there is more to consider in the substitution of a bounty for the sugar tariff than the actual monetary cost to consumers. Such a change would be sure to deflate our insular territories to a very great extent, since they depend upon the United States as

an outlet for their sugar and could not readily shift to other markets. Cuba might gain by a bounty plan, since that country is so much closer to our markets than either Hawaii or the Philippine Islands that it has an advantage in lower freight costs. In any case, our responsibility to the islands must be very carefully weighed before entering upon a bounty plan which is not made to apply to the island territories.

Summary

The tariff policies followed by most sugar-producing countries are, to a very large degree, defeating their own avowed purposes. The purpose of sugar duties, bounties, subsidies, and preferentials of various kinds has been to stimulate and make profitable the production of sugar in various parts of the world, but they have resulted in twisting the ordinary channels of trade, stimulating production in areas not well suited to beets and cane, and in general creating a maladjustment between production and consumption. This has resulted in the lowest prices in the history of the sugar industry. The World War aggravated the maladjustment, but the tariff policies which were designed to aid the industry made the situation still worse. It is difficult to see how stimulation of production can alleviate a situation in which the chief weakness is an excess of supplies.

The tariff program followed in the United States with reference to sugar has resulted in practically excluding from our markets sugar subject to the full rate of duty. This has tended to stimulate production in our insular territories and Cuba and to some extent in continental United States. There is still much room for the expansion of the sugar industry in Cuba and the Philippine Islands, and expansion is likely to continue in these regions so long as the United States continues her present tariff policy.

It is physically possible to expand sugar production greatly in continental United States. Some further expansion is likely to take place with a continuance of our present tariff policy, although such expansion is not likely to occur with prices at the low levels prevailing in 1931 and the early months of 1932. Economic factors including the tariff will, however, probably be of greater influence on expansion than the purely physical factors of soil and climate. The amount of the sugar duty will, to a very large extent, determine the size of the industry in the United States, so that as a matter of national policy we must decide on the amount of sugar to be produced in this country, and regulate the tariff rate accordingly.

But so long as our insular territories come within the pale of our protective system, we must expect very keen competition from them. They enjoy very real advantages of soil, climate, and labor, which in most cases offset the disadvantage of distance from their most important market.

Since the price of sugar in the United States is higher than the world price by the amount of the Cuban tariff rate, all the purchasers of sugar in this country must pay the cost of the tariff. During the period 1922-1929 the extra cost to the country as a whole was over 225 million dollars annually; in 1929 alone it amounted to nearly 246 million dollars; and in 1930 it reached a total of over 268 million dollars. This cost is partially offset by the revenue collected by the Government, but the offset will be reduced as a greater proportion of our total consumption is produced in the United States and in our insular territories.

Under the Tariff Act of 1922, which contained the highest duty ever levied on sugar up to that time, the production of cane sugar in this country actually decreased while the production of beet sugar increased only slightly. The sugar duty gives very real aid to 2.3 per cent of our farmers, but it taxes the entire farm population more than the amount of the benefit to the small group. It results in a net loss to all farmers as a class, and, therefore, as a farm relief measure is a failure.

Appendix A

METHODS OF TARIFF INVESTIGATION

THE conclusions of Professor Ellis regarding the effect of the sugar tariff are substantially in accord with those of such other students of the subject as Professor F. W. Taussig,[1] Dr. Philip G. Wright,[2] and Professor Henry Schultz.[3] The approach and emphasis of each author is different, but it is significant that all of them agree in substance with the conclusions reached by Professor Taussig more than 15 years ago. Although their individual estimates of benefits and burdens cannot be established with mathematical precision, the differences are of no moment for matters of policy.

Effects of the Duty on Normal Costs. Professor Taussig's work combines economic theory with observation. His chief conclusions are derived from an analysis of the effect of the duty upon production, the extensive and intensive margins of cultivation, and the cost of production. They are premised upon the theory that the duty tends to increase normal cost and price. It is shown that the tariff has increased the normal cost of production above what it would otherwise be, and has consequently burdened the consumer by approximately the full amount of the duty, with benefits to domestic and island producers and the Treasury of the United States. Professor Taussig's analysis is the only type which can deal with long run effects.

The first study of Dr. Philip G. Wright[4] was made in an attempt to answer the question, "What would be a fair rate of duty to be levied on sugar?" The analysis was made on the basis of the current doctrine that a fair duty would enable present industry to survive on the basis of comparative costs of production.[5] This necessitated a study of the effects of the duty on costs of production and price. After the original work of Taussig the United States Tariff Commission studied the cost of producing sugar in the United States, Cuba, and the islands. Dr. Wright utilized this material in estimating a rate which would "equalize costs of production."

Like Taussig, Wright worked on the theory that (1) the normal tendency of the tariff was to increase the normal marginal cost of production, (2) that normal cost of production equalled normal

[1] Taussig, F. W., **Some Aspects of the Tariff Question**, Cambridge, Mass., 1931.

[2] Wright, Philip G., **Sugar in Relation to the Tariff**, New York, 1924, and **Protection Benefits and Burdens**, Freeport, Illinois., 1930.

[3] Schultz, Henry, **Statistical Laws of Demand and Supply**, Chicago, 1928, and **The Meaning of Statistical Demand Curves**, Chicago.

[4] The second study, **Protection, Its Benefits and Burdens**, is based upon Schultz's method, discussed below.

[5] In making this study Dr. Wright, of course, did not necessarily personally subscribe to this theory of tariff-making. For a statement of his attitude, see **Tariff Making by Commission**, Freeport, Illinois, 1930.

price, and (3) hence the duty normally increased the price. He attempted to prove this as far as possible by concrete statistical data regarding prices and costs of production.

Statistical proof of these assumptions requires: (1) an independent series to measure normal cost; (2) an independent series to measure normal price; (3) a comparison of these two series to ascertain whether normal costs equal normal price; (4) a measurement of other factors, such as efficiency, affecting costs of production; and (5) conclusions regarding the net effect of the duty.

For the first series Dr. Wright used cost of production figures. For the second he used the trend of wholesale prices of sugar, inflated or deflated by the general price level. He had no precise measure of efficiency or other factors affecting costs. The costs available were, however, accounting and not truly marginal costs. Consequently, he was obliged to use the series of sugar prices as his best estimate of both costs and prices, and, with modifications allowing for efficiency, concluded that the tariff normally raised marginal costs and, therefore, prices.[6] Since, however, higher prices curtailed demand, marginal costs were raised slightly less than the duty, and the added cost to the consumer was a little less than the tariff rate.

The Neo-Classical and Equilibrium Theories. The studies of Taussig and Wright follow in large measure the reasoning of the classical school of economics, which stresses the relation between cost of production and price. More recent works follow the equilibrium theory, the mathematics of which was developed by Cournot, Walras, and others, though the reasoning follows that of the Austrian and neo-classical schools. The Austrian school stressed demand, or marginal utility, as a price-making factor. The neo-classicists by the use of marginal analysis applied both to supply and demand have developed the equilibrium theory, which holds that price will balance at a point where the supply and demand are equal. This point is dependent upon the nature of the supply and demand schedules.

Mathematics or statistics can be used in connection with almost any method of tariff analysis, but the mathematical economists have relied almost wholly on neo-classical reasoning. Sometimes their assumptions cannot be reduced to language, but insofar as they deal with economic issues they are neo-classical and are subject to the same limitations. Some of the assumptions of the neo-classicists are: that the price system is a perfect regulator of production and consumption; that business cycles, unemployment, etc., are not deter-

[6] In the words of Dr. Wright, "The point of this reasoning is that while in a dynamic system marginal cost and price may differ, there are, nevertheless, long run economic forces tending to draw them together, and hence the average price for a series of normal years may be taken as perhaps the best measure of the average marginal cost for those years." **Sugar in Relation to the Tariff, p. 118.** There is occasion for doubt as to the value of this method since it has the appearance of begging the question. However, Wright's conclusions are not wholly dependent upon it.

mining but merely "disturbing" factors; that there is perfect mobility of capital and labor; free competition; perfect knowledge of present and future markets; and a rational coordination of economic activity, so as to permit perfect adjustment at the margin.

The mathematical equilibrium method has been used by Schultz and others to measure the effects of the sugar duty. It seeks to measure quantitatively the effect of a duty on supply, demand, and price.[7] After ascertaining the elasticities of supply and demand a formula is used to ascertain their effect on the exchange price. The mathematical school in effect really attempts to furnish concrete data to fill in the purely subjective supply and demand schedules of neo-classical theory. Those who use it claim that the mathematical law of supply and demand is broader than that of the neo-classical school, but for all essential purposes the use made of the statistical method in the study of sugar shows the mathematical equilibrium method to be practically analogous to the reasoning of the neo-classicists.

Evaluating Disturbing Factors. Neo-classical economists generally assume that the long run supply curve is the normal cost curve, and the demand curve is the utility curve. Only the supply curve is determinable empirically, and then only in such cases as marginal costs are known. Two independent time series would be necessary to derive these data. Since such series would reflect conditions other than changes in quantity due to changes in price, it would be necessary to value or weigh those "other" factors to ascertain the changes in quantity due to (not merely coincident with) changes in price. Consequently, even if two good independent series of data were available showing quantity and cost and demand and price, it would still be imperative to ascertain to what extent each series was affected by "disturbing" factors. To derive supply and demand curves it would be necessary to eliminate the influence on supply and demand of all factors other than price, such as the price level, changes in population and consumption habits, the use of substitutes, patriotic self-denial, changes in national income, employment, efficiency, as well as all of the other phenomena usually embodied in the business cycle. The method of eliminating these by the use of trends or trend ratios is adequate only on the assumption that they are not the determining, but merely "disturbing" factors. But recent studies of the business cycle, the effect of inflation, war, and other disturbing factors show that in some cases these may be the major determinants of subsequent prices, since they create conditions such that supply and demand are for some time not at all responsive to price

[7] The assumptions and mathematics of this method were first elaborated by Pigou, A. C., in **Protective and Preferential Import Duties**, London, 1906, and subsequently by Schultz, Wright, and others.

changes. To "eliminate" them by the use of "trends" and to hold that the residuals express a response to price alone is an act of faith which can be justified only if the results are so obviously reasonable that they permit of no other likely interpretation.

The Cost and Supply Curves. The difficulty of weighting the disturbing factors is exceedingly great, but the derivation of supply and demand curves becomes well-nigh impossible when independent series of data are not available at all. The independent series for supply must consist of a cost curve derived from cost data. But, as Wright found, these data were unsatisfactory. Subsequently Schultz attempted to derive both supply and demand curves from the same set of data. In **Statistical Laws of Demand and Supply**, pp. 209-210, Dr. Schultz objects to the accounting cost curve, not because it does not coincide with the facts, but that it is contrary to the "assumption of free competition." The most cogent objection to it, however, is that it does not coincide with the facts, since recently, at least, supply has not been a function of cost. Certainly no one can believe that the sugar supply in the past decade has followed the neo-classical law of free competition. These practical objections, however, cannot be raised against the equilibrium theory, since it eliminates them by hypothesis. It seems to be the aim of these theorists simply to reduce neo-classical logic to mathematical terms.

There are three objections to the cost curve: (1) accounting costs represent average costs at the existing scale of production and not the marginal costs of economic theory; (2) the cost curve so conceived is not the same as the supply curve. (3) Hence the cost and demand curves would not meet at the proper point. But if actual supply does not follow actual costs, the marginal productivity theory must be abandoned, and it is doubtful whether the whole equilibrium theory has any foundation whatever.[8] If, however, the cost curve is not used, there is only one series of prices for both supply and demand, which may be called the exchange curve, since at any given time in any given market the price prevailing is the result of both supply and demand. Hence, the schedules were properly called subjective by the Austrian school of economists. They are subjective because they deal not with prices actually paid or received, but with the prices that buyers and sellers are willing to pay or receive at any given time. Since, however, at any one time only one price prevails in a competitive market, there is no objective measure of the prices which people would be willing to pay, and these prices,

[8] This seems to be the contention of Mr. Schultz in "Marginal Productivity and the Pricing Process," **Journal of Political Economy**, Chicago, October, 1929. But there is no contradiction between his two positions. Mr. Schultz holds that according to the hypotheses of conventional theory the cost curve is the supply curve, which meets the demand curve to form the exchange curve. His theories are consequently consistent with his hypotheses, although they may not always jibe with reality.

if they exist at all, are known only to the consciousness of the individual in whom they exist. It is obvious that they can only be ascertained by asking that individual to state his subjective price[9] Such information is, of course, not available. So long, therefore, as the demand curve remains subjective, it is useless for empirical analysis. Since the Austrian economists used subjective rational psychology to explain price phenomena, they were not troubled about problems arising from an attempt to translate these subjective schedules into objective statements of the elasticities of demand—based upon market statistics as contrasted with assumptions about the psychology of individuals, or about mass behavior.

The Exchange Curve. The mathematical school attempts to perform a task which on strictly logical grounds is impossible. It seeks to infer two unknowns from one known—to derive from an effect (without a third system of reference) two independent causes, without knowing the value of either cause. The known effect is the quantity of sugar exchanged at certain prices. The causes sought are the supply and demand curves which brought about this exchange curve. So long as the cost curve is used to derive the supply curve, the exchange curve can be used to derive the demand curve. If, however, the cost curve is rejected as the basis for the supply curve, both curves must be derived from the exchange curve.

Some attempts to derive two unknowns from one known assume that economic theory is the third system of reference, but economic theory is merely an hypothesis which statistics may prove, and not a proof of the validity either of statistical method or its result. To reject this or that result because it gives a curve which does not agree with economic theory, or to accept another because it does, is fallacious. It illustrates the well-known tendency to use statistics to prove preconceptions rather than to find the actual content of human behavior. Curves thus ascertained prove not how human beings behave, but merely that curves consistent with economic theory may be derived.

Available price series indicate at what price given quantities of sugar are exchanged. They cannot give us supply and demand curves, but merely exchange curves. To derive supply and demand curves from the exchange curve requires a system of reference outside these data by which it can be shown whether price changes are due to changes in the supply curve or the demand curve. Without such a system an independent series must be used to derive the supply curve, which ultimately come from the cost curve.[10]

[9] Since, however, people react only to situations which have some reality for them, it is doubtful whether these schedules actually exist within the organism.

[10] For a contrary view see Schultz, Henry, **Statistical Laws of Demand and Supply**, pp. 205-10.

With a proper marginal cost curve and an exchange curve, it might be possible to derive a demand curve.[11] All attempts to derive both supply and demand curves from a given exchange curve are, therefore, fallacious. At the present time the terms "true demand curve" and "true supply curve" are used by the equilibrium school to designate curves which coincide with the presuppositions of theory, and the data are manipulated in such a way as to make it doubtful whether the results are a reflection of the data or of the author's original preconceptions.

Demand and supply curves and coefficients of elasticity of demand and supply for sugar have been derived by Professor Schultz in his **Statistical Laws of Demand and Supply** and **The Meaning of Statistical Demand Curves.** After deriving these coefficients, Mr. Schultz uses his own version of the Pigou formula to measure the effects of the sugar duty. The methods of deriving the demand and supply curves will be explained very briefly. A complete understanding of the assumptions and statistical technique can be gained only by a study of the author's own works. This study is based upon price and quantity data for the period 1890-1914.

The Law of Demand. Professor Schultz recognizes the limitation of the neo-classical law of demand for purposes of investigation. He points out, however, that the neo-classical and the statistical laws of demand are both static laws because they each relate to a definite point in time. He finds it necessary to elaborate a technique which will show how the demand curve changes from year to year. This distinction is, therefore, made between the static law of demand, and the dynamic concrete statistical law of demand, which latter is based upon observations over a considerable period of time. The distinction is probably invalid. Insofar as his results are valid at all, they give a series of curves showing demand at various times, and a comparison of these curves shows the shift in demand over a period of years. By the method adopted, Mr. Schultz attempts to ascertain not only the demand curve for 1890 or 1914, or any intervening year, but how the curve changed through the entire period.[12]

When the raw data for price and consumption are plotted for the period 1890-1914, they fail to show a demand curve such as one might expect. Consumption seems to increase almost without regard to price. This increase is so significant that it is evident that there are "disturbing" factors which prevent the original data from revealing a good demand curve. Two questions, therefore, present them-

[11] Even so, it is questionable whether cost curves so constituted can ever be projected into the future. Costs are subject to such revolutionary changes as to be virtually unpredictable. These changes may be due to improvements in efficiency or technology, or to alterations in wages, the standard of living, and other economic factors. This makes projection into the future extremely hazardous, though without such projection it is difficult to evaluate the statistical methods used or their results.

[12] **Ibid.**, p. 27.

selves: (1) what are the disturbing factors, and (2) how can they be eliminated from the data?

Empirical analysis indicates that the disturbing factors are: (1) changes in the price of substitutes, such as glucose, corn sugar, etc.; (2) changing habits of consumption[13]; (3) changes in population; (4) changes in the price level.

The ideal method of eliminating all disturbing factors in order to reveal those changes in consumption which are due to changes in price would be multiple correlation.[14] This method, however, assumes that the significance of each of the disturbing factors is known or can be computed statistically, so that it can be allocated a definite statistical value in the equation. This is, of course, impossible. At any rate, the author rejects this method of analysis for the other explained below. In his opinion, the important disturbing factors are not changes in the price of substitutes, but changing habits of consumption, increasing population, and the price level. The subsequent procedure is, therefore, based upon the hypothesis that if these disturbing factors are eliminated from the raw data, the data will show a "true" demand relationship—that is, will reveal a typical demand curve. It is well to bear this assumption in mind, for much of the subsequent analysis is based upon the presupposition that the data really do contain a demand curve, and that the curve, if not apparent, is concealed by other factors which must be eliminated by proper statistical procedure. In general, the hypothesis seems to be a reasonable one.

The author uses two general methods for deriving the demand curve. After he has done so he computes the coefficient of elasticity. These two methods are (1) the method of relative changes (link relatives), and (2) the method of trend ratios. These are applied first to the unadjusted data and then to the adjusted figures. The adjusted figures are derived by dividing the money price by the Bureau of Labor Statistics index number of wholesale prices, all commodities, average 1900-1909 as 100, and by reducing the total consumption to per capita figures. Thus, the adjusted data make direct allowance for changes in population and in the price level. The method of analysis applied to both the adjusted and unadjusted data is in all essential respects the same. The discussion immediately following, however, refers directly to the method of link relatives applied to the unadjusted data.

The Method of Link Relatives. This method is intended to take out the disturbing factors. The procedure is as follows: first, the

[13] Per capita consumption increased from 52.8 pounds in 1890 to 84.3 in 1914. Ibid., p. 216.

[14] Ibid., p. 31.

link relatives of price and quantities of sugar are calculated; second, the link relatives are plotted in a scatter diagram. When the scatter diagram is completed, it is evident that there is a wide dispersion of the data. The problem, then, is to fit a demand curve to these data. Two curves are fitted by the method of least squares. Which of these curves should be selected as the best fit? The line selected is one which is assumed to eliminate the inaccuracies of either the regression of X on Y or the regression of Y on X, and one in which the sum of the squares of the perpendicular distances of the points from the curve are a minimum.[15] The equation of the line N is then derived. This equation (Y equals -8.840 x plus 2.910) represents the average relationship between the link relatives of prices and the link relatives of consumption.[16]

The equation of the line derived with the adjusted data is Y equals -2.0817 x +3.113.[17]

A discussion of the limitations and assumptions underlying the method of link relatives will follow the explanation of the method of trend ratios.

The Method of Trend Ratios. This method derives the demand curve from the ratios of prices and quantities consumed to their respective trends or normal values.[18] It postulates a knowledge of the "normal" consumption and the "normal" price for each year, the assumption being that the "normal" values are slowly and smoothly changing quantities about which the observed quantities fluctuate.

The major problem in this analysis consists of fitting to each series the proper trend line. The nature of the line fitted determines all subsequent figures and gives us the demand curve. The author fits a number of trend lines. He then computes the ratios of the actual data to the ordinate of the trend. By correlating the trend ratios of prices to the trend ratios of quantities, the equation of demand is chosen. The data are widely dispersed, and the trend which should be fitted is not apparent. Four curves were fitted to consumption and six to price. The problem then was to select one curve for consumption and one for price. These curves yielded a wide variety of results. By inspection five were eliminated from consideration. The other five, when correlated, showed a wide range of results. The author then selected those lines for both prices and consumption which yielded the highest correlation between changes in price and changes in consumption, and rejected those lines which did not yield results in accordance with economic theory.

[15] **Ibid.**, p. 39.
[16] **Ibid.**
[17] **Ibid.**, pp. 72-74.
[18] **Ibid.**, p. 47.

The equation of the demand curve which he selected is: Y equals -1.9782 x +2.9786.[19] The equation derived from the adjusted data is Y equals -2.1356 x +3.136.[20]

The value of the results derived by analysis depends entirely upon the adequacy of the methods used. Where the data are such as to permit the fitting of only one curve, we may say that the figures themselves establish our result. When, however, they are as widely dispersed as in the case aforementioned, it appears that they permit the selection of a wide variety of curves, and the one finally chosen is that which agrees with the author's preconceptions and represents his best judgment. As Professor Wesley C. Mitchell has pointed out (*Business Cycles, the Problem and Its Setting*, pp. 214-15): "There is, indeed, no single criterion for determining 'goodness of fit.' A mathematical test can be applied only in certain cases. . . . A test of wider application is to consider the 'reasonableness' of the value shown by projecting trend lines into the future, and to choose lines which indicate results judged to be probable. . . . But published expressions of opinion show that a fit which seems good to one man would be called poor by another. Personal equations play a large role in such judgments."

The author computes the coefficient of elasticity of demand from the demand curves which he derived by the methods explained above. This coefficient may be described as the ratio of the relative changes in quantity demanded to the relative changes in price, when the relative changes are infinitesimal.[21] The coefficient of elasticity, under normal conditions, for each of the four different methods gives approximately the same value, -0.5. That is, an increase of one per cent in price will bring about a decrease of .5 per cent in consumption.[22] The author points out that this coefficient is an average figure of the curve for the entire period 1890-1914 and for the entire range of prices. He shows, however, that the consumption of sugar has become less elastic through the period; the elasticity was greater in 1890 than in 1914. Also the demand is more elastic at high prices (and low consumption) than at low prices (and high consumption.)[23]

The Law of Supply. By lagging the price data behind the quantity data, the author attempts to derive the elasticity of supply along the same general lines as demand. He believes that he has derived a supply curve which shows the relation between supply and price. In view of the behavior of production and price during the last decade, it is doubtful that the curve has any validity for this period. It is also subject to many of the same criticisms which applied to the demand curve.

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[19] **Ibid.**, p. 60.

[20] **Ibid.**, pp. 84-85.

[21] "In mathematical symbols the coefficient of the elasticity of demand $=\frac{dx}{dy}\times\frac{y}{x}$." See **The Meaning of Statistical Demand Curves**, p. 61.

[22] **Statistical Laws of Demand and Supply**, p. 92.

[23] See **The Meaning of Statistical Demand Curves**, pp. 61, 62-64.

Qualifications and Criticisms. Professor Schultz is very careful throughout the entire volume to point out the limitations and qualifications of his method of deriving the laws of supply and demand. It is well, therefore, to point out some of the specific qualifications needed.

(1) The fundamental criticism of this method is that it embodies an attempt to derive from one known series (the exchange curve) two unknown series. This is logically impossible. If the exchange and demand curves were known it would still be difficult to derive the supply curve, or if the supply and demand curves were known, the exchange curve could be derived. But to derive two new unknown curves from one known curve, of which they are held to be its two independent causes, is logically impossible, except by reference to a third system of data. The author has recourse to economic theory, but this theory is not a proof of facts, but itself a mere hypothesis in many cases unrealized. Extreme care should, therefore, be exercised in drawing inferences on the basis of the data. The realm of judgment based on "outside" facts should be limited to those facts commonly agreed to. Certainly few would admit that the supply or demand of sugar is a function of price to such an extent that the existence of normal supply and demand curves should be taken for granted. The curves selected do not, therefore, show how people react so much as how the investigator assumes that they act within his presuppositions. This makes the results, though consistent with the assumptions, of doubtful practical value.

(2) The coefficients of elasticity derived from these data apply only to the period 1890-1914. They cannot, therefore, be blindly used for any subsequent period. If the method employed is satisfactory possibly coefficients might be derived for the period 1914-1930. But the difficulties inherent in this problem are very great. The period 1914-1920 involves the abnormal conditions caused by the War, in which the rationing of sugar was undoubtedly a more significant factor in consumption than price. The period 1920-1932 is rather a short one, accompanied by post-war readjustments of price levels and business in the United States and throughout the world, and by overproduction of sugar, all of which increase the difficulty of using such a short period of time as the basis for new curves.

(3) The coefficients of elasticity have both the merits and the limitations of the methods by which they were derived. The supply and demand curves from which they proceed were selected by the

author to yield the results he thought most reasonable.[24] They were not forced upon him by the nature of the data—rather their form was assumed and data inconsistent with the assumption were, to some extent, disregarded. This is not a criticism of the method, nor the judgment of the author. It is merely a conclusion drawn from the fact that the data were so widely dispersed as to permit the fitting of a number of curves. The curve finally fitted is, therefore, a result of the author's own judgment in selecting curves from a rather wide range.[25] This is, of course, clearly stated by the author himself in the preface to his book.[26]

The difficulties involved in correlating time series make it necessary to be very careful in the acceptance of statistical transformations and the results. In the words of Wesley C. Mitchell, (*Business Cycles, the Problem and Its Setting,* p. 266): "The proposition may be ventured that a competent statistician, with sufficient clerical assistance and time at his command, can take almost any pair of time series for a given period and work them into forms which will yield coefficients of correlation exceeding ± 9. It has long been known that a mathematician can fit a curve to any time series which will pass through every point of the data. Performances of the latter sort, have no significance, however, unless the mathematically computed curve continues to agree with the data when projected beyond the period for which it is fitted." The forecasting test, however, cannot be applied to Professor Schultz's coefficients because the period 1914-1920 was quite abnormal, and furthermore because the coefficients were not derived with a view to making long range forecasts.[27]

(4) The author contends that "the existence of the law of demand is an objective fact, quite independent of one's psychological

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[24] "The demand curves which were finally selected in this study are those which were fitted on the assumption that the reason why any point fails to fall on the curve is that it is subject to a horizontal as well as a vertical "error." The "errors" with which we have to deal are not only, or even mainly, the accidental errors due to no known cause of systematic or constant error which play such an important role in the theory of least squares. But they are treated as though they were true accidental errors. That is to say, we first eliminate such constant or systematic "errors" as may be eliminated through the use of index numbers, trend ratios, or link relatives. (Such constant "errors are due as a rule, to population growth and to changes in the general price level.) We are quite certain that there are others still, but we cannot measure them. We therefore assume that they are eliminated by the graduation process involved in fitting the demand curve." See Statistical Laws of Demand and Supply, p. 94.

[25] For example, see p. 53, Statistical Laws of Demand and Supply.

[26] "As he examines the conclusions reached in this book the reader will do well to keep in mind the fact that the results of a method cannot be separated from the method itself. The fine differences between the various methods—differences which are not always apparent and which cannot always be conveniently explained—produce differences in the results obtained with their aid. Thus the values of the elasticities of demand and supply derived in this book depend to a large degree upon the particular method of curve-fitting employed. Had the common method of curve-fitting been adopted, the results would have been quite different."

[27] See The Meaning of Statistical Demand Curves, p. 87.

preconceptions."[28] This is a statement which must be challenged in view of the author's own methods of analysis. While it is, no doubt, true that the notion of elasticity of demand need not necessarily be based upon rationalistic psychology and hedonistic calculus, it is nevertheless apparent that the coefficients of elasticity derived by Professor Schultz are not objective facts independent of his own preconceptions. The notion of elasticity may, of course, be based upon the common observation that as the income of individuals or the nation is limited, the quantities of goods which can be purchased is limited. It is merely a problem of arithmetic to show that fewer goods can be bought at high prices than at low prices with the same purchasing power. This is a matter of common observation. It is precisely because the author had confidence in this notion and a belief in a certain type of demand curve, which for the purpose of statistical analysis must be classed as preconceptions, that he rejected those curves which could be reasonably fitted to his data, but which did not show a high correlation between changes in price and changes in quantity. The data upon which these curves are based are merely the limits within which the preconceptions may be "verified" by statistical ingenuity. Sometimes the data permit a small range of selection, sometimes a wide one, and sometimes none at all. As has been pointed out above, the data involved in the present case permitted a wide variety of selection. Consequently the results obtained so far as the data permits are largely a result not of the facts themselves but of the author's preconceptions of supply and demand curves for sugar.

Conclusion. Schultz attempts to answer the significant question, "To what extent does the tariff raise the domestic and depress the foreign price?" For the reasons indicated, his method, even if it were satisfactory, could not be used to ascertain the effect of the sugar duty during the past decade.[29]

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[28] This quotation is extracted from the following paragraph: "Finally, we should like to point out the real nature of the statistical law of demand. Some economists, among whom are to be included not a few members of the institutional school, have, unfortunately, gotten the impression that any attempt to derive a law of demand must needs be based upon no better psychology than that of James Mill. A few of them even go so far as to deny the very existence of a law of demand. What these economists overlook, however, is that the existence of a law of demand is an objective fact, quite independent of one's psychological preconceptions. And when economists, in the words of Professor Mitchell, 'grasp the idea that their business is with behavior, and that behavior is objective, they will see that their psychological footing can be made secure.' For the law of demand is not a fiction of the hedonistic school. It is nothing less than a summary presentation, in quantitative terms, of an important aspect of human behavior." **Statistical Laws of Demand and Supply**, p. 95.

[29] It would not be applicable to sugar during the last ten years because it assumes free competition. The Cuban Single Seller and governmental control over production and exports were significant factors affecting supply. This formula is misleading in the case of most agricultural tariffs since a full differential between two market areas does not follow wherever imports persist. This assumption, which is fundamental to the formula method, is often contrary to fact. In the case of other products, notably butter, cheese, and lamb, to mention only a few, the equilibrium

The method used by Professor Ellis is to present not only the differential created by the duty but the alternative opportunities of producers and consumers in the sugar market. He puts the emphasis on markets rather than on supply and demand or costs. The incidence of the tariff has been judged largely by its effect on the alternative opportunities of those affected. If in its absence it appears that consumers would have access to the world market the measure of their burden is the difference between the world market and the protected market. If Cuban producers had no other opportunity but the world market they could not be said to be absorbing the duty. This type of opportunity cost theory is of course inadequate to deal with the long run effects. But it is impossible by any statistical method now known to measure the long run effects on production in direct quantitative terms. This must be done by inferences from known effects and causes, by the type of observation, induction, and deduction used by Professor Taussig. Little attention has been paid to costs of production in this monograph partly because this aspect of the problem has been adequately dealt with by others and partly because the spread between cost of production and supply has been so great in recent years. Instead an attempt has been made to set forth clearly the interrelationship of the world sugar markets and the interdependence of world prices.

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Madison, Wisconsin
January 1, 1933

method could not be used at all. Imports persist in all of these cases, but to measure the effect of the duty by the Pigou formula even were the data available to construct supply and demand curves would lead to erroneous conclusions. It has never been shown that this formula can explain a partial differential, or the benefit of a duty when it does not exclude imports, but for practical purposes creates two independent markets.

Appendix B

THE COOPERATIVE SUGAR EXPORT AGENCY, INC., OF CUBA

THE Cooperative Sugar Export Agency, Inc., of Cuba was organized in accordance with a decree signed by President Machado, July 26, 1929. The Agency or "Single Seller," as it was known to the trade, started operations September 1, 1929, and continued until April 14, 1930, when it was voted out by the sugar producers of Cuba. It was a real factor in the New York market during this time.

The Cubans proposed, by a system of control over exports, to secure a portion of the 20 per cent preferential, amounting to .4412 cent per pound on 96° centrifugal sugar, granted by the United States on sugar imported from Cuba. This was accomplished by selling in the United States markets only when a price of some .25 cent per pound above the London or world price, transportation charges considered, could be secured. When such a price differential could not be secured, no sales were made in the United States.

During the entire period of its operation, the organization was able to secure a very substantial portion of the 20 per cent preferential, as is clearly shown in Table 34, which gives the differential between the prices of 96° centrifugal Cuban sugar, c. i. f. London and c. & f. New York. A freight differential only existed prior to August, 1929, and the differential dropped again to that basis the week following dissolution, April 14, 1930.

During the week of December 19, 1929, "sales to the U. S. market by the Cuban Cooperative Export Agency totalled only 11,000 tons for late December and January shipment for which 2.10 cents c. & f. was accepted." [1] During that same week Cuba's and Domingo's, 96° basis, sold in London at 8s 7½d, c. i. f., which was equivalent to 1.88 cents per pound. After making allowance for freight, .13 cent to New York and .20 cent to London, there was a difference of .29 cent per pound.

The following quotation from C. Czarnikow, Ltd., is quite typical of market reports during the last few months of 1929 and the early months of 1930:

"The Cuban Cooperative Export Agency has made no sales this week, their idea of price for the United States being 2 1/16

[1] C. Czarnikow, Ltd., **Weekly Price Current**, London, December 19, 1929.

cents c. & f., and it is reported that bids of 2 cents have been submitted and refused."[2]

This shows the influence of the Single Seller in the market, but it also suggests that when Cuba was not selling her sugar, surplus stocks were accumulating at home, and, since no provision had been made for making advances to the producers, dissatisfaction grew and the whole plan was finally abandoned.

The Agency handled a total of 1,118,317 long tons of sugar during the seven and one-half months of its operation, 421,650 long tons of old crop (1928-29) sugar and 696,667 long tons of new crop (1929-30) sugar. By early January, 1930, stocks of sugar in Cuba had accumulated so that there were some 200,000 long tons more on hand than on the same date the previous year. At the time the Single Seller was voted out, there were nearly 500,000 long tons more on hand than on the same date of the preceding year. This explains in part the demand for dissolution on the part of the producers. It further illustrates the futility of control by only one country in reducing production and raising prices.

[2] Ibid., January 16, 1930.

Appendix C

THE CHADBOURNE PLAN

AT the time of the dissolution of the Cuban Single Seller, April 14, 1930, it was generally understood that Cuba would never again resort to a restriction of either production or sales. However, prices steadily declined, due to heavy stocks of Cuban sugar and increased crops of duty-free sugars, until a price of 1.04 cents c. & f. New York City was reached on September 29, 1930. This was a new all-time low price for sugar, and sentiment in Cuba was again turned to crop or export restriction.

Mr. Thomas L. Chadbourne, a New York attorney, submitted a plan to the Cuban planters and Cuban government which had as its purpose the stabilization of the sugar industry and the raising of sugar prices. In brief the plan called for the segregation of 1,500,000 tons of Cuban stocks of sugar to be paid for by Cuban government bonds, a limitation of the amount of exports to the United States, and the sending of a delegation to Europe to confer with European and Javanese producers in an attempt to settle upon some world plan of sugar crop or export restriction. The essential points of this plan were embodied in the Sugar Stabilization Law of Cuba enacted November 15, 1930, and in two special decrees issued by President Gerardo Machado, November 17, 1930.

The Chadbourne Agreement and the International Sugar Council

Soon after the passage of the Sugar Stabilization Law a committee, including Mr. Chadbourne, which had been appointed by President Machado, sailed for Europe to carry on negotiations with representatives of Cuban, Javanese, and European sugar producers. These conferences led to nothing of a definite nature since Germany withdrew on December 15. Negotiations were resumed again about the middle of January, 1931, and the Chadbourne Agreement was signed in Brussels, May 9, 1931, by representatives of Cuba, Java, Czechoslovakia, Germany, Poland, Belgium, and Hungary.[1]

These seven countries, which include the two largest cane-sugar exporting countries of the world and the most important beet-sugar exporting countries of Europe, accounted for 43.8 per cent of the world's crop of sugar during the period of 1926-1930. The same

[1] At the regular meeting of the International Sugar Council, the governing body under the Chadbourne Plan, held at Paris, France, December 14, 1931, Peru was admitted to full membership in the Council with five votes and an export quota of 360,000 tons for the year 1931-32 and 373,750 tons for each of the succeeding years. The Council also decided to admit Jugo-Slavia as a member of the Council provided she fulfill the terms and conditions accepted by all the other members of the Agreement.

seven countries accounted for about 70 per cent of the annual sugar crop entering international trade channels during the same period. It is apparent, therefore, that the parties to this Agreement control a very substantial part of the sugar crop of the world. (See Table A.)

Briefly, this new scheme for stabilizing the sugar industry of the world calls for: (1) the segregation of sugar out of present surpluses to be marketed during the next five years, (2) limitation of production to an amount which, together with the segregated sugar will just meet current needs, and (3) a provision which will allow for greater exports of sugar from the countries signing the Agreement when the price goes above a certain minimum. This latter provision is intended to prevent the expansion of production in those countries not parties to the plan.

The Agreement, which is to remain in force until September 1, 1935, calls for the establishment of a permanent council, known as the International Sugar Council, to be located at The Hague. Four regular meetings are to be held annually and special meetings may be called at the request of two or more nations or by the chairman. The votes alloted in the Council are distributed among the delegates as follows:

Cuba	35
Java	30
Europe	25

The 25 European votes are distributed as follows:

Czechoslovakia	8
Germany	6
Poland	6
Hungary	3
Belgium	2

Table B shows the exports that are allowed each of the seven countries during the period covered by the Agreement. It is hoped that the annual production plus the segregated sugar, in the case of Cuba and Java, will just about balance the export quotas and domestic consumption, so that no new surpluses will be accumulated during the period of the Agreement. Any such surplus would be held back in the individual country; nevertheless such a surplus would have a depressing effect upon the market in general.

The production figures for Cuba and the export quotas shown for each country are, of course, the quantities forming the basis of the Agreement and, so far as the first year is concerned, constitute the maximum figures allowed. After the first year the Cuban exports to the United States each year will be regulated by the extent

TABLE A

Average Annual Sugar Crop of the World 1925-26 to 1929-30

Country	Average crop long tons	Per cent of total
Cane Sugar		
United States		
Louisiana	105,179	.41
Porto Rico	615,684	2.41
Hawaiian Islands	787,523	3.08
Virgin Islands	6,820	.03
Cuba	4,645,733	18.16
British West Indies		
Trinidad	75,372	.29
Barbados	56,720	.22
Jamaica	61,235	.24
Antigua	17,121	.07
St. Kitts	17,263	.07
Other	6,531	.03
French West Indies		
Martinique	42,025	.16
Guadeloupe	26,148	.10
San Domingo	348,157	1.36
Hayti	14,076	.06
Mexico	187,242	.73
Central America		
Guatemala	28,486	.11
Other	63,818	.25
South America		
Demerara	110,689	.43
Surinam	14,064	.05
Venezuela	20,622	.08
Ecuador	19,797	.08
Peru	361,258	1.41
Argentine	401,767	1.57
Brazil	702,914	2.75
Total in America	8,736,244	34.15
British India	2,989,800	11.69
Java	2,492,882	9.74
Formosa and Japan	732,491	2.86
Philippine Islands	629,342	2.46
Total in Asia	6,844,515	26.75
Australia	499,174	1.95
Fiji Islands	90,272	.35
Total in Australia and Polynesia	589,446	2.30
Cane Sugar		
Egypt	88,767	.35
Mauritius	227,029	.89
Reunion	50,857	.20
Natal	236,204	.92
Mozambique	74,968	.29
Total in Africa	677,826	2.65
Europe—Spain	10,229	.04
TOTAL CANE SUGAR	16,858,260	65.89
Beet Sugar		
Europe		
Germany	1,747,226	6.83
Czechoslovakia	1,174,222	4.59
Austria	99,072	.39
Hungary	200,038	.78
France	832,789	3.26
Belgium	274,008	1.07
Holland	287,657	1.12
Russia & Ukraine	1,162,182	4.54
Poland	676,067	2.64
Sweden	130,594	.51
Denmark	153,542	.60
Italy	318,289	1.24
Spain	265,698	1.04
Switzerland	6,799	.03
Bulgaria	36,608	.14
Roumania	126,451	.49
Great Britain and Ireland	190,029	.74
Jugoslavia	95,728	.38
Other	37,272	.15
Total in Europe	7,814,270	30.54
United States	882,256	3.45
Canada	29,567	.12
TOTAL BEET SUGAR	8,726,093	34.11
GRAND TOTAL CANE & BEET SUGAR	25,584,353	100.00

Source: Compiled from yearly figures in Willett and Gray's **Weekly Statistical Sugar Trade** Journal, New York. The crop year varies in different countries. See Table 28, p. 95, for the harvesting periods in the chief sugar-producing countries of the world.

TABLE B

Exports of Sugar Allowed Under the Chadbourne Agreement

(Long tons, raw basis)

Country	First year	Second year	Third year	Fourth year	Fifth year
Cuba	1931	1932[d]	1933	1934	1935
Production, January-December	3,122,000	3,495,000	3,545,000	3,545,000	3,545,000
Drawn from quantity segregated	260,000	260,000	260,000	260,000	260,000
Total amount available	3,382,000	3,755,000	3,805,000	3,805,000	3,805,000
Cuban consumption	150,000	150,000	150,000	150,000	150,000
Available for export	3,232,000	3,605,000	3,655,000	3,655,000	3,655,000
Distribution					
Exports to United States	2,577,000[a]	2,800,000	2,800,000	2,800,000	2,800,000
Exports to other countries	655,000	805,000	855,000	855,000	855,000
Java	1931–32	1932–33	1933–34	1934–35	1935–36
Exports, April-March	2,200,000	2,200,000	2,200,000	2,200,000	2,200,000
Cumulative increase of exports after first year	——	100,000	200,000	300,000	400,000
Drawn from quantity segregated	100,000	100,000	100,000	100,000	100,000
Total exports	2,300,000	2,400,000	2,500,000	2,600,000	2,700,000
European exports, September-August	1930–31	1931–32	1932–33	1933–34	1934–35
Czechoslovakia	570,815	570,815	570,815	570,815	570,815
Germany	500,000	350,000	300,000	300,000	300,000
Poland	308,810	308,810	308,810	308,810	308,810
Hungary	84,100	84,100	84,100	84,100	84,100
Belgium	30,275	30,275	30,275	30,275	30,275
Total European exports	1,494,000	1,346,000	1,294,000	1,294,000	1,294,000
Total exports, seven countries	**7,026,000**	**7,349,000**	**7,449,000**	**7,549,000**	**7,649,000**
Distribution					
Cuban exports to United States	2,577,000	2,800,000	2,800,000	2,800,000	2,800,000
Exports to "free" markets	4,449,000	4,549,000	4,649,000	4,749,000	4,849,000
Total exports to "free" markets under increase of quotas[b]					
5% obligatory increase in event price reaches 2 cents	4,671,450	4,776,450	4,881,450	4,986,450	5,091,450
2½% increase (not obligatory) in event price reaches 2¼ cents	4,782,675	4,890,175	4,997,675	5,105,175	5,212,675
2½% obligatory increase in event price reaches 2½ cents[c]	4,893,900	5,003,900	5,113,900	5,223,900	5,333,900

TABLE B, continued

Exports of Sugar Allowed Under the Chadbourne Agreement

(Long tons, raw basis)

[a] To this amount should be added 60,000 tons afloat January 1, 1931, and 53,000 tons, for which export permits had been granted. The balance of 110,000 tons, to bring this figure to a total of 2,800,000 tons as available to the United States during the current year, was assumed to have already been supplied to the United States, and was arrived at by the deduction of the normal stocks carried in the United States on January 1, 1931, viz., 300,000 tons from the stocks of 410,000 tons actually held on that date.

[b] The quota increases will be based on the respective annual export quotas of each country as stipulated in the upper part of the table. The price refers to the quotation on raw sugar, 96 degrees polarization, f. o. b. Cuba, and "the respective prices referred to shall be considered reached whenever the average price over a period of thirty consecutive market working days shall not be less than the equivalent named."

[c] In the event that no increase in the quota is allowed at a price of 2¼ cents, the obligatory increase in the quotas at a price of 2½ cents would be 5 per cent.

[d] The quotas for 1932 were altered somewhat by the negotiations during the spring of 1932. The Cuban crop was limited to about 2,700,000 long tons and the export quotas of the European countries, Peru and Java, were reduced to 3,217,754 tons. Cuban exports to the United States in 1932 are not to exceed 1,956,420 tons.

Source: C. Czarnikow, Ltd., **Weekly Price Current**, London, April 16, 1931.

of the increase in consumption in that country. Cuban exports to "free" markets after the first year will be regulated by the basic price ruling in the Cuban market. Cuban exports to the United States were fixed at 2,577,000 long tons the first year instead of 2,800,000 long tons because of amounts afloat, ready for shipment, or already shipped to the United States as explained in a footnote to Table B. The 100,000 long tons accumulative increase in Javanese exports is apparently intended to take care of an expected increase in consumption in the Far East. It should be noted that the shipments of sugar to the United States by Cuba is the only instance where restrictive measures have been applied in regard to the amount of sugar to be sold in any country by the parties to the agreement. Table C shows the exports from the nine countries concerned during the past six years.

The chief aim of the Agreement is to restore economic stability to the world sugar industry by bringing about a more equal balance between world production and world consumption. The immediate aim is not the attainment of artificially high prices, but rather an improvement in the statistical situation of the sugar industry of the world. If for any reason, such as a crop failure, a country is unable to export her full quota in any one year, the deficit cannot be made up the following year. Each year is considered by itself. In this connection it is well to point out that any surplus Cuban sugar not required by the United States in any one year cannot be carried into the next year or become a depressing influence on other markets. Any surplus stocks which Cuba finds on her hands at the end of a contract year will merely be deducted from the production for the following year.

TABLE C

Exports of Sugar from the Countries Participating in the Chadbourne Agreement, 1925-1930

(Thousands of long tons, raw basis)

Cuba, January-December	1930	1929	1928	1927	1926	1925
Total exports	3,387	4,799	3,983	4,126	4,708	5,051
Exports to United States	2,355	3,685	2,874	3,207	3,748	3,636
Java, April-March	**1930–31**	**1929–30**	**1928–29**	**1927–28**	**1926–27**	**1925–26**
Total exports	2,107	2,316	2,631	2,080	1,713	2,070
Europe,[a] September-August	1929–30	1928–29	1927–28	1926–27	1925–26	1924–25
Czechoslovakia	600	674	813	708	1,080	1,015
Germany	234	143	83	64	47	226
Poland	452	305	163	226	272	200
Hungary	133	100	70	72	84	103
Belgium	25	44	40	46	146	181
Jugo-Slavia	18	7	0	[b]	[b]	[b]
Peru, January-December	335	362	311	298	329	205
Total exports, nine countries	7,291	8,750	8,094	7,620	8,379	9,051
Exports to "free" markets	4,936	5,065	5,220	4,413	4,631	5,415

[a] Net exports in case of European countries.

[b] Not available.

Source: All data from C. Czarnikow, Ltd., **Weekly Price Current**, London, April 23, 1931, except figures for Jugo-Slavia which are from the issue of December 30, 1931, and those for Peru which are from the issue of April 9, 1931. The Peruvian exports for 1925 are from the United States Sugar Association, N. Y.

A provision which allows for the release of sugar supplies in excess of the basic amounts stipulated provides a safeguard against the development of any statistical situation which might force prices to abnormally high levels and so stimulate output in those countries which remain outside the Agreement. This part of the plan provides that, if the world price of raw sugar, 96° basis, remains at an average of 2.00 cents per pound, f. o. b. Cuba for prompt shipment, for a period of 30 consecutive working days, the quotas allotted to each country for export to "free" markets shall be increased to the extent of 5 per cent of the original quantities allowed by the scheme. In case the price reaches a level of 2.25 cents per pound for a like period, the export quotas may be increased by 2.5 per cent, but this provision is not obligatory. If, however, the price reaches an average of 2.50 cents per pound for the prescribed period, the Council is required to increase the export quotas by a further 2.5 per cent in case the quotas were increased at the 2.25 cent price level or 5 per cent in case no such increase had been allowed. In the event of further increases in price, any additional increases in the export quotas

would, presumably, be entirely in the hands of the permanent council. Increases in the original quotas are based only on exports to "free" markets; so any increase in Cuban exports will be based on her quota of exports to countries outside the United States. A provision is included in the Agreement which allows Cuba to participate in any increase in consumption in the United States. The figures in the lower part of Table B indicate the additional amounts which may be exported as the price increases.

Appendix D

DISTRIBUTION OF SUGAR AMONG VARIOUS CLASSES OF CONSUMERS [1]

EARLY in the history of the Food Administration it was found imperative to restrict the non-essential uses of sugar, and as a basis for intelligent action some statistics relating to the matter were very much desired. Scant data were then available on this subject [2] and figures had to be compiled showing the quantities used by various classes of consumers. Early in 1918, as a result of a more or less empirical survey, based on information received from manufacturers, the following table was drawn up, showing the quantities of sugar normally used in various manufactured products:

Quantities of Sugar Used in Various Manufactured Products

(Quantities in short tons, refined)

Product	Quantity tons	Product	Quantity tons
Confectionery	350,000	Tobacco	26,000
Bread	45,000	Soap	900
Crackers	55,000	Canned Vegetables	4,000
Sweet Doughs	45,000	Canned Fruits—	
Pies	47,500	California, Oregon,	
Cakes	37,500	Washington	17,000
Sundry Bakery Goods	9,000	Rest of United States	9,000
Chewing Gum	15,000	Condensed Milk	100,000
Soft Drinks	135,000	Proprietary Medicines	6,100
Ice Cream	64,000	Total	966,000

Much more accurate data were obtained, bearing on these matters under the operations of the "certificate plan" of distribution, in operation from July 1 to December 1, 1918. A representative of the United States Sugar Equalization Board traveled all over the United States in the latter part of 1918, in order to standardize the

[1] Source: **A Statistical Survey of the Sugar Industry and Trade of the United States**, by Joshua Berhardt, in charge Sugar Section, Statistical Division, United States Food Administration, and Chief, Statistical Department, United States Sugar Equalization Board, Inc., Washington, D. C., 1920, p. 93. The Food Administration, though obliged to continue certain controls such as wheat and sugar, lifted most of its regulations soon after the Armistice and the administration of the United States Sugar Equalization Board, Inc., was officially closed by executive order July 10, 1926.

[2] In 1901 the United States Bureau of Labor determined the actual direct household consumption of sugar in 2,567 families of workingmen for the whole year in various parts of the country. The average for the United States was 50.56 pounds per capita, and since the total usage of sugar in that year, as reported by Willett and Gray, was 69.7 pounds, the per capita quantity used outside the household must have been 19.14 pounds. In percentages then, 72.5 per cent of the per capita consumption in 1901 was household consumption, while 27.5 per cent went into other channels. Since 1901, however, there has been a tremendous expansion in the sugar-using industries, so that the impression in sugar trade circles was that in 1916 about one-third of the entire consumption was outside the household.

operations of the "certificate plan" in the different states. Incidentally, he obtained the following figures from the Federal Food Administrators, showing the number of manufacturers in the United States using sugar, the number of hotels and public eating places, the bakers and the retail grocers:

Manufacturers of soft drinks and non-essentials	56,130
Manufacturers of essential food products using sugar	34,388
Hotels and public eating places	121,393
Bakers	34,662
Retail grocers	375,361

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