

AGRICULTURAL
ECONOMICS
RESEARCH UNIT



Lincoln College

THE INTERNATIONAL
SUGAR SITUATION
AND NEW ZEALAND'S
SUGAR POLICY

by

A. R. FRAMPTON



Publication No. 4

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AND NEW ZEALAND'S SUGAR POLICY

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THE AGRICULTURAL ECONOMICS RESEARCH UNIT

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P R E F A C E

In deciding whether or not there should be established a sugar beet industry in New Zealand, there are many considerations which policy makers need to bear in mind, but there are two major questions which initially must be answered.

The first question is "what is the return to the nation on the capital invested in growing and processing sugar beet by comparison with the return to be earned from the same resources used to increase traditional exports for the import of sugar from abroad?"

Such an assessment depends not only on the farm management and economic aspects of a sugar beet industry in New Zealand but it also depends on the assumptions which are used as to the price which will have to be paid for imported sugar over the next decade or so, and this, then, is the second question which must be answered, viz, "what is the likely future course of world sugar prices?"

In this paper Mr Frampton sets out to answer this second question in the context of a broad review of some general aspects of sugar marketing and trade, leading up to a tentative evaluation of the worthwhileness of the sugar industry. Before preparing this paper, Mr Frampton completed, at Massey University of Manawatu, a thesis on the farm management aspects of sugar beet production which will eventually be published as a complement to the present paper.

We should like to acknowledge the valuable assistance given by officers of the Department of Industries and Commerce, and to thank Dr R.H. Snape of Monash University for permission to reproduce parts of his doctoral thesis on "Protection and Stabilisation in the World Sugar Industry".

Lincoln College
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B. P. Philpott

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THE INTERNATIONAL SUGAR SITUATION (a)
AND NEW ZEALAND'S SUGAR POLICY

1. INTRODUCTION AND SUMMARY

The present high retail price of sugar has again stimulated interest in a proposal that a sugar industry, using sugar beet as a raw material, be set up in New Zealand. This proposal has been made and has found enthusiastic support many times since 1870. Although several reports have been submitted to Government and considerable trial work carried out there has never been a comprehensive and systematic study of either the Farm Management implications of mechanised sugar beet culture, or of the factors that should be taken into account in determining a national sugar policy. This publication is concerned with national sugar policy and brings together relevant data which should remove some of the many misconceptions in the public mind. It also suggests how sugar policy should develop in relation to the expected future fall in world sugar prices.

A review of the world sugar industry is given in section 1. The statistics reveal the spectacular rise in sugar production and consumption over the last two decades and also the nature of world price fluctuations - short periods of high prices followed by long periods of low prices.

Less than one-third of total world production of sugar has been traded internationally in recent years and less than one-half of this trade has been on a free market. Thus the

(a) I am indebted to Professor B.P. Philpott and Dr. J.T. Ward for their helpful comments on this publication.

free market is a narrow, residual market particularly susceptible to price fluctuations of a type described by economists as "cobweb" movements. The nature and effects of this instability is described in the third section.

Two international protective and subsidy arrangements - the British Commonwealth Sugar Agreement and the United States Sugar Act - as well as many national beet sugar subsidy schemes operate in the world sugar economy at present. The effects of the various protective measures are discussed in section 4 where it is found that a change in the form of protection would reduce price instability and increase world sugar consumption.

Sugar policy decisions should not be based on present prices but on the best available estimate of future prices. Such an estimate is presented in section 5. Original work has not been carried out, but the extensive studies of the Food and Agriculture Organization of the United Nations (F.A.O.) have been summarised. The author is fully conscious of the frailties of long term projections based on econometric models but estimates of future prices must be attempted. The general conclusion is that there is no likelihood of a world shortage of sugar in the future, because low cost cane sugar producers are ready and willing to increase cane sugar production enormously at relatively low prices. Increased uncertainty is associated with these projections because of the political factors which could influence the Sino-Soviet-Cuban relationship. Any break between Cuba and the Sino-Soviet world would place large quantities of sugar on the world market and would probably bring disastrously low prices for producers supplying the free market.

The final section describes present New Zealand sugar policy and tentatively evaluates the worthwhileness of a domestic sugar beet industry. Two different assumptions concerning the New Zealand currency exchange rate have been

made and each has been discussed. The main conclusion is that New Zealand should continue to purchase sugar at the world price and make no attempt to set up a sugar beet industry for at least five years.

Appendix A presents a brief description of the United States Sugar Act, the British Commonwealth Sugar Agreement, the International Sugar Agreement and the Free Market. Appendix B treats the cobweb effect in more detail. The various statistical tables are brought together in Appendix C and a short list of references are given in Appendix D.

2. A REVIEW OF WORLD SUGAR PRODUCTION, PRICES, TRADE AND CONSUMPTION

A brief review of the main factors which have influenced the development of the world sugar industry over the past fifty years is presented in this section. This background knowledge is required for an appreciation of the factors contributing to the recent violent price fluctuations in the world raw sugar market.

High grade sugar^(b) can be produced from many plants but the main commercial sources are sugar beet and sugar cane. The beet sugar industry is principally located in northern temperate regions while sugar cane is a product of tropical and sub-tropical areas.

(b) As a centrifuge is used in the manufacture of high grade sugar, this is usually termed centrifugal sugar. There is significant production of non-centrifugal (crude) sugars in many of the less developed countries of the world.

2.1 World Production of Sugar

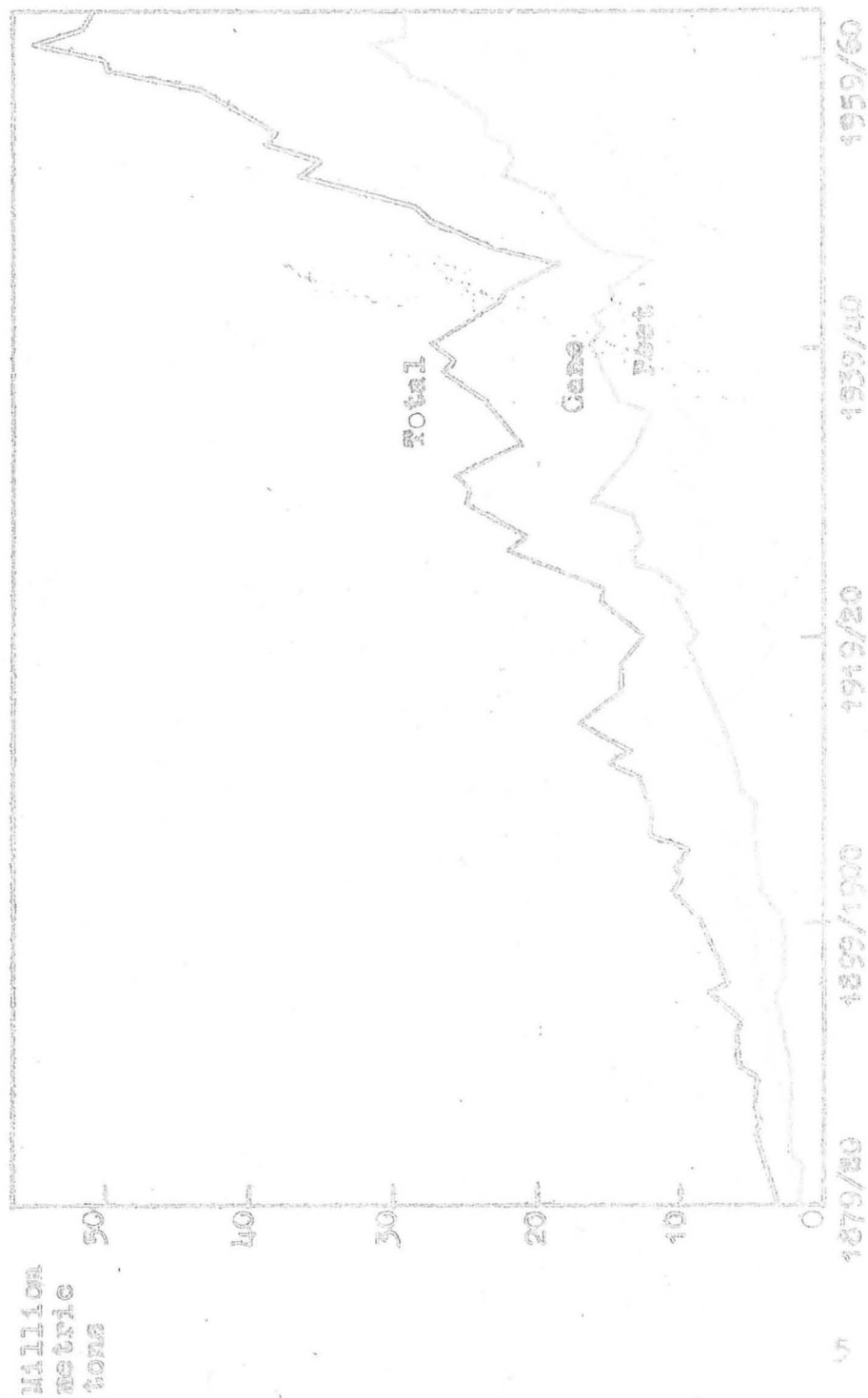
The total production of all types of sugar, centrifugal and non-centrifugal, increased from 5 million metric tons in 1880 to 58 million tons in 1960 - a growth of nearly 1,100 per cent in 80 years⁽¹⁾ (see Figure 1). At the beginning of the period production was almost equally divided between beet and cane, but by 1900 beet sugar contributed 65 per cent to the world total of 8 million metric tons. The pattern changed soon after 1900 and by 1924-28 cane sugar constituted 60 per cent of world sugar supplies.

The economic depression of the thirties stimulated nationalistic agricultural policies and during the five years before the second world war the percentage of cane in total sugar production declined to 57 per cent. Since the end of the second world war both beet and cane sugar have advanced rapidly, but in the last few years cane appears to have advanced slightly more.

One of the most significant developments of the post-war world agricultural economy has been the growth in the production and consumption of sugar. During the second world war production fell by 20 per cent and the pre-war average of 24.6 million metric tons was not regained until 1947/8. Since then the progress of production and consumption has been more rapid than that of any other agricultural commodity.⁽²⁾ The enormous growth in sugar production over the last eighty years is shown in Figure 1 which also shows separately the production attributable to cane and beet.

Apart from the influence of seasonal weather conditions the post-war increase is explained by the upward trend in production capacity. The area under cane and sugar beet has expanded steadily during the past decade and factory capacity, which in many countries constituted an effective limitation on production, has

Figure 4
World Production of Centrifugal Sugar



Source: The World Sugar Economy in Figures 1880-1950,
F.A.O., Rome 1952-53

been enlarged and modernized at considerable cost. New factory construction has increased the world sugar making potential by 8 to 10 million metric tons. Many countries which used to import all their sugar have begun domestic production while others have started to construct factories or to experiment with sugar cultivation. Countries included in this latter category are: Greece, Congo, Chile, Ethiopia, Israel, Ceylon, Iraq, Ghana, Nigeria, Syria, Tunisia, Portugal and New Zealand.

Nor is the end of the trend in sight. The U.S.S.R. and Mainland China have announced tremendous expansion programmes which aim at increasing their centrifugal sugar manufacturing capacity by 4 or 5 million metric tons. To some extent their problems differ from those of other countries since substantial increases in consumption are predicted on expansion of domestic production. But expansion is evident in other countries as well. An incomplete tabulation by F.A.O. in 1961 showed that private concerns or public authorities in approximately 25 countries had formulated further investment programmes to expand sugar-grinding or sugar refining capacity.

The highest world output of centrifugal sugar so far recorded was 54.95 million metric tons in 1960/1 (see Table 1). Production in the following year was lower by 3.5 million metric tons. The reduced output of both beet and cane sugar in 1961/2 resulted from acreage and harvesting cut-backs in response to changing marketing patterns, unfavourable free market prices and heavy stocks carried over from earlier years. In addition, adverse seasonal conditions in some areas caused lower yields. Total world production in 1962/3 remained approximately the same as for 1961/2. Beet sugar production in both Western and Eastern Europe was reduced due to a continuing run of adverse weather. The severe winter made harvesting extremely difficult and a proportion of crops remained in the ground

and were not processed. In the U.S.S.R. sugar production continued to increase.

The lower Cuban harvest of 1961/2 resulted from below-normal rainfall, labour and management difficulties, inadequate cultivation and harvest practices and the fact that little new cane was planted in the years 1959 to 1961.⁽³⁾ The Cuban Government policies for increasing diversification of agriculture and of collectivization have also had adverse effects on sugar production. In addition, the 1962/3 crop was affected by the hurricane which devastated large areas in the Caribbean in October 1963. Increased production occurred in the United States, India, Australia, South Africa, Mexico and the Philippines but these increases were offset by decreases in other parts of the world. Production of centrifugal sugar for 1963/4 is currently estimated at 53 million metric tons by F.A.O.

2.2 World Sugar Prices

The first world war caused a great decline in beet production so that the war and immediate post-war years saw a period of wild prosperity for cane producers, high prices (see Figure 2) being followed by rapid opening up of new cane lands and expansion of processing facilities. As the beet producing areas of Europe recovered from the war and with the growth of new protected industries (e.g. in the United Kingdom after 1924 and in India after 1930), production rapidly outstripped demand.

In the late 1920's and early 1930's sugar prices tumbled as stocks built up, hitting both the relatively unprotected cane producers and the main European beet producers and exporters. Acreage limitations were imposed by most of the main exporting countries under the "Chadbourne" International Sugar Agreement of 1931. The Agreement succeeded in working off 3 million tons of

Figure 2
Annual Average Price of Centrifugal Sugar, Cuba



Source: Stape, R.H. to 1961, Figure 2 in reference (4), and C. Omerikow, Sugar Reviews 1962 and 1963.

excess stocks but action on the part of exporters alone was not sufficient to restore prices to more lucrative levels so that in 1937 an International Sugar Agreement including both exporters and importers was signed. Before it became effective the second world war began when production was again detrimentally affected.

Sugar stocks were very low after the second world war. Experience had demonstrated that for the efficient operation of national distribution systems, stocks of at least 6-10 weeks were essential. During the period 1947/50, the increase in stocks, while substantial, was no more than the minimum necessary for operation. However, with the record harvest in Cuba in 1952, stocks rose steeply with inevitable effects on prices. Stocks increased further in 1954/5 when they amounted to 16-17 weeks of world consumption. Demand on the free market could not keep pace with supply in the post-war period at what were generally thought to be desirable price levels. As stocks built up and with the growing fear of a fall in prices a new International Agreement was thought necessary. This was negotiated in 1953, reviewed in 1956, renewed in 1958 and remained in force virtually unchanged form until December 1961.

The sharp increase in stocks after 1958 caused a general weakness in the world market which deepened through 1961 with the record 1960/1 production and the appearance in mid-year of cheap European and Cuban refined sugar. The downward trend was intensified with the entry of the 1961/2 European crop in September of that year and reached £ stg 19.75 per long ton, raw basis, c.i.f. U.K., the lowest price for more than twenty years. Since January 1962, apart from short lapses there has been a continuing recovery, beginning in February with the withdrawal of Cuba from the market for the remainder of 1962. The recovery strengthened later as indications of lower

European and Cuban production were confirmed. Then prices moved sharply upward with the onset of the crisis over the Cuban missile bases. On 22 October 1962, immediately before the crisis the London daily price was £ stg 27 per long ton. By the year's end the price had moved to £ stg 40. In this movement, two factors were involved as the initial rise was a response to the crisis, then, when the international tension eased, prices continued to rise as the supply position began to exert the more powerful influence. On 23 May 1963 the London price reached £101 per ton but fell to £56 per ton in September. It again rose, however, and the November price was £105 per ton. Since that date price has fluctuated with a steady downward trend and at the time of publication was £50 per ton.

2.3 The World Sugar Trade

Although sugar production has risen markedly since the last war, this increase has not affected all sugar producers equally. The countries that were the major cane sugar producers (and the main exporters) in the pre-war years have generally shown the lowest rate of increase of production of all countries and in some cases production has decreased. The exporters that have expanded production considerably over the last three decades are generally those with large home markets or with large preferential markets. However, the largest increases in production have been in importing or self sufficient countries. F.A.O. has estimated that during the 1950's production doubled in self-sufficient countries, more than doubled in countries which were net importers at the beginning of the decade, and increased by only 40 per cent in net exporting countries.

The result of the rapid growth of production in countries that had been large importers is that international trade (until 1960) has increased at a much slower rate than

total world production. Snape⁽⁴⁾ has analysed the international trade in sugar for the year 1958/9 and his figures are reproduced in Tables 2 and 3. The relatively static level of post-war international trade is shown by the decline since 1947/8 of net exports expressed as a percentage of world production (Table 2). The importance of Cuba, accounting for more than a third of the world's exports, and the United States, absorbing an even higher proportion of world imports, is clear (Table 3). The policies of both countries have been of major importance to the sugar industry of the world during the present century.

The dominant feature of the world sugar economy since 1960 has been the drastic change in the pattern of international trade brought about by the cessation of United States sugar imports from Cuba and the appearance of the U.S.S.R. and Mainland China as the major buyers of Cuban sugar. Prior to 1960 the bulk of Cuban sugar exports were directed to the United States market, where they have received preferential treatment under successive Sugar Acts. In 1959 approximately 60 per cent (2.8 million metric tons) of total Cuban exports were shipped to the United States. The quota originally established for 1960 covered a similar quantity, but following the accession to power of Fidel Castro and the deterioration of political relations between the two countries it was reduced in July 1960 by the amount of the unshipped balance of 700,000 metric tons.

In 1961, a complete ban was imposed on United States imports of Cuban sugar. The resultant gap in supplies was filled partly by greater United States domestic production, but mainly by dividing the Cuban share among other established suppliers and non-quota countries, where supplies were more than adequate following bumper 1960/1 harvests. This development was of outstanding importance

because it gave many countries an unexpected outlet for their additional production on the United States market where prices continued to be very much higher than those obtainable on the world market or under the British Commonwealth Sugar Agreement.

Cuba's market in the United States was replaced by substantially increased sales to the Sino-Soviet area totalling 4.8 million metric tons in 1961 (see Table 4). A series of trade agreements were concluded with countries in the area including one with the U.S.S.R. covering 5 million metric tons for shipment in the five year period 1960/4 and another with China involving 500,000 metric tons of sugar annually over the same period. Following the reduction in Cuba's United States quota, the U.S.S.R. gave an undertaking to Cuba that she would purchase the 700,000 tons involved if no alternative outlet could be found. Later the U.S.S.R. agreed to increase its purchases in 1961 to 2.7 million metric tons at a premium price of 4 cents per pound, f.a.s., if the United States embargo continued. China also subsequently agreed to raise its purchases in 1961 to one million metric tons.

The levels of exports and imports (see Tables 5 and 6) in other parts of the world, apart from the continued changes in the sources of United States supplies of foreign sugar, altered little between 1960 and 1961. Except for the 500,000 metric tons of Cuban raw sugar shipped to Mainland China on loan by the U.S.S.R., most of the increased exports from Eastern Europe and the U.S.S.R. were as refined sugar. These, in addition to increased quantities on offer from France, India and Turkey, resulted in a significant increase in the refined sugar trade and for part of 1961 the price of refined sugar actually fell below that of raw sugar.

Trade in 1962 was at a slightly lower level than in 1961. In 1963 trade was below the level of the previous two years due to rising consumption, production failing to rise, low stocks and the virtual drying up of "second-hand" Cuban sugar from Eastern Europe all combined with the sharp rise in world sugar prices. Cuban exports in 1963 were approximately $3\frac{1}{2}$ million metric tons including Sino-Soviet shipments, which therefore fell well below the original agreement target of 4.9 million metric tons.

2.4 World Sugar Consumption

In the eleven years to 1961 annual world consumption of sugar is estimated to have risen at a rate of over 5 per cent per annum, compounded, as against a population rise over the period of less than 2 per cent per annum. Consumption for the years 1959 to 1961 is shown in Table 7. In recent years the most striking increases in sugar consumption has been recorded in the U.S.S.R.⁽⁵⁾ Apart from the U.S.S.R. the rate of increase in sugar consumption has been fastest in countries which have begun to move towards economic prosperity and industrialization but where consumption is still relatively low. In countries where consumption is already high there has been little or no change. In the United States and Australia for instance, the low income elasticity for sugar⁽⁶⁾ indicates that only minor increases in sugar consumption can be anticipated as a result of any future income growth.

The situation in low income countries is, however, quite different. Sugar is one of the first foods to respond to a rise in income and further appreciable increases in world sugar consumption may be expected both through population growth and increases in per head consumption. This is so, provided availability and consumer price do not become more limiting factors. The actual trend will depend largely on the tempo of

economic development in low income, low sugar consuming countries. An annual growth increment of 3-3.5 per cent will give a world consumption of 68 million metric tons by 1970.

2.5 The Outlook for 1964/5⁽⁷⁾

During the remainder of the 1963/4 season, the physical supplies available on the free world market will remain tight. The outlook beyond the middle of the year is for a decline in prices. Plans or expectations of increased beet plantings for the 1964/5 harvest have been reported by F.A.O. and by the middle of the year prices will be beginning to reflect estimates of plantings and of growing conditions. Major cane producing countries have recently been formulating long-term plans for expansion under the stimulus of recent high prices. The expectation of improved supplies in 1964/5 is already reflected in futures quotations, particularly for 1965 positions.

Although the international sugar trade is particularly subject to political influences we may conclude that the prospects for the immediate future are for a rapid increase in production, a slow increase in consumption and a consequent decline in price on the world sugar market.

3. INSTABILITY IN THE WORLD SUGAR MARKET

In this section we discuss instability in the world, or "free" sugar market and indicate how international and national sugar policies have contributed to this instability. The term "free market" is used to describe the market where sugar is traded without restriction and where the forces of supply and demand (and speculation) are permitted to operate freely.

It can be seen from column 7 of Table 2 that the free market is a residual market since over 50 per cent of the sugar entering international trade is traded under bilateral or multilateral agreements at prices which bear no relationship to the world price. The two most important international arrangements in this context are the United States Sugar Act and the British Commonwealth Sugar Agreement.

The United States protects both its domestic producers of sugar beet and sugar cane, and imports most of the remainder of its raw sugar requirements at prices well above the world price (see Table 15) according to a formula laid down in the United States Sugar Act. Under the British Commonwealth Sugar Agreement Commonwealth producers of cane sugar are allocated specific quotas of sugar to be supplied to the United Kingdom at negotiated prices. The Agreement is designed to develop the production of sugar in Commonwealth countries and to assist the orderly marketing of sugar by providing long-term price stability based on "fair average costs of production".

Under the 1956 Sugar Act a Sugar Board was set up to handle the negotiated price sugar and to support the British Sugar Beet industry. The Sugar Board purchases quota sugar at the negotiated price, and immediately sells it to private traders in the country of origin at

the world price. When the world price is lower than the negotiated price (as it normally is - see Table 17) the Board sustains losses. Under these price conditions the British Sugar Corporation, which is a government controlled company processing all sugar beet in the United Kingdom, also sustains losses. These losses are taken over by the Sugar Board and, together with the loss on negotiated price sugar, is recouped by means of a surcharge on all raw sugar imported into the country. If the world price is higher than the negotiated price then the Board makes a profit on its sale of cane sugar and on the operations of the British Sugar Corporation, whose profits it also takes over. These profits are paid out as a "distribution payment" where a surcharge would normally apply.^(c)

The overall effect of the agreement is that the British consumer is subsidising Commonwealth cane sugar and domestic sugar beet production in all years when the world price is below the negotiated price. The average cost (to the British Sugar Corporation) of the raw sugar content of home grown beet plus extraction costs is approximately the same as the average price paid for negotiated price sugar by the Sugar Board. This sometimes leads to the erroneous belief that United Kingdom sugar production is not subsidised and is competitive with cane sugar production. As well as the form of subsidy explained above, some proportion of the general subsidy (fertiliser, etc.) paid to British farmers could justly be imputed to sugar beet production.

Due to the effects of these two agreements and the subsidised production of beet sugar in many countries the free market has become a small proportion of world

(c) An explanation of how these losses and profits arise together with a description of the various sugar agreements is presented in Appendix A.

production. Because of the residual nature of the free market it is clear that the effects of variations in beet yields, and any other factors (other than price) causing a change in total demand, all tend to be channelled on to the free market. In periods of international tension the main importers tend to build up stocks - the demand being met from the free market. Simultaneously the supply schedule for the free market moves to the left partly because exporters want to hold larger stocks but mainly because of the increased demand upon countries supplying preferential markets reduces the amounts they have available for the free market. Thus the demand and supply schedules, particularly the former, are highly unstable.

Snape⁽⁴⁾ has carried out an analysis which suggests that a cobweb effect operates in sugar production. The cobweb concept was first formulated by Mordecai Ezekiel to explain commodity price-output sequences in agriculture. The cobweb theorem attempts to describe fluctuations which are induced by a consistent tendency on the part of producers to make excessive responses to price changes. That is, by excessive increases in output when prices are high and by excessive curtailment of output when prices are low. Each individual producer is inclined to believe that prices will stay high (or low) until he completes his adjustment to present prices. However, in the production of many agricultural commodities a great many producers act simultaneously. Since there is usually a considerable time lag between the planning and realisation of production changes, prices will have turned from high to low in response to the increasing supply (or vice versa) by the time individual producers have completed the expansion of their production or its contraction, as the case may be. This means that a sudden increase in the price of sugar induced by a crop failure, international disputes and so on, will cause producers to plant greater acreages

of cane in the season of high prices. Consequently greater supplies of sugar will come on to the market the following season - some 12 to 18 months later - when prices may be unduly depressed due to the expectation of increased supplies on a market where demand may have returned to normal. As a result of the low price producers will cut back production and so the cycle tends to be repeated.

No commodity follows this cycle precisely but Snape's analysis (see Appendix B) shows a cobweb tendency with the additional feature that whatever the path of the cycle, it is highly probable that the long term trend of average price will be downwards.

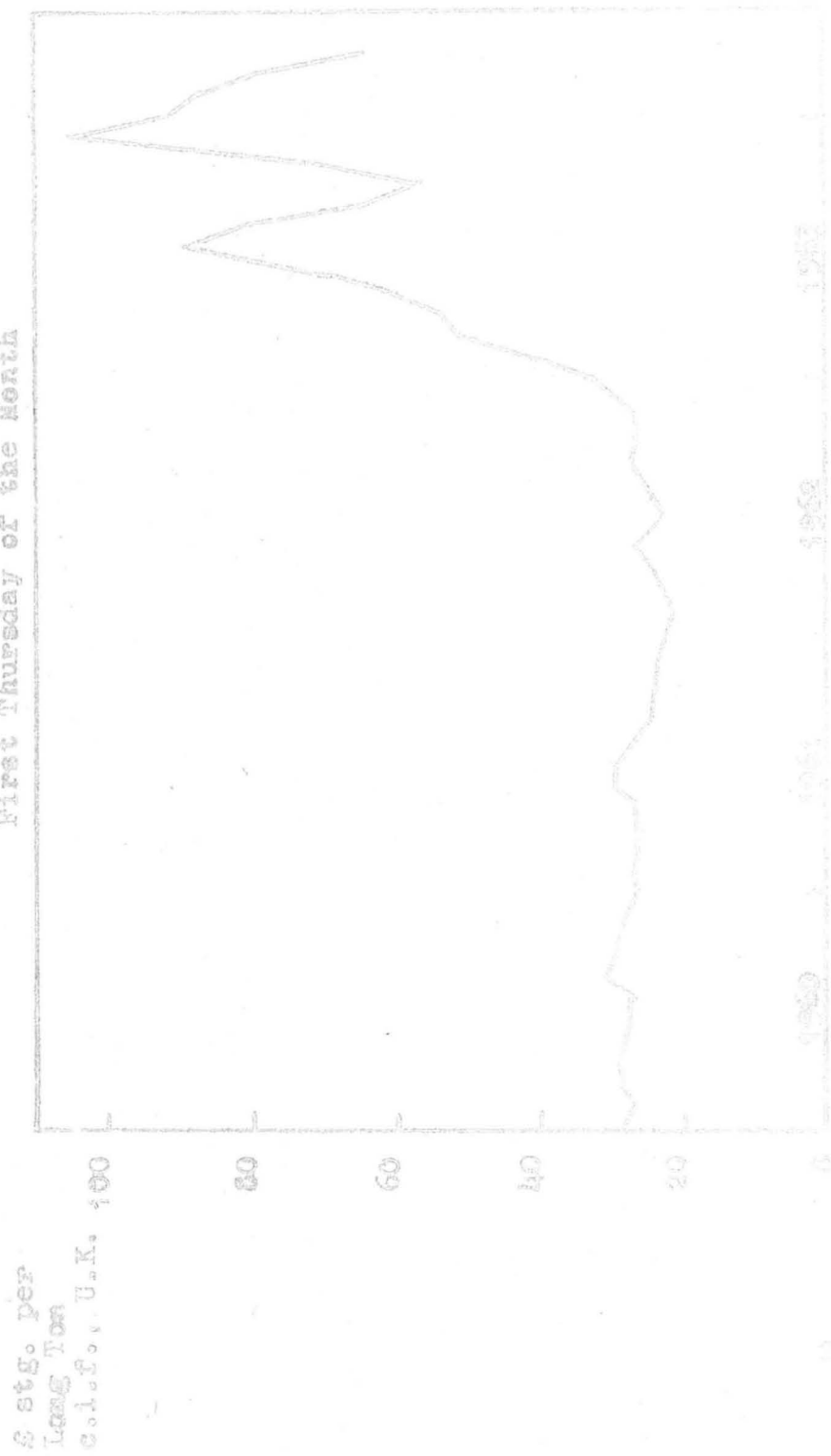
The basic model presented by Snape seems to approximate reality. The large free-market price rises in 1920 and 1950/1 both set off reactions that if left to run their courses would have brought higher and higher supply and lower and lower prices. In both cases supply and prices showed these tendencies and controls were imposed, with little effect in the former case. This inherent tendency for any price fluctuation (whether upward or downward) on the free market to bring ever increasing average supply and ever declining average price is the reason why instability is such a problem for exporters to the free market. Although the circumstances are not quite the same owing to the political uncertainty of the Cuban-Sino-Soviet relationship the basic conditions are now present for a repetition of the cobweb effect with rapidly increasing supplies in 1965 or 1966 accompanied by low prices.

Cane sugar production has increased sharply in many countries to replace the quantity previously supplied to the United States by Cuba. Fiji has announced plans for an increase in the acreage under cane and other cane producing countries will be doing

likewise. Even though agriculture in Cuba is being diversified it is highly probable that cane sugar production will again rise to something approaching previous levels. If the planned increases in sugar beet acreages in the Soviet Bloc eventuate, those countries may not be able to absorb the whole of the Cuban output, thus further increasing the supplies on the world market. Figure 3 shows the monthly price behaviour of sugar on the London Market since 1 January 1960. A period of low prices has been followed by unstable high prices with a rapid fall now taking place. This figure together with Figure 2 and the clear evidence of actual and planned production increases tends to confirm that the world sugar market is on the downward path in the "Snape cycle" and a period of low prices seems inevitable in the near future.

Figure 3

London Daily Price of Raw Sugar on the
First Thursday of the Month



Source: C. C. C. Sugar Review.

4. THE EFFECTS OF PROTECTION IN THE WORLD SUGAR INDUSTRY

There is probably no other non-military commodity the production and trade of which is subject to as much regulation and control as sugar. In this section a summary of one attempt to measure the effects of this regulation is presented.

Snape, in his paper "Some Effects of Protection in the World Sugar Industry"⁽⁸⁾ attempts to measure the extent of protection in 1959 and to estimate the effect on world consumption and trade in that year assuming that all sugar had been available for consumption at the world free market price levels for raw sugar, after allowing for refining and distribution costs. It is emphasised that the calculations are of necessity "rough", but are believed to be not so inaccurate as to invalidate the main findings. Further, the world price will be higher without protection than with it. Since it is impossible to determine how much higher it would be, no adjustments have been made so that the figures derived may be slightly over-estimated.

In Table 8 the average gross receipts of mills or factories are listed for 1959 and are expressed as import or export parity, whichever is relevant to the country in question. The f.a.s. Cuba price of 3 cents per pound is taken as export parity for all countries except for Taiwan, Indonesia and the Philippines whose proximity to markets or potential markets justify a higher export parity of $3\frac{1}{4}$ cents per pound. In Table 8 the import parity price is applied to all net importers and self sufficient countries and also for British Honduras and the Belgium-Luxembourg economic union which probably would be importers in the absence of protection. The export parity price is used for all other countries, although it is doubtful whether some of them would have been exporters if they had received only the free market

export price.

The percentages in column (2) of Table 8 give a "rough" idea of the extent of protection in 30 of the non-communist countries of the world. It can be seen that the most protected areas are Puerto Rico, Hawaii, mainland U.S.A. and some countries of Western Europe. (The figure for Indonesia is suspect because of the unrealistic exchange rate.) The least protected are the Dominican Republic, Taiwan, Peru, Argentina, South Africa and Cuba. Broadly, and in aggregate, protection involved the displacement of production from exporting to importing countries.

Snape then calculates that an additional 3,882,000 tons of raw sugar would have been consumed in 1959 if, without any change in the level of protection given to producers, deficiency payments had been used as the sole means of protection instead of import duties and export subsidies, and if there had been no (non-protective) revenue duties. Table 9 shows the results of the exercise for all non-communist countries. This hypothetical extension of demand is about 30 per cent of total net international trade in sugar and more than 70 per cent of the net free market trade in 1959 (excluding communist countries). Should the estimated extension of world demand have been brought about, its satisfaction would almost certainly have occurred very largely through an increase in international trade rather than an increase in production in the protected net importing countries. The increase in supplies would have come very largely from the principal exporters to the free market in 1959. Even at 1959 free-market prices, increases in supplies would have come more readily from these sources than from the heavily protected sugar producers in other countries. Whenever an international sugar agreement has been reviewed,

the main exporters to the free market have emphasised their capacity to augment supplies greatly.

An enlargement of the free market on this scale would secure a substantial increase in receipts, both by way of larger sales and a small rise in price. Not only would receipts be higher but they would be more stable. As both retail prices and the prices received by producers in exporting countries would be tied more closely to free market prices, the supply and demand for sugar on the free market would be more elastic than at present and the price would be more stable. At present, disturbances in the world sugar industry have a disproportionately large effect on the relatively small and highly exposed free market. If this exposed sector were much larger, the effects of the disturbances would be more readily absorbed by it.

The shrinking of the world market as a proportion of total world production has been a source of many of the problems of the lowest cost sugar producers in recent years. A partial solution to these problems is implicit in Snape's analysis which does not involve a change in the level of protection but merely in its form. A reduction in the level of protection would bring further improvements to world economic efficiency and further benefits to low cost producing countries, most of which are in the under-developed group of nations.

5. PROJECTED SUGAR PRODUCTION AND CONSUMPTION LEVELS FOR 1970 BY F.A.O. (9)

Over the last decade world consumption of sugar rose by 5.2 per cent per year, as against 2 per cent for population, although the trends in per head consumption differed widely between the various regions. In North America, Oceania (Australia, New Zealand, Fiji and Hawaii), and North Western Europe, sugar consumption has stabilised at a high level. In all other regions per head consumption went up steadily, the greatest percentage increase being generally recorded in the regions starting from a low consumption level. The demand for sugar is influenced by the demand for those foods and beverages to which sugar is added, dietary considerations as well as income, population and price. Detailed statistical analyses⁽⁶⁾ have shown, however, that most of the variation in per head consumption can usually be explained in terms of income and prices.

The demand for sugar in 1970 was projected by F.A.O. on the basis of population and income growth. The income effect was computed on the basis of demand functions assuming declining income elasticities and saturation at high income levels. Excluding the Sino-Soviet area, it appears that, assuming constant prices, total consumption may increase at a rate of only 2.7 to 3.2 per cent per year as against 3.8 per cent during the previous decade. If retail prices were to fall demand would increase sharply in countries with low consumption provided the retail price in those countries is reduced and moves with the world price and vice versa for a rise in prices. In countries where the sugar price is high, even a large variation in the world price will have only a small impact at retail and would only slightly influence the volume of consumption though

price elasticity is generally high in those countries. In Japan, for instance, the retail price is about four times as high as the world price (in 1962) even though more than 85 per cent of the sugar supply is imported. Under such conditions, the level of the retail price depends mainly on government policies as regards import duties, internal taxes and the level of protection given to domestic production.

Total world production of sugar of all types increased by 94% between 1947/9 and 1960/1. There is every reason for assuming that the forces which have operated in the past to raise production will continue to do so. Very substantial expansion can be anticipated in Africa and the Near East. In other regions, the largest increases for export are likely to take place in Latin America and to a smaller extent in Asia and Oceania. An abundance of excellent sugar land, coupled with relatively low-cost labour, skilled technological and business management and adequate capital resources, will greatly facilitate production expansion particularly in Latin American countries.

In Europe, a simple extrapolation of past production trends would show a sizeable export surplus by 1970. Indeed, in the European Economic Community, the increase in yield by itself would be almost sufficient to keep pace with the expected domestic demand for sugar. However, large increases for export are not thought likely for two reasons, firstly such exports would be very expensive for the Community, and secondly, the policy is likely to be to stabilise production and to leave the export market, except for nominal quantities, to the comparatively lower cost producers of cane sugar in less developed countries.

A major problem in the projection work was the large structural change in the world sugar economy

following the United States break with Cuba. In 1961, Cuba shipped about 4.7 million metric tons to the Sino-Soviet area. While some imported Cuban sugar was either re-exported or made exports of beet sugar possible, the total exports from the Sino-Soviet area and Cuba together, to other destinations were substantially less than 3 million tons, as compared with about 6 million in 1959. This change in the pattern of world trade in 1960 was facilitated by exceptionally favourable weather conditions and record crops outside the Sino-Soviet area. In many countries large increases in production took place, notwithstanding the introduction that year of measures to restrict the area under sugar crops. The new pattern is bound to continue and to reduce the need for Cuban supplies especially with the recent high prices due in large measure to the absorption of Cuban production by the Sino-Soviet area. Prices need not be much above 3 U.S. cents a pound to stimulate exports, since in many countries exports are marginal compared with domestic markets while other countries will continue to stimulate exports for financial and other reasons.

F.A.O. assumes that the world outside the Sino-Soviet area will continue to require about 2 million metric tons a year from Cuba and that the bulk of Cuban production will go to the Sino-Soviet area. Production was projected on the basis of past trends, general plans or patterns of economic development and available information as regards existing programmes for building sugar factories. By comparing demand and production projections a balance of the net import requirements was obtained for 1970. The results are reproduced in Table 10 and show that net imports could increase by 1.0 - 1.5 million tons between 1957/9 and 1970.

F.A.O.'s analysis of the current trends in the world sugar economy indicate that by 1970 consumption

outside the Sino-Soviet area will increase by 36 to 44 per cent. Production will rise by 45 to 53 per cent and trade is likely to expand by 9-14 per cent. The large increase projected for production outside the Sino-Soviet area arises from the fact that production has recently already expanded considerably to compensate for the loss of Cuban supplies.

The Sino-Soviet area could absorb 4-5 million tons of sugar notwithstanding the projected large increase in domestic production during the next decade. Mainland China, which before 1961 imported only small quantities of sugar, mainly from Eastern European countries, will probably continue with some imports both for supply and political reasons. However, should outside financial assistance continue to be available, China could be a very large market.

Whether by 1970 the net imports of the Sino-Soviet area will be nil or as high as 4 or 5 million metric tons is largely a question of policy. If net imports should disappear or decline substantially, the world market would be faced with additional exportable supplies, which would have a depressing effect on prices. While lower prices would probably reduce the rate of production expansion, there would, of course, be the additional supplies from Cuba coming on to the market. Thus, if the additional consumption of the Sino-Soviet countries were to last a few years and then disappear, a very large surplus would be left on the world market, creating great difficulties for all exporting countries. Under any circumstances a shortage in the world sugar market seems unlikely.

6. NEW ZEALAND'S SUGAR POLICY

At present there is no sugar production from either cane or beet in New Zealand, but investigations are being conducted in several areas of the Dominion to determine the economics of beet sugar production. Practically all of New Zealand's sugar is imported in the form of raw sugar, which is refined in Auckland by the New Zealand Sugar Company.^(d)

The consumption of sugar in New Zealand is now 40 per cent higher than the 1934/8 average. This increase is entirely due to population growth since consumption per head during the post war period has been slightly lower than before the war. Only 18 per cent of total sugar production was accounted for by industrial users of sugar before the war. By 1961 the industrial users had increased their share to 39 per cent.

6.1 A Review of Past Sugar Policy

The main origins of imports are Australia and Fiji, which in most years since 1951 have supplied the bulk of New Zealand's requirements. Imports under the arrangements with the Commonwealth Sugar producers have been made exclusively from Australia and Fiji because of their proximity to New Zealand. Table 11 shows the origin of imports of raw sugar in value terms since 1953.

Sugar imports into New Zealand are subject to import licensing except for imports of unrefined sugar of under 22 Dutch colour standard. Import duties of 1½d per pound on refined sugar and 1d per pound

(d) The New Zealand Sugar Company is a wholly owned subsidiary of the Colonial Sugar Refining Company of Australia.

on raw sugar have been levied since 1933. Raw sugar imported for refining enters free of duty under bond, an excise duty of 1d per pound being levied on the refined product.

The Government determines the methods of purchase and the terms of contracts under which the New Zealand Sugar Company obtains its supplies of raw sugar. Under the control of Prices Act 1947, the price of sugar is controlled by the Price Tribunal. After the purchase of raw sugar at a price related to the London daily price, all the intervening stages of the production, distribution and sale of refined sugar are subject to price control. Table 12 shows a breakdown of the refined sugar price from 1954 to 1964.

The arrangement with the Commonwealth sugar producers is reviewed annually and the New Zealand Government must decide which of three policies it will pursue. Firstly whether to continue to purchase sugar at, or related to, the world free market price, secondly whether to enter into long term contracts for the supply of part or all of her raw sugar needs and thirdly whether or not to encourage the establishment of a domestic beet sugar industry.

It can be seen from the discussion of the various sugar markets that the average price of raw sugar on the free market was lower in most years since 1956 than prices under the United States Sugar Act or the Commonwealth Sugar Agreement. Both the United States and British sugar consumers have been subsidising producers who supply them under these agreements. The agreements do provide a stable price and market for sugar shipped under them but they have reduced the size of the free market as a proportion of world sugar production and trade, thus creating conditions for violent price fluctuations as both political tensions

and production levels change. Because of the tendency for price to fall after any deviation from an equilibrium position it seems likely that the average price of sugar over a number of years will be lower if our requirements are purchased at the world free market price. There would inevitably be fluctuations in the New Zealand retail price of sugar and sugar containing goods unless some form of equalising scheme was instituted. The guaranteed overdraft scheme at present operating between the Bank of New Zealand and the New Zealand Sugar Company is one such arrangement. To make such a scheme self-financing without resort to bank overdraft finance it would be necessary to build up a substantial fund, say £5 million, by keeping the retail price of sugar at a higher level than the world price when the world price was low.^(e)

6.2 A Domestic Sugar Beet Industry

The question of a domestic sugar beet industry raises many problems many of which cannot be solved with the knowledge and data at present available. It is true to say that beet sugar production is protected or subsidised in all countries where it is grown. However, at prices and yields suggested by Mr J. Campbell-MacDonald^(f) after a visit to Otago in February 1963 it appears likely that sugar beet could be a profitable crop on some Otago farms.

An attempt is now made to relate a price of £5 per ton for sugar beet to the world price of raw sugar for the years 1950 to 1963. At the retail price ruling in

(e) A number of different equalising schemes could be proposed but a discussion of them is not relevant to this publication.

(f) The price suggested was £5 per long ton for clean beet delivered to the factory, assuming an average yield of 17.5 long tons of topped and washed beet per acre of 16 per cent sucrose content.

February-March 1963 (£75 per long ton) Mr Campbell-MacDonald said that beet sugar could compete with imported raw sugar provided the one penny per pound excise duty was waived on domestically produced beet sugar. This is equivalent to asking for protection of £9. 6. 8 per long ton. Now, in order to pay the producer £5 per ton for clean, topped beet and pay on excise duty of £9. 6. 8 per ton, the retail price for beet sugar would have to be £84. 6. 8, say £84 per ton as compared with £75 per ton for cane sugar in March 1963.

The tonnage of beet purchased by the British Sugar Corporation and the resultant production of white sugar is given in Table 13 for the years 1960/3. This shows that an average of 7.7 tons of beet was required to produce one ton of white sugar or 1.09 tons of raw sugar, so that the cost, to the New Zealand factory, of the raw sugar in the beet would be £35.3 per long ton. If the refiner's margin, excise duty, wholesalers' and retailers' margins are taken as set out in Table 12, the cost of refining and selling sugar is 4.3d per pound or approximately £40 per long ton. Because the Chelsea refinery of the New Zealand Sugar Company is probably relatively inefficient compared with a factory of the latest design, the refining costs may be over-estimated. Taking the figure of £40 per long ton, the factory can afford to pay £44 (£84 less £40) or less for raw sugar. This leaves a margin of £8.7 (£44 less £35.3) for extracting raw sugar after credit has been given for sales of sugar beet pulp. Since the extraction and refining of beet sugar would be a continuous process, the extraction margin may be under-estimated.

However, even when a price of £44 per long ton for raw sugar is assumed it is found that the world

price for raw sugar has, since 1950, been above this figure in only 1951, 1952, 1957 and 1963/4 (see Table 17). Thus even taking the conservative figures computed above, a domestic beet industry would have needed protection in some form to have maintained a payout of £5 per ton to farmers. In the years 1953, 1954, 1955, 1956, 1958, 1959, 1960, 1961 and 1962 protection additional to the remission of the excise duty would have been required.

6.3 An Evaluation of the Worthwhileness of a Sugar Beet Industry

The discussion in section 6.2 has assumed that the present official exchange rate of £N.Z.100 = £stg.100 reflects the true value of New Zealand currency. It is evident, however, because of the continued necessity for the imposition of stringent import controls, that the £N.Z. is over-valued and a premium on the earnings or savings of foreign exchange is justified.⁽¹⁰⁾ Further, so that the various export earning and import saving industries (including sugar beet) can be compared, a systematic method of evaluating individual development projects is needed so that there is a common basis for comparison and that their relative merits may be viewed in a more consistently objective manner.

Dr J.T. Ward of Lincoln College has set out a method by which this may be done and develops the following equation.⁽¹¹⁾

$$SPW = (V_1 + V_2) - (C_1 + C_2 + C_3) + a \left[X - (M_1 + M_2) \right] \text{ --- (1)}$$

Where

SPW - social present worth

V_1 - value of direct domestic benefits

V_2 - value of indirect benefits

C_1 - direct operating costs of labour and domestic materials

- C_2 - domestic development costs of labour and materials
- C_3 - indirect domestic costs
- X - increased earning of foreign currency or savings of foreign exchange due to import replacement
- M_1 - increased expenditure of foreign currency on operating costs
- M_2 - increased expenditure of foreign currency on capital items
- a - a premium for foreign currency.

This formula for social present worth is a comprehensive one, which includes all the costs and benefits likely to be relevant. Because of the lack of data and the difficulties of measuring indirect costs and benefits, Dr Ward has related the argument to direct costs and benefits only and simplified the equation as follows:

$$SPW = V - C + a [X - M] \quad \text{---- (2)}$$

Where

- V - value of domestic benefits; increased consumption on the domestic market
- C - domestic costs; labour and domestic materials plus an annual equivalent of domestic capital costs
- M - increased annual expenditure of foreign exchange on operating and capital costs
- X - increased earnings or savings of foreign exchange
- a - a premium for foreign currency.

Now, V will be zero if the purpose of domestic production is solely to replace imports provided a product of comparable quality is produced as is assumed to be the case with sugar beet. We can therefore write:

$$SPW = a [X - M] - C \quad \text{---- (3)}$$

If we now set the value of social present worth at zero, and solve for a we obtain a break-even premium on foreign exchange, i.e. the value which must be placed on the New Zealand pound relative to the pound sterling for a sugar beet industry to be just worthwhile.

We have:

$$0 = a [X - M] - C$$

or

$$a = \frac{C}{X - M} \quad \text{---- (4)}$$

i.e. a is the ratio of domestic costs to net overseas costs.

We now estimate C, X and M for a beet sugar industry.

The calculated price of raw sugar (from beet) of £44 per ton is taken as the best estimate of C. This figure is assumed constant over the last decade because the refining margin has not altered significantly during that period (see Table 12).

The average savings of foreign exchange, if New Zealand produced all of her sugar needs domestically, for the years 1954/63 gives an estimate of X. The estimate is an unweighted average price per ton adjusted for freight charges and for the 75,000 tons purchased at the London Price plus United Kingdom tariff preference of £3. 15. 0 per ton since 1957 (see Table 17).

The increased expenditure of foreign currency on capital and operating costs is difficult to estimate. It is assumed here that 50 per cent of the capital costs will be for additional imports of materials, plant and machinery and that additional expenditure on operating costs would be negligible. These costs (per ton) amortized over a 25 year term at an interest rate of 6 per cent provide an estimate of M. The estimated

capital costs of a factory with an output of 30-35,000 tons of refined sugar varies from 3-4 million pounds, inclusive of farm machinery and the provision of other ancillary services. Thus the total capital costs of producing all of New Zealand's sugar requirements from beet might be 12-16 million pounds with the expenditure of foreign exchange in the 6-8 million pound range. For the purpose of this exercise various levels of foreign exchange requirements have been assumed so that the situation can be explored. Capital inputs of foreign exchange have been set at 5, 6, 7 and 8 million pounds inclusive of the capital requirements of farmers and the ancillary services.

Since the trend of world sugar prices is uncertain values of £32.35, £37.35 and £42.35 per long ton of raw sugar on the Free Market have been used for comparative purposes.

The results of the computations are set out below.

The Premium Placed on Foreign Exchange to
Justify a New Zealand Sugar Beet Industry
Under Various Price - Capital Assumptions

Assumed Average World Raw Sugar Price (£/long ton)	Capital Inputs of Foreign Exchange			
	£5 million	£6 million	£7 million	£8 million
32.35 ^{a/}	1.51	1.54	1.58	1.61
37.35 ^{b/}	1.29	1.31	1.34	1.36
42.35 ^{c/}	1.12	1.14	1.16	1.18

^{a/} This price approximates the average world price on the London Terminal Market from 1953 to 1962 inclusive, i.e. excluding the high prices of 1963.

^{b/} This is the average price (adjusted as described) for the 10 years 1954 to 1963 and represents the average payment per ton for New Zealand's sugar imports over this period, i.e. including the high prices of 1963.

^{c/} This is a high price which is only likely in occasional years.

The results indicate the notional devaluation of the £N.Z. necessary for a sugar beet industry to be worthwhile over a 10 year period. For example, at an average world sugar price of £37.35 per ton and a capital input of £5 million sugar beet is worthwhile, only if we are prepared to accept the notion that it is worthwhile to pay £N.Z. 1. 6. 0 for every £1 of sterling saved. Even at the highest price of £42.35 per ton the level of notional devaluation is 12 per cent.

The completion of this exercise does not give a definitive answer to the question of the worthwhileness of a New Zealand Sugar Beet industry but suggests that the project should not go ahead until reliable estimates of capital costs, operating costs and social benefits have been obtained. If this procedure is carried out with other proposed industries then they can be ranked in order of desirability and the relative merits of a sugar beet industry determined, in an objective manner. If the sugar beet industry appears worthwhile according to these criteria then protection could best be given by means of a flat tariff on all sugar imports.⁽¹⁰⁾

It is emphasised that this method of ranking proposed industries assumes that devaluation will not, in fact, take place. If the £N.Z. were devalued by any of the values in the table a sugar beet industry might still not be competitive and would probably need some protection. This is because of the internal cost inflation which would accompany a currency devaluation in the absence of strong government action to prevent wage and price increases.

It must be strongly emphasised that the yield figures suggested by Mr Campbell-MacDonald were estimates based on a very small number of trial results. There is little factual data available on the crop husbandry problems of sugar beet, particularly the mechanised

handling of the crop, under New Zealand conditions. Any estimates of long term average yields could be in considerable error. A comprehensive, expensive and time consuming research programme into the agronomic aspects of the crop is necessary before the farm production problems can be discovered and solved and sound knowledge gained on the performance of sugar beet in New Zealand. In addition account must be taken of the rewards from less arduous methods of farming and whether the New Zealand farmer really wants to be involved in sugar beet growing.

Another reason for carrying out this research programme thoroughly is that large capital investments will be necessary in establishing the factory, in farm machinery and in transport facilities. Even, if as has been suggested, the factory could refine imported cane sugar if a remunerative return could not be maintained to producers of sugar beet, farmers who had commenced to grow sugar beet would be left with much unsaleable specialised equipment and would have to re-organise their farming systems. This means that farmers must be assured of a profitable return for a number of years before they should grow the crop.

Further, once a sugar beet industry has been established it would be almost politically impossible to close it down again. The following quotation from the Review of Economic Conditions in Italy⁽¹³⁾ is relevant to the New Zealand situation:

"The manner in which all countries that are lucky enough to be able to produce sugar from beets, have solved the sugar problem for many decades is a matter of general knowledge - customs protection for beets and sugar and the defence of the consumer by means of price control, Nobody so far, has found a different

policy and nobody has ever succeeded in persuading the responsible governments to give up local production even if it becomes more expensive than the sugar offered by the international market which reflects a very modest part of world production."

In this Bulletin the international sugar situation, both past and present, has been surveyed and estimates made of future production and prices. Taking the structure of the world sugar industry as revealed by Snape's analysis and using the data available it seems clear that New Zealand should not set up a beet sugar industry without a thorough investigation of all aspects of the proposal. The data available is totally inadequate to assess the worthwhileness of the scheme on its own or to compare it with other proposed industrial projects. There are, of course, many difficulties involved in the quantitative measurement of costs and benefits, especially those due to indirect and secondary effects. However, methods should be sought for solving these difficulties because of the merits of tackling the problem in a systematic and objective way.

Although the exercise of forecasting future commodity prices is always subject to uncertainty the conclusions may be stated as follows:

1. New Zealand should continue to purchase her supplies of raw sugar at the world price whether through an arrangement with the Commonwealth producers or not.
2. If Government is convinced that the industry should be positively considered, it should set up a Sugar Beet Investigation Unit staffed with competent agricultural scientists charged with the task of selecting the most suitable district (or districts) for the industry and thoroughly examining the crop husbandry, mechanical husbandry

and farm management implications of the crop. This would probably take five years to complete. If the preliminary results of this study were favourable then a thorough investigation of the indirect, as well as the direct costs and benefits of the industry should be commenced and the results studied in the context of a national development plan.

3. A study should be made of any possible trade advantages to New Zealand of purchasing our supplies of raw sugar from tropical countries to whom we wish to sell our food products - particularly dairy products to the Carribean and Latin American countries.

APPENDIX A

The United States Sugar Act

The United States accounts for approximately one-sixth of the world's annual consumption and one-fourth of the world's annual imports of centrifugal sugar. It is one of the few countries producing sugar from both cane and beet, its production (mainland and off-shore) amounting to about 10 per cent of the world total.

Sugar has been subject to Government intervention in the United States since 1789. Up until 1934 import tariffs were the main instrument of policy, but these have been largely replaced by quotas which are now the principal policy weapons. All supplies of sugar to the United States are regulated by the United States Sugar Act under which domestic mainland and off-shore producing areas (Hawaii, Puerto Rico and the Virgin Islands) and foreign supplying countries receive quota assignments. Under the Act, after the Secretary of Agriculture has determined overall requirements, domestic and specified foreign producing areas supplying the United States with sugar are assigned quotas representing their individual share of the market.

Under the quota provisions enacted in 1962 the domestic sugar-producing areas are assigned a basis quota of 5,810,000 short tons, raw value, plus 65 per cent of requirements in excess 9,700,000 short tons. Such increases are shared by the domestic beet sugar area and the mainland cane sugar area in proportion to their basic quotas. Provision is made to increase quotas for Hawaii and Puerto Rico, such increases (if granted) to be offset by reducing the quantity prorated to foreign countries other than the Philippines. Quotas for other specified countries are established as percentages of the requirements remaining after the quotas for domestic areas and the Philippines have been established. The proration for the various supplying areas at the basic level of requirements (9,700,000 short tons) and for each 100,000 short tons increase above this level is shown in Table 14.

Whenever the United States is not in diplomatic relations with a country (currently Cuba) any quota specified for it under the Act is not granted. The quantity withheld may be designated a "global quota" to be filled by competitive imports of raw sugar from any country which for the two previous years was a net exporter of sugar. Special consideration must be given to countries of the Western Hemisphere and to those countries purchasing United States agricultural commodities. Any quota deficits are allocated to the foreign countries (the Philippines again being treated preferentially), listed in Table 14 having basic quota prorations. If a deficit still remains it is added to the "global quota".

Imports to replace quotas not granted because of lack of diplomatic relations are subject to a fee to make up the difference between the United States price and the price at which sugar is available for import. The fee, when applicable at the full rate diverts to the United States Treasury amounts roughly comparable to the difference between the United States price and the world price. The fees are at lower rates for imports within basic quotas from foreign countries and to all imports to fill "deficit allocations". The rates for such imports of raw sugar are 10, 20 and 30 per cent of the full rates for 1962, 1963 and 1964 respectively. In the case of the Philippines no fee is payable on quota imports. The United States Government has announced that funds derived from these fees will be used to aid developing countries generally. Import duties on sugar have been at the rate of 0.625 cents per pound since 1951 for full duty countries and 0.5 cents per pound for Cuban imports. Special arrangements again apply to the Philippines.

Although sugar prices are not fixed by the Government, the regulation of supplies exerts considerable influence on the price of sugar. If the price rises above what the Secretary of Agriculture considers a reasonable level, he can increase quotas and they can be decreased if price falls. What has been regarded as a reasonable price has been, apart from exceptional years, considerably higher than world prices. This is illustrated in Table 15 which shows the protection afforded to Cuba until 1960. The off-shore territories and the Philippines have received additional assistance. Still more protection is granted to domestic farmers in the form of a direct subsidy, financed by means of an excise duty of 0.5 cents per pound on all raw sugar. These subsidies or

conditional payments - conditional on employing no child labour, paying fair wages and keeping to quotas - vary according to the size of the farm and have added about 20 per cent to the proceeds of cane and beet farmers in recent years. These various protective devices have all combined to raise the United States sugar price substantially above the world price in most years.

The British Commonwealth Sugar Agreement

Not only has the United Kingdom built up a substantial beet industry of its own since the first world war but it has also changed its sources of supply of raw sugar. Before 1914 most of its sugar was obtained from Europe but very little has been imported from this source in recent years. Imperial Preference, the post-war dollar shortage and from 1951, the Commonwealth sugar agreement has placed the emphasis on Commonwealth countries which now supply about two-thirds of total imports.

The Commonwealth Sugar Agreement⁽¹⁴⁾ (C.S.A.) was first signed in 1951 for an eight year period. The Agreement is designed to develop the production of sugar in Commonwealth countries and to assist orderly marketing of sugar by providing long-term price stability based on fair average costs of production. In each year since 1952 it has been progressively extended for a further year, the current expiry date being 1971. The Agreement provides for the marketing in Commonwealth importing countries of up to 2,175,000 long tons of sugar per year. The parties to the Agreement at present are the United Kingdom Government and representatives of the sugar industries and exporters in Australia, the West Indies and British Guiana, British Honduras, Mauritius, Fiji and East Africa (Tanganyika, Kenya and Uganda). Since South Africa left the Commonwealth a separate agreement for the purchase of a specified quantity of sugar at a negotiated price during the period 1962/6 has been made with the South African Sugar Association. All other sugar is purchased at world prices.

Under the Agreement the exporting countries are allocated "overall agreement" quotas and "negotiated price" quotas. The overall agreement quota limits the total of annual exports to the negotiated price market in the United Kingdom plus exports to the preferential

markets in the United Kingdom and Canada plus an annual shipment of 75,000 tons to New Zealand. The basic negotiated price quota is the quantity of sugar the United Kingdom, through the Sugar Board, agrees to purchase each year at a price negotiated annually. This "negotiated price" is a price based on fair average costs of production and is aimed at being reasonably remunerative to efficient producers in all exporting countries. The quotas that were in operation for 1963 are shown in Table 16. The "actual for 1963" is 5 per cent above base as against $4\frac{1}{2}$ per cent in 1962. The negotiated price and its premium over the world price are shown in Table 17. From 1953 to 1962 the C.S.A. has had a marked protective effect although a comparison with Table 15 shows that in only 1955 and 1961 did the premium of the C.S.A. negotiated price over the world price exceed the premium obtained by suppliers to the United States market. The C.S.A. has been absorbed into the International Sugar Agreement under which the exporting countries had an aggregate export quota of 2.575 million long tons - slightly higher than the C.S.A. overall agreement quota - in 1961 when the quota provisions were last operative.

The method by which the United Kingdom finances this arrangement and at the same time protects its domestic beet industry is highly complex in operation though simple in principle. The Government establishes each year the total area to be planted with sugar beet. The British Sugar Corporation (a commercially managed, government-controlled company) is required to purchase the entire crop of beet grown on authorised land at prices determined by the Government. It processes the beet into raw or refined sugar and sells the sugar at a price that is competitive with imported sugar plus any surcharge that is in operation. The Corporation is entitled to make a profit equivalent to a reasonable rate of interest on its issued share capital and on such reserves as are authorised by the Government. Incentive payments can be earned by keeping operating costs below pre-determined standards but must be used for plant renewals and additions and staff bonuses.

From 1939 to 1956 all sugar imports into the United Kingdom were carried out by the Government. Under the Sugar Act of 1956 trade in sugar was put back into the hands of private traders except for the purchase of negotiated price quota sugar which was entrusted to the newly established Sugar Board. The

Sugar Board buys the negotiated price sugar under the C.S.A. and immediately resells it (while still in the country of origin) at prices based on the world price. It is imported into the United Kingdom by private firms at this price. As both the guaranteed price for beet sugar and the negotiated price for Commonwealth sugar are normally higher than free-market prices both the Board and the Corporation make losses on the operations so far described. To finance these deficits a surcharge (referred to above) is levied by the Board on all sugar imported into or manufactured, in the United Kingdom, the Board making good the Corporation's loss. The surcharge is the device which ensures that the average United Kingdom price is equal to the actual cost of sugar, it being government policy that the consumer should pay an average price for his sugar equal to its original cost. The rate of surcharge is so calculated to enable the Sugar Board to balance its revenue account, taking one year with another after discharging its functions of buying and selling Negotiated Price Quota sugar and taking over the profits and losses of the British Sugar Corporation. If the Sugar Board shows a surplus on its transactions, a distribution payment is made (as in 1963/4) wherever a surcharge would have been payable. The result of this procedure is that wholesale and retail prices are free and vary from dealer to dealer and from day to day.

With respect to the domestic market in sugar the British Sugar Corporation and the Tate and Lyle Company, whose refineries comprise 90 per cent of total British refining capacity, have entered into an agreement under the terms of the 1956 Sugar Act "to secure the orderly and economic marketing of sugar". The Corporation in its sales of refined sugar adopts Tate and Lyle's prices, after formal consultation, rigidly and simultaneously. To provide an assured market for United Kingdom beet sugar the market is divided into two zones - one served mainly with beet sugar by the Corporation and the other mainly with cane sugar by Tate and Lyle. The absence of competition between these two main suppliers is a situation specifically recognised in the Sugar Act which exempts the parties from legislation against restrictive practices.⁽¹⁵⁾

New Zealand has never been a member of the C.S.A. but in 1951 entered into an arrangement with the United Kingdom to purchase at the C.S.A. negotiated price, all its raw sugar requirements for the years 1951 and 1952 and 75,000 tons annually until 1958. This worked to

New Zealand's advantage initially as the landed cost of C.S.A. sugar was lower than that of raw sugar purchased at the world free market price. Surplus stocks subsequently depressed the free market price and by mid-1956 the C.S.A. price was £12 per ton higher than the world price. In 1956 agreement was reached with the United Kingdom and Commonwealth producers to release New Zealand from its obligation to take 75,000 tons of sugar at the negotiated price. The terms of the new arrangement were:(16)

- (a) New Zealand was released from the obligation to purchase at the Commonwealth negotiated price as from 1 January 1957 - two years earlier than the actual expiry date.
- (b) New Zealand undertook to purchase 75,000 tons of Commonwealth sugar annually for seven years (1957-63) but on a new price basis.
- (c) The new price basis was called the "Commonwealth free market price". On this basis the price of sugar to New Zealand is the f.o.b. Queensland-Fiji (or other Commonwealth territory) equivalent of the current value at the time of purchase of "Commonwealth free market" sugar c.i.f. United Kingdom. The effect of this is that sellers receive the same f.o.b. return as on the world free market including the United Kingdom tariff preference of £3. 15. 0. per ton and New Zealand pays the "Commonwealth free market price" c.i.f. United Kingdom including the preference, less the freight London-Queensland or London-Fiji plus the freight Queensland or Fiji-New Zealand. In simpler language this means that New Zealand pays the London free market price plus £3. 15. 0. per ton, less the freight to London plus the freight to New Zealand, freight charged from the point of production.

This arrangement is reviewed annually by the parties concerned.

New Zealand, except during the months of the Suez crisis and most of 1963 benefited from purchasing at prices related to the London free market price. The net saving has been estimated at £3 million to the end of 1963.(17) New Zealand purchases the balance of her requirements of approximately 50,000 tons at world prices without restriction as to source of supply.

The International Sugar Agreement (I.S.A.)

The first International Sugar Agreement was signed in 1937 but the second world war commenced before it became fully operative. However, it formed a prototype for the 1953 I.S.A. and was prolonged by annual signatures to protocol until the 1953 Agreement came into force.

The present Agreement came into effect on 1 January 1959 to run for five years ending in 1963. It was substantially similar to the preceding 1953 Agreement as amended in 1956 and was designed to maintain an orderly supply and demand relationship in a manner equitable to both producers and consumers. The Agreement was essentially restrictive through adjustable export quotas fixed with regard to a price range of 3.25 - 4.0 cents per pound f.a.s., Cuba, so that the supply of free market sugar would be kept in reasonable balance with demand. Estimates of the free market requirements were made annually by the International Sugar Council and export quotas assigned to members pro rata to the basic export tonnages written into the Agreement. The quota provisions of the Agreement did not apply to sales to the United States and exporter members of the Commonwealth Sugar Agreement who shared a single, irreducible export entitlement. Adjustments to quotas were mandatory when the sugar price moved out of the set range. Since 1958 to early 1962 the free market price rarely exceeded the lower limit of 3.25 cents per pound. Actual export quotas, therefore, were less than the Agreement basic export tonnages. In 1961 when quotas were last in effect they were set at 82½ per cent of basic export tonnages. At the 1961 Conference agreement could not be reached on the basic quota allocations for the succeeding year and the quota provisions were set aside for 1962 and 1963. Although the Agreement continues in operation it has become barely more than an authority for the collection and dissemination of statistics being virtually powerless to influence the course of prices. At a United Nations Conference held in July 1963, the life of the Agreement in its present form was extended until the end of 1965. During this period the International Sugar Council will study the bases and framework for a new regulative agreement.

The present close balance between supply and demand for free market sugar has occurred without recourse to quota controls in order to achieve equilibrium. Had the complete agreement been in force in

1963 all quotas and limitations on exports under the Agreement would have become inoperative from mid January since the prevailing price exceeded 4 cents per pound f.a.s. Cuba. The quota provisions would have remained inoperative until the present time for the price has not fallen to 3.9 cents per pound when quotas would have again applied.

New Zealand acceded to the International Sugar Agreement in 1960. It has significance for New Zealand in relation to annual requirements of 50,000 tons which are purchased from Commonwealth and other sources at the World free market price. (The balance of 75,000 tons is purchased under the special arrangement with the Commonwealth Sugar Agreement.)

Snape⁽⁴⁾ says that International Sugar Agreements have not been wholly successful in removing short run price fluctuations or in preventing average prices from falling below what is thought to be desirable levels. They have, however, prevented greater fluctuations and a more serious decline in average levels. For example prices fell sharply with the suspension of the export quota provisions at the end of 1961. Consumers' interests have not suffered and the main fault of the Agreement is its inability to protect producers rather than consumers sufficiently.

The main deficiency is the lack of any guarantee to exporters that they will be able to sell their quota entitlements at a price considered to be reasonable. There is no restriction on the subsidies which participating countries can give to their domestic sugar industries nor on the form which these may take. A major problem of free market exporters is the small size of the free market relative to world production and trade and yet the Agreement has done nothing to expand this market.

The Free Market

Only a small part of the world supply of centrifugal sugar is sold at the world market price. The free market is a residual market in two senses. Firstly, it accounts for sugar that sellers could not dispose of on more favourable terms. From Table 3 it can be seen that average total exports were over 15 million metric tons for the years 1957 to 1959. Of this total only five or six million tons were sold

on the free market. Secondly, the free market, in many cases supplies only a small portion of importers' total sugar needs. Not only are the free market imports by many countries relatively small but they are a variable proportion of their total demand, the proportion required depending on the level of domestic production.

Over three-fifths of world sugar exports are traded under preferential arrangements leaving only one-tenth of world sugar production traded on the free market. In recent years the I.S.A. has embraced about 95 per cent of trade on the free market. From Table 2 it can be seen that trade on the free market failed to increase with total world production during the 1950's and it became increasingly a residual market in relation to total production. Except in times of war this has been the general tendency throughout this century.

Historically, because of Cuba's dominant position as an exporter, the f.a.s. price of raw sugar at Cuban ports for sale to destinations other than the United States was widely accepted as the indicator of sugar prices in the free market. However, with the changed Cuban situation reliance has shifted to the spot price for the No. 8 Contract of the New York Coffee and Sugar Exchange and the London United Terminal Sugar Market Associations daily price. The importance of the London Market has increased during 1962 and 1963 and nearly all bulk deals for 1963 and beyond have had the price basis determined on the London daily price of raw sugar.

Not all free market transactions are conducted through the recognised markets of London and New York, a large portion being traded by governments under special bilateral agreements which are often on barter terms. These deals can disturb the world price considerably while the market adjusts its expectations of demand and supply and of the stock position. The large sugar exports from Cuba to the Sino-Soviet countries under barter agreements, in which the nominal price placed on the sugar is not the prime consideration, was one of the factors causing the recent price fluctuations on the World market.

The direction of trade on the free market is largely from cane producers, who mainly harvest during the first portion of the year, to Northern Hemisphere importers, most of whom produce beet sugar themselves and harvest during the second half of the year. This dependence on beet harvests, which vary markedly with weather

conditions is a major cause of instability of demand on the free market, particularly as imports, in many cases, account for only a small fraction of total requirements. This instability is particularly serious for those exporters whose economies depend heavily on the earnings of their sugar on the free market.

All of these factors can make trading on the free market extremely volatile, reacting sharply to international tensions or to changes in levels of supply and demand. For instance, in 1957 at about the time of the Hungarian and Suez crises the world price nearly doubled in 60 days. The price behaviour of sugar since January 1, 1960, shown in Figure 3, reflects these factors.

APPENDIX B

The Cobweb Effect

This appendix consists of a summary of Snape's Analysis of the cobweb effect in the world sugar economy.

Snape considers two supply time periods (following Marshall), the lesser time interval being termed the market period and the greater the short run. In the market period, supply can only be altered by changes in the efficiency of raw sugar production from existing cane or beet or by alterations in the level of raw sugar stocks. In the short run new cane and beet lands can be brought into production. The dividing line between the two periods is blurred but the distinction is important.

After an examination of price elasticities of demand and supply (with respect to a departure from a position of long run equilibrium) for an unregulated peace-time free market, Snape comes to the following conclusions.

Firstly, that during the market period supply is fairly inelastic while during the short run it will be rather more elastic for a price rise than for a price fall, i.e. the supply curve has a "kink" (see Figures 4 - 7). Secondly, that demand is particularly inelastic with respect to free market price and is highly subject to exogenous movements due to weather conditions in importing countries and international crises. These conditions are set out in highly simplified pictorial form in Figures 4 - 7 and are adapted forms of the usual "cobweb" diagrams.

In these figures demand is conceived as adjusting within the market period while supply during that period is perfectly inelastic, consequently the elasticity of market-period supply that is present in practice is added to demand. For example increases in exporters' stocks are represented as part of demand from the free market. Supply in the market period is a vertical line, BX, the season's production. S_1S_2 (Figure 4) is the supply curve for the short run,

showing the short-run supply positions for departures from the equilibrium price of OA, and D_1D_2 the demand curve for the market period. For simplicity, straight lines, parallel movements and constant weather conditions are assured. It is also assumed that the slopes of the supply curve for departures of price from its equilibrium level and for departures from other prices are the same. The implications of these assumptions are examined later.

We start in Figure 4, from a position of long-run equilibrium at a price of OA, and production OB. If the demand curve shifts to the right to D_3D_4 , then in the market period price will rise to OC, bringing a supply of OF in the following season. Prices in that season will fall to OJ (and would probably fall further because the demand curve may have shifted to the left by this time - a once-for-all shift is assumed here). The "kink" in the supply curve will now move up to E, as shown in Figure 5. At a price of OJ, production in the following season will fall from OF to ON and hence price will rise to OP. Production will increase along S_4S_3 (Figure 6) to OR in the following season, the kink now having moved to T. The path of the cobweb is along the demand curve D_3D_4 as shown in Figure 7.

The properties of this type of movement, under the assumptions made may be listed.

1. No matter what the initial disturbance the path taken will be of the same form given the slopes of the curves. When the initial disturbance is a shift of the demand curve to the left an "explosive" cobweb diagram can be drawn. The result is similar in the case of exogenous changes in supply.
2. The path of the cycles will vary with the shape of the demand and supply curves.
3. Though the path of the cycle can take many forms, it is highly probable that the trend of average price will be downwards.

Snape then treats the cycle mathematically and derives the necessary and sufficient conditions for several of its possible forms.

The effect of relaxing the assumptions is now discussed. If the demand and supply curves are not straight lines, the conditions for the various movements are more complicated but the basic features of the model

Figure 4

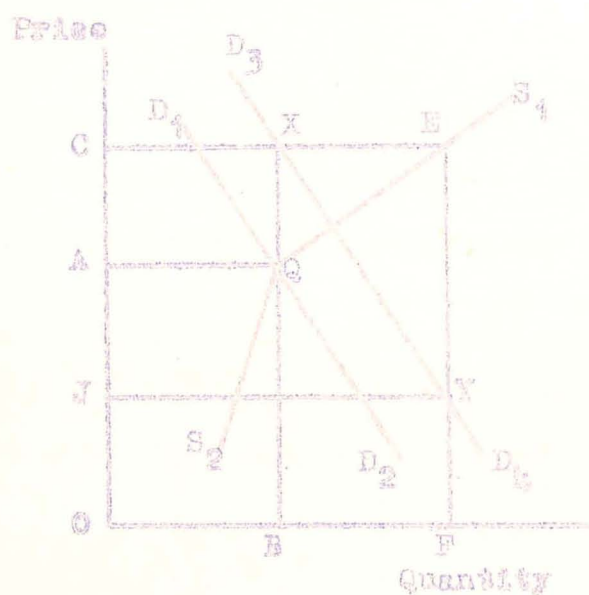


Figure 5

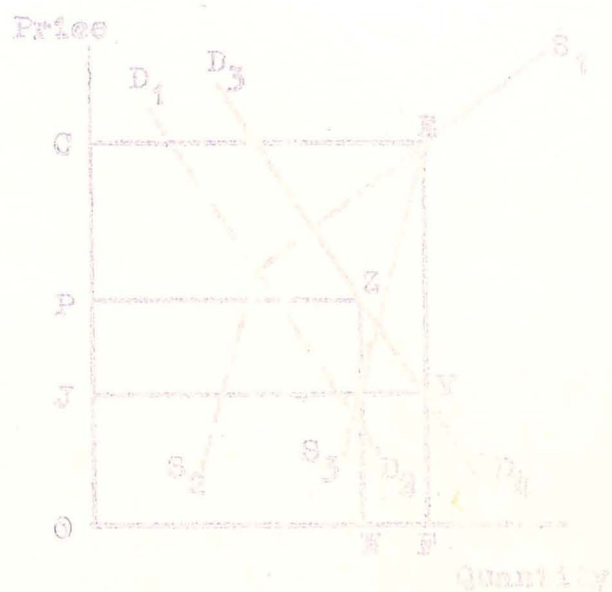


Figure 6

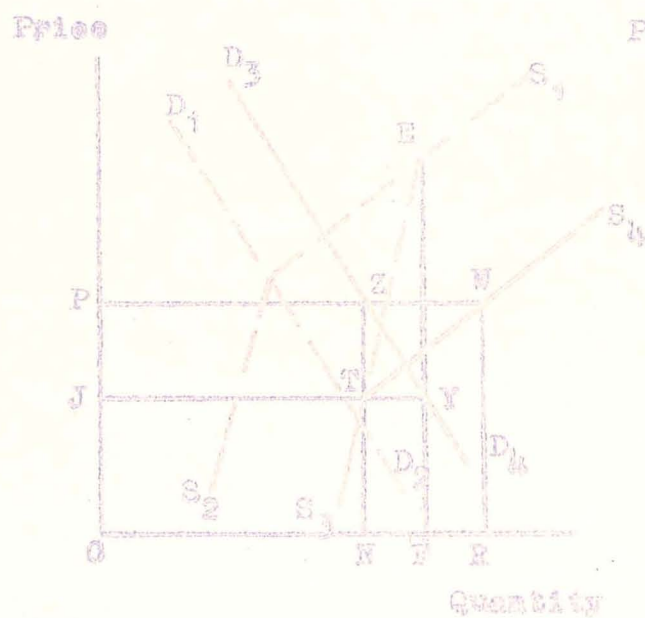
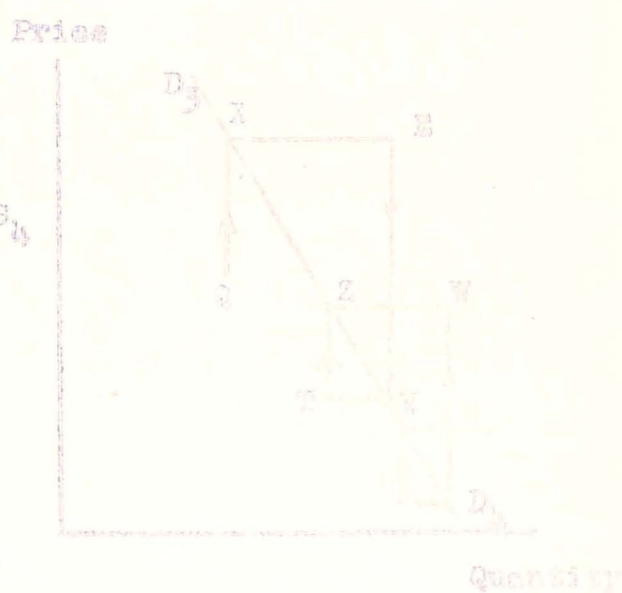


Figure 7



remain. A more important assumption is that the slopes of the supply curve for departures of price from its equilibrium level and for departures from other prices are the same. If this assumption is relaxed, important changes occur. For example it may be more realistic to assume that the upper part of the curve S_3S_4 in Figure 6 is rather steeper than the upper part of S_1S_2 . The effect of this will be to damp down the fluctuations in price, though the same general pattern will tend to occur. This may, however, be counterbalanced by relaxing the assumption of a once-and-for-all initial movement to set the process going, though it is possible that further exogenous movements will prove to be off-setting rather than aggravating.

A further complication would be to relate supply not only to the price of the previous year but to the prices of several previous years. It is at this point that simple geometry fails. If the price of the previous season exerts most influence, as seems likely, the model will still bear the characteristics outlined above.

For a full explanation of the derivation of the cycle and an account of the underlying assumptions, see Snape⁽⁴⁾ Chapter 3, pp. 77-117.

APPENDIX C

Statistical Appendix

- Table 1 - World Production of Centrifugal Sugar (Raw Value) and Non-centrifugal Cane Sugar 1960-1 to 1962-3.
- Table 2 - Production and International Trade in Centrifugal Sugar.
- Table 3 - Source and Direction of Exports of Centrifugal Sugar - Annual Average 1957-9.
- Table 4 - Cuban Exports of Centrifugal Sugar to Sino-Soviet Countries.
- Table 5 - World Exports of Centrifugal Sugar (Raw Value) 1960-2.
- Table 6 - World Imports of Centrifugal Sugar (Raw Value) 1960-2.
- Table 7 - World Consumption of Centrifugal Sugar (Raw Value) 1958-61.
- Table 8 - Home-Produced Raw Sugar, 1959: Estimated Average Receipts (or Costs).
- Table 9 - Calculation of Increase in Consumption of Sugar with Removal of Protection and Revenue Duties.
- Table 10 - Projections of Net Imports of Sugar for the Main Importing Regions (Excluding Sino-Soviet area) on Assumption of Constant Prices.
- Table 11 - Origin of Imports of Raw Sugar into New Zealand.
- Table 12 - Breakdown of New Zealand Refined Sugar Price 1962 to 1964.
- Table 13 - Production of White Sugar from Beet in the United Kingdom.
- Table 14 - Proration of Quotas Under United States Sugar Act Amendment, 1962.

Table 15 - Price Premium on United States Quota Sugar
1960-1963.

Table 16 - Commonwealth Sugar Agreement Quotas 1963.

Table 17 - Negotiated Price Premium Under Commonwealth
Sugar Agreement, 1950-1963.

TABLE 1

WORLD PRODUCTION OF CENTRIFUGAL SUGAR (RAW VALUE)
AND NON-CENTRIFUGAL CANE SUGAR 1960-1 TO 1962-3
(1000 metric tons)

<u>Region</u>	<u>1960-1</u>	<u>1961-2</u>	<u>1962-3</u>
<u>Europe:</u>			
Beet	14,375	11,830	11,200
Cane (Spain)	35	35	30
<u>U.S.S.R.</u>			
Beet	5,717	6,652	6,603
<u>North and Central America:</u>			
Beet	2,370	2,310	2,485
Cane	13,320	11,560	10,600
Non-centrifugal cane	265	255	245
<u>South America:</u>			
Beet	105	100	105
Cane	6,220	6,265	6,560
Non-centrifugal cane	1,050	1,000	1,015
<u>Asia:</u>			
Beet	980	760	770
Cane	6,650	6,345	6,380
Non-centrifugal cane	5,105	6,025	6,270
<u>China (Mainland):</u>			
Beet	325	300	350
Cane	900	900	950
<u>Africa:</u>			
Cane	2,400	2,845	2,980
<u>Oceania:</u>			
Cane	1,555	1,560	2,135
<u>World Totals:</u>			
Beet	23,870	21,950	21,510
Cane	31,080	29,510	29,640
Total Beet and Cane	54,950	51,460	51,150
(Non-centrifugal cane)	(6,970)	(7,830)	(8,080)

Source: Monthly Bulletin of Agricultural Economics and Statistics
12 (7-8) : 27 Table 6. F.A.O. Rome.

TABLE 2

PRODUCTION AND INTERNATIONAL TRADE IN CENTRIFUGAL SUGAR
(Thousand Metric Tons, Raw Value)

(1) Year	(2) World Prod'n.	(3) Total Net Exports	(4) Net Exports to Free Market	(5) Total Net Exports as % of Production	(6) Free Market Exports as % of Production	(7) Free Market Exports as % of Total Net Exports
1937 ^(a)	27,186	9,809	3,279	36	12	33
1947/8 ^(a)	25,797	10,986	4,727	43	18	43
1948/9 ^(a)	28,401	10,979	4,238 ^(b)	39	15	39
1949/50 ^(a)	29,578	11,791	4,300 ^(b)	40	15	36
1950/1 ^(a)	33,795	13,103	5,000 ^(b)	39	15	38
1951/2 ^(a)	36,098	11,782	4,886	33	14	41
1952/3 ^(a)	35,486	13,617	5,524	38	16	41
1954	37,373	11,596	4,474	31	12	39
1955	38,925	12,510	5,318	32	14	43
1956	40,217	12,372	5,131	31	13	41
1957	43,992	13,439	6,243	31	14	46
1958	47,210	13,886	6,156	29	13	44
1959	49,557	13,087	5,273 ^(b)	26	11	40
1960	52,627	15,183	6,900 ^(b)	29	13	45

(a) September to August

(b) Estimate

Source: Snape, R.H. Protection and Stabilization in the World Sugar Industry,
Unpublished Ph.D. Thesis, University of London, 1962.

TABLE 3

SOURCE AND DIRECTION OF EXPORTS OF CENTRIFUGAL SUGAR -
ANNUAL AVERAGE 1957-59
(Thousand Metric Tons)

Exported To:	U.S.A.	U.K.	Japan	Canada	France (Met)	USSR	Morocco	Iran	Other	Total	Net Exports as % of Prod'n
Exported From:											
Cuba	2,977	423	455	126	100	273	182	8	753	5,297	91
Philippines	923	-	16	-	-	-	-	3	28	970	76
Puerto Rico	811	-	-	-	-	-	-	-	-	811	89
Hawaii	798	-	-	-	-	-	-	-	-	798	93
Taiwan	3	-	308	-	-	-	-	147	313	771	84
Dominican Rep.	92	387	60	1	6	-	-	4	177	727	88
Australia	-	333	117	130	-	-	-	-	117	697	53
Br.W.Indies	1	519	-	177	-	-	-	-	-	697	85
U.K.	-	X	-	-	2	41	-	-	613	656	..
Brazil	4	92	56	-	50	-	30	-	365	597	20
Mauritius	-	410	8	77	-	-	3	10	27	535	96
France(Met)	-	1	-	-	X	-	46	-	451	498	..
Peru	82	51	90	-	3	-	6	-	237	469	68
Czechoslovakia	-	13	-	-	-	127	7	-	195	342	40
Other											
Exporters	87	596	69	151	371	26	73	84	-11 ^(a)	1,446 ^(b)	..
TOTAL	5,778	2,825	1,179	662	532	467	347	256	3,265	15,311	..
Net Imports as % of Consum'n	70	76	94	84	2	5	100	73

(a) As this is the balance of balancing items, all errors and statistical discrepancies are reflected in this figure.

(b) Total exports. Total imports averaged 15,164 thousand tons over the period.

Source: Snape, R.H. op.cit.

TABLE 4

CUBAN EXPORTS OF CENTRIFUGAL SUGAR TO SINO SOVIET COUNTRIES
(million metric tons)

	1959	1960	1961	1962
U.S.S.R.	0.3	1.6	3.3	
Mainland China	Nil	0.5	1.0	
Eastern Europe	Nil	0.2	0.5	
Total	0.3	2.3	4.8	4.9 ^(a)
Proportion of total Cuban exports to Sino-Soviet area	6%	40.1%	75%	

(a) Estimate

Source: F.A.O. Commodity Review 1962 Part II p.49 Table 19.

TABLE 5

WORLD EXPORTS OF CENTRIFUGAL SUGAR (RAW VALUE) 1960-1962
(1000 metric tons)

<u>Region</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
<u>Exports</u>			
Europe	1,755.9	2,123.0	1,658.7
U.S.S.R.	264.0	950.7	900.5
N. and Central America	8,075.9	8,790.4	7,351.6
South America	1,612.7	1,659.2	1,234.2
Asia	2,187.3	2,396.2	2,288.6
Africa	926.5	1,146.3	1,365.3
Oceania	1,043.7	990.6	1,380.5
WORLD TOTAL	17,279.0	20,385.0	18,510.0

Note: World totals include estimates for countries for which data is missing.

Source: Monthly Bulletins of Agricultural Economics and Statistics, F.A.O., Rome.

TABLE 6

WORLD IMPORTS OF CENTRIFUGAL SUGAR (RAW VALUE) 1960-1962
(1000 metric tons)

<u>Region</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
<u>Imports</u>			
Europe	4,588.1	4,188.5	4,135.7
U.S.S.R.	1,717.3	3,596.9	2,485.9
North America	4,911.3	4,535.8	4,996.4
South America	186.3	455.7	208.7
Asia	2,115.2	2,332.8	2,419.8
Africa	1,118.8	1,152.1	1,146.2
Oceania (New Zealand)	106.2	135.3	127.3
WORLD TOTAL	16,709.0	19,801.0	18,925.0

Note: World totals include estimates for countries for which data is missing.

Source: Monthly Bulletins of Agricultural Economics and Statistics, F.A.O., Rome.

TABLE 7

WORLD CONSUMPTION OF CENTRIFUGAL SUGAR (RAW VALUE) 1958-1961
(million long tons)

<u>Region</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>
North & Central America	10.74	11.05	11.22	11.58
South America	4.21	4.20	4.46	4.80
Western Europe	10.15	10.20	10.60	10.84
Eastern Europe	2.90	2.94	3.03	3.27
U.S.S.R.	5.36	5.75	6.00	6.50
Africa	2.47	2.57	2.69	2.71
Asia	7.77	8.28	8.82	9.99
Oceania	0.70	0.70	0.71	0.70
WORLD TOTAL	44.30	45.69	47.53	50.39
WORLD TOTAL (metric tons)	45.05	46.47	48.34	51.25

Note: The International Sugar Council and European countries present sugar statistics in metric tons (2,204.6 lbs), while the short ton (2,000 lbs) is used in U.S.A. and South Africa. One long ton is equivalent to 1.017 metric tons.

Source: Daly, R.A. The Sugar Situation, 1962-63.
Quarterly Review of Agricultural Economics 16 (1) : 5.

TABLE 8

HOME-PRODUCED RAW SUGAR, 1959 :
ESTIMATED AVERAGE RECEIPTS (OR COSTS)

		Estimated Average Receipts from (or Cost of) Home- Produced Raw Sugar (U.S. cents/lb.) (1)	Average Receipts or Costs as Per- centage of Import Parity* or Export Parity** Price (2)
Cane			
Argentina		4.5	120
Australia	x	4.5	150
Brazil	x	4.75	160
British Guiana	x	4.5	150
British Honduras		5.25	140
British West Indies	x		
Antigua	x	4.25 ^s	140
Barbados	x	5	165
Jamaica	x	4.5	150
St Christopher-Nevis	x	4.75	160
Trinidad-Tobago	x	5	165
Cuba	x	4	135
Dominican Republic	x	2.75	90
Fiji	x	5	165
Hawaii	x	7 ^s	235
India		6.25	165
Indonesia	x	6	185
Mauritius	x	4.5	150
Mexico	x	5.25	175
Peru	x	3.25	110
Philippines	x	5.5	170
Puerto Rico	x	7 ^s	235
South Africa	x	3.75	125
Taiwan	x	3.25	100
U.S.A. (cane and beet)		7.5 ^s	200
Beet			
Belgium-Luxembourg		5.5	145
France (Metropolitan)		6	160
Germany (Western)		7.75	205
Italy		7	185
Netherlands		5	135
U.K.		6	160

* Import parity taken as 3.75 cents/lb.

** Export parity taken as 3 cents/lb. (except for Indonesia, Philippines and Taiwan, where taken as 3.25 cents/lb.). The export parity has been used for countries marked with x.

^s Including conditional payments to farmers.
Average for 1958 and 1959.Source: Snape, R.H. Some Effects of Protection in the World Sugar Industry, *Economica*, February 1963, p.66.

TABLE 9
CALCULATION OF INCREASE IN CONSUMPTION OF SUGAR
WITH REMOVAL OF PROTECTION AND REVENUE DUTIES

(1)*		(2) Actual Retail Price, 1959 (U.S. cents/ kg.)	(3) Percentage Reduct- ion in Price to Export or Import Parity	(4) Price Elasticity of Demand	(5) Percentage Extens- ion of Demand (3) x (4)	(6) Actual Consump- tion, 1959 (000 metric tons)	(7) Estimated Addition- al Consumption (000 metric tons) (5) x (6)
SECTION A							
Australia	x	20.4	17	-0.39	7	531	37
Austria		22.9	17	-0.42	7	271	19
Belgium-Lux.	x	25.2	33	-0.27	9	289	26
Denmark	x	17.2	1	-0.24	0	260	0
Egypt		16.0	-	-1.08	0	330	0
France (Metro.)		23.7	20	-0.30	6	1,518	91
W. Germany		29.5	36	-0.34	12	1,706	205
India		21.7	12	-1.75	22	2,297	505
Italy		40.2	53	-0.57	30	1,000	300
Netherlands		25.8	26	-0.37	10	507	51
South Africa	x	12.8	-	-0.58	0	714	0
Sweden		27.1	30	-0.32	10	353	35
Switzerland		20.9	9	-0.31	3	270	8
U.K.		20.5	7	-0.25	2	2,979	60
U.S.A.		25.2	25	-0.28	7	8,405	588
Venezuela		26.9	29	-0.42	12	234	28
Ten Other Countries ^f		-	-	-	-	<u>1,224</u>	<u>216</u>
TOTAL						<u>22,888</u>	<u>2,169</u>
SECTION B							
Algeria		20.6	8	-0.60	5	219	11
Brazil	x	17.1	1	-0.40	0	2,427	0
Canada		21.8	13	-0.30	4	816	33
Chile		18.6	-	-0.50	0	221	0
Cuba	x	17.5	3	-0.30	1	331	3
Iran		25.3	25	-0.80	20	466	93
Japan		38.4	51	-1.00	51	1,321	674
Mexico	x	12.7	-	-0.40	0	979	0
Pakistan		30.6	38	-1.75	66	221	146
Peru	x	7.4	-	-0.60	0	261	0
Philippines	x	21.5	21	-0.60	13	288	37
Spain		20.2	6	-0.60	4	508	20
Turkey	x	36.0	53	-0.70	37	<u>308</u>	<u>114</u>
						<u>8,366</u>	<u>1,131</u>

TABLE 9 (Cont'd)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
SECTION C						
All Other Non-Communist Countries	-	-	-	-	<u>5,508</u>	<u>582</u>
TOTAL All Non-Communist Countries					<u>36,762</u>	<u>3,882</u>

Notes: * Countries for which export parity is relevant are marked with x.

^f Ceylon, Finland, Greece, Guatemala, Ireland, Israel, Norway, Portugal, Puerto Rico, and the Federation of Rhodesia and Nyasaland: calculations made separately for each, but presented in totals only.

Source: Snape, R.H., op. cit.

TABLE 10

PROJECTIONS OF NET IMPORTS OF SUGAR FOR THE MAIN
IMPORTING REGIONS (EXCLUDING SINO-SOVIET AREA) ON
ASSUMPTION OF CONSTANT PRICES
(1000 metric tons, raw value)
Index, 1957-59= 100

<u>Region</u>	<u>1957-59</u>	<u>1969-71</u>			
		L.	H.	L.	H.
North America ¹	4,931	5,450	5,450	110	110
Western Europe	3,179	2,700	2,700	85	85
Japan	1,191	1,850	1,950	155	164
Total industrialised countries	<u>9,301</u>	<u>10,000</u>	<u>10,100</u>	<u>108</u>	<u>108</u>
Near East	811	1,000	1,200	123	148
North Africa ²	679	600	700	90	103
Rest of Africa ³	329	500	660	152	200
Total Near East and Africa ³	<u>1,819</u>	<u>2,100</u>	<u>2,560</u>	<u>115</u>	<u>141</u>
GRAND TOTAL	<u>11,120</u>	<u>12,100</u>	<u>12,660</u>	<u>109</u>	<u>114</u>

¹ Including Puerto Rico and Hawaii.

² Algeria, Egypt, Libya, Tunisia.

³ Excluding South Africa, Mauritius and Reunion.

Note: L and H are low and high estimates respectively.

Source: Agricultural Commodities - Projections for 1970.
Commodity Review 1962 - Special Supplement, Part II p.36.
F.A.O., Rome.

TABLE 11

ORIGIN OF IMPORTS OF RAW SUGAR INTO NEW ZEALAND
(£000)

<u>Year</u>	<u>Australia</u>	<u>Fiji</u>	<u>Taiwan</u>	<u>Cuba</u>	<u>Peru</u>	<u>Indonesia</u>	<u>Dominican Republic</u>
1953	1,723	1,174	252	-	-	-	-
1954	2,417	1,606	-	99	220	-	-
1955	2,567	1,454	-	-	-	-	-
1956	2,300	1,273	-	-	-	-	-
1957	2,880	1,239	-	-	-	143	-
1958	2,654	910	-	-	-	-	-
1959	1,897	884	-	-	-	-	-
1960	2,160	358	-	-	-	-	244
1961	1,529	531	-	-	-	-	995
1962	1,773	1,285	-	-	-	-	-
1963	5,229	-	336	-	457	-	967

Source: New Zealand Year Books 1953-1961 and Department of
Industries and Commerce 1962-3.

TABLE 12
BREAKDOWN OF NEW ZEALAND REFINED SUGAR PRICE
(in pence per lb.)
From 9 April 1962

	Date When Price Became Effective							
<u>Price Components</u>	<u>1962</u>	<u>1963</u>						<u>1964</u>
	<u>9.4</u>	<u>28.1.</u>	<u>25.3.</u>	<u>6.5.</u>	<u>27.5.</u>	<u>17.6.</u>	<u>26.6.</u>	<u>16.1.</u>
Landed price of raw sugar	3.1	3.5	4.4	5.1	6.0	8.4	5.1 ^f	9.3 ^f
Refined equivalent	3.2	3.6	4.5	5.2	6.1	8.5	5.2	9.4
Refiner's margin*	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Excise duty	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Price to wholesaler	6.4	6.8	7.7	8.4	9.3	11.7	8.4	12.6
Wholesaler's margin	0.2	.2	.2	.3	.3	.4	.3	.4
Price to retailer	6.6	7.0	7.9	8.7	9.6	12.1	8.7	13.0
Retailer's margin	0.9	1.0	1.1	1.2	1.3	1.7	1.2	1.8
Price to Consumer	7.5	8.0	9.0	9.9	10.9	13.8	9.9	14.8

* Includes cost of manufacture, Auckland cartage charges, reserve stock allowance, administration expenses and refiner's profit, and transport costs to areas outside Auckland province to ensure that the retail price of sugar is uniform in the main centres.

^f The stabilization scheme operated from 26 June 1963 and has absorbed a proportion of the landed price of raw sugar.

Source: The Department of Industries and Commerce.

TABLE 13

PRODUCTION OF WHITE SUGAR FROM BEET IN THE UNITED KINGDOM

<u>Year ended 31 March</u>	<u>Beets bought (long tons)</u>	<u>Sugar in terms of white sugar (long tons)</u>
1960	5,509,769	773,292
1961	7,215,261	887,525
1962	5,936,479	760,388
1963	<u>5,313,003</u>	<u>686,512</u>
TOTALS	<u>23,974,512 (a)</u>	<u>3,107,717 (b)</u>

Notes: The average tonnage of beet required to produce one ton of refined sugar during 1960-63 = $\frac{a}{b} = 7.7$ tons

Using a conversion rate of 92 parts refined = 100 parts raw 7.7 tons of beet produce 1.09 tons of raw sugar.

At £5 per ton for beet the cost of the raw sugar is £35.3 per ton.

Source: Report of the Directors and Statement of Accounts for year ended 31 March 1963, British Sugar Corporation Ltd., London, p.18.

TABLE 14

PRORATION OF QUOTAS UNDER THE UNITED STATES
SUGAR ACT AMENDMENT 1962
(short tons, raw value)

Area	Proration of first 9,700,000 short tons	Proration of each additional 100,000 short tons
<u>Domestic:</u>		
Domestic beet sugar	2,650,000	48,589
Mainland cane	895,000	16,411
Hawaii	1,110,000	0
Puerto Rico	1,140,000	0
Virgin Islands	15,000	0
Total Domestic	<u>5,810,000</u>	<u>65,000</u>
<u>Foreign:</u>		
Philippines	1,050,000	0
Cuba	1,484,121 (1)	20,220
Peru	189,804	2,348
Dominican Republic	319,804 (2)	2,348
Mexico	189,804	2,348
Brazil	180,186	2,230
British West Indies	90,235	1,116
Australia	39,884	494
Republic of China	35,075	435
French West Africa	29,984	371
Colombia	29,984	371
Nicaragua	24,892	308
Costa Rica	24,892	308
Ecuador	24,892	308
India	20,084	248
Haiti	20,084	248
Guatemala	20,084	248
South Africa	20,084	248
Panama	14,992	185
El Salvador	10,183	126
Paraguay	9,900	123
British Honduras	9,900	123
Fiji Islands	9,900	123
Netherlands	9,900	123
Other Countries	1,332	0
Ireland	10,000	0
Argentina	20,000	0
Total Foreign	<u>3,890,000</u>	<u>35,000</u>
GRAND TOTAL	<u>9,700,000</u>	<u>100,000</u>

1. Percentage proration reduced by 150,000 tons to cover added allocations to Dominican Republic and Argentina. Balance of proration, not made while U.S. is not in diplomatic relations with Cuba becomes "Global quota". 2. Includes 130,000 tons allocated from proration for Cuba.

Source: The World Sugar Economy Structure and Policies Vol. I.
International Sugar Council, London, 1963 p.113, Table 26.

TABLE 15

PRICE PREMIUM ON UNITED STATES QUOTA SUGAR 1950-1963
(U.S. cents/lb. raw value)

Year	U.S. Price c.i.f. (a) New York	Insurance and Freight Cuba	U.S. Price f.a.s. Cuba	Free Market Price f.a.s. Cuba	U.S. Price Premium
	(1)	(2)	(1)-(2)=(3)	(4)	(3)-(4)=(5)
1950	5.43	0.34	5.09	4.98	0.11
1951	5.56	0.49	5.07	5.67	-0.60
1952	5.76	0.41	5.35	4.17	1.18
1953	5.79	0.36	5.43	3.41	2.02
1954	5.59	0.38	5.21	3.26	1.95
1955	5.45	0.46	4.99	3.24	1.75
1956	5.59	0.49	5.10	3.48	1.62
1957	5.74	0.44	5.30	5.16	0.14
1958	5.77	0.36	5.41	3.50	1.91
1959	5.74	0.39	5.35	2.97	2.38
1960	5.80	0.42	5.38	3.14	2.26
1961	5.68	0.42	5.26	2.92	2.34
1962	5.82	0.42	5.40	2.93	2.47
1963	7.22	0.42	6.80	7.71	-0.91

(a) Ex duty

Note: The Figures for 1961, 1962 and 1963 are, of course, hypothetical.

Source: Snape, R.H. op. cit. and Monthly Bulletin of Agricultural Economics and Statistics, F.A.O., Rome.

TABLE 16

COMMONWEALTH SUGAR AGREEMENT QUOTAS : 1963

<u>Country</u>	Overall Agreement Quota <u>Long tons (t.e. quel.)</u>	<u>Negotiated Price Quota</u>	
		<u>Basic long tons (t.q.)</u>	<u>Actual for 1963 (a) long tons (t.q.)</u>
Australia	600,000	300,000	315,000
West Indies and British Guiana	900,000	641,050	673,103
British Honduras	25,000	18,000	18,900
East Africa	10,000	5,000	5,250
Fiji	170,000	120,000	126,000
Mauritius	470,000	335,000	351,750
TOTAL	2,175,000	1,419,050	1,490,003

(a) All quotas 5% above base.

Source: Daly, R.A. op. cit. Table 10, p.15

TABLE 17

NEGOTIATED PRICE PREMIUM UNDER COMMONWEALTH SUGAR AGREEMENT :
1950-1963

Year	Negotiated Price £/long ton (a)			Av. Free Mkt.Price £/long ton (b)			Negotiated Price U.S.cents/ lb. equiv. (3)			Av. Free Mkt.Price U.S.cents/ lb. equiv. (4)			Negotiated Price Premium U.S.cents/ lb. equiv. (3)-(4) = (5)		
	(1)			(2)			(3)			(4)			(3)-(4) = (5)		
1950	30	10	0	40	16	8	3.81			5.10			-1.29		
1951	32	17	6	49	11	8	4.11			6.20			-2.09		
1952	38	10	0	45	13	4	4.81			5.71			-0.90		
1953	42	6	8	30	18	4	5.29			3.86			1.43		
1954	41	0	0	29	15	0	5.12			3.72			1.40		
1955	40	15	0	31	10	0	5.94			3.94			2.00		
1956	40	15	0	35	0	0	5.94			4.38			1.56		
1957	42	3	4	46	17	6	5.27			5.86			-0.59		
1958	43	16	8	31	7	6	5.48			3.92			1.56		
1959	45	2	0	27	5	0	5.64			3.81			1.83		
1960	44	8	10	28	6	0	5.56			3.54			2.02		
1961	45	2	0	25	13	0	5.64			3.21			2.43		
1962	45	15	3	25	19	0	5.72			3.24			2.48		
1963	46	0	10	71	14	0	5.76			8.96			-3.20		
1964	46	0	10	-	-	-	5.76			-			-		

(a) Sellers are liable for agreed rates of freight and insurance and buyers for any additional charges.

(b) c.i.f. U.K. ex-duty

Source: Snape, R.H. op. cit. and Czarnikow Sugar Reviews.

APPENDIX 4

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