LABOUR DISPLACEMENT

IN A

LABOUR-SURPLUS ECONOMY:

THE SUGAR INDUSTRY

OF

BRITISH GUIANA

By

EDWIN P. REUBENS

and

BEATRICE G. REUBENS

Kingston, Jamaica

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF THE WEST INDIES, JAMAICA.

LABOUR DISPLACEMENT

IN A

LABOUR-SURPLUS ECONOMY:

THE SUGAR INDUSTRY

OF

BRITISH GUIANA

By

EDWIN P. REUBENS

and

BEATRICE G. REUBENS

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH

UNIVERSITY OF THE WEST INDIES, JAMAICA.

FOREWORD

The present report was initiated by the Institute of Social and Economic Research of the University of the West Indies at the request of the Minister of Labour, Health and Housing of British Guiana. For this purpose the Institute engaged the services of Dr. Edwin P. Reubens, Professor of Economics at the City College of the City University of New York, and author of a previous Institute study on "Migration and Economic Development in the West Indies", and Dr. Beatrice G. Reubens, sometime Lecturer in Economics at Barnard College, Columbia University.

The field work for this study was done in 1961 in British Guiana, Jamaica and Trinidad. The report owes much to the courtesy and co-operation of many persons in the sugar industry, the trade unions and the Government of each of these territories, and to the Director and staff of the Institute of Social and Economic Research of the University of the West Indies.

New York,
January, 1962.

CONTENTS

LIST OF TABLES

LIST OF TABLES (Contd.)

CHAPTER I

The Economic and Social Setting

Economic changes which tend to displace labour from existing employment are a matter of public concern in all nations. But such changes are particularly disturbing in the primary-producing countries whose economies are not highly diversified, are not growing rapidly, and are already plagued with widespread unemployment and underemployment. Public policy is therefore compelled to face, as a crucial problem, the issue of employment versus productivity; that is, a choice between programmes to keep employees in their present jobs while their output and earnings tend to remain low, **versus** practices which displace workers while making it possible to raise the incomes of those who remain in employment.

In British Guiana, the issue is at present centred on the displacement of labour in the sugar industry. We have addressed ourselves to establishing the facts and their implications for the period from the late 1940's to the present time. To throw light on the situation in British Guiana we have drawn upon relevant experience and policies in other British Caribbean territories.

The present chapter sketches the economic and social background of the British Guiana sugar industry, in terms of the state of the local economy, the degree of economic dependence upon sugar, and the local and international conditions affecting the sugar industry. Chapter II sets forth in detail the employment trends in the sugar industry since the Venn Report was completed in 1949. Chapter III indicates the underlying technological changes — both mechanical and non-mechanical — which have affected employment, and considers the prospects for further changes of these kinds. Chapter IV, concerned with the financial effects upon the companies, traces costs in relation to the trends of technology, employment, wages and prices. In Chapter V we present the available evidence on the impact of labour displacement as regards the individual workers, and current practices to alleviate that impact. Chapter VI summarizes the preceding chapters, with a view to the underlying causes of labour displacement and the policy implications.

A. The Economy of British Guiana

British Guiana is a low-income, primary-producing country of the export-economy type, but has some special characteristics of its own. Occupying an area not much smaller than Great Britain, the population of British Guiana numbers only 560,000. Almost all of this population is concentrated on the narrow strip of rich alluvial soil along the coast, which is devoted chiefly to the cultivation of sugar cane and rice. As this strip lies in part below the high-tide level of the sea and the rivers, and as seasonal rainfall is heavy and the water-table is high, large expenditures are required for water-control, including an elaborate system of dykes, drainage canals and pumping stations.

The interior is mostly uninhabited and undeveloped. It is poor in soil quality, and its mineral and lumber resources are difficult and expensive to utilize; it remains in tropical forest and savannah, except for a few enclaves, notably the recently established settlements for mining bauxite and manganese, and the Govern-

ment's new rice-land development projects which are to extend back from the coast and the rivers.

Besides the geographic pattern, another special feature of Guianese society is the ethnic division. Slightly over half of the population today is descended from migrants from India, thus differing sharply with the great preponderance of people of African origins in the other British Caribbean territories (only in Trinidad is there a substantial minority of East Indians). The Guianese population also contrasts sharply with the Latin and native Indian peoples of neighbouring countries in South and Central America. In addition, the East Indian group in British Guiana shows the fastest rate of natural increase, and thus tends to increase its preponderance. The other chief group, consisting of persons of African descent, accounts for almost 35 percent of the total population today; persons of mixed origins, together with Europeans, Chinese and others, make up the remainder.[1]

Much of social structure and political behaviour in British Guiana tends to split up along these racial lines. In addition, nationalistic and ideologic attitudes promote hostility toward the "expatriate" companies in sugar, bauxite, etc. The trend toward urbanization, present in British Guiana as in most developing countries, brings not only social dislocation and overt unemployment but also an aggravation of the racial issue. For the African people tend to gravitate into Georgetown, (especially upon losing their occupations in the countryside), while the East Indians tend to stay on the land and move into the new rice projects. This brings into dispute the scope of the Government's developmental schemes to raise incomes and absorb the unemployed, and especially the distribution of these schemes among regions and occupations.[2]

In aggregate economic terms, British Guiana at present is rather more prosperous and diversified than many other countries of the primary-producing type, and has shown appreciable growth during the past decade, but seems to have slowed down in recent years (Table I-1).

The figure for British Guiana's gross domestic product **per capita** in 1954 was about $389 (W.I.), slightly above the corresponding level for Jamaica, but considerably below that for Trinidad.[3] By 1960, the B.G. figure had climber $434 **per capita.** Although substantially outstripped by both Jamaica and Trinidad on that date, this figure was equivalent to about U.S. $250 at current exchange rates. British Guiana is thus near the top of the group of "underdeveloped countries" which together comprise two-thirds of the world's population, but obtain only about one-seventh of the world's income.[4]

In trend over these years, British Guiana's gross domestic product (total, not **per capita)** grew during 1952-57 by 5.2 per cent a year in real terms (current prices deflated by consumer price index). Owing, however, to a recession in 1958 and

[1]Colonial Office, **Annual Report,** British Guiana, 1959, p. 20

[2]On the causes of the drift of population from the countryside to a few large commercial cities in all the underdeveloped countries today, and the consequent social and economic problems, see W. A. Lewis, "Employment Policy in an Underdeveloped Area", **Social and Economic Studies,** Vol. 7, No. 3, Sept. 1958, pp. 43-45. Professor Lewis is sceptical of proposed measures, to cope with these problems, whether in the cities or in the rural areas.

[3]Carleen O'Loughlin, "The Economy of British Guiana, 1952-56", **Social and Economic Studies,** Vol. 8, No. 1, March 1959, p. 7, gives $389 for 1954. Recomputation of the British Guiana figure, with revised estimates of G.D.P. and population, yields a **per capita** figure of $404 for 1954, as shown in Table I-1. Allowing for the role of overseas income transfers, which are relatively larger for British Guiana than for Jamaica, but also allowing for the purchasing power of money, which is slightly higher in British Guiana than is indicated by the exchange rate of the W.I. $ against the Jamaican £. Dr. O'Loughlin estimates that real personal incomes per head in the two territories were probably about equal in 1954.

[4]Proportions derived from P. N. Rosenstein-Rodan, "International Aid for Underdeveloped Countries", **Review of Economics and Statistics,** Vol. XLIII, No. 2, May 1961. Table I-B. The top of the income bracket for this group is taken here as U.S. $300 of gross national product **per capita.**

TABLE I — 1. GROSS PRODUCT AND CAPITAL FORMATION OF BRITISH GUIANA AND SUGAR INDUSTRY SECTOR ‡

(aggregate values in $000,000 W.I., at prices of each year)

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Total gross domestic product at factor cost (G.D.P.)	108.7	119.5	135.0	150.6	160.8	178.0	193.9	193.9	209.9	226.6	214.6[1]	219.8[1]	242.9[1]
Product originating in sugar industry[3]	not available				32.1	35.0	31.0	30.2	31.5	37.7	37.2[2]	34.4[2]	43.2[2]
Sugar percentage of total G.D.P.					**20.0**	**19.7**	**16.0**	**15.6**	**15.0**	**16.6**	**17.4**	**15.7**	**17.8**
Total gross capital formation (G.C.F.)	25.8	23.6	25.9	34.7	26.5	24.4	38.4	46.0	48.1	63.5	56.7[4]	56.6[4]	81.6[4]
Total G.C.F. percentage of total G.D.P.	**23.7**	**19.8**	**19.2**	**22.2**	**15.8**	**13.7**	**19.8**	**23.8**	**23.0**	**28.0**	**26.4**	**25.7**	**33.6**
G.C.F. originating in sugar industry	not available				0.99	5.5	0.8	2.8	5.3	not available			
Sugar G.C.F. percentage of total G.C.F.					**3.8**	**22.7**	**2.1**	**6.1**	**11.1**				
G.D.P. **per capita** of whole population (in $ W.I.)			354				404			450			434[1]

‡ **Sources:** Statistical Bureau, British Guiana, **Quarterly Statistical Digest,** Tables 12 and 13; also special tabulations provided by the Government Statistician.

[1]Revised figure as of June 1962.

[2]Revised figures as of March 1962.

[3]The trend of these sugar estimates agrees broadly but not perfectly with data on the industry's production (Table II-1), exports (Table I-3), and net sales proceeds of the B.G. sugar industry which were as follows:

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
£000,000 W.I.	25.4	31.4	40.1	41.8	40.4	42.2	44.6	54.1	53.1	50.0	57.6

[4]Provisional figures.

slow recovery in 1959, the real growth rate for the whole period 1952-59 was only 3.2 per cent[5] a year.

These rates are far below the achievement of Jamaica and Trinidad during the corresponding period.[6] Furthermore, even the modest gains shown by British Guiana rest precariously on a favourable turn in the terms of trade which is due largely to the Commonwealth Sugar Agreement raising the negotiated quota price, while the import prices of manufactured goods declined. The gains in G. D. P. also include the large factor incomes which are paid abroad. When deduction is made for these two items, with a view to determining the real developmental trends within British Guiana, the adjusted growth rate for national income during 1952-57 falls to a mere 2—3 per cent a year.[7]

Since population is growing by about 3 per cent a year, it appears that economic expansion — at the adjusted growth rate, during the most vigorous period — has barely kept pace with natural increase. Since 1957, slower economic growth implies an actual decline in available **per capita** income.

The high rate of natural increase indicated above is the outcome of a persistently high birth rate combined with a remarkably reduced death rate. In the years 1957-1958-1959 the crude birth rate per thousand of the population stood at 44.5—44.5—42.8, which is not far from the highest levels observed anywhere in the world. In contrast, the crude death rate during those same years was low and still declining at 11.6—10.2—10.2, reflecting especially the vast success of the postwar anti-malarial campaign which drove the death rate down from its former levels of 25 or more per thousand. The resulting present differential, upwards of 32 per thousand, provides the heavy pressure of population upon the means of support.

The effects of this population pressure are evident in the lagging trend of employment, together with the high and rising levels of unemployment and underemployment. For data on this matter, the findings of the 1960 Census not being available as yet, we rely upon the special survey of the B.G. labour force conducted in 1956 by an expert of the International Labour Office (commonly known as "the McGale Report")[8], supplemented by estimates for the subsequent years by the Government Statistician.[9]

According to the data in the McGale Report, about 39 per cent of the total population is in the labour force (defined as those who are gainfully at work, plus the unemployed who are seeking work). Of this labour force, not quite two-thirds (63 per cent) were males; 37 per cent were females. Table I-2 shows that almost half of the labour force consisted of employees working for wages; that over one-third were self-employed (mostly rice-farmers, tradesmen, and other service personnel); and that 18 per cent were unemployed on the survey date. It must be noted that the high indicated rate of unemployment — amounting to nearly 30,000 persons — is a seasonal peak rate, resulting from the decision to make one of the

[5]Peter Newman, "The Economic Future of British Guiana", Social and Economic Studies. Vol. 9, No. 3, Sept. 1960, p. 264. The 1960 figure was only 7 per cent above 1957 in money terms, and very little above 1957 in real terms.

[6]Federal Statistical Office, National Income Statistics, No. 1 of 1960, Table 5 (p. 22) shows annual growth rates at 8 per cent or more for Jamaica and Trinidad during 1953-57 (using "Consumers Expenditure" deflated by consumer price indices); figures given for the whole National Income and Product, Tables 3 and 4, op. cit., after similar deflation, show still faster growth.

[7]Newman, op. cit., pp. 264-266.

[8]I.L.O., Report to the Government of British Guiana on Employment, Unemployment and Underemployment in the Colony in 1956 (Geneva 1957). The most reliable data in this report come from a sample survey taken in the week ended 14 July, 1956, in the out-of-crop season for the sugar industry when unemployment was known to be high. The survey area covered the inhabited coastlands and the accessible settlements in the interior, altogether containing about six-sevenths of the territory's population. The usual difficulties with sampling and the questionnaire technique, as well as varying labour practices in working hours and multiple jobs, restrict the findings to an approximate account.

[9]Special memorandum "Unemployment since 1956", prepared by the British Guiana Government Statistician in August, 1961.

TABLE I—2. LABOUR FORCE, EMPLOYMENT, UNEMPLOYMENT, OCCUPATIONS, BRITISH GUIANA, MID-JULY 1956‡

Total Labour force in survey:	164,600	
At Work	135,000	
Employees[1]		76,800
Self-employed[2]		58,200
Unemployed	29,600	
Industrial Occupations of the Total Labour Force:		
Agriculture, mining and quarrying,	66,600	
rice cultivation and milling,		26,000
sugar cultivation and processing,		27,300
mining and quarrying,		1,900[3]
other primary activities[4]		11,400
Manufacturing[5]	19,200	
Building and construction	11,500	
Transport and communications	8,200	
Distribution	18,400	
Public administration, finance and professional services	15,300	
Recreation and other services	15,300	
Never worked in any industry	10,100	
Total	164,600	

‡ Table constructed from data in International Labour Office, **Report to the Government of British Guiana on Employment, Unemployment and Underemployment in the Colony in 1956** (Geneva, 1957), Tables 3 and 4. Original data were obtained by sample survey in mid-July 1956, in the area of the inhabited coastlands plus accessible settlements in the interior, altogether accounting for an estimated 86% of the total population. Figures given here have not been blown up to represent the total population.

[1]Includes 3,200 apprentices and learners, and 3,700 persons "employed but not at work during the survey week" (allocation based on the cited **Report**, p. 14).

[2]Includes 14,600 "Unpaid family workers", and 2,700 self-employed persons who were "not at work during the survey week".

[3]Under-represented in the sample. True total figure believed to be nearer 4,000 (**Report**, p. 11).

[4]Includes cattle-raising, fishing, forestry, miscellaneous crops.

[5]Includes dressmaking, tailoring, other handicrafts.

two labour force surveys in mid-July, an off-season for agriculture. Unfortunately the other survey, in late September, was affected by an unusually heavy rainfall, and therefore does not adequately reflect the seasonal peak of employment. There is no question, however, that resurgence of activities in agriculture in the fall of each year, and again in spring, considerably reduces the level of seasonal unemployment. Averaging the in-crop and out-of-crop periods, the Berrill Report estimates unemployment in 1956 at 14 per cent of the labour force.[10]

The extent of underemployment is still more difficult to measure. Adopting the criterion of less than 30 hours (four days a week) worked during the first survey week (mid-July), the McGale Report found that 20,200 persons — 15 per cent of the total number at work — were "underemployed". Of these, 15,000 were in the rural areas. The underemployed constituted the following percentages of the total number at work in the principal industries:[11]

	%
Sugar	15.8
Rice	11.1
Other agriculture	21.4
Manufacturing	17.3
Distribution	12.4

The figures on underemployment in sugar and other branches of agriculture reflect seasonal slackness as well as overcrowding on the land. The substantial

[10]K. Berrill, **Report on the British Guiana Development Programme, 1960-64**, pp. 14-15.

[11]McGale **Report**, Ch. V.

percentages shown for manufacturing and for distribution reflect the narrow scope for economic activity in the many small dressmaking shops and petty trading ventures which are included in those "industries" and have multiplied far in excess of effective demand. For the whole category of the self-employed, who commonly extend their working time to very long hours in the hope of raising their total earnings, an additional measure of "underemployment" was made by comparing their declared earnings with a certain minimum standard (namely, the minimum rate for daily-paid manual workers in government employment, viz. $15 (W.I.) a week for men and $11 for women). By this measure, 55 per cent of the self-employed males and 72 per cent of the females had either zero earnings or sub-standard earnings.[12]

The occupational pattern of the labour force reveals the degree of diversification in the British Guiana economy. According to the data in Table I-2, the "primary occupations" in 1956 accounted for just over 40 per cent of the labour force; five-sixths of this category being in rice cultivation and milling together with sugar cultivation and processing (in nearly equal numbers for rice and sugar), while mining and quarrying employed very few persons. Manufacturing (excluding rice milling and sugar processing) provided occupation for nearly 12 per cent of the labour force, while construction and transport and communications occupied another 12 per cent, so that these four "secondary activities" engaged almost one-fourth of the whole labour force. Service activities, listed in the remaining categories, accounted for nearly 30 per cent, together with 6 per cent who had never established any occupational tie. This pattern suggests a considerable departure from the traditional economy, which was overwhelmingly agrarian in occupation. Yet it must be recalled that much of the activity under the categories manufacturing and services is in those handicrafts, petty trading, domestic service and public works projects which are not socially valuable production, but rather socially wasteful duplication. The individuals concerned often overcrowd these handicraft and service activities, not so much in pursuit of attractive opportunities there as in flight from the lack of opportunities elsewhere.

These occupational proportions are broadly correlated with the industrial origins of the gross domestic product. Using the O'Loughlin estimates for 1956, primary activities (including, as before, farming, forestry and fishing as well as cane and rice milling and oil pressing, also mining) accounted for about 45 per cent of the total; secondary activities (manufacturing, construction, transportation and communications) for about 20 per cent; and tertiary (service) activities made up the remaining 35 per cent. This correlation suggests that productivity is roughly in proportion to numbers employed. However, when we examine production in finer detail, we find wide disparities[13]. Mining, with at most 2.5 per cent of the labour force, provided 11.3 per cent of the G.D.P.; while manufacturing, with nearly 12 per cent of the labour force, provided only 3.2 per cent of the G.D.P. The sugar industry, as set forth in Section B below, is approximately at the average for productivity of the whole economy. These relationships tend to reaffirm the conclusion that some occupations which account for substantial portions of the labour force are in fact overcrowded and unremunerative rather than attractive and rewarding; the highest-yielding occupations employ very few persons.

The trends of employment and unemployment since 1956 give no basis for contentment. Absolute declines of employment have occurred in the categories sugar, residential construction, gold mining, and Government employment. Absolute in-

[12]Data on underemployment derived from the McGale Report, pp. 31-33.
[13]O'Loughlin, op. cit., Table 5, p. 26; and McGale Report, Table 4, p. 86.

creases have been noted in bauxite, manganese, rice and retail trade. On balance, according to the Government Statistician[14]

> .....it is quite probable that contraction of employment opportunities in some sectors may well have counter-balanced expansion in other fields. At the same time, the annual increase of the labour force is estimated at about 6,000. The conclusion therefore, is that the probabilities are strongly in favour of the view that unemployment is running at a significantly higher level, both absolutely and relatively, than the I.L.O. expert found in 1956.

Looking to the future of the economy, British Guiana presents numerous potentialities which might be realized by the expenditure of much money, effort and time. While the prospects for expansion in sugar are not bright (see below, Section D), the interior of the country is largely unused land which could be brought into rice cultivation and cattle raising by provision of drainage, transportation, housing, schools, medical facilities, and all the other social overhead requisites. Such projects would be a great extension of similar developments now under way along the coast. But serious questions have been raised regarding the wisdom of such heavy allocations of scarce capital, especially in view of the natural handicaps of the terrain, the high water-table, the uncertain rainfall, the lack of interest in rice farming by persons of African descent, etc.[15]

Similarly heavy outlays will be required for the development of the mineral resources recently discovered; and these minerals face an apparently worsening world market, and would not in any event provide a great deal of new employment. Manufacturing industries, to replace imports and possibly to provide exports, are under discussion in governmental circles, but have been criticized outside of those circles as uneconomic for the small size of the British Guiana market. As regards tourism, which is making a remarkable contribution to increasing prosperity elsewhere in the Caribbean area, British Guiana appears to have little to offer the foreign visitor seeking seaside recreation and entertainment.

It is significant that the International Bank for Reconstruction and Development, in making a loan of U.S. $1.25 million to British Guiana in June 1961, consigned the funds to the British Guiana Credit Corporation which makes loans to aid farming, forestry, animal husbandry and fishing; that is, mainly for modernization and expansion of the primary-producing sector (outside of sugar).[16] On the other hand, Professor Newman has recommended a bold and massive programme to transform the economy on the basis of its natural resource endowment, with large inflows of foreign capital, and along lines already undertaken in neighbouring Surinam. He declares:[17]

> . . . . . the long-run economic future of British Guiana — if it is to have one — is as an economy based predominantly on heavy industry, principally metal, wood and mineral manufactures, backed up by an efficient export agriculture and light industry.

In the absence of a huge in-pouring of foreign funds, and in view of the actual obstacles to development in British Guiana today, it seems likely that economic growth will continue to be slow during the next few years, barely appreciable in per capita terms, and hardly absorbing the additional persons seeking employment. Labour redundancy is likely to persist.

[14]Government Statistician's memorandum, cit. sup.

[15] Cf. Newman, op. cit., p. 275, who computes an incremental capital output ratio of 6 : 1 for rice land development, certainly a discouraging measure of capital absorption. See also Appendix F in the present report.

[16]International Bank for Reconstruction and Development, Press Release No. 695, June 23, 1961.

[17]Newman, op. cit., p. 278.

B. The Sugar Industry in the British Guiana Economy

Sugar is still the largest single support of the economy of British Guiana. But we have noted that the degree of "monoculture" has been much reduced in comparison with prewar years.

The most immediately relevant measure is the importance of the industry in providing employment. Lacking the results of the 1960 Census, we must rely upon the McGale Report for 1956. In July of that year, one of the slackest months in sugar, the sugar industry accounted for 17 per cent of the total at work.[18] At this time, the numbers at work in the rice industry actually surpassed those in sugar by 1,500 persons, while those recorded as occupied in "Manufacturing" numbered only 5,400 fewer than the 22,800 listed for the sugar industry.

Considerably greater dependence upon sugar employment might be expected during the harvest months. Since the I.L.O. survey happened to be made during a rainy week in September, the results are an understatement of the importance of both sugar and rice employment. Employment in the sugar industry was placed at 30,000, or 22 per cent of the occupied labour force of September 1956. If an average for the year is struck, guided by data from the British Guiana Sugar Producers' Association, the sugar industry provided about 28,500 jobs of all kinds, or 21 per cent of all the positions held by members of the British Guiana labour force. More realistically, wage employment in the sugar industry should be measured against wage employment in other industries, excluding owners, self-employed, supervisory and clerical employees. On this basis, the sugar industry, counting field and factory, provided about one-third of all the wage employment shown in Table I-2.

While reliable labour force figures for 1960 are lacking, an estimate for the same coverage as the 1956 study would show a labour force of about 188,600 in 1960. If the unemployment rate is assumed to be about 20 per cent, the number at work in 1960 would be 150,880.[19] Average employment in the sugar industry, on a basis comparable to the average figures given above for 1956, would have been about 23,000 in 1960, or 15.2 per cent of the working labour force. If the comparison is confined to those in wage employment only, the sugar industry accounted in 1960 for just under one-fourth of the jobs in British Guiana. There has therefore been a decrease since 1956 in the share of jobs provided by the sugar industry.

It may be suggested that the indirect economic benefits of the sugar industry should be counted along with the direct contribution to employment. On the assumption that all the service industries are dependent upon the flow of production, employment and income generated in the so-called "basic" industries, we may assess the importance of the sugar industry in the economy in terms of its share of the "basic" industries, namely, agriculture, mining and manufacturing. These three industries provided employment to 76,000 persons in July 1956, according to the I.L.O. Survey. Of this total, the sugar industry accounted for 30 per cent. A similar computation in terms of national product in 1956 shows that the sugar industry's contribution was 32 per cent of the total value product of the same three "basic" industries.[20] Thus, the sugar industry was responsible at most for one-third of the "basic" support of British Guiana's economy.

[18]McGale Report, Table 4. These figures count owners, self-employed, supervisory, clerical workers, etc., but omit the unemployed.

[19]The I.L.O. report gives, in Appendix A, some projections of the labour force to 1966 which imply, on the low side, an annual increment of 5,740 persons per year and, on the high side, 6,840 persons per year. The Government Statistician, in the communication cited above, estimates the annual increment at about 6,000 persons. He also suggests that unemployment is at a higher rate than the 18 per cent of the 1956 I.L.O. report. These figures are consistent with those in the Berrill Report, pp. 14-16.

[20]Percentage derived from Table I-1 above, and O'Loughlin, op. cit., Table 5.

In terms of total value produced, as seen in Table I-1, the direct contribution of the sugar industry was at its low point in 1956, when it provided only about 15 per cent of the gross domestic product of British Guiana. This level was reached after several years of decline from 1952 onward. But in the years after 1956, the total value produced by the sugar industry rose in both absolute and relative terms.

The direct contribution of the sugar industry to the gross capital formation of British Guiana has also been modest. According to the available data, which only cover 1952-56, as shown in Table I-1, sugar investment during this period ranged widely from a low of 2 per cent of the territory's total to a high of 22.7 per cent; and was almost always well below this industry's percentage contribution to the total gross domestic product of the economy. The fact that the estimated total of gross capital formation has been rising rapidly, both in absolute amount and in percentage of the total gross domestic product (well over 20 per cent in recent years), is not to be attributed in any large part to direct undertakings by the sugar industry as such. On the other hand, the prosperity of sugar during this period has provided much of the funds, which, by way of personal incomes, inter-industry purchases, and taxation, have provided the increased investment in private construction and governmental projects.

The actual contribution of the sugar industry to governmental finance in British Guiana is substantial. In recent years 45 per cent of the government's revenue from income tax and excise duties was derived from sugar and its by-products.[21] But all income and excise duties provide less than half of the total revenue of the territory, since about two-fifths of the total comes from customs duties and the remainder comes from a variety of charges.[22] Thus income and excise taxes on sugar and by-products contributed roughly 20 per cent of the total revenue of government in 1954 and likewise in 1957. Additional sums were paid in customs duties, property taxes, etc. These charges altogether come to a somewhat larger percentage of total governmental revenue than sugar's share of the national income.

The sugar industry also makes a special contribution to consumers' welfare in British Guiana by way of the low price at which it is required to sell sugar for the local market. This price is well below the export-price levels: not only below the Commonwealth Agreement price, but also below the free-market price at which little if any profit is made. In 1960, when the average price realized by the sugar producers was $178 (W.I.) per ton, the local sales price was $134; as the free-market price in that year was $143 per ton, the industry gave up $9 per ton, on nearly 20,000 tons sold locally, representing a total sacrifice of almost $180,000 (W.I.). The importance of this "subsidy" to the individual consumer may be gauged from the fact that the average working-class family in British Guiana spends about half of its weekly outlay on food items of all kinds, but among these sugar is a very minor element.[23] While it is thus a negligible cash benefit to the individual, the subsidy carries a political and social significance.

More substantive is the contribution of sugar to British Guiana's exports and her balance of international payments. Although the expansion of mining and of rice cultivation during the years since the second World War has cut into the prewar dependence of the economy upon sugar, the exportation of sugar, molasses and rum still accounts for over half of the country's total exports by value, as may be seen in Table I-3. Of the other exports, bauxite represented about one-fourth of the total in 1959, and rice was next with about 12 per cent; the remaining 12 or 13

[21] Bookers Sugar 1954, p. 19; also B. G. Sugar, No. 21, Feb. 1958.
[22] British Guiana, Quarterly Statistical Digest, Table 16.
[23] Survey of Family Expenditures, 1956.

per cent of the exports were provided chiefly by timber, diamonds, and gold. British Guiana's total exports chronically fall short of her total imports on visible account. The importance of sugar is such that in most years a drop of about 15 per cent in the value of sugar exports would approximately double the deficit on visible trade.

TABLE I—3. SUGAR AND OTHER PRINCIPAL EXPORTS, AND TOTAL TRADE, BRITISH GUIANA, 1949 — 1959‡

($000,000 W.I.)

Principal Commodity Exports	1949	1950	1954	1956	1958	1959
Sugar	21.1	23.1	41.4	43.6	54.7	46.4
Molasses	.4	.6	1.2	.9	2.6	2.3
Rum	4.8	3.6	2.3	3.8	3.5	3.5
Bauxite	12.0	13.8	23.2	29.3	20.6	24.9
Rice	3.1	3.9	9.3	9.8	4.8	12.5
Total exports of merchandise[1]	46.0	50.7	85.4	94.7	97.2	103.5
Total imports of merchandise[2]	49.8	55.1	79.9	99.9	116.0	110.6
Balance of visible trade	-3.8	-4.4	+5.5	-5.2	-18.8	-7.1

‡ 1949 and 1950 data from Colonial Report, **British Guiana 1950**, pp. 46-49 1954-1959 data from British Guiana, **Quarterly Statistical Digest**, December 1960, Tables 30 and 37.
[1]F.O.B. Includes re-exports.
[2]C.I.F.

In more qualitative ways, the sugar industry makes numerous contributions to the economy and the whole society which are difficult to measure precisely. The drainage and irrigation system maintained by the sugar estates provides water control and piped water supplies that benefit the whole population. Similarly, the roads and water-transport systems, the malaria control and health centres, and various research and training activities carried on by the sugar companies, serve the populace as a whole.

In the final analysis, the social contribution of any industry depends upon the economic efficiency with which it uses the available resources. Sugar is said to be "a supremely efficient user of land", as compared with other agricultural crops.[24] This assertion rests upon the value yield per acre in sugar compared with that of rice or ground provisions. In 1949-1953, the wage bill alone per acre of sugar was nearly double the whole value per acre of the milled rice crop; the difference was even greater in the case of ground provisions. It has recently been calculated that a peasant family cultivating five acres of sugar cane manually could obtain a net return of not less than $1,300 a year, while the same family growing rice manually on five acres would net only $699.20; both estimates allow for the value of family labour.[25]

Comparing sugar with other industries in British Guiana, we find that the value product of sugar per employee in 1956 was fairly close to that for the average of all industries.[26] For cane cultivation alone (i.e. excluding milling), the field employment amounted to 16 per cent of the 1956 survey total at work, or 14 per cent of the survey total extrapolated to the whole population; while the value product of cane came to 10 per cent of the gross domestic product.[27] This was quite a high

[24]**Bookers Sugar 1954**, p. 19.
[25]Letter from the Director of Agriculture, 4th January, 1962.
[26]Sugar employment (field plus factory) accounted for about 21 per cent of the survey total at work, or 18 per cent of the total extrapolated to the whole population. Sugar value product was estimated at 15-16 per cent of G.D.P. (Table I-1).
[27]Computed from data in Table II-4, Table I-2, and O'Loughlin, **op. cit.**, Table 5.

relative performance for an agricultural industry; in most countries agricultural productivity per worker runs far below the national average, and usually falls between one-third and one-half of productivity in industry.[28]

C. Character and Problems of the British Guiana Sugar Industry

The relatively high productivity per acre of sugar cane arises from its basic suitability to tropical conditions as well as from scientific improvements in the application of labour and capital in cane cultivation. The physical advantages of sugar cane in the tropics have been well summarized as follows:

(1) the cultivation of sugar cane maintains soil fertility to a remarkable degree;
(2) . . . . cane resists the ravages of tropical storms far better than any other crop which can be grown in our area; and cane is also drought-resisting;
(3) . . . . the sugar cane bagasse supplies the fuel for operating the factories;
(4) . . . sugar will maintain more labour per acre than any other crop, except bulb growing and tomato cultivation.[29]

Thus, while it is possible to use small portions of land more productively in market gardening than in sugar, it is not easy to find in the tropics another crop that will employ large numbers of workers and extensive acreage with a productivity equal to that of sugar.

While sugar cane thus offers great advantages for tropical agriculture in general, there are special problems in British Guiana arising from the peculiarities of its terrain and climate. As the Handbook of the British West Indies Sugar Association describes this region:[30]

> The coastal sugar belt is, in effect, a mud-flat of seaborne silt and clay from the Amazon and other large South American rivers. The estates run more or less in narrow strips from the sea front and rivers to the swamps behind; the land adjoining the sea lies below high tide level; the ocean is kept out by a sea wall and on most estates the rain fall has to be pumped off the land. Only those estates which lie on the banks of the rivers have any degree of natural drainage. These difficulties have made necessary an almost unique system of high and low level canals, the low for drainage and the high for cane transport and irrigation. This country has the further disadvantage of two rainy seasons, one in December to February, the other in May to July; so that there is seldom a long enough ripening period. Yields of cane are heavier than in many other countries, but on the other hand the sucrose content is on the whole less.

Because of these local peculiarities, sugar-cane cultivation in British Guiana involves special techniques, extra effort, and more urgent timing than in most other producing countries, and tends on the whole to show relatively higher costs. The unique necessities of water control involve a vast amount of work in building seawalls, digging canals and ditches, maintaining them in operative condition, pumping out excess water, and so forth. Similarly, the heavy soil requires much preparation, and the luxuriant growth of weeds and pests calls for much tillage or chemical control measures. The terrain presents many obstacles to the mechanization of field operations and transportation, although it has not prevented considerable mechanization, as discussed in Chapter III below. In particular, the terrain makes necessary the special system of cane transport by means of "punts" on the canals. The seasonal pattern of two grinding periods a year, with relatively short intervals between them, places extra burdens on the sugar factories as regards the time

[28]Cf. A. R. Burns, **Comparative Economic Organization** (New York, Prentice-Hall, 1955), pp. 44-45; and Colin Clark, **The Conditions of Economic Progress** (London, Macmillan, 1951), pp. 316-319.

[29]British West Indies Sugar Assn. (B.W.I.S.A) **Sugar in the West Indies and British Guiana, 1958 Handbook, p. 4.**

[30]**Op. cit. p. 16**

available for cleaning and overhaul of the equipment. On the other hand, the local conditions make possible the British Guiana practice of flood-fallowing (covering a fallow field with standing water) which in turn promotes successful extension of ratooning (the successive re-growth of cane from the root-stock left in the ground at harvesting) for many years longer than was previously supposed feasible, and thus considerably reduces the toil of more frequent re-planting.

The difficulties and challenges presented by local conditions have stimulated a great deal of research, both independently by the British Guiana sugar companies and also in co-operation with other West Indian producers. Many of the findings and the consequent technological changes — both mechanical and non-mechanical — have improved efficiency and warded off disasters; and usually have also affected the labour requirements per unit of output (see Chapter III).

At the end of the second World War, we have been told, British Guiana was a comparatively high-cost producer of sugar within the British West Indies group, which in turn had comparatively high costs relative to Cuba and other world producers. Thus the Venn Report stated that British Guiana "has inherently higher costs of production than any other area in the Caribbean". The Report presented a comparison of British Guiana with Barbados in 1945-47, from which it was concluded that "the costs of raising cane are somewhat higher, those of its processing more than half as high again, in British Guiana."[31]

The relation of West Indian costs to other producers is shown in Table I-4 (using "units of American practice"), which indicates that in U.S. cents per pound West Indian costs of sugar at the factory were about middling for cane, while in tons of sucrose per acre of cane the West Indies made a rather poor showing in 1944-45. The relatively high costs in British Guiana in 1945, according to data in the Venn Report converted as far as possible into presumably comparable units, are shown on the last line of Table I-4. Since 1945, substantial advances in technology have occurred in many sugar-producing countries, altering their ranking in level of costs.

In addition to its peculiar natural features and their effects on costs, British Guiana is remarkable for the ownership pattern which prevails in the sugar industry. Unlike Jamaica, Trinidad and Barbados, where peasant cane-farmers grow a substantial portion of the cane, the large estates in British Guiana supply virtually all of the cane to the factories. Furthermore, the estates in British Guiana are largely owned and entirely managed by two companies (Appendix A). One company, Bookers Sugar Estates Ltd., is responsible for about 80 per cent of the sugar output of British Guiana. No such dominance of one company can be found on the larger islands of the British West Indies.

The firm of "Booker Brothers, McConnell & Co., Ltd.", with headquarters in London, is the head of the "Bookers Group" which consists of some one hundred companies operating in the United Kingdom, Canada, Trinidad, Jamaica and Central Africa as well as British Guiana. In British Guiana alone, the Group's chief activity is sugar production, managed by "Bookers Sugar Estates, Ltd."; but other Bookers' companies in that territory carry on rum distilling and marketing, drug manufacturing, printing, stock-feed production, balata extraction, shipping, retail and wholesale distribution, insurance, advertising, and other activities.

In the other parts of the world where Bookers operate, they are engaged in wholesale and retail distribution, agriculture and light manufacturing, and heavy manufacturing of sugar machinery and pumps. The organization thus shows diversification with a certain common core, also close operating links as well as financial ties among the component companies, and a managerial tradition of loyalty to the

[31] Colonial Office, Report of a Commission of Inquiry Into The Sugar Industry of British Guiana (H.M.S.O., 1949), p. 156 and pp. 149-50.

TABLE I—4. COMPARATIVE COSTS OF PRODUCTION OF SUGAR,[1] 1944 — 1945 ‡
(in units of American practice)[2]

	U.S. ¢ per lb.	Short tons sugar per acre
Beet Sugar		
U.K.	4.75	2.09
U.S.A.	4.1	1.96
Cane Sugar		
Queensland	2.7	3.16
Louisiana, U.S.A.	3.1	1.79
Cuba	1.5	2.35
Puerto Rico	2.3	3.57
Natal	1.55	3.67
Java	n.a.	6.0[3]
Philippine Is.	n.a.	2.5
Hawaii	n.a.	7.0[3]
West Indies	2.0	3.02
British Guiana	3.0	2.66

‡ All figures, except for British Guiana, from A. Van Hook, Sugar, (Ronald Press, New York, 1949), pp. 92, 111. Figures for costs in British Guiana computed from cost of production in 1945 given in Venn Report, p. 150, converted by current exchange rates into units of American practice. Figure for sugar per acre in 1945 from Venn Report, p. 21.
[1]Factory cost of 96° sugar.
[2]Values in U.S. cents per pound; tonnage in U.S (short) tons.
[3]"The soils of both Java and Hawaii are of volcanic origin and extremely fertile". (Van Hook, op. cit., p. 92).

House. A somewhat similar pattern, although on a much smaller scale, is characteristic of the Demerara Company, which is the sugar-producing subsidiary of Sandbach Parker and Company, Ltd., another large diversified enterprise.

The sugar estates, while owned and directed from abroad, were involved not only in an economic enterprise but also in paternalistic and quasi-governmental functions, including housing, water supply, sanitation, medical care, etc. As late as 1950, most of the sugar workers lived in the "ranges" on the estates, the resident population there numbering 78,200 persons, or nearly one-fifth of the total population of the Colony.[32] Such dependency on the part of workers tended to induce feelings of both helplessness and resentment; while at the same time management felt burdened by heavy and unsuitable responsibilities. These difficult relationships were rendered all the more acute by the redundancy of labour and the seasonal alternations of agriculture.

Until recent years, these labour difficulties, together with the depressed market for the product, tended to perpetuate both inefficiency and misery in the sugar industry of British Guiana. According to the present top executive of Bookers, commenting on his first visit to this region during the middle 1930's: "the sugar industry was dependent upon, and utterly demoralised by, a system of cheap labour following from slavery and the indenture system".[33]

During the last decade, however, a number of changes and improvements have been made both within the sugar industry — as the result of technical progress and new institutional arrangements — and also outside the sugar industry, as new opportunities for workers have opened up. The changes in technology and personnel practices are described in subsequent chapters. Here it is worth noting in addition certain new welfare benefits provided by joint action of the Government, the unions and the companies: particularly the replacement of estate housing (the so-called "ranges") with freehold village houses sold to individuals on long-term

[32]Colonial Report for 1950, cit. sup., pp. 16-19.
[33]Sir Jock Campbell, Chairman of Booker Bros., McConnell & Co., in an unpublished paper given in a 1959/60 seminar at the London School of Economics.

credit; also the provision of recreation and cultural centres for sugar workers; and the general advance of collective bargaining.

D. British Guiana in the World Sugar Industry

Underlying these advances, and making them possible, is the dramatic improvement in the export market for British Guiana sugar since the second World War. For many decades sugar had been one of the worst cases of a staple agricultural product suffering from chronic over-supply relative to the effective demand. Because of the large and inelastic — or indeed perversely elastic — supply of sugar, the market in many periods could not be cleared at a price that would cover the costs of most of the producers. As Table I-5 shows, world production has climbed strongly in recent decades. Acreage has been expanded, yield per acre has been raised, and sugar extraction per ton of cane or beets has been enlarged. Consumption has also increased, but not by enough to take off the chronic surplus. The annual carry-over of sugar stocks in recent years (1956-59) has amounted to over one-fourth of the annual world production. When the market was left free, as in the 1920's and the early 1930's, sugar prices were disastrously low.

The conditions facing the sugar cane branch of the industry have been specially adverse because of the competition from beets. The development of beet sugar in Europe and America, behind the protection of tariff walls, has excluded much cane sugar from its expected markets.

TABLE I — 5. BRITISH GUIANA IN THE WORLD'S SUGAR INDUSTRY ‡
('000 of long tons)

	1938-39	1950-51	1951-52	1956	1958	1959
Total world production, cane and beet sugar	27,024	33,471	36,098	39,164	46,269	48,227
Production cane sugar: British Caribbean [1]		859	892	1,026	1,070	1,107
Production cane sugar: British Guiana		196	217	263	306	284[2]
British Guiana production as percentage total world		.6	.6	.7	.7	.6[2]
British Guiana production as percentage British Caribbean		22.8	24.3	25.6	28.6	25.7[2]
Total world consumption, cane and beet sugar	27,305	31,909	33,242	39,962	43,791	44,757
Annual world carryover of stocks				10,061	12,104	14,030

‡ Yearbook, International Sugar Council; Handbook, British West Indies Sugar Association (Inc.); Bookers Sugar 1954, p. 12.
[1] Includes British West Indies and British Guiana.
[2] 1959 production dropped below trend. 1960 production recovered to 334,000 tons.

Efforts to cope with this situation have resulted in a series of marketing agreements covering the bulk of the world's sugar that is internationally traded. In the British sphere, Imperial preference was instituted after the first World War, and was followed by the Commonwealth Sugar Agreement inaugurated in 1951 and continuing today. The French community also provides preferential treatment for its producers. The United States Government has been setting import quotas at prices which are profitable to the foreign suppliers and are protective to the domestic producers (these quotas and prices, however, are currently under reconsideration and may be drastically changed).

In consequence of these and other special agreements, only a small fraction of total world production (about 15 per cent in recent years) is sold on the so-called "free" market; and even here regulation is attempted by means of export quotas under the International Sugar Agreement. This multilateral scheme, formulated in 1937 and re-negotiated in 1953 and again in 1958, became deadlocked over the Cuban quota in the negotiations at the end of 1961.

Under the special agreements, the consumers of sugar are of course subsidizing the producers. The Commonwealth Agreement in particular provides, over a sliding period always eight years forward, a guaranteed market for approximately two-thirds of each member country's production available for export, at prices which are to be "reasonably remunerative to efficient producers." The importance of this subsidy as regards British Guiana is strongly asserted in the Berrill Report. On a calculation that in 1958 British Guiana received under the Commonwealth Agreement $13 million more than its sugar exports would have been worth on the free market, the Report concludes:[34]

> Firstly, without the Sugar Agreement the British Guiana industry's prosperity would vanish; and secondly, the subsidy paid by the U.K. consumer to British Guiana **via** a high sugar price is much more important than C.D. and W. gifts.

This benefaction, however, is neither unlimited nor unreciprocated. The eight-year Commonwealth guarantee made it possible for member producers to expand acreage and modernize factories, so as to meet the United Kingdom requirements after the second World War without resort to United States dollar purchases of sugar in a period of acute dollar shortage. Furthermore, the agreed Commonwealth price is not a "cost-plus" formula which would prop up every producer, however inefficient. To be sure, the scheme does incorporate **average** increases in costs, as measured by a factor-price index — covering virtually all input elements of all the participating producers — which is applied to the 1950 base price.

Nevertheless, the scheme sets a single, uniform price for all participants (subject to some small negotiated variations), and thus puts pressure on the high-cost producers and those who get out of line with other participants, and forces them to make improvements. Moreover, as approximately one-third of total Commonwealth exports must still be sold at the low prices prevailing in the free market, there is general pressure to hold down costs of production.[35]

Under these conditions, a drive to reduce costs and raise efficiency in field and factory has prevailed in the sugar industry in most parts of the world during the past decade. Productivity in tons per acre and per man-day has in fact been raised substantially. It is not yet clear for most regions whether these changes have actually tended to reduce costs, either absolutely or relative to selling prices; in particular, the financial effects of some kinds of mechanization are still under dispute. Nor is it clear in general how the gains in productivity have been divided among workers (some retained, some displaced), stockholders, consumers, tax payments, re-investment in the industry, etc.; in particular, there appears to have been in many regions a decline in man-days worked per ton of sugar, while wage-rates have been rising. But there is no doubt that technological progress in most quarters of the world-wide industry has put almost every producer — except for those most favoured by nature or by protected markets — under heavy pressure to modernize or close down.

[34]Berrill **Report, cit. sup., p. 9.**

[35]The price level in the "free" market — representing a kind of clearance sale for remaindered sugar — fluctuates widely but has generally been at least 30 per cent below the Commonwealth negotiated price. In 1959, a year of especially low prices when world sugar prices ranged between a low of 20s. 5d. and a high of 29s. 5d. per cwt. f.a.s. Cuba, the Commonwealth negotiated price was 44s. 2d. per cwt. f.a.s Jamaica (**B. G. Sugar**, Vol. 3, no. 3, March, 1960).

All these trends brought major changes to the sugar economies of the Caribbean as the discussions leading to the Commonwealth Agreement got under way in 1949. Fixing their sights on the sugar export quotas to be negotiated under this Agreement, the British Guiana sugar companies adopted an expansionist policy. During the interval 1949-52, they raised their tonnage of sugar produced by 40 per cent (Table II-1). During this same period, production of sugar elsewhere in the British West Indies hardly changed at all (actually declining in several of the territories) while world output rose by only 27 per cent (Tables I-5 and II-3, and sources cited therein). Then in 1953 and 1954, British Guiana production slackened off, while other B.W.I. producers pushed forward (notably in Jamaica and Trinidad). Resuming in 1955, the British Guiana companies have almost steadily enlarged their output while other B.W.I. producers have fluctuated or even reduced their output. As a result, British Guiana's output of sugar grew from 1949 to 1960 by over 6 per cent a year (compound rate), and her share in the regional total has climbed (as shown in Table I-5) from not quite 23 per cent in 1950 to nearly 29 per cent in 1958 — followed by a drop in 1959 due to a poor harvest in British Guiana, but returning in 1960 to the long-term trend.

In recent years, the British Guiana companies have been fortunate in picking up the unfilled quotas of several other members of the Commonwealth Agreement, and in 1960 in obtaining a substantial portion of the very remunerative United States sugar import quota as re-allocated from the former suppliers in Cuba. But such windfall markets cannot be counted upon in the future. Consequently the prospects, viewed in the context of world supply and demand, hold out little hope for much future expansion for British Guiana sugar. The Berrill Report declares:[36]

> Because the U.K. quota is not expected to grow in the 1960's, and because production for the world at the free price is barely economic, sugar output is not expected to grow at the recent fast rate, but to creep up at 1 per cent per annum.

Executives of the sugar companies in British Guiana, while determinedly optimistic, do not disagree widely with this forecast. The outlook for the proximate years therefore is that the sugar industry will not contribute much of a positive increment to the national product of British Guiana, nor offer much expansion in volume of operations to offset decreasing employment per ton.

[36] Op. cit., p. 9.

CHAPTER II

EMPLOYMENT TRENDS, 1949 — 1960

The outstanding characteristic of employment in the sugar industry, as in most agricultural work, is its irregularity. There is, first of all, the fairly predictable irregularity dictated by the alternating seasons. In British Guiana where there are two dry and two wet seasons each year the pattern is more varied than in single-harvest countries. The spring crop brings peak harvest employment in late February, March and April followed by a sharp drop-off in the rainy months of June and July. Employment begins to mount again in August, usually reaching its high point in September; during the autumn harvest it is maintained or drops slightly through October and November. In the rainy months of December and January, employment is low, completing the seasonal alternation of wet and dry weather, and low and high employment.

Over the whole year, about four months are slack and eight months busy, but this generalization is subject to much modification from year to year, from one part of British Guiana to another, and from one estate to another. In 1960, five estates had as many as 37 crop weeks, while three had only 28 or 29 weeks. The Berbice coast appears to have a longer harvest period than other areas (Appendix D). Days of work per crop usually fluctuate between 85 and 110.

The unpredictable variations of weather from year to year, combined with day-to-day uncertainty about the amount and kind of work which can be performed within the seasonal pattern, make for an almost daily change in labour requirements. The industry is able to offer a steady year-round job to only a handful of those who labour in field and factory below the supervisory level. Except for those who are paid on a weekly or monthly basis, the companies have no obligation to offer work on any particular day, and days of idleness may come in the midst of the busiest periods.

When the cane is ready for cutting, there is great pressure to move it rapidly to the factory so that the sucrose content will not be impaired and the factory will be kept supplied for round-the-clock grinding. At such times it is almost inevitable that some labour shortages should appear in the midst of general labour surpluses. At other times the numbers of able and willing workers greatly exceed the available jobs. In 1947, the King Committee reported that throughout the year there were available no more than 3.66 days' work per week for male employees in the field;[37] the situation improved somewhat in the 1950's. (Table II-14). The Venn Commission said on this subject:[38]

> . . . . there are without doubt several weeks in every year when there is insufficient work for those willing to perform it. To a lesser extent the same is true of the factories whose grinding periods . . . are intermittent. with consequential fluctuations in their labour requirements. A minority of all factory hands, e. g. engineers and mechanics, enjoy a full year's employment, the rest working only during grinding periods.
>
> . . . . over the whole year, there are on an average perhaps one or one and a half additional days per week when work, especially field-work, could be provided for certain categories of employee. There is definitely a shortage of labour at cutting and grinding periods: there is at other times a superabundance, mainly consisting of women, young persons and the less efficient men.

[37] **Venn Report**, p. 76
[38] **Ibid.**, pp. 81-2

This statement of the situation is still largely true at present. Labour shortages appear only in the harvest period when there is an inadequate number of strong, adult males willing and able to cut cane steadily through the week.

The labour force has reacted to the uncertain and inadequate employment offered by the sugar industry by a high absenteeism rate. On the one hand, workers seek other occupations to supplement incomes, and on the other hand, they feel resentment and hostility toward the industry, as though work were being deliberately withheld. As one sugar company put it:[39]

> The effects on the outlook of the worker of an over-large labour force in relation to work available are insidious and possibly disastrous. It can and does generate an attitude of **laisser faire** towards employment—a state of mind which says "we won't get work every day so we'll work when we want to".

Supplementary occupations, particularly rice farming, are often in conflict as well as supplementary to sugar employment. But the high absenteeism rate of sugar workers is attributed to factors other than alternative occupations. Poor health and nutrition, the rigours of a tropical climate, the observance of traditional holidays, the high valuation of leisure, the weak desire for higher standards of consumption, the excessively long and hard days worked in mid-week, and the long, tedious and unpaid exertion of getting to actual work positions — all these factors have been offered as additional reasons for the high absenteeism rate.

Against this background, we discuss the main trends in employment in the sugar industry since 1949 when the Venn Commission made its report. Our main findings are set forth in seven sections which follow.

1. Since 1949 the sugar companies of British Guiana have substantially increased acreage under cane, acres reaped, tons of cane ground and tons of sugar produced. At the same time, the overall need for labour, in terms of the average weekly number of workers and the total man-days per year, has decreased absolutely.

The substantial expansion of the B.G. sugar industry is clearly visible in the successive columns of Table II-1 (see Appendix C for data on individual estates). The index numbers show that the tonnage of sugar produced rose by 92 per cent from 1949 to 1960. While the number of acres under cane was enlarged by 37 per cent during this period, the number of acres reaped rose more rapidly, by 72 per cent, reflecting the tendency to cut younger cane and to reap some acres twice in one year in the drive for greater production. Tons of cane ground increased by almost 86 per cent during the same period, in response to improved cane types and higher yields per acre, and more efficient transportation to and use of the factory. Finally, the figures on sugar produced show a still higher rate of increase as a result of the greater sucrose content of the cane, steadier supply to the factory, new equipment and larger factories, and somewhat longer grinding periods. On an annual basis, tonnage of sugar grew by over 6 per cent a year, compound rate, from 1949 to 1960.

This notable record of growth reflects the decision by management in the late 1940's to take the risky course of rapid expansion in the hope of obtaining a larger share of the market, especially in the quotas to be assigned under the Commonwealth Sugar Agreement which was then under discussion. The growth was made possible by the application of scientific discoveries and the investment of capital in field and factory, as discussed in detail in Chapter III.

Employment trends in the sugar industry have moved in the opposite direction from output. The work force was virtually stable during 1949-54 (small year-to-year variations being attributable to political disturbances in 1953, strikes, weather conditions, and the like). Subsequently a contraction of over 20 per cent occurred

[39]Bookers Sugar, 1954, p. 62

TABLE II—1. ACREAGE AND OUTPUT OF SUGAR, 1949—1960‡

Year	Amounts				Index Numbers (1949=100) of Amounts in Cols. (1) — (4)			
	Acreage under[1] cane at 31 December (English Acres) (1)	Acres Reaped[1] (English Acres) (2)	Tons of Cane[2] Ground (3)	Tons of Sugar[2] Produced (4)	(1a)	(2a)	(3a)	(4a)
1949	68,533	55,945	2,011,627	174,227	100.0	100.0	100.0	100.0
1950	71,472	64,940	2,162,848	195,651	104.3	116.1	107.5	112.0
1951	77,736	67,126	2,453,662	217,306	113.4	120.0	122.0	124.7
1952	80,022	72,787	2,672,493	242,692	116.8	130.1	132.9	139.3
1953	77,163	71,485	2,756,291	240,176	112.6	127.8	137.0	137.8
1954	78,361	78,311	2,745,698	238,922	114.3	140.0	136.5	137.1
1955	78,316	75,928	2,716,949	250,111	114.3	135.7	135.1	143.5
1956	81,012	74,028	2,837,549	263,333	118.2	132.3	141.1	151.1
1957	86,741	81,339	2,962,882	284,973	126.6	145.4	147.3	163.6
1958	87,976	84,788	3,476,275	306,361	128.4	151.6	172.8	175.8
1959	89,825	87,658	3,218,096	284,425	131.6	156.7	160.0	163.2
1960	94,103	96,303[3]	3,737,889	334,441	137.3	172.1	185.8	191.9

‡ B.G. Sugar Producers' Association

[1]Estates only. Small farmers have had 1,800 to 2,500 acres under cane, annually, 1949-1960.

[2]Estates' and farmers' canes. Farmers provided 25,000 to 60,000 tons of cane, annually, 1949-1960.

[3]Some acres reaped twice.

in the average weekly number employed in field and factory (Table II-2 Col. 1). In comparison with over 28,000 manual workers employed in field and factory in an average week in 1949, and still at that level in 1954, less than 20,500 were at work on the average in 1960 (Department of Labour series). The B.G.S.P.A. series (Col. 2 in Table II-2), which begins in 1954 and includes about 2,000 more persons than the Labour Department figures, shows much the same trend during the corresponding years, with an absolute drop of 7,000 persons from 1954 to 1960.

In view of various deficiencies in the statistics of average weekly employment, a more reliable measure of the decline of employment opportunities is the number of man-days worked annually in field and factory (see Appendix B on comparison of measures). In 1955, when the series begins, almost 6.6 million man-days were recorded. Each year thereafter shows a decline, with the low of 5.7 million in 1959; there was a slight rise in 1960 (Table II-2, Col. 3). The decrease in man-days from 1955 to 1960 was 13.2 per cent; the corresponding series for average weekly employment fell by over 21 per cent (Table II-2, Col. 2a, 3a). The less rapid decline of man-days, compared with average weekly employment, implies that those persons remaining on the work force worked a somewhat fuller week.

It bears emphasis that the displacement of labour would have been even greater if the sugar industry had not expanded its acreage while introducing the labour-saving changes described in Chapter III.

TABLE II — 2. EMPLOYMENT ON SUGAR ESTATES, FIELD AND FACTORY OPERATIONS, 1949 — 1960 ‡

Year	Average Weekly Number Employed in Field and Factory (Dept. of Labour Series) (1)	Weekly Average Number Employed in Field and Factory (B.G.S.P.A. Series)[1] (2)	Man-days Worked in Field and Factory (B.G.S.P.A. Series)[1] (annual) (3)	Index Nos. of Col. 1 (1949 = 100) (1a)	Index Nos. of Col. 2 (1955 = 100) (2a)	Index Nos. of Col. 3 (1955 = 100) (3a)
1949	28,184	n.a.	n.a.	100.0	—	—
1950	28,232	n.a.	n.a.	100.2	—	—
1951	27,938	n.a.	n.a.	99.1	—	—
1952	28,352	n.a.	n.a.	100.6	—	—
1953	26,307	n.a.	n.a.	93.3	—	—
1954	27,899	29,426	n.a.	99.0	—	—
1955	26,092	28,479	6,586,414	92.6	100.0	100.0
1956	24,837	27,912	6,317,215	88.1	98.0	95.6
1957	24,574	26,197	6,318,975	87.2	92.0	95.9
1958	23,495	24,715	6,238,193	83.4	86.8	94.7
1959	21,531	22,866	5,673,033	76.4	80.3	86.1
1960	20,480	22,409	5,719,397	72.7	78.7	86.8

‡ Department of Labour, Annual Reports; B.G.S.P.A. special reports.
n.a. Not available.
[1]The Department of Labour has no statistics on man-days in factories. Department of Labour series on man-days in field operations is given in Table II-4. B.G.S.P.A series includes distillery workers (except Albion Distilleries Ltd.); also includes ancillary workers such as compound workers, club caretakers, hospital and creche attendants, stablemen and persons on "compassionate employment". In 1957, 740,005 man-days were attributable to this group. Man-days include overtime work in factory.

2. During the last decade, the input of manual labour per acre and per ton of sugar was reduced markedly, and appears to have declined relatively more in British Guiana than in Jamaica or Trinidad.

The computations in Table II-3 show the number of field workers employed per 100 acres under cane, and the number of factory workers per 1,000 tons of sugar produced, separately for Jamaica, Trinidad and British Guiana. Because the statistics of workers are derived in a different fashion in each territory, the results should not be compared across the columns, and certainly should not be used to

TABLE II — 3. TRENDS IN FIELD AND FACTORY EMPLOYMENT ON SUGAR ESTATES, JAMAICA, TRINIDAD AND BRITISH GUIANA, 1950 — 1960 ‡

Year	Number of Field Employees per 100 Acres Under Cane (Estates only)			Number of Factory Employees per 1,000 Tons Sugar Produced (Estates and Farmers' Canes)			Acres under Cane (Estates only)			Tons of Sugar Produced (Estates and Farmers' Canes)		
	Jamaica[1]	Trinidad[2]	British Guiana[3]	Jamaica[1]	Trinidad[4]	British Guiana[3]	Jamaica	Trinidad	British Guiana	Jamaica	Trinidad	British Guiana
1950	52.8	30.0	30.3	21.3	30.6	33.7	51,977	41,717	71,742	271,582	146,508	195,651
1951	49.0	33.4	28.2	21.6	32.9	28.3	56,039	41,578	77,736	267,928	140,668	217,306
1952	47.7	33.7	27.4	22.0	33.7	26.4	58,256	41,226	80,022	265,872	137,358	242,692
1953	48.2	32.0	26.6	18.3	29.9	24.2	60,030	42,832	77,163	330,237	152,618	240,176
1954	46.9	30.0	28.1	16.6	25.2	24.5	62,500	43,445	78,361	363,304	172,767	238,922
1955	44.1	24.4	26.2	15.6	20.7	22.2	62,713	44,846	78,316	396,551	192,793	250,111
1956	44.7	30.3	24.6	17.1	30.2	18.5	61,007	45,285	81,012	356,309	160,230	263,333
1957	43.2	29.7	22.5	16.7	23.0	17.8	61,839	45,898	86,741	359,067	167,805	284,973
1958	39.9	24.7	20.9	17.8	21.7	16.8	64,924	49,693	87,976	332,975	187,500	306,361
1959	38.7	27.5	18.6	15.7	22.4	16.8	64,988	47,927	89,825	378,226	181,131	284,425
1960	31.2	23.3	17.0	13.9	19.3	13.4	71,278	51,727	94,103	418,276	217,919	334,441

‡ Computed from "Sugar in the West Indies and British Guiana", 1958 Handbook of the British West Indies Sugar Association (Inc.), and data provided by sugar producers and government agencies.

[1]Average weekly employment is a weighted figure: average in-crop employment per week multiplied by number of crop weeks, added to average out-of-crop employment multiplied by number of weeks out of crop, the sum divided by 52.

[2]Average fortnightly number employed. 1950-1955 field employment assumed to be three-fourths of total field and factory. 1958 employment based on average of two quarters.

[3]Average weekly number of employees computed from total monthly work records divided by number of accounting weeks in month, as published by Department of Labour.

[4] 1956-1960 factory employment figures refer to numbers employed during first fortnight of February, May, August and November. First fortnight of February and May have lower employment than actual average fortnight in those quarters. 1950-1955 factory employment assumed to be one-fourth of total field and factory. 1958 employment figure based on average of two quarters.

assess the efficiency of the several sugar industries. But the changes from year to year within a given column give a significant measure of the declining application of manual labour in each territory.

For the field analysis, statistics are available only on estate labour; the important cane farmers of Jamaica and Trinidad are not included. It is apparent that the number of field employees per 100 acres under cane has fallen more sharply in British Guiana than in Trinidad or Jamaica. Jamaica showed its greatest decline between 1959 and 1960, from 38.7 to 31.2 workers per 100 acres (the figure for 1960 may not be final). Trinidad's ratios show a certain variability, in part the result of using estimates for some years. From 1954 forward the B.G. field employment ratio descends at an even and steady pace. The drop from 30.3 workers per 100 acres in 1950 to 17 in 1960 represents a 43 per cent decline over the decade in British Guiana.[40] For Trinidad the decrease was 21 per cent in the same period, while Jamaica's decline was 27 per cent from 1950 to 1959 and 41 per cent from 1950 to 1960.

Turning to the comparative experience in the factories, we find that British Guiana also leads in the reduction in the number of factory workers required per 1,000 tons of sugar produced from 1950 to 1960. Moreover, the decline over the decade was more regular in British Guiana than in Trinidad or Jamaica. In every case, the 1960 ratios were lower than in any previous year. For British Guiana, the low of 13.4 workers per 1,000 tons of sugar in 1960 represents a decline of 60 per cent from the 1950 requirement of 33.7 workers. The drop in Trinidad from 30.6 to 19.3 workers over the same period of time was a 37 per cent decrease. Jamaica's 1950 figure of 21.3 workers declined to 13.9 workers by 1960, a 35 per cent drop. Both Trinidad and British Guiana showed a larger reduction in the factory than in the field as regards the number of workers per unit of output. But all three sugar industries demonstrate an unmistakable expansion of labour-saving methods in field and factory. In this movement, British Guiana has taken a relative lead, although it is by no means clear which area has the lowest labour input in absolute terms.

3. While employment opportunities on the sugar estates of British Guiana have decreased relatively more sharply in the factories than in the field over the past decade, the absolute decline has been greater in the field, especially since 1955.

The decline of employment in the sugar factories came earlier and was more gradual than in field operations. From the high of 6,761 workers in 1949, factory employment dropped to 4,479 in 1960, according to the Department of Labour series; the shorter period covered by the B.G.S.P.A. series shows a slightly smaller decrease from 1954 to 1960 than the Department of Labour statistics for the same period (Table II-5 Cols. 1 and 2). In the field, the level of employment hovered around 21,500 - 22,000 from 1949 through 1954, with the exception of a lower figure in the politically disturbed year of 1953. Beginning in 1955, each year showed a lower average weekly number of employees than the preceding year, reaching 16,001 in 1960 in the Department of Labour series and 17,836 in the B.G.S.P.A. data (Table II-4, Cols. 1 and 3.)

Over the whole period, 1949-1960, factory employment fell by 33.8 per cent, while field employment declined by 25.3 per cent. From 1955 to 1960, factory employment decreased by 17.5 per cent and field employment by 22.2 per cent, according to the B.G.S.P.A. series (Table II-4, II-5). It is the decline in field employment which has given most concern to Government, both because of the large absolute numbers of workers involved and because most of the decrease has occurred in recent years.

Turning to the measurement in terms of man-days, we find that data for factory

[40]The Venn Report (p. 77) found 35 workers per 100 acres in 1947-48 in British Guiana.

TABLE II — 4. EMPLOYMENT ON SUGAR ESTATES, FIELD OPERATIONS, 1949 — 1960 ‡

Year	Average Weekly Number of Workers in Field Operations (Dept. of Labour Series) (1)	Annual Man-Days, Field Operations (Dept. of Labour Series) (2)	Average Weekly Number of Workers in Field Operations (B.G.S.P.A. Series) (3)	Annual Man-Days, Field Operations (B.G.S.P.A. Series) (4)	Index Numbers of Amounts in Column 1 1949 = 100 (1a)	Index Numbers of Amounts in Column 2 1949 = 100 (2a)	Index Numbers of Amounts in Column 3 1954 = 100 (3a)	Index Numbers of Amounts in Column 4 1955 = 100 (4a)
1949	21,423	4,320,859	n.a.	n.a.	100.0	100.0	—	—
1950	21,641	4,472,428	n.a.	n.a.	101.0	103.5	—	—
1951	21,784	4,480,798	n.a.	n.a.	101.7	103.7	—	—
1952	21,948	4,551,025	n.a.	n.a.	102.5	105.3	—	—
1953	20,503	4,195,847	n.a.	n.a.	95.7	97.1	—	—
1954	22,054	4,403,707	24,158	n.a.	102.9	101.9	—	—
1955	20,548	4,379,914	22,937	5,026,495	95.9	101.4	100.0	100.0
1956	19,958	4,122,023	22,174	4,855,700	93.2	95.4	97.6	96.6
1957	19,504	4,207,108	21,034	4,761,862	91.0	97.4	92.6	94.7
1958	18,354	4,184,928	19,468	4,618,871	85.7	96.9	85.7	91.9
1959	16,747	3,806,927	17,990	4,205,670	78.2	88.1	79.2	83.7
1960	16,001	3,743,657	17,836	4,277,284	74.7	86.6	78.5	85.1

‡ Department of Labour, **Annual Reports**; British Guiana Sugar Producers' Association, **Special Report**

TABLE II — 5. EMPLOYMENT ON SUGAR ESTATES, FACTORY OPERATIONS, 1949 — 1960 ‡

	Average Weekly Number of Workers (Dept. of Labour Series)	Average Weekly Number of Workers (BGSPA Series)	Annual Man-days Worked[1] (BGSPA Series)	Average Weekly Number of Workers (Dept. of Labour Series)		Average Weekly Man-days worked (BGSPA Series)[1]		Number of Factory Workers on Employment Roster[4] (BGSPA Series)	Number of Factory Workers Eligible for Holi-days with Pay[5] (BGSPA Series)	Recipients of Holidays with Pay as Percent of Average Number of Weekly Employees in High Month (Col. 9 as % Col. 5)
				Low Month	High Month	Low Month	High Month			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1949	6,761	n.a.	n.a.	5,408[2]	5,928[3]	n.a.	n.a.	n.a.	n.a.	n.a.
1950	6,591	n.a.	n.a.	5,311[2]	5,928[3]	n.a.	n.a.	n.a.	n.a.	n.a.
1951	6,154	n.a.	n.a.	4,917[2]	5,617[3]	n.a.	n.a.	n.a.	n.a.	n.a.
1952	6,404	n.a.	n.a.	5,779	6,982	n.a.	n.a.	n.a.	n.a.	n.a.
1953	5,804	n.a.	n.a.	3,591	6,577	n.a.	n.a.	n.a.	n.a.	n.a.
1954	5,845	5,268	n.a.	5,395	6,314	n.a.	n.a.	6,323	5,347	84.7
1955	5,544	5,542	1,559,919	4,996	6,096	n.a.	n.a.	5,931	5,118	84.0
1956	4,877	5,018	1,461,515	4,277	5,892	n.a.	n.a.	5,502	4,645	78.8
1957	5,070	5,163	1,557,113	4,210	5,385	n.a.	n.a.	5,337	4,488	83.3
1958	5,288	5,247	1,619,322	4,159	5,623	19,718	35,086	5,238	4,637	82.5
1959	4,784	4,876	1,467,363	4,201	5,179	21,676	33,373	4,460	4,096	79.1
1960	4,479	4,573	1,442,113	4,131	4,881	17,834	31,186	4,366	4,103	84.1

‡ Department of Labour, Annual Reports; B.G.S.P.A. special reports.

[1]Includes overtime work in factory.

[2]Represents non-milling season.

[3]Represents milling season.

[4]Each estate has its own rules to determine which workers shall be considered as regular employees, entitled to work during the next crop. See Appendix B.

[5]Average of both crops. See Appendix B.

workers is available only since 1955, in the B.G.S.P.A. series (Table II-5). This shows a drop of 7.6 per cent from 1955 to 1960, as against a decrease of 17.5 per cent for the average weekly number of workers. The inclusion of overtime and premium-time work in assessing man-days in factories makes this a good measure of the amount of manual work performed, and demonstrates that the workers remaining in factory jobs secured more days of work, on the average, than in previous years, in spite of the decline in the total number of man-days.

In the field, man-days are a less accurate measure of the total amount of manual work (see Appendix B). The decline in man-days, 1949-1960, was 13.4 per cent, against a 25.3 per cent decrease in the average weekly number of workers (Table II-4, Cols. 1a and 2a) .In the briefer period, 1955-1960, man-days dropped by 14.9 per cent, while the average weekly number of workers declined by 21.5 per cent (Table II-4, Cols. 3a, 4a). The fact that man-days decreased more than the average number of workers indicates that the remaining workers were more steadily employed.

4. The decline in employment has been relatively heavier among adult females, young workers and older persons than among adult males, reflecting both the changing labour needs of the estates and the preferences of the labour force.

Women workers have never been numerous in sugar factories. Until 1953, the proportion of women among factory workers was rising slightly, although the absolute number of females dropped year after year. Thereafter, both the percentage and the number of women factory workers declined (Table II-6). From 285 women in 1950, the number fell to 88 in 1960; and instead of representing 4.1 per cent of the factory labour force, as in 1950, women were only 2.0 per cent in 1960.

Women field workers numbered 5,665 in 1950, the high point in the decade. A fairly regular decline thereafter reduced the total number to 2,994 in 1960. Constituting 28.2 per cent of the work force in the field in 1949, adult females were only 18.7 per cent by 1960. Man-days attributed to women workers rose through 1952, then dipped and recovered, remaining above 4 million per annum through 1958. In 1959 and 1960, the number of their man-days was sharply lower. As a percentage of all man-days worked in the field, women's labour declined markedly and steadily through the decade, from a high of 25.7 per cent in 1949 to 16.4 per cent in 1960 (Table II-7).

The downward trend in female employment in the field is a continuation of the post-war trend when women dropped from 31.7 per cent of the total field force in 1944 to 27.8 per cent in 1948.[41] In its investigations, the Venn Commission paid

TABLE II — 6. EMPLOYMENT OF WOMEN ON SUGAR ESTATES, FACTORY OPERATIONS, 1950 — 1960 ‡

Year	Average Weekly Number of Women Employed (1)	Women Workers (Col. 1) as Percentage of Total (Table II-5, Col. 1) (2)
1950	285	4.1
1951	270	4.3
1952	266	4.2
1953	255	4.4
1954	224	3.8
1955	180	3.2
1956	151	3.1
1957	139	2.7
1958	129	2.5
1959	100	2.1
1960	88	2.0

‡ Department of Labour, Annual Reports.

[41] Venn Report, p. 54

TABLE II — 7. EMPLOYMENT OF WOMEN[1] ON SUGAR ESTATES, FIELD OPERATIONS, 1949 — 1960 ‡

Year	Average Weekly Number of Women Employed (1)	Women Workers (Col. 1) as Percentage of Total (Table II-4, Col. 1) (2)	Man Days Worked by Women (3)	Women's Man Days (Col. 3) as Percentage of Total Field Man-Days (Table II-4, Col. 2) (4)
1949	5,612	28.2	4,320,859	25.7
1950	5,665	26.2	4,472,429	24.9
1951	5,474	25.1	4,480,798	23.7
1952	5,247	23.9	4,551,025	22.2
1953	4,754	23.2	4,195,843	21.9
1954	4,900	22.2	4,403,707	22.1
1955	4,468	21.8	4,379,914	20.5
1956	4,305	21.6	4,122,023	20.7
1957	4,144	21.2	4,207,108	19.4
1958	3,601	19.6	4,184,928	17.2
1959	3,205	19.1	3,506,927	18.0
1960	2,994	18.7	3,743,657	16.4

‡ Department of Labour, **Annual Reports.**
[1]Excludes young females (under 18 years). Total of all field workers includes this category.

special attention to the position of women workers. Although they unhesitatingly recommended that women and girls should not be permitted to weed canals, the Venn Commission was lenient in its attitude toward women's field work of other kinds. Save for young mothers, the Commission believed that women would need and want to work in the fields until the day when men's productivity and wages rose sufficiently to enable women to give up wage work.[42]

The trend foreseen by the Venn Commission appears to be in evidence by 1960, as women retiring or discharged from field work are not replaced by other female workers. In part this represents estate policy, based upon the changing methods in field work (see Chapter III). But women are not reported to be clamouring for work. Thus, no particular social or economic issue has appeared so far in the declining proportion of women in the work force of the sugar industry. However, it all female employment were eliminated, hardship might be imposed on certain women who have no other means of support.

Young workers (over 14 years of age and under 18) show the same pattern of declining employment as adult female workers. In the factories, young boys (girls

TABLE II — 8. EMPLOYMENT OF YOUNG PERSONS (UNDER 18 YEARS) ON SUGAR ESTATES: FACTORY OPERATIONS, 1951 — 1960 ‡

Year	Average Weekly Number of Young Persons Employed[1] (1)	Col. (1) as Percentage of Average Weekly Number of Workers in Factories (Table II-5, Col. 1) (2)
1951	420	6.8
1952	419	6.5
1953	411	7.1
1954	391	6.7
1955	271	4.9
1956	228	4.7
1957	248	4.9
1958	248	4.8
1959	189	3.9
1960	136	3.0

‡ Department of Labour, **Annual Reports**
[1]Excludes apprentices, "Young Persons" refers to boys.

[42]**Venn Report, pp. 54-6**

are not employed at all) have decreased in number, both absolutely and as a percentage of all factory workers since 1953 (Table II-8). From 411 boys in 1953, the total dropped to 136 in 1960, and the percentage declined from 7.1 to 3.0. This decline would seem to be more a matter of factory needs than of reluctance on the part of boys to accept jobs. We were informed that factory work was greatly favoured over field employment, and that the only jobs young boys might prefer in the sugar industry were positions in the office.

The employment of young persons in the field appears to have begun its definite decline in 1957. The average weekly numbers employed and the total man-days as well as the ratio of young persons' work to all field work was at a peak in 1957, but by 1960 had declined by 40 per cent or more (Table II-9, Cols. 3, 4, 5, 6). Whereas the average weekly number of young persons at work in the field had been 1,284 in 1957, it was down to 712 by 1960; the proportion of all field workers had dropped from 6.6 per cent in 1957 to 4.5 per cent in 1960. Man-days totalled 302,377 in 1957 and were 7.3 per cent of all field man-days; by 1960, man-days were down to 172,604 and constituted only 4.6 per cent of the total. In 1959 and 1960, the decline in young girls' employment, as measured by man-days, was relatively more severe than the drop for boys. Previously, girls were responsible for about 20 per cent of the man-days of young people, around 50,000 man-days annually. The drop to 20,904 in 1959 and to 10,670 in 1960 was drastic, and left the girls' share at about 5 per cent of the total (Table II-9, Cols. 2, 3).

The work customarily performed by young persons varies according to the needs of the moment. But young girls usually are engaged in the application of chemical or organic fertilizers, bailing punts, fetching earth and other "General Purpose Gang" work. Several estates report an increasing difficulty in obtaining young girls for fertilising tasks, which they perform carefully and skilfully. The attempt to use cane-cutters for this work out-of-crop is a good move from the point of view of affording round-the-year employment. However, the estates are not satisfied with the results, and the cane-cutters, regarding themselves as highly paid specialists, look down on the lower-paid work. It is the opinion of management that girls will be less available for field work as the years go on, and that other arrangements must be made.

Young boys present a different problem. At present they are used to lead mules and oxen, as punt bailers, bateau boys, breakfast boys, field mechanical operators' assistants and greasers, members of the "General Purpose Gang" for fertilizing tasks, etc. It is not clear whether young boys are refusing employment or are in light demand by the estates. If the former, a problem may arise in the future supply of adult male field workers, since the forward-looking estates plan to train gangs of young boys as the nucleus of later adult gangs of non-specialist sugar workers, ready to do whatever work is needed throughout the year.

Older workers are not separately classified in the statistics, and there is a certain overlapping with "adult males and females". Some of the decline in female employment previously described is explained by the disbanding of "granny" gangs and the elimination of fringe jobs; similarly, there are fewer "old men's" gangs.[42a] At present, there is a category in the employment statistics called "non-ablebodied persons on light or compassionate employment". Between 1,100 and 1,400 men and women fell in this category in 1960. They were deemed unable to do a proper day's work through age, ill-health or temporary incapacitation, and were paid according to their work capacity. Usually, they were employed as sanitation workers, gardeners' assistants, cow-minders, watchmen, and tractor attendants. We were told that a number of workers have been dismissed since 1958 on

[42a]Venn Report, pp. 59, 78-79, 88-90.

TABLE II—9. EMPLOYMENT OF YOUNG PERSONS (UNDER 18 YEARS) ON SUGAR ESTATES: FIELD OPERATIONS, 1949—1960 ‡

Year	Annual Man-Days Worked By Young Persons			Total Young Persons' Annual Man-Days (Col. 3) as Percentage of All Man-Days (Table II-4, Col. 2)	Average Weekly Number of Young Persons Employed	Young Persons as Percent of Total of Field Workers (Average Weekly Numbers) (Table II-4, Col. 1)
	Male	Female	Total			
	(1)	(2)	(3)	(4)	(5)	(6)
1949	198,688	55,466	254,154	5.1	1,090	5.1
1950	212,107	49,646	261,753	5.2	1,127	5.2
1951	228,465	48,856	277,321	5.6	1,208	5.5
1952	234,087	50,811	284,898	6.3	1,266	5.8
1953	225,443	48,516	273,959	6.6	1,228	6.0
1954	216,064	50,269	266,333	6.0	1,160	5.3
1955	208,726	50,932	259,658	5.9	1,149	5.6
1956	218,017	50,960	268,977	6.5	1,190	5.9
1957	255,874	46,503	302,377	7.3	1,284	6.6
1958	235,427	47,966	283,393	6.8	1,181	6.5
1959	176,752	20,904	197,656	5.6	836	5.0
1960	161,934	10,670	172,604	4.6	712	4.5

‡ Department of Labour, **Annual Reports.**

medical grounds. As pension plans begin to make adequate provision for elderly persons, they will move from employment to retired status, and the proportion of older workers in the industry will be further reduced. This development will receive general approval, if the pensions approximate the former earnings.

5. Over the decade, out-of-crop employment opportunities in the field have fallen off more severely than in-crop, accentuating the seasonal unemployment characteristic of the sugar industry.

The significant change in seasonality in recent years has been the intensification of off-season unemployment, while in-crop employment has remained stable. Scanning the series of the peak month of field employment in every year since 1949, we discern no real trend. The Department of Labour series has moved up and down, around the 25,000 mark, except for a drop to 19,150 in 1960 (Table II-10, Col. 3).[43] Statistics on man-days in the high month for the last four years (Cols. 7 and 8) show a similar stability, in spite of the substantial increase in acreage under cane.

A sharp contrast is presented by the record of employment in the low month of each year. The average weekly numbers employed have declined from 20,271 in 1949 to 9,478 in 1960 (Table II-10, Col. 1). A somewhat larger number of workers, and a slighter drop from 1955 to 1960 is registered by the B.G.S.P.A. series (Col. 2). The fall in man-days is less severe (Col. 5), indicating that those remaining at work are obtaining a somewhat fuller work week than previously (Col. 9). It appears that the lengthening of the work week in recent years has been more pronounced in-crop than out-of-crop, but the record is too brief to draw firm conclusions. (Col. 9, 10; see also, Table II-15, Col. 4-9).

When the total field work force is separated into its main components, the changes in employment are more clearly seen. The four chief categories of field labour have been male cane-cutters, other male piece-workers, male time-workers, and female piece-workers. The month-by-month employment totals for each group have been graphed on the accompanying chart (Table II-11). The first two groups are charted from July 1954 through 1960, and the remaining two from January 1957 through 1960 (July 1956 has been omitted because data are lacking).

It is evident from this graph that the demand for cane-cutters has risen slightly, and that there is a distinct tendency for high employment to persist over several months during the autumn harvest, unlike the earlier sharp peak and decline. Furthermore, cane-cutters are known to be working more days of the week, in-crop, on the average (Table II-12; and II-14, Col. 5). The out-of-crop picture is much as it always has been — a month or two of practically no employment, preceded and followed by a month of employment mid-way between the low and high. Only a handful of men can ever expect to be employed year-round as cane-cutters. For the vast majority, cane-cutting provides no more than six to eight months of work per year. If they look to the sugar industry for work during the balance of the year, they must seek other piece work in the field, usually in the "boy" gang.

The category "adult male piece workers" includes all adult males, except cane-cutters and field mechanical equipment operators or servicemen; it includes shovelmen, forkmen, the "boy" gang, and mule boys. It will be observed that the peaks and troughs of employment for this group are the reverse of the pattern for cane-cutters; the out-of-crop months show the highest employment and in-crop the lowest. These workers are chiefly used in the cultivation and planting process.

Formerly, it was possible for large numbers to alternate between cane-cutting in-crop and other field work out-of-crop. However, in recent years the peak month

[43]The B.G.S.P.A. series does show a downward movement from 1955 onward (Table II-10, Col. 4).

TABLE II — 10. SEASONALITY OF EMPLOYMENT ON SUGAR ESTATES:

FIELD OPERATIONS, 1949 — 1960 ‡

Year	Average Weekly Number of Workers Employed: Low Month		High Month		Average Weekly Number of Man-Days (B.G.S.P.A. Series)[1]				Average Number of Days Worked per Week	
	(Dept. of Labour Series)	(B.G.S.P.A. Series)	(Dept. of Labour Series)	(B.G.S.P.A. Series)	Low	Month	High	Month	Low Month	High Month
	Number (1)	Number (2)	Number (3)	Number (4)	Number (5)	Month (6)	Number (7)	Month (8)	5 ÷ 2 (9)	7 ÷ 4 (10)
1949	20,271	n.a.	23,678	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1950	17,668	n.a.	25,587	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1951	17,760	n.a.	24,751	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1952	13,368	n.a.	27,634	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1953	11,543	n.a.	24,998	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1954	17,414	n.a.	26,445	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1955	15,212	17,422	24,306	26,882	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1956	15,801	17,897	24,495	26,818	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1957	15,722	15,133	23,190	24,773	57,911	Jan.	117,676	Sept.	3.8	4.8
1958	13,632	13,618	25,967	23,242	59,207	June	116,654	Sept.	4.3	5.2
1959	10,273	11,479	25,612	22,746	43,089	June	119,676	March	3.8	5.2
1960	9,478	11,389	19,150	21,031	34,426	Jan.	102,415	Nov.	3.0	4.9

‡ Department of Labour, **Annual Reports**; B.G.S.P.A. special reports.

[1]Monthly totals of man-days worked has been divided by the number of accounting weeks in each month, in order to put all the figures on a weekly basis.

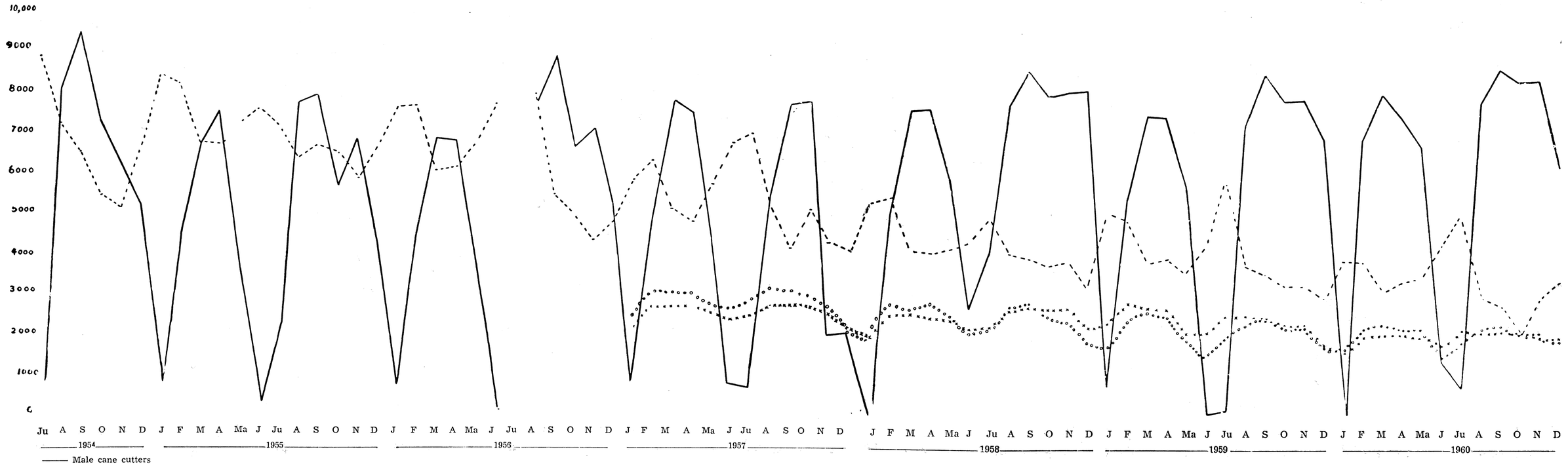

TABLE II—11. EMPLOYMENT OF SELECTED GROUPS OF FIELD WORKERS, MONTHLY, 1954—60

figures, which formerly showed employment of over 8,000 male piece workers, have fallen to 5,000 or less and those for the low month of employment, which used to hover around 5,000, are now close to 2,000. The decline in numbers has hardly been offset by the slight rise in the average number of days per week worked. This important category of workers has borne the brunt of the decline of employment opportunities. There is a reduced need for them both in and out-of-crop, but the reduction in the latter period is more serious because the alternative of cane-cutting is unavailable. Many of the older men, shovelmen and forkmen, are not suitable for cane-cutting, and the decrease in field work has eliminated some of them from the industry entirely. We were told that many more field workers could be eliminated if the companies pursued a ruthless policy of employing only the number strictly necessary to accomplish the specified tasks. Chapter III describes the changed practices in the field which account for the diminished need for cultivation and planting labour.

The two remaining categories, male time-workers and female piece-workers, show much greater seasonal regularity of employment and a slighter downward trend overall. The male time-workers are described as older men, or boys (over 18), whose jobs typically are in transport, in collecting and bailing punts, in checking on cultivation; or as rangers for coconut, cocoa and rice production, and as sea and river defence rangers, carpenters and porters, messengers, etc. The female piece-workers do weeding, grass-banking, fertilizing, spraying insecticides or piece-work cutting of fodder for stock. The absolute numbers and trends in both groups are very similar. Moving from peak employment around 3,000 in 1957, they now each show about 2,000 workers at the high point; the figure for the low month, which was about 2,500 in 1957, is now approaching 1,500. The peaks and troughs are in the same months as the cane-cutters, but there is little or no interchangeability of workers in any case.

The average weekly number of field workers out-of-crop was formerly 60 per cent or more of the harvest labour force, but in recent years, it has been under 50 per cent, and tending to go lower. The records of the several estates vary on seasonality. One estate maintains out-of-crop employment at a level of about two-thirds of in-crop employment; this proportion was shown in 1955 and it held in 1960 and the spring crop of 1961. This particular estate pays considerable attention to the stabilization of its labour force over the entire year, as well as in harvest. An estate whose acreage is expanding rapidly may be able to offer more out-of-crop work than one which is levelling off or contracting acreage.

Among the chief categories of field workers, only the demand for cane-cutters has been sustained in the peak months. Together with increases in other minor types of employment, cane-cutting maintains the in-crop level of employment at a fairly steady number. In the months when little or no cane-cutting is necessary, the decline in the demand for other kinds of workers has produced a shrinking volume of employment year after year. Taken over the year as a whole, the declining low months have been depressing the figures of annual average employment.

It is clear that the sugar industry's technical progress in the last decade has not resulted in a stabilization or regularization of employment over the year; seasonality in the field has been intensified. The impact has been felt not only by the workers; traders in the villages have reported that business is very slack when the sugar workers are not harvesting. This was represented as a change from the old days when earnings were more evenly spread over the year. The fact that the remaining out-of-crop workers have a somewhat fuller working week than before does not compensate for the growing numbers who can find work in the sugar

industry only during the in-crop season.

Seasonality in factory employment is not so marked as in the field (Table II-5, Cols. 4 and 5). There appears to be no trend toward an increasing gap between the low and high months of employment in the factory; if anything, since 1956 the decline in off-season employment seems to be less steep than that in the peak milling month. During the last three years, there have been no significant changes in the average number of days per week worked in the factory in the low and high months. In the low month, the average work-week was 4.76 days (1958), 5.16 days (1959), 4.31 days (1960). In the high month, when overtime and premium-time occur, the average work-week was 6.23 days (1958), 6.44 days (1959) and 6.38 days (1960). Not only do fewer workers hold jobs in the factories in the off-season, but they work a shorter week; the three shifts a day of the milling season are replaced by one shift a day off-season. There is, however, little ground for complaint on the length of the work-week in the factory out-of-crop in recent years, since the low month in the factory shows a work-week as long as that in the high month among field employees.

6. The impact of the decreased need for labour in total has been all the heavier because available work has been deliberately concentrated among a smaller group of workers.

There are three aspects of the stabilization or decasualization of labour in the sugar industry. The first concerns the effort to regularize the flow of cane to the factories in the harvesting period. The second relates to the elimination from the industry of casual workers — those who seek employment infrequently and irregularly. The third deals with the desire to provide year-round, full-time employment to a stable labour force.

(1) Cane-cutters are the critical group in the flow of cane to the factory. The Venn Report dealt at length with the work habits of cane-cutters.[43a] As matters stood in 1949, cane-cutters attempted to cram into Tuesday, Wednesday and Thursday the amount of work which might be performed in a full week. The poor attendance from Friday through Monday was attributed chiefly to the "week-end call of ground provision and other forms of individual cultivation. It was suggested . . . . that the higher rates of attendance in areas such as the East Bank, Demerara, where little or no land is available for these purposes, were due to this." The traditional holiday on Monday and the preference for leisure over additional income were also offered as reasons for the work pattern. During the autumn rice-reaping, a period of about three weeks, the supply of labour was seriously reduced, although the mid-week concentration of labour continued. Workers engaged in the transport of cane as well as factory workers were also inclined to such work patterns.

The consequence of the cane-cutters' work habits was an irregular supply of cane to the factories, with the greatest insufficiency on Saturday. Overall, the factories received only 85 per cent of their cane requirements during the autumn crop of 1948. Deterioration of sucrose content through delay in loading and congestion of punt traffic were additional arguments against the cane-cutters' practice of working three to three-and-a-half days a week. To alter this pattern, the sugar industry instituted a series of bonuses and special benefits which rewarded attendance at work over the week-ends and during a high proportion of the available days of each crop. Appendix E gives the salient details about each of these schemes, which also cover other sugar workers besides cane-cutters.

The beneficial effects of bonuses and decasualization on turnout during the week and over the entire crop are dramatically seen in the case of cane-cutters.

[43a]Venn Report, pp. 73—75, 82—85.

In 1948, the S.P.A. calculated that of 5,298 cane-cutters whose records were studied half worked for three days or less and that one-third worked for two days or less a week. A survey of a single estate during the autumn crop of 1948 indicated that 142 days of work were available and that only 8 of the 462 cane-cutters had put in over 100 days. A full third of the workers took employment on less than ten of the available days. Fifty per cent of the cane was handled by 18 per cent of the cane-cutters; these workers put in more days of the week, appeared during more weeks of the crop, and had a slightly higher daily productivity than the more casual workers. On this estate, the most regular and productive cane-cutters were the African, non-resident workers.[44]

A comparable study of cane-cutters was made on eleven Bookers' estates for each crop from autumn 1954 through autumn 1959. The records for each crop were examined on each estate to determine the number of cane-cutters who had worked a given number of days of each week; the results were averaged for each crop. Table II-12 summarizes the results for three separate crop periods when most of the estates reported. The span from spring 1955 to spring 1959, with autumn 1957 as a mid-point, provides evidence of some striking changes in the work habits of cane-cutters; the number of cane-cutters was reduced while tons of cane rose sharply. In 1955, 32.3 per cent of the cane-cutters worked on the average on only one day of the week, and 61.7 per cent worked three days or less; this is actually a worse record than the S.P.A. showed in 1948. By autumn 1957, those who turned out for one day constituted a mere 7.8 per cent of the total, while 22.4 per cent worked for three days or less. Still further progress was registered by the spring of 1959 when only 2.6 per cent put in one day, and 13.7 per cent worked for three days or less. The percentage working for 4.1 days or more rose from 22.7 in 1955 to 59.5 in 1957 and to 60.4 in 1959.

On almost every estate and in almost every crop the daily productivity of those who worked on the average more than 3.1 days a week was greater than that of the less regular workers. No information is available on the distribution as regards resident and non-resident workers or Africans and Indians; nor can we learn whether cane-cutters are now accomplishing in five normal days what they formerly did in three overtime days. Such a change in pattern would make little difference to the earnings of cane-cutters, although factories now are able to

TABLE II-12. DECASUALIZATION AMONG CANE-CUTTERS, 1955—1959‡

Number of estates	Spring Crop, 1955 9[1]	Autumn Crop, 1957 10	Spring Crop, 1959 10[2]
Number of cane-cutters	9455[1]	7062	7140[2]
Percentage Distribution of Cane-Cutters by Number of Days Worked in Week: Crop Average			
	1955	1957	1959
Total	100.0	100.0	100.0
One day or less	32.3	7.8	2.6
1.1 — 2 days	15.2	5.5	2.9
2.1 — 3 days	14.2	9.1	8.2
3.1 — 4 days	15.6	18.1	25.9
4.1 — 5 days	16.2	38.2	43.2
5.1 and over	6.5	21.3	17.2

‡ Special study by Bookers Sugar Estates, Ltd.
[1]Data for one estate are for autumn 1955.
[2]Data for one estate are for spring 1958; for another estate, data are for autumn 1958.

[44]Venn Report, pp. 74-5, 83.

count on a more reliable supply over week-ends. In 1950 it was estimated that 71.8 factory hours were lost per week on the average because of lack of cane over week-ends; by 1960, the loss of time was down to 34.7 hours per week.

Additional evidence comes from overall data on cane-cutters. Despite the fact that the amount of cane ground rose by over 1 million tons from 1955 to 1960, the number of cane-cutters dropped by about 25 per cent (see Table II-12). A more startling decline was registered on one estate which doubled the tons of cane cut between 1950 and 1960 and halved the number of cane-cutters employed. Since daily productivity per worker hardly changed during this period, the result is attributable to the discharge of the casuals and the increased number of days per week of the remaining workers, as well as somewhat longer crop seasons.

Another estate increased its sugar tonnage by over 25 per cent between 1956 and 1960, reduced its average weekly work force by almost 25 per cent, but raised the average number of man-days per worker per year from 210 to 239 and the average days per week per worker from 4.0 to 4.6. This estate's management reported that while a core of full-time workers were employed steadily, a considerable number wanted only three days of work in a week, or less. The increase in the average work-week was attributed to three main causes: the improved health of the whole community, the institution of mechanized transport to work in the field, replacing punts and long walks, and the desire to earn more money in a society where levels and standards of living were rapidly rising.

On another estate which cultivates 9,000 acres, it was estimated that its present output could be achieved with 500 fully employed male workers aged 18 to 45, if further improvements in technique and machinery were introduced, but harvesting remained unmechanized. At present the estate requires the equivalent of 1,200 fully employed workers. When the estate cultivated 5,000 acres, it used an average of 4,000 workers, or the equivalent of 2,000 fully-employed workers.

Information on the changing work habits of sugar workers also comes from data on their willingness to work a high percentage of the available days during each crop, as indicated by meeting the work requirements for holidays-with-pay (see Appendices B and E). Table II-13, Col. 2 shows that the number of field workers qualifying to receive holidays-with-pay rose steadily from 1954 to 1959 and then dropped in 1960. Taken as a percentage of the average weekly number of field

TABLE II—13. DECASUALIZATION OF LABOUR ON SUGAR ESTATES, FIELD OPERATIONS 1954—1960‡

Year	Number on Employment Roster[1]	Number Eligible for Holidays with Pay[1]	Number of Grade I Workers Eligible for Free Medical Treatment[2]	Number of Grade II Workers Eligible for Free Medical Treatment[3]
	(1)	(2)	(3)	(4)
1954	41,491	15,259	n.a.	n.a.
1955	37,189	16,297	n.a.	n.a.
1956	36,390	17,239	n.a.	n.a.
1957	32,984	18,747	21,530	657
1958	27,212	19,600	23,918	433
1959	25,448	20,297	23,946	722
1960	24,495	19,462	23,973	683

‡ B.G.S.P.A. special reports
[1]See Appendix B on Qualifications of Workers.Figures are average of both crops, and exclude factory workers.
[2]Grade I workers are those who have qualified for Holidays-with-Pay in both crops in the previous year, or have qualified for Holidays-with-Pay in one crop and have worked at least 150 days in the previous year. Figures include factory workers.
[3]Grade II workers are those who worked for not less than 150 days in the previous year but did not qualify for Holidays-with-Pay in either crop. Figures include factory workers.

workers in the high month (Table II-10, Col. 4), the rising number of field workers receiving holidays-with-pay constitutes an even more significant proportion of the peak field labour force. In the case of factory workers, the absolute number in receipt of holidays-with-pay has been declining since 1954, but no significant change has occurred in the percentage of employees in the high month who work enough days to obtain holidays-with-pay at the end of the crop. (Table II-5, Cols. 9, 10).

The data on eligibility for free medical treatment includes field and factory workers (Table II-13, Cols. 3, 4). The enormous preponderance of Grade I workers and the small number in Grade II gives evidence that most workers are employed on a high percentage of the available days in-crop. It should be emphasized that the earning of benefit rights is based upon the acceptance of offered work, usually during the crop, and conclusions cannot be drawn on the adequacy of work throughout the year. The effectiveness and limitations of the incentive payments are suggested by the following complaint in the industry's newsletter which workers receive:[45]

> Amongst a large number of Sugar Workers when they have completed work attendance on 75% of the days available, and when they have 'guessed' or 'found out' when the crop is going to end — they then decide that there is no further need for them to turn out to work. As a result there are not enough Cane-cutters at work to finish the crop and keep the factory working. Some of these workers however, either make the wrong additions, or just plainly don't-know-what-they-are-doing, and as a result fall short of their number of qualifying days by one or two days and in consequence lose their Holidays with Pay bonus!

(2) While incentive payments have undoubtedly stimulated workers to more regular attendance, the improved record also reflects the elimination from the industry of large numbers of workers who would not or could not work for any considerable part of the crop. The impetus to decasualize employment was given in 1954 by the British Guiana Constitutional Commission which observed considerable underemployment among sugar workers.[46]

> We gained the impression that often this under-employment was accepted by the management of the sugar estates, out of a desire to spread work among a growing population; but it has the unfortunate result that no one is pleased, and few labourers employed on the sugar estates really have continuous profitable employment. The view was put to us that the proper course for the industry would be to try to limit its labour force to the number it can fully employ, perhaps by some kind of registration or "tally" system such as was at one time operated for dock labour in the United Kingdom.

Apart from its sensitivity to the criticism that average wages were low, the sugar industry saw other reasons for dropping the casual workers. Many labour disputes arose from the conflicting claims of an excessive number of workers. When the available work was insufficient and casual workers displaced regular workers, the latter were discontented. The assignment of jobs and their superintendence were more difficult and work was accomplished more slowly when irregularity of attendance was tolerated. Productivity was shown to be greater among regular workers. By making the latter more dependent upon the sugar industry through the provision of a greater share of the available days of work, the industry also would have a labour force less prone to strike. There has in fact been a decline in the number of man-days lost through labour disputes in recent years, but other factors are undoubtedly also responsible. According to a B.G.S.P.A. survey, there were 66,468 man-days lost in the field and 13,739 man-days lost in factories due

[45]B. G. Sugar, Vol. 3, No. 5, May 1960

[46]Report of the British Guiana Constitutional Commission, 1954, para. 39.

to labour disputes in 1957; the 1960 figures were only 8,541 man-days in the field and 163 in the factories.

The fact that many more workers were attached to the sugar industry than were needed on any rational allocation of labour was pointed out by the Venn Commission.[47] In 1947 and 1948, 52,000 to 53,000 individuals performed some work on sugar estates, but the average weekly number employed was about 27,000. Allowing for the fact that employment in the peak months was likely to be 29-30,000, it is apparent that the industry could have dispensed with over 20,000 individuals who offered themselves for some work during the year.

A study of cane-cutters on a single estate in the autumn crop of 1948 indicated that 462 individuals had worked during the crop, but that no more than 140 cane-cutters were needed each day. The excess is not the whole difference between 462 and 140 because cane-cutting is extremely hard work and a reserve of workers above the 140 would be needed to replace those who could not carry on for five days a week, as well as the normal drop-out. But it is clear that a considerably smaller labour force could have completed the cutting.

The method adopted by the sugar industry to eliminate casual workers was the creation of an employment roster and the introduction of the concept of a regular employee of the estate. In connection with establishing eligibility for holidays-with-pay, the various estates formulated individual definitions of "regular employee"; other workers are called "casual", and usually they are not eligible for fringe benefits. Estates with labour shortages have not been able to impose stringent rules. Four such estates have not established formal definitions of "regular employee" because of labour shortages in their area. On one of these estates an attempt was made to require acceptance of 33⅓ per cent of offered work in crop as a condition of subsequent employment, but the rule was withdrawn when it resulted in the disqualification of too many workers. Another estate reviews the individual work record at the end of crop and interviews those who worked less than 20 days, dropping workers who give unsatisfactory explanations. One estate has varying percentage requirements for different gangs of workers. Only two estates make the definition of "employee" as strict as the conditions which must be met to receive holidays-with-pay. One estate plans to raise the qualification for employment to 82½ per cent by spring 1962 and gradually to extend the requirement to acceptance of a certain percentage of offered days throughout the year. Several estates give priority for off-season work to those who earned holidays-with-pay in-crop.

Decasualization is most successful on the estates which are levelling off their acreage under cultivation and which have an adequate labour supply. An expanding estate, particularly in a labour shortage area, may find the decasualization process a disadvantage. By applying the rules rigidly after one crop, the estate finds that it has made some competent workers ineligible for employment in the next crop. It is forced to re-engage dismissed workers or to take on less able workers as "casuals" to meet labour needs. Some union spokesmen regarded this procedure as somewhat deliberate on the part of management, inasmuch as "casual" workers are now ineligible for most bonuses and fringe benefits. It should be noted that some estates which recruit cane-cutters as needed to supplement the stable labour force, may make such "casuals" eligible for holidays-with-pay and other benefits.

The actual operation of the stabilization programme was studied by Bookers on its many estates, and to a lesser extent, by Demerara Company on its two estates. The data cover five crop periods, from the autumn 1955 crop through the

[47] Venn Report, pp. 50-51, 75, 176.

autumn 1957 crop. Table II-14 shows the total numbers of workers whose names were struck off the rolls on the estates of both companies. Ranging from 845 at the end of crop, autumn 1955, to 2,114 at end of crop, autumn 1956, the total number was 7,851 and the average number released was 1,570 over the five crops. Some

TABLE II -- 14. STABILIZATION OF THE LABOUR FORCE, FIELD OPERATIONS, 1955 — 57 ‡

Number struck from rolls for[1] poor attendance	Crop of: Autumn 1955	Spring 1956	Autumn 1956	Spring 1957	Autumn 1957
	845	1031	2114	1901	1910
Percentage who had worked,[2]					
0-10 days	83.6	64.6	63.1	43.2	40.9
10.1—30 days	11.3	31.7	18.9	53.2	31.7
30.1—50 days	0.1	3.5	8.9	3.5	21.0
50 or more days	0.0	0.2	6.1	0.1	6.4
Total	100.0	100.0	100.0	100.0	100.0
Number re-engaged and new employees	501	1209	1508	1246	1101

‡Special studies by Bookers Sugar Estates, Ltd. and Demerara Co., Ltd.
[1]Total of Bookers and Demerara Co. estates. Each company re-hired a certain number of the disqualified workers.
[2]The days worked refer to each individual crop season. The days of work available generally range between 85 and 110 per crop.

workers were re-engaged at the next crop because the work force was inadequate. It is therefore possible that certain individuals were dropped several times, after successive reinstatements. To obtain a true figure of the number of individuals eliminated from the sugar industry for inadequate attendance over this period of five crops, the total number of workers struck from the rolls, 7,851, must be reduced by those who found work on other sugar estates, those who were re-instated and were retained, and those who were re-engaged and subsequently dropped.

Table II-14 gives a combined figure for the number re-engaged and new employees, presumably from the beginning of each crop to the end of the next out-of-crop season. Since the figures are not separated into old and new employees, it is not possible to compute the net number dropped from the rolls. In fact, many of the re-engaged and new workers may have been hired to replace the natural attrition of the labour force due to deaths, resignations, retirements, disciplinary and medical discharges. It is interesting that losses due to these causes, but excluding pregnancy, promotions and declared redundancy, were slightly greater than the total of stabilization separations. The data are available only for Bookers estates and only for the five crops from August 1955 through August 1957. A total of 5,436 workers were lost in normal attrition as against 5,253 gross through the stabilization programme. Some 618 were declared redundant.

The Bookers survey indicated that about 10 per cent of the workers dismissed for inadequate attendance were female. Since this is a lower proportion than women are of the entire labour force of the sugar industry, the conclusion is suggested that women are more steady and reliable workers than men.

Table II-14 reveals a considerable variation from crop to crop in the records of those dismissed for "inadequate attendance". A breakdown of the data as between Bookers and Demerara Company estates also shows divergent patterns. Undoubtedly, a separate study for each estate would indicate further variations. The question arises whether the stabilization programme has been masking retrench-

ment due to reduced labour requirements, whether of a seasonal or long-range character.

The seasonal factor is suggested because dismissals under the stabilization programme at the end of the autumn crop tend to eliminate fairly high proportions of workers who worked over 30 days, or even over 50 days. In autumn 1956 Demerara Company's stabilization dismissals totalled 759, of which 119 were workers with 50 days or more of work. In autumn 1957 the ratio was 88 out of 606. Bookers did not show so high a proportion in any crop, but, as Table II-14 indicates, workers with 30 days or more per crop formed quite high percentages of the dismissals in autumn 1956 and autumn 1957. Presumably this reflects the fact that the spring crop takes a somewhat smaller labour force; discharges at the end of the autumn crop are a preparation. It is further borne out by the fact that the gap between the number dismissed and the number re-engaged or newly hired is larger for autumn crops than for spring.

Not only may variations in the standards for dismissal under the stabilization programme be geared to seasonal labour needs, but they may be used to slough off permanently workers who have really been rendered redundant by technical changes. Demerara Company with 20 per cent of sugar production accounts for over one-third of all stabilization dismissals. Demerara's total additions to staff through re-hiring and new employment were only 40 per cent as great as its dismissals, while Bookers' showed almost 80 per cent. In fact, the net drop in Demerara's employment was 1,570 against Bookers' 716. Losses due to normal attrition are not considered in these figures.

Some measure of the overall impact of the stabilization programme is provided by Table II-13, Col. 1. The number of persons on the field employment roster has declined from 41,491 in 1954 to 24,495 in 1960. Not all of the decrease represents an elimination of actual workers. In 1954 the roster contained names of totally inactive persons, deceased persons, and duplications due to payroll listings under more than one name. Nevertheless, there has been a substantial reduction of persons eligible to work in the field since 1954. At present, only a comparatively small number of "casuals" are taken on at peak periods. Union spokesmen believe that non-resident workers have been relatively harder hit by decasualization than have resident workers. In the factories, the decline has been less noticeable since 1954 because decasualization had already proceeded much farther. At that time 6,323 workers were on the roster; by 1960, only 4,366 were listed (Table II-5, Col. 8).

(3) The sugar industry has frequently given the impression that the decline in employment over the past decade has been almost entirely due to the stabilization programme and that a substantial advance has been made in the goal of providing a stable labour force with year-round, full-time employment. Previous sections of this chapter have been devoted to an explanation of the decreased need for labour, overall, at particular times of the year and among particular types of workers. All the indices point to an increasing difficulty in providing a full year of employment to sugar workers. To be sure, considerable numbers of workers have alternative employment or small farms, and do not look to the sugar industry for year-round employment. Studies are needed of the off-season pursuits of the peak labour force on several estates in different parts of the country. The extent of total unemployment, seasonal unemployment and underemployment throughout the year on the sugar estates is very imperfectly estimated at present.

One measure of the success of the stabilization programme is the increase in the length of the average work-week. Ideally we would like to know the total man-days per year divided by the total number of individuals who worked at least one day in the year. Lacking this data, we fall back upon the less satisfactory measure

of the average weekly man-days divided by the average weekly number of workers. As Appendix B points out, this measure fails to allow for the effect of decasualization, namely that over the course of the years the actual number of separate individuals at work has decreased more than the decline in the average number of workers suggests. Thus the true increase in the average length of the working week tends to be somewhat understated. On the other hand, this method of calculating the length of the average work-week completely ignores weeks of total unemployment. It is difficult to say what the effect of this exclusion has been on the movement of the statistics over time, particularly since voluntary and involuntary employment cannot be distinguished.

One further change in the composition of the labour force has a bearing on the lengthening of the average work-week. In contrast to 1949 or 1950, the present field labour force has a relatively smaller number of female and male piece workers, groups which tend to have a short work-week.

Table II-15 presents data on the average work-week of all field workers and selected groups, including some breakdowns by high and low months. The change from 1949 to 1955 is not significant; however, the decasualization programme only began in earnest in the latter year. Reductions in the average number of days per week in 1956 are attributable to an economy drive in the last months of the year when work was deliberately curtailed. The overall rise from 3.89 to 4.5 days a week for all field workers is not a striking increase from 1949 to 1960, nor is the corresponding increase for adult male field workers. Adult female field workers show very little change over the entire period, except for the unusually low figure in 1955. Decasualization certainly did little to give women more days of work in the week. Cane-cutters appear to have made some gains in-crop, but it is not the length of the in-season work-week which tests the success of year-round stabilization.

It may be that there is little room to increase the average work-week in view of the various interruptions to agricultural work in the course of the year. The ideal of a five-day, forty-hour week may be impractical in agriculture, as many have said. The sugar industry must exercise restraint in its claims regarding the accomplishments to date of the stabilization programme and in its anticipations for the future as regards the approach to a full week and whole year of work for each remaining employee. Proposals to remedy the situation in other ways, such as that of the Sugar Boilers' Union for a guaranteed annual income, and the M.P.C.A.'s suggestion for an increase in the price of locally-consumed sugar to provide a fund for unemployment compensation for field workers, are likely to be presented with increasing urgency, if the record of out-of-crop unemployment and in-crop underemployment is not substantially improved.

7. The workers remaining in employment have substantially increased their real earnings over the decade and some of them have acquired skills which are in demand in other parts of the economy.

The rise in real wages in the sugar industry since 1949 is in sharp contrast to the stagnation of real wages during the preceding decade. From 1939 to 1948, money earnings per man-day more than doubled for most categories of sugar workers, but the cost-of-living index also more than doubled; in consequence, male workers made only a small gain and female workers actually suffered a loss in real wages.[48]

From 1948 to 1960, annual money earnings per worker tripled while the cost of

[48]Venn Report, pp. 77— 78 and 178.

TABLE II—15. AVERAGE NUMBER OF DAYS WORKED PER WEEK BY FIELD WORKERS, 1949—1960‡

Year	Average Number of Days Worked per Week by all Field Workers[1] [2]	Average Number of Days Worked per Week by Adult Male Field Workers[2]	Average Number of Days Worked per Week by Adult Female Field Workers	Average Number of Days Worked per Week by Cane-cutters		Average Number of Days Worked per Week by Adult Male Time Workers		Average Number of Days Worked per Week by Adult Female Piece Workers	
				Low Month	High Month	Low Month	High Month	Low Month	High Month
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1949	3.89	3.87	3.79	n.a.	n.a	n.a.	n.a.	n.a.	n.a.
1950	3.97	4.01	3.73	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1951	3.96	4.01	3.73	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1952	3.99	4.06	3.71	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1953	3.93	3.97	3.72	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1954	3.91	3.93	3.83	3.31[3]	4.59[3]	n.a.	n.a.	n.a.	n.a.
1955	4.10	4.15	2.59	2.75	4.59	n.a.	n.a.	n.a.	n.a.
1956	3.97	3.99	3.81	2.41	4.68	n.a.	n.a.	n.a.	n.a.
1957	4.25	4.35	3.79	2.43	5.05	4.35	5.32	3.11	3.61
1958	4.38	4.51	3.85	3.91	5.12	4.43	5.60	3.15	3.71
1959	4.37	4.51	3.80	2.55	5.13	4.17	5.37	2.92	3.72
1960	4.50	4.63	3.95	3.63	5.11	4.19	5.37	3.11	3.93

‡ Department of Labour, **Annual Reports**, B.G.S.P.A. monthly reports.

[1]Includes piece and time workers, resident and non-resident workers, and young persons.

[2]Includes cane-cutters.

[3]July—December 1954 only.

living rose by less than 40 per cent.[49] For recent years, more information is available and is more exact. Thus, wages paid per man-day have risen from $2.79 in 1955 to $4.25 in 1960. The average worker earned $585 in 1954 and $1,085 in 1960, an increase of 85.5 per cent.[50] During this six-year period the cost-of-living index rose by 11 per cent, leaving real wages about 67 per cent higher in 1960 than in 1954. This is an increase of nearly 9 per cent a year (compound rate) in the purchasing power of the average sugar worker.

The rise has resulted not from increases in the "basic" wage rates, but rather from boosting the "cost-of-living allowance" almost every year and from the introduction of bonuses and holidays-with-pay. In addition, the stabilization programme has eliminated marginal workers, those who worked only a few days or weeks a year, and had very low annual earnings. The decreasing proportion of women and elderly workers, a low earnings group, also tends to raise the statistical average for the remainder. Since 1954 average annual money earnings show a more rapid increase than wage-rates plus the cost-of-living allowance, reflecting the progressive decline in the proportion of marginal and poorly paid workers. The enlarged wages pie is now shared among a smaller number of more fully-employed, adult, male workers.

It is clear that all groups of workers did not fare equally well in the advance of earnings. Between 1954 and 1959 the average weekly earnings of adult female workers in the field did not increase greatly. Female piece workers moved from $5.21 per week in 1954 to a high of $6.58 in 1958 and then dropped to $5.95 in 1959; time workers earned $4.02 in 1954 and reached a high of $5.21 in 1959. Young females (under 18) did considerably better; they began with $3.83 in 1954 and reached $6.18 by 1959.[51]

Among males, the greatest relative gains were made by young males (under 18). Their weekly wages rose from $4.61 in 1954 to $7.51 in 1959. Adult male time-workers earned $8.88 in 1954, $13.74 in 1958, and $12.30 in 1959. The very important category of adult male piece-workers, including cane-cutters, had the highest absolute earnings, $11.51 in 1954 and $16.56 in 1959, but their relative advance was not as great as the other two groups of male field workers. In all categories, average weekly earnings appear to be highest on estates on the East Bank of the Demerara River, with the three other main areas closely ranked behind.

The introduction of machinery in the sugar fields has produced entirely new classifications of workers: drivers of tractors, operators of graders, dredges, draglines, etc., mechanics, apprentice-mechanics, repairmen and other workers in the mechanical equipment workshops or garages. The sugar industry has been the training ground for workers who have moved on to jobs in government or private industry as operators of mechanical equipment or who have tractors and harvesters on their own rice farms. Bookers Sugar Estates operate two apprentice training schemes in engineering trades, one in Berbice and one in Demerara. Designed to produce trained fitters, machinists, agricultural mechanics, electricians and welders, the schemes each accept twenty new students annually, after competitive examinations. At present there are 88 trainees in the Berbice scheme and 70 in the Demerara. While the trainees are expected to work on the sugar estates upon the completion of their course, they may eventually find a place in some other

[49]B.G.S.P.A. data on total wages and bonuses paid has been divided by the average number of workers in field and factory (Department of Labour series). Statistical Bureau indices of cost of living ("old" index extrapolated by means of "new" index).

[50]Total wage bill, including all wages, bonuses and holidays-with-pay, divided by average weekly number of workers in field and factory (B.G.S.P.A. series).

[51]All statistics on average weekly earnings come from the annual reports of the Department of Labour. They exclude bonuses and holidays with pay and should not be compared with the annual figures cited above.

growing industry, contributing the skill developed initially in the sugar industry to the industrial diversification and expansion of British Guiana.

The expansion of employment opportunities has also been extended to junior and senior executives of the sugar companies. Bookers Sugar Estates, Ltd. has described this policy in a special memorandum:

> In the past, the staff of Bookers Sugar Estates has always been fully Guianised up to the level of junior staff (which includes senior supervisors). There has, however, been the category of senior staff (270/290 in number) which in the past, was predominantly expatriate .... Over the past 10 years, and increasingly over the past 5 years, this category has been, and continues to be, Guianised .... With the demands of modern technology — both in the field and in the factory — increasing all the time, the major present need is for suitably trained Guianese engineers, chemists, and technical Field Superintendents. In these categories the greater number of recruits still have to be expatriate. But every effort is being made to bridge this gap by the award of cadetships to young Guianese emerging from the fast developing secondary school system. Over the past 5 years Bookers Sugar Estates have awarded 22 scholarships for technical training abroad: 10 of these have returned from their training and now occupy senior staff positions on the estates ....
>
> Concurrently with the award of cadetships the extensive programme of training courses within the Company gives our present Guianese staff the opportunity to equip themselves for promotion to senior jobs.

This policy is to advertise vacancies, if they cannot be filled by promotion, first in British Guiana, then in the West Indies, and finally in the United Kingdom. Guianization has, however, not been encouraged at the expense of prejudicing the company's operations or its responsibilities to present expatriate employees.

The results of the policy of Guianization in Bookers from January 1956 to June 1961 can be summarized briefly. Total senior staff dropped from 299 to 289 between the two dates, but Guianese senior staff rose from 105 to 137. The overall decline is entirely accounted for by the reduction of the number of senior staff on the estates from 268 to 240; the Georgetown staff rose from 31 to 49. Among Guianese senior staff, however, the number on the estates rose from 98 to 117 and in Georgetown from 7 to 20. Since West Indian employees also increased slightly, the overall reduction was accomplished by not hiring expatriates from the U.K. or other countries.

We were told by union representatives that Guianese who replaced expatriates were not paid as well or given the same perquisites and allowances as the latter for identical work. This is a vexed issue because the benefits and allowances which are offered to induce expatriates to take up residence far from home are, in some respects (e.g., travel allowances for school-age children), irrelevant for Guianese. On the other hand, if the basic pay, housing, pensions, medical care, etc. are different, there is cause for discontent.

CHAPTER III

TECHNOLOGICAL CHANGES AND LABOUR REQUIREMENTS

The main influences bearing on the volume of employment offered by the sugar industry have been changes in technology and changes in acreage and output. The technological changes include not only mechanization but also many scientific and organizational improvements involving little or no capital equipment. Both kinds of technological change have tended to reduce the total of man-days required for a given output, and therefore have also tended to reduce the number of persons employed. In contrast, the expansion of acreage and output over the last decade tended to raise employment, and in effect concealed or cushioned the impact of technological displacement. The process of decasualization, discussed in Chapter II, is excluded here, inasmuch as it does not directly affect the man-day requirements as do the other changes.

A. Field Operations

The sharp declines in field employment, described in Chapter II, are due largely to the technological changes introduced over the decade (Table III-1). In the transition from "Methods in 1948" to "Methods in 1961", we must distinguish among three kinds of operations: (a) those which are substantially unchanged, marked "manual as in past"; (b) those which have been "mechanized" by the introduction of major capital equipment; and (c) those which are still labelled "manual" and utilize little or no capital equipment, but have been significantly altered in technique.

This distinction is important in principle. While both types of change, (b) and (c), raise questions of promoting efficiency versus maintaining employment, type (b) also raises questions of capital allocation and its alternative returns, from the private as well as the public viewpoints. In practice, however, the two types of changes interact, facilitating alterations first of one kind, then the other. Technological change of type (c) is indeed an old story in the sugar industry of British Guiana, but mechanization in the field is fairly new and has facilitated additional kinds of technological progress.

1. Mechanization. The introduction of mechanical equipment in field operations was stimulated by the expansionary programme adopted at the end of the 1940's. It did not appear feasible to the sugar industry to open up so much new land, and to bring it under cultivation so rapidly, without the use of machinery. Not only were the costs of manual preparation of new land judged to be vastly higher, perhaps prohibitive, but also the supply of labour for the British Guiana sugar industry was considered to be very short at the end of the second World War. A Booker's memorandum cites the following factors at that time:[52]

> There was a greatly increased demand for bauxite during the war and a great many skilled and semi-skilled men gravitated to Mackenzie (bauxite centre in the interior of British Guiana). A good many skilled and unskilled men were required for the construction of Atkinson Field (airbase). The Mahaicony-Abary rice scheme

[52] "Mechanisation in the British Guiana Sugar Industry", a memorandum prepared by Mr. R. R. Follett-Smith, former chairman of Bookers Sugar Estates Ltd.

TABLE III—1. CHANGES IN SUGAR ESTATES' FIELD OPERATIONS, BRITISH GUIANA, 1948 and 1961

Operation	Methods In 1948[1]	Methods In 1961[2]
Land Preparation		
Land Clearance in New Areas	cutlasses : manual	mechanized : crawler tractors with bulldozer blades
Canals for Drainage		
Irrigation and Transport	"shovel gang", "boy gang" : manual	mechanized : 3/8 dragline dredges
Cultivation		
Tillage	ploughing (occasionally): by oxen or tractors	mechanized : regular (at end of each cycle) ploughing, breaking subsoil, and forming new beds, using crawler tractors with discs and harrows:
	and/or "forking beds" : manual	elimination of forking;
	also inter-row tillage : manual	reduction of inter-row tillage.
Internal Drainage of Fields	"shovel gang" chiefly to maintain existing drains : manual	mechanized : digging drains, using crawler tractors with T. D. 18 drain diggers.
Planting	"half-bank and plant" (re-planting usually after every four years) : manual	manual, but changed to "chop and plant", with extension of ratooning cycle.
Fertilizer Application	"creole gang" : manual	{ manual : 95% of fertilizer tonnage; mechanical spreaders : 4%; airplane spraying : less than 1% } with scientific selection of timing and types.
Weed Control	"weeding gang", using cutlasses : manual	{ manual with cutlasses : 60% of weeding expenditures; manual with chemical spray in shoulder tanks : 37% (pre-emergence spraying reduces need for inter-row tillage); rotary slasher : less than 1%; airplane spraying : less than 2%
Harvesting		
Reaping	"cutters" using cutlasses : manual	manual as in past.
Bundling	"cutters" using canebands : manual	manual as in past.
Field Transport of Cane	"cut-and-drop" by cutters plus loaders : manual	manual, but changed to "cut-and-load" by cutters only.
Transport to Factory	punts drawn by oxen or mules	mechanized : punts drawn by wheeled tractors.
Transport of Labour to Work Site	mostly on foot	mechanized : bicycles plus estate lorries

[1]Based chiefly on Venn **Report** (Gt. Britain, Colonial Office, No. 249), especially Chaps. III — V.
[2]Based chiefly on memoranda from Bookers Sugar Estates, Ltd., August, 1961.

required a great many shovelmen in the initial stages. There was a severe epidemic of malaria in 1943-44. Shortage of imported foods stimulated local food production. A shortage of consumer goods reduced the incentive to do more than a minimum of work.

By 1948, however, the labour shortage was disappearing, as a result of malaria control with D.D.T. (begun in 1946), plus reversion to more usual economic conditions. The Venn Report, written in 1949, declares that: "Labour, indeed, would not appear likely to form the limiting factor to any further expansion in sugar production, for . . . . . everything points to its growing superfluity" (pp. 5-6).

Additional to this special concern with the means of expansion was the industry's perennial interest in reducing operating costs. Much the same machinery to be adopted for opening up new lands could be applied to cultivating the old lands. The industry was also embarrassed by reports of low wages paid, both daily and annually, to sugar workers. The introduction of machinery appeared as a device to facilitate expansion, raise productivity per worker employed, and lift the wages paid to more productive employees.

The Venn Commission emphasized that human labour, especially that of women and girls, should not be employed in water. The Report urged that "draglines should exclusively be used for the dredging and cleaning of all canals and waterways" (p. 17). More generally, the Commission gave every encouragement to the sugar industry to mechanize, not only for the sake of the industry, but on behalf of the workers themselves:

> It is obvious that every opportunity will in future have to be taken to relieve human muscles from performing tasks that can be more cheaply and efficiently performed by machines . . . the numerous . . . operations are necessarily performed under conditions of climate and temperature which, it is generally agreed by physiologists, must adversely affect human endurance and therefore output . . . . (p. 78).

Still more broadly, the Commission asserted that:

> . . . . if the industry is to be able to compete economically it must mechanize . . . . the agricultural world has always found that mechanization, by increasing the earnings of a few and so promoting the flow of money, stimulates subsidiary industries and ultimately benefits the whole community (p. 36).

The actual introduction of machinery took place mainly in land preparation, tillage, drainage and transport; that is, in the field operations prior to planting a new crop, in the maintenance of the drainage system, and in the haulage of the loaded punts by tractor. As Table III-2 shows, purchases of equipment were at a relatively high level from 1947 until 1952, evidently in accordance with the new-lands programme. Of the 112 crawler tractors held by Bookers on the 1961 inventory it is estimated that 49 were used for earth-moving and 63 for tillage and drain-digging. After 1951 or 1952, Bookers' purchases in the four equipment categories slackened for a few years, but rose to another peak in the mid-1950's (for wheeled tractors the high level of purchases was during 1957-61) with the extension of mechanical methods of cultivation, drainage maintenance and transport. Demerara purchases generally lagged a year or two behind Bookers. The introduction of equipment over these years shows a considerable correlation with the decline in employment described in Chapter II, although allowance must be made for many other influences.

Other mechanical devices, not shown in Table III-2, include shoulder tanks for the spraying of chemical fertilizers, insecticides and weedicides. Female weeders have been partially displaced by the new method, but much manual labour is still applied by the male gangs using the shoulder tanks. The airplane has been used by the Bookers estates chiefly for "supplementary applications" of fertilizer in high cane, after five to eight months' growth makes hand application difficult or

TABLE III—2. YEARLY PURCHASES OF FIELD MACHINERY BY SUGAR COMPANIES, 1947—1961 ‡

Year	Crawler Tractors			Wheeled Tractors			Draglines			Agricultural Implements[1]		
	Bookers	Demerara	Total	Bookers	Demerara	Total	Bookers	Demerara	Total	Bookers	Demerara	Total
1947	9	N.A.	9	8	N.A.	8	2	N.A.	2	7	N.A.	7
1948	10	N.A.	10	6	N.A.	6	1	N.A.	1	13	N.A.	13
1949	18	N.A.	18	23	N.A.	23	5	N.A.	5	15	N.A.	15
1950	18	0	18	12	2	14	3	0	3	30	1	31
1951	11	0	11	32	7	39	5	0	5	33	8	41
1952	6	1	7	21	1	22	6	3	9	10	7	17
1953	4	1	5	8	4	12	3	2	5	8	5	13
1954	7	3	10	7	6	13	13	2	15	5	5	10
1955	9	3	12	1	5	6	10	1	11	19	8	27
1956	20	1	21	9	1	10	3	0	3	22	4	26
1957	10	3	13	39	4	43	7	0	7	8	6	14
1958	0	2	2	49	1	50	3	1	4	4	4	8
1959	1	4	5	17	5	22	0	1	1	2	6	8
1960	0	4	4	15	6	21	1	3	4	3	2	5
1961	1	N.A.	1	28	N.A.	28	1	N.A.	1	4	N.A.	4
Totals Purchased[2]	124	22	146	275	42	317	63	13	76	183	56	239
Net Inventory on Hand 31.12.61.	112	19	131	209	32	241	60	13	73	174	44	218

‡ Memoranda supplied by Bookers Sugar Estates Ltd., and Demerara Company Ltd.
[1]Refers to mechanical equipment such as disc ploughs and harrows; does not include hand tools and sundry equipment. Purchases of lorries and personnel carriers also excluded.
[2]The totals represent cumulative purchases over these years, without regard to scrapping.

impossible. Airplane fertilizing represents an additional operation rather than a replacement of a manual task.

In weed control, where the total volume of spraying has also been enlarged, aerial applications at present are minor compared with spraying by field workers. The former is used chiefly when weather conditions and/or a shortage of labour prevent weed control at the crucial times. Some 60 per cent of one company's annual weeding expenditure still goes for manual weeding (cutlassing); and of the remainder spent on chemical weed control, about one-third still goes for wages.

The expense of airplane purchase and maintenance, in relation to the acreage involved, has prevented Demerara Company from making use of this method. On Bookers estates the use of the airplane has produced complaints by farmers that their ground provisions and tree crops were adversely affected by the spraying. Although these protests were regarded as scientifically unfounded, Bookers' field supervisors felt that increased use of aerial spraying might be retarded by local opposition.

It must be noted that mechanical cultivation did not reduce the quantity of operations to be done per acre, but sometimes even increased it. The old system utilized the existing beds and drains as much as possible, so that cultivation consisted mainly in weeding, forking and planting on top of the beds, tilling between the rows, and clearing the drains. But the new mechanical system involved complete re-working of the land at the end of each ratoon cycle, including ploughing, harrowing, forming new beds and digging new drains. On the other hand, because of the use of equipment, the intensive work of preparing the land and digging and maintaining canals and trenches employs less human and animal labour than before.

It is difficult to measure the amount of labour directly displaced by machinery, because of the foregoing changes in operating procedures, as well as the lack of work data subdivided into particular operations. It is still more difficult to measure comparative efficiency, because the differential outputs per unit of time must be set against differential costs, and the costing practices in this industry are not yet entirely satisfactory. The following data attempt such comparisons for three specific operations which have remained fairly comparable, and show both work ratios (output per time unit) and cost ratios (cost per unit of output) for recent years:[53]

(a) Digging drains: T. D. 18 draindigger vs. shovelman

Work ratio	75 : 1
Cost ratio	1 : 3

(b) Digging canals: 3/8 dragline vs. manual digging

Work ratio	20 : 1
Cost ratio	1 : 2

(c) Hauling cane: tractor vs. mule

Work ratio	10 : 1
Cost ratio	1 : 2

These figures indicate the superiority of machinery over manual and animal labour as regards both speed and cost-saving for these particular operations.

2. **Non-mechanical Improvements.** The non-mechanical changes introduced since 1948 include some made desirable and indeed possible by the new mechanical methods, as well as others developed independently of mechanization. Thus the improved cultivation achieved with equipment (especially the improvement of drainage by the use of draglines), assisted by independent progress in fertilizing

[53]Data specially prepared by Bookers. Costs of manual labour represent wages only. Costs of mechanical operation represent "full ownership and operating charges" (including depreciation, but excluding interest charge on the invested capital).

and in weedicides, reduced the need for laboriously building up the cane beds by manual "forking"; it also cut the need for inter-row tillage, another manual operation. This was at first partly converted to mechanical tillage and then, after 1956, was sharply curtailed.

A further consequence of the improved cultivation was better flood-fallowing and stronger crops; and these in turn led to longer ratooning, which meant less frequent re-planting and thereby brought a large reduction in labour requirements. The extension of ratooning which began after 1956 is shown in the following percentages of standing canes in each year:

	New Plants	1st Ratoons	2nd	3rd	4th	Older Ratoons
1955	26.1	23.9	24.1	18.6	5.0	2.3
1956	27.9	24.5	23.3	17.1	5.1	2.1
1958	19.7	22.5	22.8	19.9	9.6	5.5
1960	11.9	13.0	18.0	19.4	17.8	19.9

At the same time, research studies were conducted to demonstrate that under these conditions there was no real loss from the elimination of forking, the curtailment of inter-row tillage, and the extension of ratooning: the decline in yield being small, and negligible compared to the saving in cost.

Among the independent advances, continuing a long tradition of scientific investigation in the sugar industry, were the development of stronger plant types, more resistant to weather, weeds, insects and plant diseases; varieties with different growth cycles, so that portions of the crop reach maturity in sequence rather than all at once; also richer fertilizers, to maintain or increase the yield; more powerful weedicides and pesticides; and more rational schemes of applying the fertilizers, weedicides, etc. The increased use of these chemical aids, which are still manually applied for the most part, actually tended to raise the need for labour. But other effects, particularly from the new pre-emergence spraying which prevents the growth of weeds and insect pests in the first place, have reduced the need for the corresponding kinds of manual tillage.

Still other changes have come, not from formal research, but simply from on-the-spot improvements which curtail laborious jobs. One instance is the widespread adoption of the "chop and plant" method of putting in a new crop, which saves much effort compared to the old method of "half bank and plant". Another instance is the shift from the "cut and drop" method of harvesting the crop (whereby one gang used to cut the canes and carry them to the canal bank where another gang would pick them up and load them into the punts) in favour of the "cut and load" method (whereby the cutter himself carries out the whole operation), at a considerable saving in time and duplication of effort. The change over in these methods of harvesting was largely accomplished by the early 1950's.

Related to these improvements in methods, and also related to the decasualization programme, is the rationalization of labour use. While formal time-and-motion studies are still over the horizon for this industry, the managers of estates and factories and the Georgetown offices have been giving increasing attention to the elimination of unnecessary jobs, the transfer to pension rolls of superannuated employees, the re-scheduling of work flow, and the reassignment of individual workers to the jobs best suited to them. While some of these rationalization measures only reduce the total number of employees, others also cut the total man-days required.

If we take account of all the forces which have reduced the labour requirements in the field over the past decade, we cannot place all of the responsibility on mechanization, as has frequently been done in official debates and in press reports. The term "mechanization", it is true, has been used loosely as the cause of all labour

displacement. When pressed, the accusers will retreat on the issue of how much new machinery has actually been introduced. For the purposes of this study, mechanical changes are distinctly separated from non-mechanical changes.

The non-mechanical improvements, which require small or negligible capital outlays, appear to be on a par with capital-intensive machinery in displacing labour. In fact, the two types of change interact with each other; a mechanical innovation makes possible certain non-mechanical advances, and vice-versa. Furthermore, the reduction of costs has not been the sole consideration in labour-saving measures. Company managements have also striven to improve technical performance (such as higher yields per acre, and higher productivity per man-hour) as well as operating convenience and reliability (relative to the unavailability, reluctance or incapacity of human labour at certain times in the cultivation cycle).

3. **Effects on Seasonality.** The decline in labour requirements has not been uniformly spread over the year or over the several operations in the field. The new technologies have drastically reduced the labour input per acre in cultivation, while the labour requirements for harvesting each ton of cane have hardly changed. This means that the disparity between the man-days required in the 33 weeks or so when the two crops are harvested, and the man-days required during the remaining weeks of off-season, has been widening over the past decade. The intensification of seasonality of employment, discussed in Chapter II, is directly attributable to the reduced labour requirements in cultivation.

B. Factory Operations

While factory labour requirements also declined during the past decade, the underlying technological changes were quite different from those in the field. Since most factory operations had already been mechanized long before the second World War, the postwar changes did not include much new mechanization of formerly manual operations, nor much displacement of labour by non-mechanical improvements. The main features of technological advance in factories during this period were: (1) consolidation of sugar manufacture in a smaller number of individually larger factories, and (2) replacement of certain equipment with larger and more efficient units, some of them more automatic. Both lines of action tended to displace labour.

1. **Consolidations since 1948.** The consolidation of sugar estates has been going on for a long time in British Guiana, in accordance with the vicissitudes of the industry and the weakness of small producing units.[54] Table III-3 shows the continuation of this process in the postwar period: from 16 sugar factories in 1948, many of them quite small by modern standards, to 11 plants in 1961 with greatly enlarged capacity. In this period the following factories were closed: Lusignan in 1950; Ruimveldt in 1953; Port Mourant in 1955; Houston in 1955; Ogle in 1958. Three of the five factories belonged to Bookers; Houston was owned by the Vieira family; the fifth, Ruimveldt, was the property of the Demerara Company. The process of consolidation of factories in British Guiana has undoubtedly been facilitated by the

[54] "The continued marketing of slave-produced sugar by non-British countries after 1834, the withdrawal of protection by the Sugar Act of 1846 and indifference to the practices of the Continental sugar-beet industry at the expense of the Colonies, all combined to eliminate the resident proprietor on his small estate and to substitute the centralized factories financed from England. In 1829 there were 230 sugar estates turning out an average of 232 tons of sugar a year; in 1953 there were only 14 factories averaging 18,500 tons a year". (**Bookers Sugar 1954, p. 15**).
Most of this reduction in numbers had already occurred by the end of the nineteenth century; in 1896 there were only 64 estates in the territory. By 1948 the number of factories had fallen to 16. Besides those consolidated, a number of sugar estates and their factories were abandoned during the inter-war era, notably the closure of the four factories on the Essequibo coast.

TABLE III — 3. NUMBER AND CAPACITY OF SUGAR FACTORIES, 1948 and 1960‡

Factory[1]	Grinding Rate (Tons Cane per Hour)		Approximate Maximum[3] Capacity (Tons of Sugar)	
	1948	1960	1948	1960
(D)[2]				
Skeldon	45	60	16,000	24,000
(D)				
Port Mourant	55	closed	20,000	closed
(D)				
Albion	55	85	20,000	36,000
Rose Hall	57	115	20,000	47,000
(D)				
Blairmont	55	75	20,000	27,500
(D)				
Enmore	55	100	18,000	37,000
Lusignan	45	closed	16,000	closed
(D)				
L. B. I.	40	100	14,000	38,000
Ogle	35	closed	9,000	closed
Ruimveld	16	closed	4,000	closed
Houston	15	closed	4,000	closed
(D)				
Diamond	95	120	28,000	40,000
Wales	44	70	12,000	22,000
(D)				
Versailles	30	40	8,000	12,500
Leonora	50	65	14,000	22,500
(D)				
Uitvlugt	60	85	20,000	31,000
Total			243,000	337,500

‡ Great Britain, Colonial Office, No. 249, (Venn Report), Table XXXII, p. 175; B.G.S.P.A. memorandum.
[1] (D) indicates that a distillery is attached to the factory.
[2] Skeldon distillery not operative.
[3] The figures on approximate maximum capacity are based on an average of 30 weeks of grinding in 1948 and 33 weeks in 1960.

fact that only two sugar companies operate in the colony. Each can make centralized decisions on where to concentrate its operations and where to shut down. Such concentration of ownership of factories does not exist in Jamaica and Barbados, as indicated by the following tabulation for 1958:

	No. of Factories	Sugar Production (long tons)	Average Production per Factory (long tons)
Barbados	20	141,673	7,084
British Guiana	12	306,361	25,530
Jamaica	20	332,975	16,649
Trinidad	6	184,000	30,667

Source: B.W.I.S.A., Sugar in the West Indies and British Guiana, 1958, pp. 95-96.

Jamaica, whose sugar industry is roughly of the same size as British Guiana's, showed "several hundred factories" in 1805, reduced to 130 by 1897, to 59 by 1920, and so to 20 in 1958. This is a slower rate of consolidation than is shown by the figures given above for British Guiana, and also a smaller average size of factory than in British Guiana. Barbados, which had as many as 440 factories at the end of the nineteenth century, still shows less concentration than British Guiana. Trinidad is the most concentrated of all.

The closure of some factories, and the transfer of their cane-grinding to nearby factories, has been dictated by considerations of efficiencies of scale, concentration of improvements, and advances in transportation. The Venn Report (1949) stated that:

> . . . a factory of 20,000 tons capacity is nowadays accepted as the smallest thoroughly efficient unit, and that 30,000 is as large as the prevailing transport conditions will permit. The former figure connotes a cane acreage of 7,000, which is in fact the average size of all the estates. At current rates of yield the larger factory could just absorb the out-turn of a 10,000 acres estate. At present seven plantations exceed 9,000 acres in size, four are below 4,000 acres; but all could add to their cane areas from abandoned or unused lands (p. 10).

Between 1949 and 1954, steps were taken in this direction; in particular the factories at Uitvlugt and Enmore were enlarged or rebuilt to a capacity of approximately 30,000 tons. But smaller factories persisted — down to Ogle, the smallest, at 10,000 tons capacity. After 1954, the sights were raised still higher, in accordance with technological advances in the plant, improvements in transport (strengthened canals, mechanical haulage of punts), and lengthening of the grinding seasons. Today several factories with upwards of 40,000 tons capacity are in operation; and only one factory, Versailles, now remains with a capacity of less than 20,000 tons.

Table III-4 shows the operating results for the individual factories, designated by letters, and arranged in descending order of volume of sugar produced over the period 1957-60. It is evident that the lowest number of man-days per ton of sugar is now found in the largest factories, and that the smallest factories show the highest labour requirement. But this correlation does not hold uniformly throughout the range of sizes, nor in every year. In a number of instances, economies of scale (narrowly defined) are overshadowed by improvements in the equipment and operation, as suggested by the record for factories A, B, E, G, H, I, where during 1957-59 there was little or no expansion in volume but there was a marked reduction in labour requirements. Similarly, in any one year, 1960 for example, factories of similar size presented markedly different labour requirements. To be sure, managerial skill as well as quality of cane and regularity of its delivery and other factors play a role here, together with improvements in the equipment. The latter, however, is probably the most pervasive influence.

As a result of these enlargements and improvements, the industry has been able to process an increased volume of cane in a reduced number of plants with fewer man-days and fewer workers than before. We turn now to the technologic improvements in detail.

2. **Replacements and Innovations since 1948.** Maintenance of factories had been minimized, and modernization, had been neglected, during the 1930's when low prices discouraged expenditure, and also during the second World War when sugar prices rose but equipment was often unobtainable.[55] The situation at the end of the war has been described as follows:[56]

> Machinery was in many cases worn out and incapable of further efficient service, or obsolete and costly to maintain and to run; buildings were in a poor state of repair; the fuel bill was high, and recovery of sugar indifferent by modern standards. It became increasingly difficult to operate many of the factories economically, and as soon as new machinery and structural materials became available once more, rehabilitation schemes were put into effect. Between 1945 and 1953, sugar factory machinery to the value of $9,000,000 or £1,875,000 was imported into the Colony.

The new installations included new, continuous juice clarifiers and rotary vacuum filters, enlargements of evaporating plant, new and larger vacuum pans, high-speed semi-automatic centrifugals, water-cooled crystallizers, turbine drives for the crushing plant, extensive electrification (with installation of electrical generating equipment), improved steam-raising plant and new instruments for

[55] **Bookers Sugar, 1954, p. 9.**
[56] **Ibid., p. 57. Cf., the Venn Report, p. 43**
In the early 1950's, B. G. sugar factories still employed about 400 operatives on the average, in contrast to about 150-200 in Queensland and Hawaii **(Bookers Sugar, 1954, p. 125).**

TABLE III—4. SUGAR PRODUCTION AND LABOUR REQUIREMENTS, INDIVIDUAL FACTORIES, 1957 — 1960 ‡

	1957			1958			1959			1960		
Factory	Tons Sugar	Man-days	Man-days per ton	Tons Sugar	Man-days	Man-days per ton	Tons Sugar	Man-days	Man-days per ton	Tons Sugar	Man-days	Man-days per ton
A. Rose Hall	45,270	212,283	4.7	46,202	201,616	4.4	40,684	174,674	4.3	46,510	166,536	3.6
B. L.B.I.	33,736	215,830	6.4	37,964	212,211	5.6	32,670	139,382	4.3	37,625	135,415	3.6
C. Diamond	32,003	200,650	6.3	35,436	224,038	6.3	33,057	203,999	6.2	40,323	177,117	4.4
D. Enmore	31,420	148,094	4.7	33,150	149,222	4.5	28,719	154,852	5.4	36,915	167,585	4.5
E. Albion	31,400	163,968	5.2	31,048	156,981	5.1	30,183	141,174	4.7	36,305	145,998	4.0
F. Uitvlugt	25,465	112,470	4.4	28,265	114,792	4.1	26,745	142,758	5.3	30,990	163,693	5.3
G. Blairmont	25,156	151,708	6.0	27,035	155,985	5.8	24,320	139,641	5.7	26,083	127,986	4.9
H. Skeldon	19,110	114,807	6.0	20,050	111,539	5.6	20,335	105,337	5.2	23,485	103,679	4.4
I. Leonora	16,293	94,982	5.8	18,568	97,599	5.3	18,900	89,557	4.7	22,527	82,178	3.6
J. Wales	16,050	79,699	5.0	18,400	120,729	6.6	18,825	99,761	5.3	21,520	104,555	4.9
K. Versailles	9,070	62,622	6.9	10,243	74,610	7.3	9,987	76,228	7.6	12,320	67,371	5.5
	284,973	1,557,113	5.5	306,361	1,619,322	5.3	284,425	1,467,363	5.2	334,851	1,442,113	4.3

‡ B.G.S.P.A. records: Data on man-days for Port Mourant divided between Rose Hall and Albion factories, 2/3 and 1/3 respectively. Rose Hall includes data on Lochaber. L.B.I. includes Houston and Ogle.

measurement and control. In a few cases, virtually the whole factory was rebuilt. Altogether, between 1945 and mid-1959, a sum exceeding $18,500,000 (W.I.) was reported to have been spent along these lines.[57]

The postwar process of rehabilitation served both to raise productivity per worker and to promote the consolidations described above (since the most disadvantageous plants were closed while the others were expanded in the course of modernization). When equipment was replaced, the new item was generally larger, more powerful, more rapid, more automatic, more efficient. But the new equipment, processing much more cane per day than the old apparatus, seldom requires more workers to operate it; often far fewer workers are needed:[58]

> More efficient work is done by five electrically driven high-speed automatic centrifugals . . . than was done by 16 machines of the old type. All the operator has to do is to charge the machine and set it in motion; an automatic timing device stops it after a pre-set spinning interval, and the sugar is discharged on the conveyor below by a plough . . . high-speed machines have reduced personnel at the centrifugal stations from about eight to two . . . the Oliver-Campbell vacuum filter requires one operator compared with three to six for filter press station.

At present, each sugar boiler can tend two pans instead of one as formerly. In addition, some processes formerly conducted by skill of eye and hand, and governed by rule-of-thumb (e.g. the "string-proof" process of boiling), are now automatically controlled by instruments. Waste is reduced, and fewer man-hours of work are required, although a few instrument technicians must be added to the rolls.[59]

Office work has also tended to decline with the consolidation of factories and the introduction of business machines; but this effect has been offset by the expansion of paper-work and record-keeping, incidental to modern business everywhere.

A few operations formerly done by hand in the prewar factories have been reduced or eliminated by equipment. Thus the entire bagging operation was eliminated by bulk loading, discussed below. Elimination of bagging has wiped out not only the job of operating the bagging equipment but also the former work of loading the bags into barges for transport to the port at Georgetown. The sugar in bulk is now moved by a conveyor directly into the coasters and barges or, for shorter hauls near Georgetown, into specially designed lorries. On the other hand, the use of fork-lifts and similar equipment for transport of supplies within the factory has barely been initiated.

FACTORY OPERATIONS: AVERAGE HOURS PER WEEK IN CROP‡

	Hours of Actual Grinding	Hours Lost for Mechanical Reasons	Hours Lost over Week-ends "Premeditated Out of Cane"[1]	Tons of Sugar per Grinding Hour
1950	83.9	12.3	71.8	4.85
1951	92.1	11.3	64.6	5.27
1952	105.2	11.1	51.7	5.13
1953	90.2	10.2	67.6	5.47
1954	97.1	10.1	60.8	5.23
1955	96.0	7.0	64.9	5.79
1956	110.7	9.6	47.8	5.98
1957	121.3	9.4	37.3	6.15
1958	119.8	7.9	40.4	5.90
1959	124.9	6.2	36.9	6.40
1960	127.1	6.2	34.7	6.48

‡ Bookers memorandum, July 17, 1961.
[1]Weekends when factories did not grind for lack of cane.

[57]B. G. Sugar, March 1959, p. 4.
[58]Bookers Sugar 1954, p. 58 and p. 125.
[59]Ibid., p. 58.

Another alteration is the greater regularization of factory operations which has resulted from better machinery and steadier cane deliveries, especially over week-ends. The effect has been to regularize employment during crop, and to reduce the delays and waste due to interruptions and breakdowns. The preceding table shows the progress made in the factories of the Bookers Group.

The outcome of all investments, in both field and factory, since the second World War is roughly recorded in the trend of company capital per worker during this period. As shown in Table III-5, the value of the total capital (in current dollars) was nearly doubled from 1947 to 1960; the increase is appreciably less if deflated for price rises. During the same interval, the average number of workers apparently declined by 27 per cent, although man-days declined by considerably less. Accordingly, the value of capital per worker was multiplied 2.7 times in the figures shown, although really somewhat less after the adjustments mentioned. This remains a substantial increase in capital-intensity relative to labour.

TABLE III—5. CAPITAL PER WORKER IN SUGAR INDUSTRY, 1947 and 1960‡

Year	Capital[1] (W.I. $)	Average Weekly No. of Workers (field & factory)	Capital per Worker (W.I. $)
1947	$20,030,000	28,071	$ 715
1960	$39,862,000	20,480	$1,950

‡ **Source:** for 1947, the Venn **Report**, p. 154;
for 1960, the British Guiana Sugar Producers Association.

[1]Figures on "capital" are taken from the financial records of the sugar companies, and represent original book value of shares plus surplus additions to share capital whether from reinvested profits or from new capital inflows. Coverage is assumed to be the same in the two years, as this could not be checked directly. Value of capital over time is affected by depreciation of capital goods — for which there are replacement reserves but not necessarily adequate provision — and also affected by price rises. The relevant price-index would be somewhere between the persistently rising level of consumer prices in British Guiana and the level of import prices which fluctuated but probably recorded no marked net change over this whole period; the sugar industry's index of cost-prices shows a steeper rise than the consumer price-index, and suggests that the 1960 price level was perhaps 60% above 1947 (see Table IV-3, fn. 3).

C. Bulk Loading

The new system of handling sugar in bulk, instead of in bags, is one of the outstanding changes in technology. It was necessitated as early as 1955 by the action of British Guiana's chief customers in Britain and Canada who had already converted their facilities to receive and store sugar in bulk rather than in bags. Since the competing suppliers, in the West Indies and elsewhere, are equipped for bulk handling (or soon will be), the British Guiana producers faced the danger of losing their markets unless they made a similar conversion. Aside from market considerations, it was also to be expected that the new mechanized operations would effect a cost-saving, not only in the handling charges on the dock, but also in the accelerated turn-around of cargo ships which formerly clogged the harbour during slow loading.

The new installation, the Demerara Sugar Terminal, completed in 1960, is a joint subsidiary of Bookers and Sandbach Parker. Located on the Demerara River just outside Georgetown, it cost $7¾-million (W.I.) to construct and equip, the cost being particularly high because of the problem of an adequate foundation, solved by using semi-buoyant rafts of pre-stressed concrete. Sugar which arrives at the Terminal by coasters and barges is transferred to the store by cranes and conveyor belts; sugar which is transported by lorries arrives in special containers which are lifted off and emptied into a hopper. For outward shipping, the sugar is mechanically transferred from the store by conveyors and retractable booms directly into the holds of ships. This equipment is capable of loading a 10,000-ton ship in

about 20 hours, instead of the several days required by the old methods of transferring bags of sugar.[60]

The new mechanized Terminal has eliminated the sugar industry's need for waterfront labour in shipping sugar. We were told that this affected several thousand persons, but that many of them formerly obtained from sugar only a small portion of their employment and income. On the other hand, the new Terminal employs, on very nearly full-time, some 100 persons, including management and a high proportion of skilled workers (crane operators, electricians, fitters, etc.).[61] It is estimated by the industry that the through-put charge in 1961 was $6.00 per ton in the bulk-shipping operation, in comparison with the previous cost of about $8.00 per ton (average of bagging and wharfage charges).

D. Prospective Trends in Labour Requirements

The reductions in labour requirements during the past decade have not exhausted the possibilities for further action along these lines in both field and factory. Steps which so far have been taken only on certain estates can be extended to the whole. Additional devices and procedures which would raise output per worker are known; some are already in current operation in other countries. Still other devices and procedures may be expected from investigations by existing research institutions as well as from empirical findings by operating personnel. Extensive laboratory research is supported by the British Guiana sugar companies individually and by the British West Indies Sugar Association and the Imperial College of Tropical Agriculture in Trinidad; in addition the British Guiana companies have Mechanization Committees which meet regularly, review local and foreign experience, and experiment with original and modified types of equipment.

A survey of the current range of possible new actions suggests that a few of these may actually call for additional labour, but most of them are labour-saving. The survey also indicates that it would be relatively easy to extend more widely the technological changes, both mechanical and non-mechanical, already introduced during the past decade in British Guiana; new types of technological change, however, would in many cases be increasingly difficult and costly, and therefore are not likely to be introduced rapidly unless the pressure to maintain or reduce costs of production is correspondingly severe.

1. **Possibilities in the Field.** The most immediate technological possibilities are in the activities of cultivation. Further advances are to be expected in the quality of chemical fertilizers, weedicides and pesticides, together with intensified application to the fields. Some increase in labour requirements might result from such expansion in chemicals, were it not for the possibilities of increased use of mechanical spraying, both on the ground and from the air.[62] Another mechanical device which may come into wider use is the rotary slasher for weeding, which has barely been introduced. Mechanical carriers — such as fork-lifts, front-end loaders and light mobile cranes — can take over many jobs of transporting supplies in the field. Possibilities exist for still longer ratooning, and consequently reduced need

[60] **B. G. Sugar**, February-March 1961, p. 4; interviews with Bookers' executives.

[61] Some additional light on waterfront labour displacement by bulk shipping comes from the situation in Jamaica, where a new mechanical installation at Ocho Rios is coming into operation. The new facility will require only 6-8 men to do the work — some 22,000 tons of sugar shipped annually from this port — which formerly gave part-time employment to 569 men. It may be estimated from a Government survey that these men obtained the major part of their annual earnings from the loading of the sugar ships together with the unloading of cargo imported in these ships.

[62] Airplane spraying has been introduced only recently, and so far accounts for only a tiny fraction of chemical application, and is not scheduled for any great expansion immediately; but the record for the first six months of 1961 already shows an appreciable percentage increase over the corresponding period of 1959 and 1960.

for planting operations. Scientific progress in plant physiology and related matters will probably raise yield per acre without much additional effort in the field and thus will reduce the application of labour per acre.

Further advances may be expected in the organization of work-flow and in the assignment of workers. Even the introduction of time-and-motion studies is not altogether remote. At the same time, the advancing quality of nutrition and health together with rising material desires and other incentives, will probably improve the attendance of workers in days per week, and lift their productivity per day and perhaps per hour. Thus fewer persons, and even fewer man-hours, will be required.

The largest possibilities, and also the most difficult problems, in replacing field labour lie in the mechanization of planting, cutting, and loading. Extensive experimentation has been going on in many parts of the world, and various devices have been adopted, with varying results, notably in Hawaii, Louisiana, Florida, and Queensland, and — in more limited respects — in Jamaica and even in Cuba.[63] To be sure, the suitability of these devices to British Guiana is severely limited by the prevailing climate, terrain, field layout, and other features peculiar to this territory. But the history of mechanization indicates that all sorts of forbidding obstacles can be overcome by ingenuity and capital expenditure, if the pressures on costs and the opportunities for gain are sufficiently strong.[64]

Mechanical planting is in common use in Hawaii and Queensland, although a considerable amount of manual labour is still required, especially in the former area, to supplement the machine operations. In Louisiana and Florida, where cane cultivation is on the whole highly mechanized, the cane setts are still placed in the furrows by hand; and the traditional practices are followed in most other areas. The implication is that "the small gain from placing the cane sett by machine appears not generally to compensate for the risk of damage to the awkward seed piece and the consequent danger of a poor stand".[65]

Mechanical cutting of cane is general in Hawaii, largely in response to the scarcity of field labour and the high level of wage rates; various devices have been adopted in an effort to overcome wasteful performance under Hawaiian conditions. In Louisiana, mechanized cutting has been particularly successful, in response to climatic circumstances (a short growing season, with danger of frost at the end), erect stands of cane, light yields per acre, as well as comparatively high wage rates, small tonnages and other factors. As the same circumstances do not prevail in most other cane-growing regions, least of all in British Guiana, the spread of mechanical cutting must wait for the development of superior new devices, as well as a new field layout.

Mechanical loading of the cut cane in the field is much further advanced than the mechanization of planting or of cutting. Varieties of grabs, rakes and slung baskets, with or without saws for cutting the stalks into shorter lengths, are in use not only in Hawaii, Louisiana and Florida, but also in Colombia, Peru, Cuba, Puerto Rico and elsewhere in the Caribbean. But numerous problems, both technological and social, have attended this development. Particularly significant and relevant here is the experience at Monymusk Estate in Jamaica, which will be

[63]The following discussion draws particularly on V. P. Timoshenko and B. C. Swerling, **The World's Sugar,** (Stanford Univ. Press, 1957), Chap. 6; also A. Van Hook, **Sugar,** (Ronald Press, 1949).

[64]It is worth recalling that prior to the introduction of mechanical cultivation, numerous authorities were sceptical of the possibilities. Thus the Caribbean Commission's Research Council, after reviewing conditions in British Guiana in 1945 concluded that: "In these circumstances mechanical tillage has not made much progress and the industry is satisfied that, under present conditions, equally good results can be obtained, more cheaply, by flood-fallowing and hand cultivation." (**The Sugar Industry of the Caribbean,** Washington D.C., 1947, p. 23.)

[65]Timoshenko and Swerling, op. cit., p. 139.

described here on the basis of a Government investigation in the autumn of 1960 and a subsequent re-survey by the present writers in the summer of 1961.

The degree of mechanization of the sugar industry in Jamaica in general is at roughly the same stage as in British Guiana: soil preparation and cultivation are carried on largely with mechanical equipment, including the use of chemical fertilizer partly applied by tractor-drawn spreaders and by airplane spraying. Bulk shipping of sugar is just coming into operation. But planting and cutting the cane is still manual, as is the loading in the field, except on Monymusk Estate (plus a few small experiments elsewhere). The main reason for extending mechanization, according to the management, was "labour troubles", comprising difficulties of labour supply at the requisite times, together with wage pressure intensified by union rivalries. These troubles became so acute at Monymusk that the management came to feel that they could not carry on without major alterations in existing practices.

Mechanical loading was initiated at Monymusk for the 1961 crop by introducing 12 Broussard loaders, abandoning the existing railway system in the fields in favour of tractor-drawn cane carts, and making appropriate changes in the cultivation and cutting practices, including the re-arrangement of field layout and burning off the fields before harvesting. The principal operating difficulty encountered has been the large quantity of earth and trash picked up by the mechanical loaders, adversely affecting the quality of the extracted juice and damaging the equipment in the factory. The indicated solution is to install a cleaning and washing operation in the factory, at an additional unanticipated expense. There has also been the usual difficulty in training the workers to use the new equipment, and especially to use it so as to minimize the proportion of waste material.

On the economic and social side, the major problem has been the displacement of workers. Out of a total in-crop work force of some 7,000 persons at Monymusk estate, approximately 1,600 persons — 23 per cent of the total — were displaced, in the following categories:

Cane loaders	584	Cane Cutters	400
Hoistmen	106	Draymen (contract work)	250
Hoistwomen	48	Others (trash turners,	
Railway workers	79	clerks, etc.)	50 plus

The impact on the retrenched individuals is discussed in Chapter V below.

For those cane-cutters who remained in employment, the income effects of this mechanization have been beneficial. It is estimated that under the new arrangements a cutter can double his output per day, while his rate of pay has been raised about 8 per cent as an incentive to accept the new system. Theoretically he could therefore earn more than twice as much per day as before; but in practice problems of scheduling the flow of work seem to hold the gain to a much smaller advance over the old system (frequently not more than 40 per cent rise in daily earnings).

The gains to the company appear to have been small, so far. A calculation of operating costs — ignoring interest charges on the investment in loading equipment, but assuming a five-year write-off of the original outlay, also ignoring the costs of the washing equipment and any other changes that are now required, and ignoring the lump-sum severance payments — indicates that loading per ton of cane under the new system probably costs a little less than under the old manual system. Adding in the ignored items as listed above would probably convert the small gain into a net loss for the current operation. The management hopes,

however, that in the longer run improvements in the equipment and its use will reduce the cost substantially.

Despite the initial setbacks at Monymusk, it is expected in Jamaica that mechanical loading will soon be widespread. It is also expected that mechanical cutting will be introduced at the same time, because of difficulties in scheduling the flow of cane as well as problems of dealing with the cutters when only loading is mechanized. The result of these two innovations over the next five to ten years will be to displace as much as 50 per cent of the field labour force on Jamaican estates. Some such massive impact on employment must be anticipated in any other area where mechanization is introduced into the harvesting of cane.

2. **Possibilities in the Factory.** The most natural tendency in multi-plant management is to bring the laggard plants up to the standards achieved in the most advanced. As Bookers' **Review of the Year** for 1960 put it:

> The core of future factory development plants will be the reconstruction in the next few years of the Wales and Albion factories—the latter to cope initially with up to 130 tons of cane per hour. These will be further steps in the continuing post-war programme of factory rehabilitation—Uitvlugt, Rose Hall and La Bonne Intention factories having so far been radically modernized or entirely rebuilt (p. 25).

There is therefore much room in the British Guiana sugar industry for general application of those improvements already installed in some of the factories, as well as for introduction of still other improvements to be copied from foreign practice or to be devised for special local conditions. A small sample of such potentialities is the introduction of fork-lifts and other transport equipment for handling materials within the factory and factory-yard.

A more drastic possibility is the adaptation to cane sugar of certain major technologic innovations developed in beet sugar factories. These are the "ion-exchange" method and the "continuous diffusion" method of extracting the sucrose. In the beet sugar industry, the latter method has proved extremely labour-saving as compared with traditional milling.

Another prospect is the extension of the factory consolidations already described. Five factories still remain with capacity well below 30,000 tons. It would be difficult, however, to consolidate these with others because of special locational problems plus the general restraints on transportation by punts (limited roughly to ten miles per day). If the transportation problem could be overcome, the potential for increasing the scale of any of the factories would be vastly enlarged, since Jamaica and Trinidad already have factories of 90,000—100,000 tons capacity (fully double the capacity of the largest plant now operating in British Guiana), let alone the 200,000 ton capacity of the Central Delicias in Cuba. As we have already noted, expansions of scale are generally accompanied by reductions in labour input per ton.

3. **Overall: Field and Factory.** When the labour requirements of sugar production in British Guiana are compared with those of Queensland, Louisiana and Hawaii, it is apparent how heavy is the labour application in British Guiana, and how wide is the technological possibility for reduction. It was estimated that ten years ago Hawaii obtained an output of about 60 tons of sugar per worker, while British Guiana was showing about 8 tons per worker.[66] Subsequent trends in the two territories have perhaps narrowed that wide disparity, but still leave it very great since even in 1960 British Guiana output per worker was only 16.4 tons, while Hawaii has been making additional advances.[67] Differences in labour costs

[66]Statement by R. R. Follett-Smith at a meeting in Government House, Georgetown, 1953.

[67]In Hawaii "mechanization has halved the labour force in sixteen years and has increased production" (New York Times, Nov. 24, 1961). Hawaiian production, which slumped during and immediately after the second World War, is today a little above pre-war levels.

and other costs govern the advisability of applying more capital and displacing labour; as conditions in British Guiana move closer to those in Hawaii, the process of increasing capital-intensity and diminishing labour input may be expected to proceed.

The actual effect upon employment depends, as already noted, on total acreage as well as labour input per acre. The prospects for increasing acreage, however, are not hopeful. As indicated in Chapter I, the market for British Guiana sugar is so tight that expansion of output cannot be expected to run much more than 1 per cent a year in the coming years. In addition, the supply of land which could be used for sugar without great expenditure is very limited.[68] The outlook therefore is for far less than the 6 per cent annual rate of expansion of sugar output which characterized the past decade. Accordingly, growth in volume of operations in the future is unlikely to offset or cushion the technological displacement of labour as it did in the recent past.

The variety of potential changes in production methods as set forth in this section is only a list of technological possibilities. Whether any or all of them will actually be adopted is a matter of economic, social, political and other forces discussed in subsequent chapters.

[68]Almost all land of the sugar estates is already in beneficial use. Bookers reports that about 13.5 per cent of their total holdings are unutilized at present and estimates that about three-fourths of this category are in locations and soil-types "unsuitable for cultivation".

CHAPTER IV

Financial Results of Technical Change

The technical changes described in the preceding chapter brought a substantial increase in total output of sugar, as well as a marked and progressive reduction in labour input per ton. However, this technical result, while gratifying to the engineer, is not the important consideration for the companies, the work force, the Government or the economy as a whole. For these parties, the criterion of technical progress is the trend of unit costs, as shown in the financial results. Of course, in framing policy, these cost effects will often be disregarded for the sake of other, non-economic considerations; but this will be at an economic sacrifice whose magnitude is shown below.

It is costs per ton which largely determine the competitive position of British Guiana sugar in the commercial export market, and thereby determine the survival of the industry, let alone the industry's ability to pay wage increases to labour and remit dividends to shareholders. If unit costs in British Guiana should rise relative to costs and prices in the Commonwealth Agreement countries and in the world market, British Guiana sugar would tend to be priced out of these markets — unless there are substantial profits which can be sacrificed, or large subsidies paid by the rest of the economy, to offset the rise in costs. Technical changes are therefore sought as a means of reducing unit costs, or at least for holding them down while paying increased wage rates or other factor price-rises. Thus if labour-saving changes do not tend to reduce costs, then such changes must be condemned as financially unsound and socially undesirable in a labour-surplus economy; whereas if the changes are technically and financially sound, then the problem of labour displacement shifts from a question of optimal production technique to a question of social policy.

In general, it cannot be assumed that every technical change will reduce unit costs. The change may not do so if it entails relatively heavy investment input with consequently heavy annual depreciation and interest charges, or if it causes offsetting waste elsewhere (external dis-economies), or if it is accompanied by a disproportionate rise of other cost-prices (e.g., wage increases for the remaining work force). Conversely, if dollar costs per unit of output do not fall during a period of technical change, the latter is not necessarily to be blamed, since all other factors may not have remained constant. It therefore becomes imperative to investigate the trend of actual unit costs, and to break down that trend into the behaviour of operating efficiency, capital charges, and factor cost-prices, including wages. For historical comparisons, we must also adjust the current figures for changes in the purchasing power of money during these years. And for estimation of profits, we must relate the unit costs to the volume of production and to the net sales realization.

The actual records show that the technological changes introduced into the British Guiana sugar industry and the increased scale of operations since 1947, have been accompanied by a progressive rise in wage rates and the total wage bill. This has occurred without a corresponding rise in the cost of production per ton.

A. Overall Direct Costs

The simultaneous trends of "total direct costs", "routine costs", and wage costs per ton, as well as wage rates and earnings per man-day, are shown in Table IV-1. This table summarizes the available data from a variety of sources, recognizing that the categories are not quite uniform, and that they contain some debatable items. The figures on costs per ton (lines A and B in Table IV-1) refer to one of the principal sugar companies of British Guiana. The figures on wages (all lines under C and D) refer to the entire industry. The category labelled "total direct costs" is said to include all operating costs plus overhead charges — except for depreciation and interest charges and reserves for pensions and taxation. Wage increases shown in Table IV-1, Section C, line 3(b), represent the "cost-of-living bonus"; this is the principal form of wage increase in the sugar industry, and is expressed as a percentage added to the long-established "basic rate" for each particular job. This "cost-of-living bonus", which is not related to the actual cost of living, has been supplemented by a number of miscellaneous, less important bonus payments which are not shown in Table IV-1. A shorter series, giving the industry's index of wages and salaries since 1953, is shown in line 3(a) of the table.

It is evident that "total direct costs" per ton of sugar rose sharply after the second World War, but drew approximately level from the middle of the 1950's onward, despite generally rising factor prices.

The B.G.S.P.A. weighted price index for all the goods and services purchased annually by the sugar industry was as follows:

1953	1955	1956	1957	1958	1959	1960
100	106.6	110.4	114.9	118.0	122.8	123.8

This increase of 23.8 per cent in 7 years amounts to 3½ per cent a year, simple average.

While wages along with equipment and warehousing recorded the steepest rises, well over the average, inflation affected most other items (except for fertilizers and field chemicals, whose prices declined during this period). During the preceding period, 1947-53, prices apparently rose more rapidly. Wage rates rose throughout this period, piece-rates climbing by 5-6 per cent a year (simple average) plus miscellaneous bonuses, while earnings per man-day shot up by as much as 10 per cent a year on the average. These increasing costs of labour, while the prices of other cost elements were rising as well, would have immediately lifted the total costs of production per ton if it were not for the technological improvements which economized on labour input per ton. Accordingly, the wage cost per ton showed a post-war rise until 1954, and has since remained very nearly steady or even moved slightly downward. The annual wage-bill paid by the industry has actually been rising — rapidly in the immediate post-war years, more slowly since the mid-1950's — as the wage-rates per man-day have increased more sharply than the decline in total man-days worked.

To put this conclusion in another way, the technologic advances which have displaced labour in the British Guiana sugar industry also brought higher incomes to those remaining in jobs, and by increasing their productivity made it possible to pay these higher incomes without a corresponding inflation of costs of production. From the mid-1950's forward, it was even feasible to absorb, without cost rise per ton, the surge of more than 3 per cent a year in the prices of all goods and services, including labour, bought by the sugar industry.

B. Costs by Sectors

In a comparative analysis of the sectors of cultivation, harvesting and factory processing, we find a still closer association of costs per ton with the presence or

TABLE IV—1. COSTS OF PRODUCTION, SUGAR INDUSTRY, 1945—1960‡

	1945	1947	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
A. Total "Direct" cost[1] per ton of sugar	$77.29[2]	101.28[2]	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	140.59[3]	150.04[3]	141.89[3]	148.52[3]	144.20[3]	
B. Total "Routine" cost[4] per ton of sugar	n.a.	n.a.	$93.41	92.27	111.12	108.97	117.20	116.50	117.10	118.90	116.95	120.63	114.49	
C. Wages paid														
1. Total amount of wages paid ($000)														
(a)[5]	$6,493	9,265												
(b)[6]									$21,082	22,699	22,837	22,074	24,986	
(c)[7]							$17,214	18,378	19,361	20,336	22,489	20,616	24,323	
2. Earnings per man-day[8] ($)							n.a.	2.79	3.06	3.22	3.60	3.63	4.25	
3. Wage rates (indices)														
(a) (1953 = 100)[9]						100	n.a.	107.5	111.6	116.9	122.2	133.6	134.8	150.4[11]
(b) (1939 = 100)[10]	120	130	140	150	170	175	175	182.5	192.5	200.0	210	217.5	225.0	245[11]
D. Total wage cost per ton of sugar														
(a)[5] [7]	$41.30	55.32					72.05	73.52	73.52	71.36	73.41	72.48	72.73	
(b)[4]			$52.77	51.64	59.51	58.68	66.68	66.55	68.03	66.19	66.15	69.32	68.39	

‡ 1945 and 1947 data from Venn Commission Report; subsequent data from British Guiana Sugar Producers Association and member companies.

[1]Including administrative overhead; excluding depreciation, interest on investment, and reserves for pensions and taxation.

[2]Venn Commission Report, Table XXVI p. 150. The statement, ibid., that depreciation was already included in these figures is evidently erroneous, as may be seen in a comparison with Table XXVII. p. 152, op. cit.

[3]Data from one of the principal sugar companies of British Guiana.

[4]Excluding all overhead and "special revenue expenditure"; from one of the principal sugar companies of British Guiana.

[5]Venn Commission Report, p. 77; presumably covers operating wages.

[6]British Guiana Sugar Producers Association; includes all salaries and contractors' wage payments.

[7]British Guiana Sugar Producers Association; covers operating wages (excluding junior staff and contractors).

[8]Based on wage figures in line 7. Cf. "average daily earnings of a resident male piece-worker," in 1945: $1.36; in 1947: $1.74 (Venn Commission Report, p. 78).

[9]Covers wages and salaries; from components of price index of British Guiana Sugar Producers Association.

[10]Covers both piece and time workers, except for a slightly larger increment in 1960 and 1961 for the time workers; paid in the form of a so-called "cost-of-living allowance" added to fixed basic rate as percentage of latter. There are also other bonus payments, including "Week-end Cut-and-Load Bonus", "Weekly Production Target Bonus", "Crop-end Production Bonus", "Annual Production Bonus"; "Holidays-with-Pay". See Appendix E.

[11]Based on wage-agreements concluded for 1961.

TABLE IV — 2. SUGAR PRODUCTION: ROUTINE COSTS[1] WITH BONUSES ‡

(W.I. $ per ton of sugar)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Cultivation											
Wages	20.99	18.93	20.79	18.75	24.58	25.64	24.87	21.19	17.49	18.23	17.17
Other	13.26	14.39	15.38	12.96	18.12	18.04	18.92	18.54	16.71	17.05	14.98
Total	34.25	33.32	36.17	31.71	42.70	43.68	43.79	39.73	34.20	35.28	32.15
Harvesting											
Wages	18.44	19.82	23.66	24.25	25.75	25.49	26.85	27.61	30.49	31.88	31.98
Other	4.56	4.28	5.10	4.38	3.94	3.86	3.92	4.56	4.42	4.55	4.50
Total	23.00	24.10	28.76	28.63	29.69	29.35	30.77	32.17	34.91	36.43	36.48
Factory											
Wages	12.80	12.40	14.92	14.76	15.93	14.93	15.45	15.44	15.99	16.17	15.75
Other	19.02	18.83	27.04	27.58	22.97	22.57	20.99	23.92	24.40	23.50	20.73
Total	31.82	31.23	41.96	42.34	38.90	37.50	36.44	39.36	40.39	39.67	36.48

‡ One of the principal sugar companies of British Guiana.

[1]Excluding general overhead and special revenue expenditure.

absence of major technological changes. Table IV-2 presents the sectoral data on "routine costs of production per ton" for one of the British Guiana sugar companies, for 1950 through 1960. "Routine costs" cover operating costs including bonuses, but exclude depreciation and interest charges and all general overhead charges.

In the cultivation sector, these data show that per-ton costs did not rise much despite strong pressures. Unit costs actually declined from 1950 to 1953, then rose to a new high level prevailing during 1954-56, then began a new decline which brought the 1960 amount to a point slightly below that of 1950. The detail for wages and other cost elements indicates that wages, which constitute over half of the total costs of cultivation, were the chief mover in this cost pattern. Other costs of cultivation have moved less vigorously, and show less correlation with the total costs of cultivation. It will be recalled that cultivation is one of the sectors where substantial technological changes, both mechanical and non-mechanical, were introduced during this period.

The sector of harvesting presents a sharp contrast. Here costs per ton rose steadily, with virtually no interruptions, until by 1960 the figure stood at 58 per cent above the 1950 amount. In this case wages, which account for 80 per cent of the total costs of harvesting, were the sole mover, as other costs of harvesting showed practically no change over the period. In fact, the wage cost per ton rose by roughly the same percentage as the wage rates for piece-work plus all bonuses. Very little technological change was introduced during these years in harvesting, and there was little rise in productivity per man-day to offset the rise in wages per man-day.

Performance in the factories falls between the cultivation case and the harvesting case. Total factory costs per ton rose sharply during 1952-53, then dropped to a new and stable level approximately one-fifth above the 1950-51 level. The behaviour of non-wage costs, which make up about 60 per cent of the total factory costs, closely paralleled the total factory costs; a sharp rise of about 50 per cent during 1952-53, followed by a drop to a new and approximately stable level from 1954 to 1959 at about 20 per cent above the 1950-51 level. Meanwhile factory wage costs per ton rose by 25 per cent from 1950-51 to 1952-54 and then approximately stabilized at that level. The effect of technological changes economizing on labour is seen here chiefly in the modest rise of wage costs per ton, while wage rates were rising from 1950 to 1960 by 66 per cent as a result of the cost-of-living allowance alone (to which must be added the other miscellaneous bonuses).

Taking all three sectors together, the "routine cost" figures show that ability to absorb rises in wages and other prices varied with the degree of relative technical innovation in each sector during the period covered.

C. Comprehensive Costs

It must be noted once more that the "direct cost" and "routine cost" figures exclude depreciation charges, and also exclude interest on the invested capital. Without reckoning these elements of cost, it is impossible to determine whether the new investments during the past decade were justified even from the management standpoint of restraining or reducing total costs per ton. To meet this need, we have assembled in Table IV-3 the available data on comprehensive costs per ton in 1947 and in 1960, noting the inadequacies and obscurities of the figures at several points. No entry is made for the value of land usage, except to the extent that capital improvements enter into depreciation and interest charges on invested capital.

If these figures are acceptable at least as to orders of magnitude, they indicate that the modernization effort of the past decade brought only a small gain to the companies. To be sure, the per-ton "direct costs" alone rose by only 42 per cent, being held well below the cost-price rise of almost 60 per cent over this period,[69] this trend reflects the direct gains from raising productivity. However, the item for depreciation more than quadrupled over the same period, and thus absorbed most of the "direct" gain. The interest charge per ton remained at the same figure, since the doubling of total capital between 1947 and 1960 was just offset by the doubling of tonnage output over the same interval.[70] In consequence of all three

TABLE IV—3. "COMPREHENSIVE" COSTS OF PRODUCTION AND "REALIZED" SELLING PRICES PER TON OF SUGAR, 1947 and 1960 ‡

	Current $ W.I.		Percentage Change
	1947	1960	1947-60
"Direct" costs[1]	101.28	144.20	+ 42.4%
Depreciation [2]	3.15	13.40	+325.4%
Interest [3]	7.35	7.15	— 2.7%
	111.78	164.75	+ 47.4%
Realized selling price [4]	106.70	178.03	+ 66.9%
Net revenue [5]	- 5.08	+13.28	

‡ 1947 data from Venn Commission Report; 1960 data from British Guiana Sugar Producers Association.
[1]From Table IV-1, line A.
[2]For 1947, calculated from reported depreciation in Venn Report, p. 154; for 1960, calculated from depreciation reported to us by B.G.S.P.A.
[3]Computed at the rate of 6 per cent per annum, on capital amount (issued capital plus surplus) reported in same sources cited for depreciation.
[4]Realized price in 1960 calculated as weighted average of net proceeds from sales of sugar and molasses to all categories of buyers: sales in British Guiana (at prices fixed by regulation), preferential sales (under the Commonwealth Sugar Agreement), and "free market" sales, the respective proportions being 6%, 50% and 44% of total tonnage sold; plus special premiums and molasses revenue. From B.G.S.P.A. Price in 1947 represents export price as computed in closest available correspondence to 1960 measurement. From Venn Report, p. 150.
[5]Difference between Comprehensive Cost and Realized Selling Price.

trends, comprehensive costs advanced by 47 per cent, or a little less than the estimated rise of factor prices including wages.

In other words, the management did a little better than to hold the line on real costs in total, while wage rates rose sharply and most other cost-prices rose by somewhat less. Thus most of the gains of improved productivity per worker appear to have accrued to the workers — i.e., to those who remained in employment.

D. Profitability

In considering what gains accrued to the companies, we must relate the behaviour of costs to the behaviour of selling prices, although it is not possible to

[69]Factor-cost price trends measured by an index showing 1960 as 159.5, with 1947 as 100. This index is based on the B.G.S.P.A. weighted price index for goods and services purchased by the sugar industry during 1953-60, extrapolated back to 1947 by means of the "old" official Cost of Living Index (Venn Report p. 178 and B.G. Quarterly Statistical Digest, Table 23). A less steep rise of prices is shown by the "new" official Cost of Living Index and by the index of prices of most imports (both of these indices computed by the Government's Statistical Bureau for the years since 1953).

[70]The wide difference between the 1960 and the 1947 figures for depreciation charges per ton, while interest charges per ton showed no significant change, relates in part to the increased share of short-lived equipment in the total capital employed in 1960, compared to more durable forms of capital goods (buildings, dikes, etc.) which made up most of the capital investment in 1947. Another explanatory factor is that the rate of depreciation computed in 1947, a period of financial stringency, is considered by the industry today to have been "wholly inadequate", in comparison with the present provision based on assessed life years and full replacement cost of assets. The Commonwealth Sugar Agreement, negotiated in 1949, has enabled the industry to provide for replacement and improvement in factory and field.

draw any simple conclusion as to the trend of net profits because of the role of numerous other items (sundry revenue and expenses, taxes, pensions, inter-company transactions, etc.).

The average realized selling price per ton of sugar — including molasses, but net of freight, brokerage and selling commissions — was $106.70 in 1947 and was $178.03 in 1960, as shown in Table IV-3. Thus the realized selling price of 1947 was in fact slightly below the estimated "comprehensive cost" figure of $111.78 in that year (with depreciation probably under-stated); a net loss is indicated. By 1960 this situation had been reversed, to achieve a net revenue amounting to 7.5 per cent on sales, according to this accounting of sugar operations.

Additional data submitted to us by the sugar companies on a confidential basis indicate that the industry's net profit — after counting all costs, obligatory reserves, taxes, and sundry items of revenue and expenditure, but **not** counting any interest charge on the invested capital — comes to about 6 per cent on capital, on the average, for recent years. This would suggest that the industry is earning only an interest-return on its capital. The data are, however, difficult to interpret because of numerous estimated elements of cost and of revenue, including transactions with non-sugar companies under one group management.

CHAPTER V

Retrenchment And Welfare Measures

Implicit in the broad and impersonal trends described in the preceding chapters are the effects on the retrenched workers. These are workers who were attached to and dependent on the sugar industry; they would not voluntarily have left their jobs, nor were they old enough to be pensioned. Workers who left the sugar industry of their own accord are not regarded as retrenched. It is true that a substantial part of the decline in employment over the decade resulted from not replacing those who departed in the normal attrition of the labour supply due to death, illness, retirement, and shift of job or residence. But the curtailment of labour requirements and the tendency to concentrate available work among fewer individuals undoubtedly affected thousands of sugar workers with a commitment to the industry. Retrenchment cannot be measured merely by the numbers receiving severance pay.[71]

For some, the impact was light; their days of work in the off-season were fewer than before or they were transferred to another job in the industry with comparable or, more often, less pay. Others were left completely unemployed, either in the dramatic and public circumstances of the closing of an entire factory or dismissal of a whole gang, or in the quiet and personal termination of particular jobs. Some of the unemployed were assisted by management in their search for new occupations; some were granted land or severance pay; many others, especially in field work, received neither kind of help. While the precise number of individuals retrenched over the past decade cannot be estimated, nor can their fate be traced individually, information is available on the impact in particular cases.

A. FACTORY CLOSURES AND BULK LOADING

The closing of two factories, Port Mourant and Ogle, resulted in a loss of 715 jobs. Table V-1 shows that 65 to 70 percent of the workers were given severance pay. Only 76 were offered alternative employment, while 56 were pensioned. The remainder at Ogle were classified: "recommended for re-employment at L.B.I. and elsewhere", "temporary employees", or "no information available on future".

The introduction of bulk loading in 1960 resulted in the termination of 152 jobs at five Bookers factories, while three other Bookers factories reported no dismissals (Table V-2). Presumably these factories absorbed some displaced workers before dismissing the remainder. Of the 152 terminated at five Booker's factories, 125 received severance pay, while 7 were granted pensions. The remaining 20 were not employed long enough to qualify for severance pay. No report was received in regard to Diamond and Leonora factories, but we were informed orally that very few discharges had occurred and that transfers to other jobs at the factory had been arranged. Union spokesmen and Labour Inspectors informed us that some of the former sugar-baggers had been offered non-grinding rates of

[71]From 1955 through 1957, Bookers Estates declared 618 workers "redundant", but only 285 received severance pay. In the same period, 5,436 workers were lost for other reasons, excluding pregnancy, promotion and stabilization causes. See Chapter II on the stabilization programme as a mask for retrenchment.

pay in-crop, and that this was a source of dissatisfaction. They would have preferred severance pay and odd jobs on piece or day rates.

A related effect of the bulk shipping of sugar was the dissociation of sugar exports from the ordinary shipping industry. The changed method of shipping sugar abroad did not affect employment in the sugar industry as such, but the displacement of waterfront labour is properly attributable to technological change in the sugar industry. However, the complex situation on the waterfront makes

TABLE V — 1. RETRENCHED WORKERS IN TWO FACTORIES ‡

Ogle Factory: (Factory closed — end of autumn crop 1958)	
Employed at Ogle Factory	335
Retained at Ogle after Factory closed	16
Recommended for re-employment at La Bonne Intention and elsewhere	32
Recommended for retirement either due to age, or service, or both, when Factory closed	21
To be given severance pay, but not specially recommended for further employment	192
Temporary employees (i. e. have recently started and have been given temporary employment letter)	44
No information available on future	30
Port Mourant Factory: (Factory closed — end of autumn crop, 1955)	
Employed at Port Mourant Factory	380
Offered alternative employment	60
Granted pensions	35
Granted severance pay	285

‡ Bookers' Sugar Estates, Ltd.

TABLE V — 2. RETRENCHMENT DUE TO BULK SHIPPING OF SUGAR ‡

	Estate	Total Number Terminated because of Bulk Shipping of Sugar	No. Retrenched but because of Inadequate Service, did not get Severance Pay	No. Granted Severance Pay	No. Granted Pensions	Total Amount Paid Out as Severance Pay
1.	Skeldon	36	Nil	36	Nil	$20,609.87
2.	Albion	84	17	66	1	50,705.85
3.	Rose Hall	Nil	Nil	Nil	Nil	Nil
4.	Blairmont	18	Nil	14	4	17,857.92
5.	Enmore	Nil	Nil	Nil	Nil	Nil
6.	Wales	4	Nil	4	Nil	2,419.43
7.	Versailles	10	3	5	2	2,875.58
8.	Uitvlugt	Nil	Nil	Nil	Nil	Nil
		152	20	125	7	$94,468.65

‡ Bookers' Sugar Estates, Ltd.

an analysis of the impact difficult. Sugar was only one of the products handled by waterfront workers and the new system is too recent to permit comparisons with earlier years. Furthermore, extensive changes in the system of hiring on the waterfront in order to decasualize labour, and a high level of general imports during the first half of 1961, have masked the effects of the termination of sugar handling on the waterfront. This generally favourable situation is expected to worsen as the Shipping Association and wharf operators increase the productivity of labour and thus reduce the employment opportunities for casual workers. It is further expected that if restrictions are imposed on credit and on hire-purchase facilities, there will be a drop in general imports.

In the opinion of persons close to the situation, two groups of waterfront workers have already suffered some loss as a consequence of bulk shipping: (1) the

regular men who under the old arrangements were permitted to work two consecutive shifts, with the second shift at heavy overtime rates; (2) the casual workers who occasionally took a job on the waterfront to supplement other earnings. A few waterfront workers were transferred to the Demerara Sugar Terminal, but it was reported that other vacancies at the new Terminal had to be filled from outside when suitable waterfront workers rejected job offers. The British Guiana Labour Union, which represents the waterfront workers, is said to have shown no particular concern over labour redundancy due to bulk shipping.

Had the situation in British Guiana been more like that on the north coast of Jamaica, where bulk shipping was introduced in the latter half of 1961, the effects of the new procedure would have been very noticeable. Three wharves at St. Ann's Bay and Rio Bueno in Jamaica were devoted almost solely to shipping sugar. They employed 569 workers with an annual wage bill of £35,000 and faced virtually a complete shutdown when the bulk shipping facility was opened at the Reynolds Bauxite pier at Ocho Rios. Very few workers were to be kept on at the wharves, and the bulk shipping operation was expected to employ none of the waterfront workers.

An unpublished study by the Government of Jamaica disclosed that more than half of the interview sample of 117 redundant men were between 35 and 55 years of age, and were neither skilled nor mobile. Slightly more than 36 per cent had worked on the wharves for 20 years or more. Of the 117, only 30 had some land, either as owners or tenants. Eight men had 1 to 5 acres; the rest had less than one acre, usually enough land for a small house. Fifty-seven of the 117 men had other earnings: just over half drew income from fishing, a fourth found wage-employment, and the remaining fourth worked on their own account. The amount of outside income acknowledged by the group was small, usually less than 10 per cent of their wharf wages (on the average, over £5 for wharfmen and £16. 13. 4 for boatmen in the work week of the survey).

Most discouraging of all was the lack of alternative employment opportunities in the area. The community took public notice of its serious plight, for there were not only the unemployed workers and their 1,500 dependents, but also the ruined businesses of the wharf-owners and the drastic decline of sales which small traders would experience as the wharf wages ceased to circulate.[72]

B. RETRENCHMENT EXPERIENCE IN FIELD OPERATIONS

In British Guiana there has only recently been an acknowledged case of retrenchment in the field. It would be useful to know more about the 222 field workers at Port Mourant whose dismissal in 1961 stirred the Legislative Assembly and stimulated the present study. Lacking such surveys for British Guiana, we may examine the results of an investigation conducted by the Government of Jamaica into the circumstances of field workers displaced in autumn 1960 by the installation of mechanical cane-loaders and the dismantling of the railway at Monymusk Estate, a large plantation owned by the West Indies Sugar Company. These changes abruptly reduced the work force of 7,000 to 5,400, a decline of 23 per cent.

The Jamaican Government's analysis was confined to the dismissed workers who received severance pay under a special scheme offered by the Company. From a list of 825 names, the investigators located 577 retrenched workers living in the Monymusk area. The remaining 284 former workers, or 30 per cent of the 825, were presumed or known either to have returned to their homes on the

[72]Daily Gleaner, Kingston, Jamaica, July 12, 1961.

island, or to have migrated to the United Kingdom, or to have found jobs in the Kingston area or elsewhere.

By means of a 25 per cent sample in each of the four relevant occupational groups, the 577 workers were surveyed as to their attachment to the company and area, their employment history since being laid off, their present income, the number of their dependents, and their plans for the future. The group was deemed fairly typical of sugar workers in Jamaica. However, Monymusk draws its workers from all over the island, in contrast to the local source of labour supply on most other plantations in Jamaica. In addition, Monymusk is located in an area of especially high unemployment with few jobs outside of the sugar industry and very little available land for farming.

The group of 577 workers on severance pay consisted of 366 loaders, 89 hoistmen, 44 gleaners and 78 railway workers. They included proportionately fewer loaders and hoistmen than the original list of 825, since the 30 per cent who were not located consisted chiefly of these workers. The loaders and hoistmen, especially those who were not found, frequently were not residents of the area, and were the type to migrate to the United Kingdom.

A very high degree of attachment to the estate and area prevailed among the 577 displaced workers. Some 50 per cent had worked for Monymusk for over 10 "crop-years" while only 5 per cent was attached to the company for under 3 "crop-years". The survey showed that 60 per cent of those interviewed had lived in the estate area for over 10 years. All of the railway workers and gleaners had been with the estate for over 10 crop years. Even the loaders and hoistmen showed very high percentages with long work histories at the one company.

The long employment records were clearly related to the advanced age of the displaced. Among the 78 railway workers, 67 were 40 years old and over and none were under 30. Forty of the 44 gleaners were 40 years old or more and none were under 30. Of the 89 hoistmen, 54 were 40 years old or more and only 12 were 20 to 29, with none younger. The 366 loaders showed 9 under 20 years of age and 26 who were 40 or more; most of the loaders were 20 to 39 years old.

A group with such an age distribution might be assumed to have a considerable burden of dependency. The 577 workers had 2,109 dependents, 1,739 of whom lived with the breadwinners. Children under 19 years of age accounted for 1,150 of the dependents, while children over 19 numbered 338. Wives and husbands, legal and common-law, constituted the bulk of the remaining dependents. Loaders, a younger group than railwaymen or hoistmen, had relatively fewer dependents.

A persistent theory about sugar workers in Jamaica is that they work their own land in addition to, and in conflict with labouring on the estates. This inquiry afforded one of the rare opportunities to test this hypothesis. The possession of land was rare indeed among the 577 retrenched workers. The vast majority, 77.3 per cent, neither owned nor rented land. Of the 119 who owned some land, the majority held one-quarter of an acre or less, and only a very few owned 20 to 25 acres, the largest amount reported. The 12 who rented land also had small parcels, suitable only for supplementary farming.

Landholding varied considerably among the four occupational groups included in the survey. Only among railway workers was land ownership more common than non-ownership; 48 of the 78 owned some land, and 4 rented. The railway workers owned almost all of the large holdings, and the average size of their holdings exceeded one acre. At the other extreme were the 366 loaders with only 35 landowners among them, and an average holding of one-quarter of an acre. Such small plots were insufficient for self-support.

Most of the workers were retrenched in August and September of 1960. The survey was conducted during four weeks in November and early December 1960, so that a brief period had elapsed in which new jobs could be obtained. These months were, moreover, poor ones for agricultural employment. As the report states:"The work history of those interviewed suggests that the majority did little or no steady work over the period".

One specific week was investigated in detail as to work experience. Only 23 per cent of the 577 were "at work" during the reference week; "at work" meant self-employment for 106 of the 132 reporting employment. Railway workers were most successful in finding work, followed by hoistmen, loaders and gleaners. All of the employed railway workers, three-fourths of the employed hoistmen and loaders, and half of the employed gleaners were self-employed; farming (72 per cent) and fishing (25 per cent) were the chief pursuits. The 26 who had paid jobs were chiefly in farming (22), while four hoistmen worked as time-keepers.

Land-owners were reported "at work" more frequently than non-owners. The older workers were more successful in finding work than the younger. None of those under 20 years of age were listed as " at work"; 27 (14 per cent) of the 189 aged 20 to 29 were "at work"; 35 (18 per cent), of the 192 aged 30 to 39 were "at work"; and 70 (37 per cent) of the 187 aged 40 and over were "at work". Those with a long attachment to the estate also fared slightly better. The high proportion of older men "at work" is correlated with their being railwaymen who owned land and worked on their own account. Those "at work" had, on the average, more dependents than those "not at work".

The replies on income earned during the reference week were sufficiently evasive so that no tabulation was made. A general impression was created that those engaged in fishing and truck driving were doing relatively better than those in farming or labouring. Some indicated that they were earning too little to support themselves and their families.

How then were these retrenched workers existing? Some received aid from relatives in the U.K. Some had the assistance of other members of the household — chiefly women in petty trade or higglering. Most had used up much or all of their severance pay. (The average amount of severance pay to the 577 workers was £81 and ranged from under £10 to over £500; probably half of the retrenched workers received under £50). Some hoped to get work in the next crop, while others thought that they might obtain work when the ALCOA port installations were begun nearby. The interviewers felt that a high proportion of the 577 retrenched workers would find it difficult to leave the area because their roots were deep.

Asked about plans for the future, some 26 per cent of those interviewed said they planned to go to the U.K., and most had already begun the involved and lengthy process of securing the necessary papers. About one-third had no plans at all, were indefinite or secretive. More than one-fourth expected to stay in farming and another 14 per cent planned to do higglering, petty trading, trucking and fishing. Enumerators reported tension in the Monymusk area and a general restlessness among the interviewees.

The results of this inquiry in Jamaica have been reported in such detail, not because it is believed that precisely the same characteristics would be found if similar surveys were conducted among other groups of retrenched workers, either in Jamaica or British Guiana. It is rather because such surveys are so rare. And in their absence, it has been all too easy to conclude that no true redundancy has occurred or that no real hardship has been inflicted. The truth of this was forcibly borne in upon us when we made several visits to the Monymusk area in July 1961

and spoke to the 'investigators' in the 1960 survey. Lacking a follow-up survey, the very persons who lived in the area and had interviewed the retrenched workers in November 1960 were unable to say what had happened to the group since the interviews. In an area which had widespread unemployment, underemployment, poverty and unrest, the distress of the retrenched workers merged with that of the larger mass.

C. ALLEVIATION OF THE IMPACT

The burden of hardship and unemployment among retrenched workers is not, in itself, a conclusive argument against technical changes which displace labour. But it is a persuasive reason for minimizing the adverse effects of retrenchment. Leaving to other studies the complex problems of expanding the general economy, we may here concentrate on the measures which are directed specifically toward easing the burden on retrenched sugar workers within existing economic conditions. These measures may be classified as advance notification, severance pay and self-employment.

1. Advance Notification

The matter of advance notice was an issue in the recent retrenchment of field workers at Port Mourant. At the Debate in the Legislative Council of British Guiana on July 5, 1961, the Minister of Labour, Health and Housing, Mrs. Janet Jagan, referring to her discussions with directors of Bookers Sugar Estates, Ltd., stated: "I also said it was highly improper to retrench employees without notice and the workers should have been given six months' notice in order to adjust themselves as they would be out of employment".

Management representatives have belittled the importance of a warning period on the ground that very few workers have the alternatives, initiative, or mobility necessary to benefit from advance notice. Yet the prospect of receiving severance pay gives to retrenched workers with long service the disposition of a substantial capital sum, perhaps the first time in their lives. Some period of preparation and decision before the job is terminated would materially assist workers who are contemplating major moves — migration to another country, or the purchase of land, a tractor, a truck, or a fishing boat. These alternatives were taken up by some of the retrenched Monymusk workers, and they undoubtedly lost several months by not having earlier information about their retrenchment.

It would seem a minimum point of agreement that workers should be notified of their redundancy before the beginning of a new crop. Sugar producers in British Guiana, Jamaica and Trinidad contend that any substantial advance notice to workers of a coming retrenchment, especially in the field, could decrease worker productivity, cause resentment or even violent resistance, and could complicate industrial relations. At Monymusk, concern for the physical safety of management personnel led to a surprise announcement and to more extensive changes at one time than were advisable from the technical or economic point of view — all in order to minimize worker resistance. It should be noted that management rarely is so successful in keeping a secret; the closing of the wharves on Jamaica's north coast was rumoured long before the official announcement. Wherever a change involves physical construction, such as a sugar terminal or a new factory, it is pointless to pretend that no displacement will occur. Then it becomes a matter of concealing just how many and which particular individuals will be affected. One may question whether panicky gossip is not more destructive of worker morale and productivity than early official announcements by management.

Whatever validity there is to the idea that workers benefit little from advance notice of impending changes, the case for informing unions and government in advance rests on broader considerations. The need for prior notice and consultation with unions to soften the blow on affected workers and to arrange new terms for workers remaining under altered conditions was stressed to us by every union official we interviewed in Jamaica, Trinidad and British Guiana. Mr. Richard Ishmael, president of the Man-Power Citizens Association, the chief union among sugar workers in British Guiana, declared at the ceremonies opening the new L.B.I. boiling house in March 1959:

> Unions are also greatly concerned about the manner in which technological change is introduced. We want an orderly procedure for joint management-union consideration of possible adverse effects on workers and we want efforts taken to meet affected workers' problems on a mutually satisfactory basis.....[73]

In developed countries, unions play an important role in such matters.[74]

It is hardly likely that unions could be given advance notice of technical changes or a planned retrenchment without the affected workers soon discovering the news. The importance to management of withholding information from workers until the last possible moment must be weighed against the desirability of giving unions substantial warning.

The right of government to have advance knowledge of labour-saving technical changes rests on a broad responsibility for the national economy. Following the sudden displacement of 1,600 workers at Monymusk, the Premier of Jamaica, Mr. Norman Manley, stated that "Government recognises that the mechanisation in the sugar industry is a matter with serious implications to the economy of Jamaica and to the lives of the workers themselves". Thus far, the Government of Jamaica has not placed any restrictions on the freedom of industry to mechanize, decasualize or otherwise displace labour. It has asked the sugar industry to inform Government at least one year in advance of any major change in operations which will result in displacing any significant numbers of workers, and to give the sex and occupation of the redundant employees. The Government has also asked assurance that an estate contemplating changes will, where possible, phase the programme in ways that will cause the minimum dislocation.

Unfortunately the phasing of lay-offs by a single estate is likely to be difficult. It might, however, be feasible to limit the number of estates which are permitted to introduce labour-saving changes in any season. This kind of phasing may be of some importance where the whole industry is convinced, as it is in Jamaica, that mechanized cane-harvesting will be installed on most estates within the next five to ten years. If, as appears to be the current situation in Jamaica, Government does little more than collect information on impending labour-saving changes, then the need for considerable advance notification is not as strong as if Government were actively regulating the process of retrenchment and providing alternative employment for the displaced.

2. Severance Pay

It is a fairly recent concept that a special payment, similar to a lump-sum pension, should be made to sugar workers whose jobs are terminated because of technical change. In British Guiana, the first severance payments were made in 1955 on the occasion of the closure of Port Mourant factory; to date, ten other

[73]Quoted in B.G. Sugar, vol. 2, no. 4.

[74]An example of very advanced union activity is the recent agreement in the U.S.A. between the International Longshoremen's and Warehousemen's Union and the Pacific Maritime Association. See Lincoln Fairley, "The ILWU-PMA Mechanization and Modernization Agreement", Labor Law Journal, July 1961, pp. 664-680.

instances of severance payments to retrenched workers have been recorded (Table V-3).

Severance payments have been confined to factory workers, with one exception. The closure of a whole factory or distillery accounted for three of the five instances of severance pay before 1961; retrenchment due to bulk loading explains five of the six cases in 1961.

Before 1961 each retrenchment was an independent occurrence and the terms of severance payments were negotiated separately. With the signing of agreements on wages, pensions and other matters in January 1961 by the M.P.C.A., and in January 1962 by the Sugar Boilers Union, all of the categories of labour represented by these unions became eligible to receive severance pay on uniform, predetermined conditions. A year earlier Trinidad had adopted a scheme of a more general character, while in 1958 Jamaica had established by union agreement a

TABLE V — 3. SEVERANCE PAYMENTS TO RETRENCHED WORKERS ‡

Name of Estate	Year	Numbers Involved	Amounts paid out	Reason for Retrenchment
			$	
1. Port Mourant	1955	285	77,729.00	Closure of factory
2. Ogle	1958	192	69,248.62	do
3. Skeldon	1960	9	3,747.92	Closure of distillery
4. do.	1960	6	4,270.48	Change in method of curing sugar due to improved machinery.
5. Versailles	1960	5	2,000.00	Gratuitous payments to aged female workers in factory.
6. Skeldon	1961	36	20,609.87	Introduction of bulk shipping of sugar
7. Albion	1961	84	50,705.85	Introduction of bulk shipping of sugar — closure of Creek shipping station.
8. Blairmont	1961	18	17,857.92	Introduction of bulk shipping of sugar.
9. Wales	1961	4	2,419.43	do
10. Versailles	1961	10	2,875.58	do
11. Port Mourant	1961	222	26,899.50	Introduction of new methods in the field.
Total		871	$278,364.17	

‡ B.G. Sugar Producers Association.

system of severance payments covering all factory workers, but only a very limited group of field workers. The trend in the Caribbean area has been toward general severance payments agreements.

In evaluating the adequacy of severance payments in British Guiana's sugar industry, some comparisons will be made with the schemes in Trinidad and Jamaica.

a. **Definition of Compensable Termination:**

British Guiana

Termination of employment by reason of changes in methods in field, factory, office, workshop, laboratory or other place of work. Termination of employment as a result of the introduction of some labour-saving method.

Trinidad

Any termination of employment, provided it is not due to dismissal for theft or wilful damage to the employer's property. Death and involuntary

retirement due to illness or age are included as compensable causes of termination. Temporary lay-off is excluded.

Jamaica

Permanent loss of employment arising out of the introduction of new methods of working whether by mechanization, rationalization, amalgamation, merger, or any other means. Suspension of operations for other reasons up to nine months shall not qualify as compensable redundancy, nor shall unemployment resulting from the involuntary liquidation of the company. Redundancy caused by contraction of operations is not compensable if the employer can prove that such contraction was necessary for the continuance of the company.

It can readily be seen that the Trinidad scheme is a catch-all, serving the purposes of unemployment compensation, workmen's compensation, and old-age pensions, as well as severance payments for retrenchment. As between Jamaica and Britsh Guiana, the former has a more inclusive definition of redundancy. Management decisions, such as a decasualization programme, apparently would cause compensable redundancy in Jamaica; such is not the case at present in British Guiana.

It is in fact extremely difficult to pinpoint changes in field methods as a cause of redundancy. If such changes are occurring simultaneously with a reduction in the acreage under cane and a decasualization programme, the joint effects may obscure the existence of compensable retrenchment. It is quite possible to operate a decasualization programme during a period of declining labour requirements so as to drop from the employment roster large numbers of workers who might have a valid claim to severance pay. After the public storm over the dismissal of redundant field workers at Port Mourant, estate managers may well be tempted to effect a reduction of field staff more quietly, through raising the work attendance requirements for inclusion on the employment roster, or through discharges on medical grounds. On the other hand, some estates may improperly keep a gang on short-time work rather than dismiss half the workers and acknowledge compensable redundancy.

The severance payments agreement will require constant surveillance to make certain that retrenchment due to labour-saving methods in the field is clearly identified and not disguised as decasualization or short-time work. It is also entirely reasonable that the industry should not be asked to bear the burden of compensating workers who are displaced as a result of the extension of peasant cane farming, whether within the empolders or outside. A supplementary government programme may be needed to compensate such displaced workers.

b. Eligibility for Severance Pay

British Guiana

Covers most employees in factory and field; headmen and clerks are not covered. Five or more completed years of adult service (18 years of age or over) with the employer. Workers over 45 years of age are eligible with one complete year of service.

Trinidad

Employees (that is, all workers included in the Recognition Agreement with the Union, including those employed only in crop-time) who have completed ten years of service with the employer, of which the last five years have been continuous, but excluding temporary layoffs of up to twelve months.

A year of service is one during which the employee has earned holidays with pay. The employee shall be not less than 30 years of age at the time of termination.

Jamaica

Three years of unbroken service, provided that temporary lay-off periods shall not constitute a break in service. In the factories, ancillary departments and distilleries: all daily, hourly, weekly and task workers are eligible. In the field, those eligible are weekly workers, headmen, rangers, stock attendants, tradesmen, motor vehicle and tractor drivers and repairmen, power house and pump operators and maintenance men, telephone exchange operators, hoist operators and maintenance men, or other machine operators and maintenance men, however paid. A redundant worker becomes ineligible for severance pay if he is offered alternative employment in the company on similar or better conditions. Where a retrenched worker is offered employment at a lower rate, he shall be given the option of accepting the alternative job or claiming severance pay.

British Guiana has a broader coverage of eligible workers than Jamaica and a shorter eligibility period than Trinidad. The M.P.C.A. demand that retrenchment in British Guiana should fall first upon the workers who have been most recently hired may tend to disqualify some retrenched workers under the present eligibility conditions Therefore, it might be desirable to lower the eligibility period from five to three years.

The choice that Jamaica offers to a retrenched worker between severance pay and an alternative job at a lower rate of pay might be incorporated in the British Guiana agreement. A clear statement should be given the worker of the terms of the alternative employment and the amount to be granted as severance pay, since we have heard of disappointed transferred workers who would have preferred severance pay, and also recipients of low amounts of severance pay who regretted that they had not stayed in employment. It is reasonable that an estate should be freed of obligation to make severance payments to workers who have been offered and have refused to accept alternative employment on similar or better conditions.

c. Scale of Benefits

British Guiana

Workers shall receive notice of retrenchment one full week ahead of the termination date. Benefits shall be computed as follows for qualified workers;

1½ weeks' pay for each full year of employment up to 10 years;

2 weeks' pay for each full year over 10 years;

1½ weeks' pay for each year of age over 45, up to a maximum of 15 years, provided employee has a minimum of five complete years of continuous service as determined by estate management. If five years of continuous service are not shown, workers over 45 years of age shall receive 1 week's pay for each complete year of uninterrupted service.

One week's pay is the total wages paid during the previous 12 months divided by 52. Wages include workmen's compensation and holidays-with-pay payments, but exclude bonus, sickness benefits, overtime and premium time payments. Severance pay may be a lump-sum payment or equal weekly amounts, convertible at any time to a lump sum payment of the balance, either to the worker or his survivors.

Trinidad

No provision for advance notice. Two per cent of employee's earnings during each calendar year in which the employee qualified (two per cent of annual earnings is regarded as one week's pay). Total years of employment qualified for benefit shall not exceed the forty years immediately preceding termination of employment. No employment before January 1, 1945 shall qualify.

Jamaica

No provision for advance notice.
3 weeks' pay for 3 years service;
1½ weeks' pay for the 4th and 5th years of service;
2 weeks' pay for the 6th and every subsequent year of service.
A week's pay shall be the equivalent of the total wages earned in the 24 calendar months immediately preceding the redundancy divided by 104. Service of fractions of a year shall be regarded as follows: up to 3 months disregarded; 3 to 9 months treated as 6 months; 9 to 12 months treated as one year.

Trinidad is clearly less generous than either Jamaica or British Guiana in the amount of severance pay provided. As between Jamaica and British Guiana, the length of service determines which is the more favourable system; a higher rate is paid by British Guiana to those with up to seven years of service. Beyond eight years of service, Jamaica pays more, although workers over 45 years of age in British Guiana receive a bonus which is not available in Jamaica. Under the British Guiana system, an employee with ten years of service will receive a sum amounting to 15 weeks' pay or not quite 30 per cent of one year's income. As a practical matter, the amount of severance pay received on the average is considerably affected by union insistence on the "last in, first out" principle. The most recently hired employees are those with short periods of service, and they are unlikely to qualify for the age bonus. Some union leaders, however, are proposing that employees close to pensionable age be retrenched first of all, since for long-time employees, severance payments at present greatly exceed pensions; conversely, employers are opposed to this proposal.

The severance pay formula used in earlier years, when Port Mourant and Ogle factories were closed, provided more generous benefits than the 1961 agreement and had an eligibility requirement of only one year of service; particularly favourable bonuses for age and lengthy service were offered.[75] Yet the average payments in 1955 and 1958 were lower than those made in 1961 to workers retrenched as a result of the introduction of bulk shipping (Table V-3). Not only differences in the length of service of the particular groups of workers, but also rises in wage rates and earnings since 1955 explain the apparent inconsistency of lower average payments derived from a more generous formula.

In all, British Guiana has awarded severance pay to only 871 retrenched workers (Table V-3). The average payment has been $317.29 (W.I.) It may be assumed that the payments to well over half of the recipients were lower than the average. In the distribution observed at Monymusk in Jamaica, where the average severance payment to 814 workers was £91, 47.9 per cent received under £50 and 75.4 per cent were paid less than £100; only 9.8 per cent were awarded £200 or more, with a scant .5 per cent receiving £500 or more.

In discussions of the operation of the severance payments scheme, we heard several complaints of the method used to compute the weekly wage. It was felt

[75]B. G. Sugar, Vol. 2, No. 1. January 1959, p 5

that weeks of unemployment should not be counted. Both Trinidad and Jamaica use essentially the same method as British Guiana and it is certainly the least subject to misunderstanding or manipulation, and administratively the simplest. Alternatively, it would be possible to count only wages earned in crop, dividing by the appropriate number of weeks. Another way to raise average severance pay is to increase the number of weeks' pay to be given per year of service, especially for the early years.

A second complaint concerns the determination of the length of service. Workers said that a break in service should not prevent earlier years from counting in the formula. A specific allowance of lay-offs of up to twelve months, such as the Trinidad and Jamaica agreements provide, might be written into the British Guiana agreement. The definition of a "complete year" might be the earning of holidays-with-pay in both crops. Problems of lost records and changes of name require individual handling. Bad as some records at the estates may be, it is certain that workers' memories cannot be accepted as superior evidence.

If, in time, unemployment insurance and/or a guaranteed work week are introduced in British Guiana, either for the sugar industry alone or as a government scheme for all workers, the severance payments scheme will need to be revised and integrated with the new programmes.

3. Self-employment of Retrenched Workers

The final announcement of the number of workers retrenched after a major change in the field or factory is usually somewhat smaller than the first estimate. A certain number of workers are kept on because the new method creates new positions; we were told repeatedly of the conversion of mule boys into tractor drivers, mechanics and repairmen. A few workers are transferred to existing vacancies at their old estate or on an associated one. In some cases, the company feels obliged to provide employment for retrenched workers who have declined their severance pay. At Monymusk, some 20 railwaymen refused to accept severance pay and the company found alternative work for them. At Port Mourant, it was announced at first that 295 members of the female weeding gangs and the "Boy" gangs would be retrenched but the final number was 222.[76]

However, most workers slated for retrenchment are left jobless. With the best will and effort, the volunteer attempts of the sugar estates to find new jobs on other estates or in related companies will relocate only a handful. Nor can much hope be held out by the government's employment exchanges so long as general labour redundancy persists in economies such as British Guiana's. Free housing also is a positive deterrent to relocation of many resident sugar workers. In these circumstances, emphasis is quite rightly placed on expanding the opportunities for self-employment. A large share of the obligation to provide for retrenched workers falls on the sugar companies, according to the president of the sugar workers' union, Richard Ishmael:[77]

> The M.P.C.A. believe that management has a positive responsibility to soften any blow of new technology on its workers not only in the factory but in field operations. The workers cannot be forced to carry all of the sacrifice or burden of adjustment. Measures needed to aid affected workers should be considered as properly a part of the cost of the introduction of new machines and new methods. To put it in another way, management must devote some of the savings to be gained from introduction of new equipment to the easing of adverse effects on workers.

Two specific means of giving self-employment to displaced sugar workers have found favour. The measures are: the provision of lands on the sugar estates for individual farming and the expansion of peasant cane farming. Each of these

[76]Mr. A. Tasker, Debate in the Legislative Council, June 29, 1961.
[77]B. G. Sugar, Vol. 2, No. 4, April 1959.

will be reviewed with chief attention to the employment-giving aspects.

a. Individual Farming On Sugar Estates

It has been traditional on British Guiana's plantations to allot to resident workers small plots of estate land on which ground provisions and rice may be grown. A common complaint which we heard concerned the decline in the acreage made available for such purposes. In 1950, 8,233 acres were allotted for rice cultivation. By 1960, the total was down to 3,994 acres. The allotment for ground provisions was 1,843 acres in 1950, 1,325 in 1953 and 2,619 in 1960.[78] Representatives of the workers maintain that the estates have curtailed allotment acreage because they want to limit the conflict between rice and sugar harvesting in the autumn season. Management, pointing to the variations among the estates on this matter, claim that on several plantations rice beds or provision plots go begging, that some workers rent out their plots or hire others to work them, and that the need to expand cane acreage in some areas has resulted in calling back allotment lands.

The recommendation of the Venn Commission, that a minimum of one acre should be set aside for each plot, has not been adopted; rice plots are one-half to three-quarters of an acre on most estates. Nor can it be said that the estates have given "full encouragement . . . to the workers to become self-reliant . . . [by taking] the opportunities of saving expense and even of augmentation of income afforded by their ground provision and rice plots".[79]

The Venn Commission was concerned with the allotment lands of regular employees, and the estates have confined their allotments in recent years to workers whose names appear on the employment rosters developed through the decasualization process. It would be quite a departure to suggest, as has Mr. Ishmael, the M.P.C.A. president, that the estates should consider the retrenched workers as eligible for this type of aid:[80]

> With technological advancements in field operations, for example, resulting in the need for fewer forkmen, planters, shovelmen, and others, and also resulting in fewer days available for gainful employment to men who have given their lives to the industry — lands now in the possession of estates and not required for cane cultivation should be made available to these affected workers to supplement their reduced wages.

This recommendation has special meaning in British Guiana where so many sugar workers live on or near sugar estates, and the estates own so much of the arable land in the narrow belt of settlement on which most Guianese live. If provision plots are to be made available to underemployed or retrenched sugar workers, they inevitably must be provided by the sugar companies. Since it is impractical to locate provision plots at a great distance from the workers' dwellings, this benefit may only be useful to resident retrenched workers.

The question of enlarging the total amount of provision land available to underemployed and displaced workers must be considered separately estate by estate, in view of the varying circumstances on each plantation. In areas where independent rice-farming is well established, the retrenched workers may not need or want small rice plots on the estate. Some plantations may argue that they have no reasonably located land to set aside for additional provision plots. The government may wish to consider the acquisition of suitable sugar lands for this purpose, and also to lease government lands to retrenched workers as leases held by sugar companies expire.

[78]Department of Labour Memorandum. The rise in 1960 is attributable to the claim of one estate that it set aside 1,548 acres for this purpose; according to inspectors of the Department of Labour, this estate gave some retrenched workers provision land in lieu of severance pay.

[79]Gt. Brit., Col. Office. No. 249 (Venn Report) p. 140.

[80]B. G. Sugar, Vol. 2, no. 4, April 1959.

In any case, it would seem desirable to permit retrenched workers to retain their rice and provision plots so long as they live nearby and do not sub-lease or hire labour to work it. The hardship attending loss of employment may be seriously aggravated if the allotment land is withdrawn at the same time. Supervision of allotments will disclose which regular workers are not making proper use of their plots, and these can be reclaimed for distribution to others, including the retrenched workers. If the sugar companies feel that such assistance smacks of paternalism, the administration of the allotment lands could be assumed by the Sugar Industry Labour Welfare Board or a similar agency. If land suitable for such purposes can be obtained from other sources than the sugar companies, a government agency might be empowered to acquire the lands and rent them to displaced sugar workers and other unemployed. The average size of such holdings should be larger than the current size of allotments on the estates. Provision plots should not be an alternative to severance pay, but a supplement.

Such a measure as is here discussed is no more than a stopgap, inasmuch as the allotment is unlikely to be large enough to support a family. Yet it is useful if it will keep families from drifting toward Georgetown, only to be unemployed there, or if it will supplement wages from casual labour. Administered wisely, it will not deter migration to other areas if jobs or other economic opportunities are available. The suggestion that the S.I.L.W.B. make loans to retrenched workers to enable them to build houses in new locations is worthy of serious consideration.

b. Peasant Cane Farming

When the Venn Commission surveyed the sugar industry in 1948 cane produced by peasant farmers made about 3,000 tons of sugar, less than 2 per cent of the Colony's total. The Venn Commission, following the line of the Colony's Ten-Year Development Plan, recommended that the output of cane-farmers should rise to 10,000 tons, both by increased yields per acre and by enlarged acreage. To this end, the Commission suggested co-operative action by cane farmers, less dependence upon the estates for supplies, and improved husbandry practices.

However, the Commission made it plain that "the salvation of the industry has been to adopt large-scale farming and, indeed, only thus can maximum efficiency of cultivation and production be assured. An expansion of cane-farming and of peasant agriculture is not recommended because sugar is most economically produced thereby . . . . but because it is one of the ways in which the increasing population of the Colony can best be absorbed into its economy."[81]

In 1960, when both peasant and estate production were at the high point, the canes of small farmers yielded 7,941 tons of sugar, 2.37 per cent of the total output of British Guiana. While the 10,000 ton goal had not been achieved twelve years after the Venn Commission made its report, the cane farmers had more than doubled their output and had a slightly larger share of total production than in 1948. As in 1948, East Demerara is still the chief stronghold of cane farmers. Table V-4 shows a small increase from 1948 to 1961 in the number of acres farmed in East Demerara, but a substantial decline in the number of farmers — from 1,235 to 707. The result has been a rise in the size of the average farm from 1.16 acres to 2.50 — still a miniscule holding.

If cane farmers are defined as those with less than 25 acres in cane, or those who send less than 1,000 tons of cane to the factory, they are found, apart from the East Coast farmers who deliver to Enmore and L.B.I. factories, in the Wales Pilot Scheme and on miscellaneous plots at Rose Hall, Wales and Versailles. Since 1948, the Golden Grove-Nabaclis cane farmers have ceased operations. The

[81]Venn Report, pp. 104-8.

TABLE V—4. CANE FARMING IN EAST DEMERARA 1948, 1957, 1961‡

Village	No. of Farmers			Acres Farmed			Average Acres Per Farmer		
	1948	1957	1961[1]	1948	1957	1961[1]	1948	1957	1961[1]
Plaisance	119	184	130	132.5	215	228	1.11	1.17	1.75
B/V-Triumph	454	537	338	726.5	853	873	1.60	1.59	2.58
Buxton-Friendship	637	530	239	547	658	669	.86	1.24	2.80
Golden Grove-Nabaclis	25	-[2]	-[2]	28.5	-[2]	-[2]	1.14	-[2]	-[2]
	1235	1251	707	1434.5	1726	1770	1.16	1.39	2.50

‡ Data for 1948 from Venn Report (Col. No. 249) p. 104; data for 1957 and 1961 (preliminary) from Department of Agriculture.
[1]Data for 1961 are preliminary.
[2]Peasant cane farming ceased in the Golden Grove-Nabaclis area after 1948.

Wales Pilot Scheme was instituted in 1956. Eight hundred acres in the Belle Vue section of Wales Estate, within the estate's empolder, were divided among 57 farmers. Ranging from 8.5 acres to 16.5 acres, with more than half of the farms 13.5 acres or larger, the holdings of the Wales cane farmers are much more extensive than those of the peasant farmers who grow cane outside of the estate empolders.

In other respects, the Wales farmers also operate in different fashion from other peasant farmers. Because these cane farmers are within the estate's empolder and bad cultivation practices would impair surrounding estate cultivation, their work is carefully supervised by a full-time Director of Cane Farming resident at Wales. Each farmer's land is divided into a number of small strips so as to give good proportions of land in flood fallow, plant and ratoon cane. The estate does a good deal of work for the farmers — drainage, navigation, irrigation and mechanical tillage — all at cost, and also provides supplies at cost, thus passing on the savings of bulk buying. The farmers pay a rent of $25.20 per acre and a supervision fee of $20 per acre yearly. Cane is purchased by the factory at 60 per cent of the net factory revenue from sugar and molasses. Some farmers on Wales Estate have better yields per acre than the estate as a whole, according to an unpublished Department of Agriculture study.

Other cane farmers, outside the estate empolders, receive aid from the Cane Farming Officer of the Department of Agriculture. The Agricultural Officer, East Demerara, also serves as an **ex-officio** member of the Central Cane Farmers' Association. Despite the very small size of the farms, a recent survey by the Department of Agriculture revealed that there are a few "gentlemen cane farmers" who pay to have all of their work done and that a number of the small farms are rented out. Most cane farmers have other, more remunerative occupations. The prevalence of part-time cane farming is attributed to the shortage of land in the vicinity of factories and the restrictions imposed by the factories on the amount of cane they will accept from farmers.

Relations with the estates are less close than in the case of the farmers within the empolder. Husbandry practices among cane farmers leave much to be desired, but some are able to match the yields of nearby estates. Cane farmers buy tops from the estates, and obtain lime and fertilizer at a discount from the same source. They rely on estates' punts, which are available to them only on certain days of the week in crop. Factories buy farmers' cane, in stipulated amounts, on a price formula based on the sucrose content of the cane, the variety of cane and the Commonwealth Sugar Agreement. A revised formula was suggested in the Mackenzie Report of October 1960.

There are then two distinct groups of cane farmers in British Guiana — a small

number on fair-size farms operating within the empolder, under the close direction of the estate, and the larger number of part-time farmers on very small farms outside the empolder. Under pressure from Government, the industry has been seeking ways to expand the acreage allotted to cane farmers. A second pilot scheme for Skeldon Estate which will establish cane farms within the empolder has been devised, but its operation has been postponed. It is hoped that the estate management can find ways to relax the discipline imposed on the cane farmers without exposing the estate lands to the repercussions of bad farming practices or endangering the farmers' financial position.

In response to requests by East Coast farmers for expanded cane acreage, the Government initiated negotiations with the sugar industry. Bookers Estates agreed to accept cane from 610 additional acres; 560 acres were allotted the East Coast farmers and 50 acres to the West Coast. In addition, 2,330 acres in new areas of the East and West Banks of the Demerara River were recognized as cane-farming land.[82] Farmers have been slow to take up the additional acreage; only 67 acres were claimed as of June 30, 1961. Demerara Company have not yet developed cane farming, but are said to be giving active consideration to establishing cane farming outside their empolders.

Various proposals for the expansion of small-scale cane farming have originated in a feeling that the industry which is disemploying workers should do something to provide these workers with the means of self-support. This feeling is reinforced by a widespread belief that a small-holding peasantry is socially and politically desirable. While these and other ethical and social considerations are beyond the scope of the present enquiry, it is imperative to consider the economics of small-scale farming, and particularly whether such farming can be expected to provide a successful net absorption of the labour displaced from the sugar estates.

One characteristic of sugar-cane cultivation which is often cited by advocates of small-scale farms is the high-labour-intensity of this activity. We have already noted that the sugar estates employ relatively high numbers of workers per acre of cultivated land; and even after the labour-saving changes of the last decade, sugar is still labour-intensive in comparison with most other field crops (Chapter I). But the open question here is whether any higher degree of labour-intensity will be practised by the small farmers. If they follow the Wales Pilot scheme, which provides that cane farmers shall conform to a certain minimum of the mechanized and rationalized procedures of the estates and encourages them to adopt other such practices, then cane farming will absorb no more workers per acre than do the estates.

On the other hand, the B.G. Department of Agriculture contends that a cane farmer and his family can handle about 5 acres entirely by their own labour and without any machinery.[83] This is the type of cane-farming practised in East Demerara at present, but on extremely small holdings (Table V-4). Now the problem arises as to the additional supply of land for the expansion of cane-farming. In British Guiana there is little unused land outside the estate empolders which is agronomically suitable for sugar, already provided with basic drainage and irrigation, and sufficiently close and accessible to a factory. All other land outside the empolders would require great capital expenditure on development, coming into the same range as the cost and time required for opening up new lands for rice or other crops.

Clearly the main areas for the expansion of cane farming, without great outlays

[82] **Annual Report of the Director of Agriculture**, 1960, p. 6.
[83] Letter from the Director of Agriculture, January 4, 1962.

on development and without long delays in time, are on the existing estates. Here small farms of say 5 acres, operated in traditional fashion and without modern equipment or chemical applications, would certainly absorb the labour quickly. But the estate managements oppose the creation of such small cane farms on the ground that any scale below 15 acres will not be economically viable for a family, and presumably also on the ground that very small farms are difficult to supervise and to keep from damaging the estate cultivation. The Director of Agriculture, however, suggests that 5 acres is economically viable, since 5 acres can, at current prices, yield about $2,000 (W.I.) a year gross, and not less than $1,300 (W.I.) net per family.[84]

If each family farm within the empolders is to be 15 acres in size, it will actually tend to displace additional labour from the estates. At present the average estate requires approximately three workers per 15 acres (based on 94,000 acres employing 18,000 field workers on the average). Using similar techniques, the small farmer will devote about the same amount of labour. But it will be composed differently, viz: the farmer's own work and his unpaid family helpers, plus hired services, perhaps amounting to 1 to 1½ worker-equivalents (consisting of some estate-supplied services, plus outside help in harvesting). It appears that at least one estate worker would be displaced from employment, his place being taken by the two or more part-time family helpers. In effect, the country's labour force would be increased by the entry of women and children who presumably would otherwise not seek employment. If the transfer of 15 acres of estate lands is made to an individual who is not a retrenched sugar worker, as the sugar companies maintain has been the case thus far, the effect would be to render redundant more regular estate workers.

In aggregate economic terms, the use of unpaid family labour can make a real contribution to the family and to the economy if it increases total saleable production — either by settling cane farmers on new land at little cost, or by encouraging the estates to open up new lands to compensate for old estate lands transferred to the small operators. However, such additional production would be saleable only if the world market were open and available for sugar as it is for some other crops. But the sugar market being tight and regulated, the sugar industry of British Guiana operates within a virtually limited total of production. Therefore if the output of cane farmers is to be increased, the output of the estates must be correspondingly reduced.[85]

Whether or not it is socially desirable to obtain a larger proportion of the total cane supply from small farmers, the economic fact seems to be that such a decision would not result in the continued employment of all the adult males now in the industry. Whatever the case for small cane-farmers on non-economic grounds, it cannot be advocated as a means of increasing the net absorption of adult male labour in economically successful work.

Other crops with greater possibilities in both the domestic and the export markets will absorb peasant farmers far more easily. Given the capital costs of opening up new land and training farmers if the crop is unfamiliar, these other crops — rice, ground provisions, bananas, cocoa as well as the raising of poultry, milk cattle, and fish — provide a larger agricultural potential for coping with the rapid growth of the labour force. (See Appendix F on rice farming). Still other measures to absorb surplus labour, outside of agriculture altogether, lie beyond our present terms of reference.

[84]Letter from the Director of Agriculture, January 4, 1962.

[85]If the total saleable quota is increasing, it becomes possible to enlarge the share of the small farmers without making an absolute reduction in the operations of the estates. The prospect for an increase in the total saleable quota, however, is not auspicious (Chapter I).

CHAPTER VI

Summary and Policy Considerations

This study of labour displacement in the sugar industry of British Guiana was prompted by public concern that the mechanization of this industry was responsible for substantial labour retrenchment, and thus was aggravating an already serious problem of unemployment and underemployment. The preceding chapters have examined in detail the facts of the case, and our findings are summarized in Section A of this chapter. Section B is a presentation of the underlying factors which determine recent and potential efforts to introduce labour-saving methods. In Section C, we outline some types of public policies to cope with labour retrenchment in the sugar industry.

A. Summary of Findings

Chapter I surveyed the basic economic problems of British Guiana as a whole and in relation to its sugar industry. Like most other primary-producing countries, British Guiana faces a heavy and increasing pressure of population upon an economy whose rate of development has been inadequate, and is in fact tending to slow down. Such an economy, severely dependent upon foreign markets which are not expanding very strongly, tends to show a rising volume of unemployment and underemployment as population grows. Even when expansion has been rapid in certain sectors (e.g. bauxite, sugar, rice) and in the whole national product (e.g. during 1952-57), labour has not been absorbed in sufficient numbers to reduce idleness, let alone to give a marked lift to the average level of income accruing to the whole population. Meanwhile, demands for improvement in the current levels of wages, employment and welfare are becoming more powerful each year.

The coastal strip of British Guiana is intensively cultivated in sugar, rice and other crops, and is already over-populated (except for certain abandoned sections). The hinterland, however, is virtually uninhabited and could be developed by large capital outlays. Large-scale mining of bauxite and manganese has been instituted, but these industries require relatively few workers. Development of the interoir for rice cultivation, cattle-raising, forestry, and other land use would be far more labour-absorptive. Whether such land development would attract and absorb many of the present unemployed as well as the underemployed is a question turning partly on the racial division of the British Guiana labour force: persons of East Indian descent are eager for rice lands, while persons of African descent prefer to seek urban occupations, chiefly in Georgetown.

Manufacturing activities which can be based on known local resources — bauxite, manganese, silica sand, lumber, water power, as well as cane pulp and rice husks — are almost entirely possibilities for the future; the present industries are largely handicrafts plus simple manufactures for local needs. Agriculture, together with other primary occupations, still accounts for two-fifths of the total labour force, according to the I.L.O. study of the British Guiana labour force in 1956.

The sugar industry alone, counting both field and factory, employed, as of 1956, only one-sixth of the labour force (and was nearly matched by rice cultivation

and milling). Excluding the unemployed, the sugar industry accounted for one-fifth of the total numbers at work. Sugar also accounted for almost a fifth of the gross domestic product of the territory, indicating that this industry's productivity per worker was nearly on the average for the whole economy. Since 1956, sugar's share of total employment appears to have declined appreciably.

As regards total capital formation in British Guiana, the available estimates attribute only a modest proportion to the sugar industry. As regards governmental revenues, however, this industry in recent years has paid more than one-fifth of total taxes. As regards total merchandise exports, sugar, plus molasses and rum, has been responsible for over half the aggregate by value.

One of the special features of the British Guiana sugar industry is its concentration in the hands of two large, diversified, foreign-owned companies, one accounting for 80 per cent of the total cane output, the other responsible for most of the remainder, as independent estates and peasant cane farming are negligible. These two companies have provided a wide range of services for their employees as well as for non-employees who live on sugar estates as a residual of the indenture system. In recent years, there has been an effort to move from paternalism to the Welfare State; the tendency has been to transfer some services to public or quasi-governmental agencies, to abandon others, and to expand programmes which provide benefits to workers as an earned right rather than as an eleemosynary gesture.

Like most producers of sugar, the British Guiana companies have been engaged during the past decade in a drive to raise efficiency and productivity. In response to local conditions and international competitive pressures, the companies adopted various cost-cutting devices and methods. These devices have tended to reduce employment per acre of cane and per ton of sugar.

In Chapter II we analyzed the record of employment in the sugar industry since 1949. Our chief findings are summarized in the following seven points:

(1) Since 1949, the sugar estates of British Guiana have substantially increased the acreage under cane, acres reaped, tons of cane ground and tons of sugar produced. During the same period, the overall need for labour in field and factory has decreased, both in terms of the average number of workers and the total number of man-days per year. From 1955 to 1960, the total number of man-days worked per year (data on man-days are not available for the period before 1955) declined by 13.2 percent. The decline was still greater in the average weekly number of workers — from 28,479 in 1955 to 22,409 in 1960, a drop of 21.3 percent.

(2) During the past decade, the input of manual labour per acre of cane and per ton of sugar was reduced markedly, and appears to have declined relatively more in British Guiana than in Jamaica and Trinidad.

(3) The percentage decline of employment in the sugar industry of British Guiana has been more severe in the factories than in the field over the past decade. The absolute amount of decline, however, has been greater in the field, especially since 1955.

(4) The decline of employment has been heavier among adult females, youths and aged persons than among adult males. This differential reflects the changing labour needs of the estates and the preferences of the labour force.

(5) Over the decade, field employment has declined more in the out-of-crop periods than in-crop. This tendency has intensified the seasonal fluctuations in employment which have always been characteristic of the sugar industry.

(6) The decreased amount of work available in the sugar industry has been deliberately concentrated among a smaller group of workers in an effort to control the flow of cane to the factory and to eliminate the casual and irregular workers from the industry.

(7) The workers remaining in sugar employment have made substantial gains in real earnings over the decade due chiefly to increased wage rates. Annual money wages per head (based on the average weekly number of workers) rose from $585 in 1954 to $1,085 in 1960. This was an 86 percent rise in money earnings, which amounted to 67 percent in real earnings after price-deflation. A still larger increase was recorded over the longer period since 1948. In addition, some workers have acquired valuable new skills which are in demand in other parts of the economy.

Probing beneath the foregoing record of employment, Chapter III explored the technical changes in the sugar industry responsible for reducing its overall need for labour. We found that the decline in employment is not attributable solely to the substitution of machinery for workers. The actual changes comprised not only mechanization, but also non-mechanical advances in physical, chemical and botanical technology, as well as improvements in labour utilization. All of these changes were part of a pattern of interacting and cumulative advances in both field and factory. Economies of scale together with more productive techniques have reduced the labour input per acre of cane and per ton of sugar to a degree exceeding the rise in total acreage and tonnage; meanwhile these changes have been raising the application of capital per worker.

Future prospects include little further expansion of acreage and tonnage totals. There is, however, a long and currently lengthening list of possible new labour-saving innovations in technology, not all of which involve mechanization. The largest potential displacement of labour is in harvesting operations, which are still primarily manual. But the mechanization of cutting and loading cane, which has lagged in most cane-producing areas, would encounter particularly difficult and costly conditions of terrain and field layout in British Guiana. Likewise, further consolidation of factories would run into problems of transporting the cane over still greater distances. Under sufficient pressure, these difficulties can be probably overcome, given time and heavy capital investment. On the other hand, non-mechanical changes would be comparatively easy, following the lines of action of the past decade. Almost all of the potential changes would further economize on labour input.

Chapter IV indicates the financial results of technical changes and expansion of output during the past decade. The progressive rise of wage rates and of other cost-prices, at an average rate of about 3 per cent a year since 1953, has been absorbed without a fully corresponding rise in the total ("comprehensive") cost of production per ton. Ability to absorb the rises in factor costs has been correlated with the degree of technological improvement in each sector of the industry: the "routine costs per ton" did not rise much in cultivation, where substantial technological improvement occurred during the decade; but there was a rapid climb of costs per ton in harvesting, where very little advance in productivity had been achieved.

To the extent that technological change in field and factory involved capital investment, the annual charges for depreciation and interest showed a strong increase. These overhead charges apparently swallowed up most but not all of the gains which resulted from restraining routine costs per ton while sales prices per ton rose more rapidly.

The effects of all these trends upon the retrenched workers is described in

Chapter V. Not all of the reported decline in employment represents persons actually retrenched. Much of the reduction in numbers at work came about as workers died, retired or voluntarily left the sugar industry, while no new workers were hired to replace them. The number of regular workers who were truly retrenched is thus difficult to determine. For the period 1955-61, 871 persons were actually awarded severance pay.

Before the labour-management agreement of 1961, severance pay was awarded only on an **ad hoc** basis, and did not apply to field workers. Under the new agreement, all retrenched workers who have at least 5 years of service with the employer receive severance pay amounting to 1½ weeks' pay for the first ten years of service, with 2 weeks' pay for each year of additional service.

The characteristics of the retrenched workers in British Guiana have not been studied, and little is known of the subsequent employment history of those individuals. Comparable experience in Jamaica was examined to indicate the difficulties facing the retrenched workers: few of those surveyed in Jamaica had found substitute jobs or self-employment of equivalent value.

Chapter V concludes with an examination of relevant experience with three types of measures which might alleviate the impact of retrenchment: advance notification to redundant workers; severance pay; and self-employment of retrenched workers in farming. These matters are discussed below, in Section C. Policy Considerations.

B. Economic and Social Determinants of Labour Displacement

Basic economic and social forces in British Guiana, as in most parts of the world today, are compelling industries to introduce labour-saving devices. In primary-producing countries, the most immediate force is the market pressure of competition resulting from substantial world surpluses of primary products, sugar included. Underlying the various attempts to regulate the market is the fact that sugar tends to suffer from an inelastic demand. This type of demand resists efforts to raise total sales volume by **generalized** price cuts, and yet encourages any individual seller to try to increase his share of the market by cutting his **own** prices. Conversely, while the commodity demand also tends to be inelastic to rising prices, yet it defeats efforts by any seller to raise his own price, because buyers switch from high-price sellers to lower-price sellers at home or abroad.

At the same time, the supply is quite expansible in response to price **rises.** But the supply does not shrink when prices **fall;** in fact, falling prices often lead, "perversely", to expanding production, in a generally futile effort to make up for the decrease in revenue per unit by way of some increase in volume.

As this situation has tended toward ruinous competition, with selling prices below cost of production, the industry has obtained various international and internal agreements to provide some shelter from sheer market forces. But these schemes work imperfectly and unreliably. Competition persists to a degree within most of the agreements, wherever more than one source of supply is operative (or merely is latent). And competition is much more intense in the "free" market where all producers try to dispose of their residual output that is not covered by various preferential pacts; here the International Sugar Agreement, working through a quota system, attempts, with but meagre success, to curb the gyrations of prices.

Because of such competitive pressures, each producer is led to seek means of controlling costs by various innovations which usually include labour-saving devices. In turn, most of these innovations, no matter where they may have

originated, become compulsory for every producer who is neither exceptionally favoured by local circumstances nor is absolutely protected and subsidized by cartels or by government.

The British Guiana sugar companies are found to be in most respects subject to these general compulsions. As the physical conditions of sugar production in British Guiana are not very favourable on the whole, and particularly entail heavy expenditure for dykes against the sea and for drainage within the empolders, the costs of production per ton are not low in this territory. The companies could not survive without the price support of the Commonwealth Sugar Agreement, even though today it covers less than two-thirds of the British Guiana annual production. Within this Agreement, a virtually uniform price for all producers assures that the British Guiana companies cannot let their costs get out of line with those of other member countries.

Outside this Agreement, much more severe competition is encountered in the "free" market where most of the remaining production must be sold. Accordingly, if the industry in British Guiana did not keep up with the trend of efficiency in the entire sugar industry, it would soon show losses.

In addition to the force of competition, the sugar industry is affected by secular trends throughout the world which are changing the relative supplies of labour and capital and altering their availability to particular industries. Thus the reduction of the death rate (by malaria-control, etc.) in British Guiana is rapidly increasing the population and the total labour force; but education, communications, union organization, and the international "demonstration effects" of higher living levels elsewhere, are reducing labour's willingness to do agricultural work. Workers become increasingly dissatisfied with highly seasonal employment in which periods of intense activity alternate with periods of idleness and small or zero income; and similarly dissatisfied with certain kinds of unpleasant tasks, poorly-paid jobs, and work considered demeaning.

As these influences spread, the sugar industry may eventually face serious labour shortages, especially for cane-cutting at harvest time. In that event, management will be forced to pursue mechanization and other labour-saving devices not merely to cut costs, but actually also to sustain the total volume of output. But even short of such extremes of absolute scarcity, the increasing relative scarcity of labour at times of peak demand, with vigorous union demands for wage increases, fringe benefits, and shorter hours, is undoubtedly tending to raise labour costs per man-hour. Only by reducing man-hours per ton of sugar can costs be held down.

At the same time as these factors tend to limit the effective work force in the sugar industry, and raise its costs, the supply of capital available to the sugar industry has become more plentiful. This is partly by reason of the profits which have appeared in this industry since the desperate conditions of the 1930's, and partly by reason of the secular and worldwide decline in interest rates and in the acceptable level of returns on equity investment. Accompanying this cheapening of capital is the cheapening of capital goods — plant and equipment for the industry, including its research laboratories — relative to the price of the product, and also relative to the price of the labour which is displaced by the equipment and new techniques.

Finally, the practices of industrial management have been drastically overhauled during the past few years all over the world. Management nowadays is increasingly ready to consider alternatives to long-established methods, ranging from mechanization of processes through diversification of activities to abandonment of industries or countries where operations are no longer profitable. The

top management of the British Guiana sugar companies has participated vigorously in the movement toward more scientific and rational treatment of production methods, cost control, and personnel relations.

While cost pressures and international competition are basic inducements to labour-saving changes in the British Guiana sugar industry, there are other factors which specifically stimulate changes of the mechanizing type. These factors are not purely economic; in fact, innovations are sometimes introduced with quite inadequate data as to the comparative costs of the new machinery relative to the prevailing manual techniques, and sometimes merely in the hope that eventually the large initial capital expenditure will pay for itself by reductions in cost per ton.

One of the psychological factors which is conspicuous in other Caribbean areas is the increasing managerial difficulty of contending with labour in the mass and in dealing with individual workers who are unreliable and unpredictable. Faced with interruptions of work and labour demands which sometimes lead to violence, the sugar companies tend to seek relief by mechanizing. It seems to them that production will be conducted more easily if the total number of required employees is reduced. If in addition the remaining work force will be more fully-employed, better-paid, and more content, there is hope for social approval, a sanction rarely bestowed upon foreign-owned sugar companies.

Certain more specific aims have also contributed to the introduction of mechanized and other labour-saving methods. One of these aims is to hasten a particular job (e.g., the opening of new lands for sugar cultivation in 1949-52); another is to do a job which manual labour cannot do easily or at all (e.g. certain kinds of chemical spraying of fields); or to fit into technologic practices elsewhere (e.g., the introduction of bulk loading to serve customers in the United Kingdom and Canada who had installed bulk handling facilities for raw sugar). Furthermore, when worn-out factory equipment is replaced, or new factories are built, it is usual for the new machinery to require fewer workers, and to yield a higher output per man-hour.

After certain processes are mechanized, the logic of supply requirements leads to further mechanization. Such has been the pattern at Monymusk in Jamaica. Anticipation of supply trouble is enough to induce successive labour-saving devices, once the procedure has been set in motion. But in areas which still have a long way to go before they reach an advanced stage of mechanization, such as prevails in Hawaii, one restraining doubt remains: will not a small, indispensable, and highly organized work force pose an even greater threat to management than the present large mass?

Most of the changes in the British Guiana sugar industry to date have been accepted and often welcomed by those workers who remained in employment. It is significant that the sugar industry unions in British Guiana have offered no strong opposition in principle to labour-displacement, but instead have concentrated their insistence upon gradual and orderly procedures, and upon corresponding improvements for the employees who remain.

The foregoing considerations, which thus involve the union side as well as the management side, help to explain the general acceptance of the Venn Report of 1949 which strongly recommended mechanization and other steps to raise productivity. This report was taken by the sugar industry virtually as gospel, and many of its recommendations have by now become established practice. It is noteworthy that the expansion of British Guiana's rice industry has proceeded with an even greater acceptance of mechanization; only recently has the propriety of substituting machines for men been seriously questioned (see Appendix F).

The managements of the British Guiana sugar companies are well aware of the importance of their industry as a source of employment. Cognizant of the hardships affecting the particular individuals who are displaced by measures which raise the productivity of the remaining workers, several executives have expressed a policy of "not proceeding faster than necessary".

In the long run however, the underlying determinants are likely to prevail. The British Guiana industry is far short of the known limits in the application of currently available technology and labour-saving methods, as indicated in Chapter III. The present limits can probably be pushed further by vigorous research and experimentation. If existing economic and social pressures continue, and if no legal barrier is imposed, the sugar companies will have compelling reasons to extend the modernization process of the past decade.

C. Policy Considerations

The displacement of labour by technological change is an ancient process, visible throughout the Industrial Revolution of the last two centuries, and discernible in still earlier innovations. And it is a widespread process, occurring in most countries, from the highly advanced to the severely retarded. This process always brings some disruption and hardship to the individuals and families directly concerned. It becomes a serious social problem whenever technological or other change does not result in a general expansion of the economy adequate to absorb the displaced workers plus the annual net increment of the labour force.

This is the kind of problem which has emerged in British Guiana as a result of labour retrenchment in the sugar industry while output of this product was actually increased. The specific policies which a Government might adopt to cope with this problem divide into several types: (1) measures to retard or halt labour-displacing actions by the companies; (2) measures to aid the retrenched workers; and (3) measures to expand the economy and employment opportunities.

1. **Limiting Labour Retrenchment:** At least three approaches toward controlling the tempo and degree of labour retrenchment in the sugar industry may be distinguished:

(a) to halt or retard the mechanization process, and/or other forms of labour saving, by imposing legal conditions and restraints; (b) to regulate the rate of displacement by consultation and agreement among employers, unions and Government; (c) to induce voluntary action by employers, through official measures to raise the effectiveness and profitability of employing labour instead of machinery.

(a) One procedure would limit mechanization by legal restriction, but would not interfere with labour displacement due to reduction of acreage or due to scientific and organizational advances. The introduction of new machinery might be limited by a licensing system, or by high duties on imported machinery, or by other deterrent charges; the proceeds might possibly be paid into a Relief Fund for the benefit of workers displaced by mechanization.

The rationale of this programme consists in part of leaving to the sugar companies some degree of freedom to cope with cost pressures and competitive standing by recourse to non-mechanical improvements. Changes of this type involve relatively small sums of capital, often no more than working funds, and sometimes no appreciable outlay at all. In contrast, mechanization requires substantial capital investment, but does not always yield incremental productivity exceeding its incremental cost. Furthermore, agricultural equipment is a dubious social investment under Guianese conditions, as Professor W. A. Lewis has pointed out for Barbados:[86]

[86] W. A. Lewis, "Employment Policy in an Underdeveloped Area", **Social and Economic Studies**, Vol. 7, No. 3, September 1958, p. 50.

> It obviously does not make economic sense for the Barbadians to use their limited foreign exchange reserves to import machinery to do forms of work on sugar plantations which could just as well be done by human labour. And yet at the current level of wages it pays the sugar producers to do so. Their case is that since they produce for a competitive market they cannot neglect innovations which are introduced elsewhere.

This statement clearly points up the conflict between private and public interest, as the economist sees it. It is socially desirable to devote scarce capital to labour-displacing purposes in a labour-redundant economy which allegedly contains many opportunities for new, labour-absorbing investments? This question turns on British Guiana's actual circumstances. There is at present no organization to control and re-allocate private capital in British Guiana, whose capital market is at best rudimentary. If the sugar companies are prevented from investing in machinery, the most likely result will be to remit accumulated funds to the home office, or to fail to draw new capital into British Guiana. The net effect may be socially harmful.

As a practical matter, it is not simple to separate mechanization from other types of technological advance. The record described in Chapter III indicates that a number of non-mechanical changes were derived from or were preliminary to mechanical changes, and had joint effects on employment. Furthermore, if management concentrates on introducing those labour-saving, cost-cutting changes which are in fact separable from mechanization, the net displacement of labour may not be slowed down very much, although capital would be conserved.

As these efforts at partial restriction of labour displacement appear to be difficult to administer, there may be an inclination to turn to seemingly simpler and more sweeping measures. These would consist in freezing the existing situation, whether by requiring the maintenance of the present total volume of employment, guaranteeing each worker his job, forbidding all "changes which displace labour", banning machinery imports, or the like. A closer look at such rigid rules, however, reveals that they would tend to prevent the industry from adjusting to changing conditions, would restrict improvements in wages and other labour-management relations, would impair the industry's competitive standing, and would create huge administrative problems of definition and enforcement.

It bears mention that many of the conditions governing the behaviour of the sugar industry in private corporate hands will persist even if the ownership pattern is changed, however drastically. If this industry were nationalized, the administration would still face the poverty and backwardness of the local economy, and the limitations imposed by the international markets for sugar. Indeed, the expenditures of a government on development projects, whether in one or two sectors or in a wholly socialized economy, still require the extraction of "profits" in the sense of a portion of the net economic product withheld from current consumption, for purposes of investment.

(b) The policy of regulating the tempo and intensity of labour displacement by consultation and agreement among employers, unions and Government finds support in many countries where automation is a current issue. Some maximum rate of labour displacement could be established, based perhaps on the average rate of the last five years. By phasing out the changes, both over time and among the various sugar estates, the social impact may be reduced. Advance notice to Government of forthcoming changes is a reasonable provision, if Government does not participate directly with management and unions on a working committee on labour displacement.

(c) The proposal that Government should make the use of labour more attractive and profitable than the installation of machinery is theoretically interesting but

in practice difficult to achieve under the existing institutional and political circumstances of British Guiana. Such a policy would entail the subsidization of employment by reducing real wages and/or directly assisting employers, so as to support or increase the profitability of labour-intensive undertakings. Professor W. A. Lewis, who has suggested this line of approach in the article cited above, recognizes that there is virtually no possibility of reducing money wages. He indicates various ways of taxing the whole population — e.g. by import duties, currency devaluation or excise taxes — in order to offer protection and raise the profitability of new industrial expansion. These taxes can provide a fund to pay cash subsidies or permit special tax allowances to companies which give preference to labour in place of machinery. The whole scheme will not succeed, of course, if the consequent increases in the cost of living are immediately translated by trade unions into demands for increased money wages, as is likely to happen in British Guiana, and in many other underdeveloped countries.

A less inflationary means of making labour attractive to employers would be through measures which improve the performance of the local work force — by health programmes, general education, specific training, and the like.

The programme of inducing employers to favour human over mechanical effort is most appropriate for a whole economy which must lift itself by its own bootstraps, forming capital by restraining consumption for the sake of increasing the investible resources. The programme is not easily applied to a single industry. Since the market prevents the companies from increasing sugar output very much, the inducement policy would not influence these companies unless they were willing to extend their diversification in British Guiana, investing sugar profits in new, labour-intensive lines of industry. Furthermore, the financial inducements would not be very effective against non-economic reasons for replacing workers with machines, viz., the psychological and emotional reactions of management to labour disputes, absenteeism, union pressure, and uncertainty about work performance.

2. **Aiding Retrenched Workers.** To the extent that labour retrenchment is not halted by any measures such as those examined above, we must consider the possibilities for alleviating the personal and social impact of displacement. A useful presentation of such possibilities may be found in the recent Report of the President's Committee on Labour-Management Policy in the United States of America, where rapid technological change of the "automation" type is causing increasing concern over unemployment despite the general prosperity of the economy.[87]

While a high proportion of labour displacement in the British Guiana sugar industry has been accomplished by not replacing workers who voluntarily terminated their employment for personal reasons, hardships are imposed upon a considerable number of workers who have been, or will in the future be, involuntarily retrenched. As suggested in Chapter V, advance notification to prospective retrenchees would be a quite easy form of assistance; it should be announced perhaps at the end of the preceding crop season (conceding to management's fear that a longer period of warning might disorganize work during the previous crop). A vigilant surveillance by unions is also recommended to ensure proper classification and aid for every worker who was truly retrenched.

A liberalizing of severance pay, both as to qualification requirements and as to

[87]This report was prepared by a nineteen-member committee of labour union leaders, corporation executives, and representatives of the public, and was submitted in January 1962. It made no recommendation to interfere with technological change or to shorten the work week, but advocated advance notification to employees and unions, suggested the suitability of public works and of tax reduction to offset unemployment of large groups, and concentrated its attention on measures for the welfare and readjustment of individuals who are displaced.

amount and duration of payments, may be considered. It is possible that the workers who remain employed in the sugar industry should be asked to make a contribution toward a Severance Pay Fund. This would recognize the fact that the raised productivity and higher wages for those who remain employed was derived from the same changes responsible for the displacement of fellow workers.

Other measures which would assist displaced sugar workers include: re-training and re-location schemes; public works of a labour-intensive type; provision plots on sugar estates; extension of peasants' cane-farming and rice-farming (see Chapter V). The use of estate land for cultivation of rice and ground provisions was found a useful, but short-run and supplementary expedient. The extension of peasant cane-farming both within and outside the estate empolders, a measure strongly advocated in some quarters, was found to have limited value: small-scale cane-farming is not likely to provide a satisfactory net absorption of adult male labour because it causes an offsetting reduction in sugar estate employment. Other crops, particularly rice, also poultry-raising, milk cattle, and fisheries, offer a more promising prospect.

In general, all of these measures amount to drawing upon the resources of the whole community to offset the burdens imposed on a special group. The impact on particular individuals, groups or industries is thus alleviated.

3. **Expanding the Economy and Employment Opportunities.** It has recently become apparent that even rapid rates of economic progress in the Caribbean area, and in similar regions, have not usually succeeded in creating enough jobs to absorb the unemployed.[88] Thus the annual increases in national income, at rates well above 5 per cent in Jamaica, Trinidad and Puerto Rico, have left each of these territories with a virtually stagnant volume of unemployment. One might of course ignore unemployment and underemployment on the ground that only growth in output matters. But if the avoidance of heavy unemployment is one of the high-priority objectives of a society, then developmental programmes must emphasize labour-intensive industries which offer a potential of successful expansion. And they probably should stress labour-intensive types of technology in each such industry, unless waste and costs would thereby be raised to an intolerable degree. For example, the expansion of rice-farming — which looks toward an expansible market abroad, but is costly to develop because of physical obstacles — will not absorb much labour unless the highly mechanized farming techniques are restricted in favour of labour-intensive methods. Similarly, construction work — whether private or public — can sometimes be done about as cheaply by low-wage, hand labour with simple tools, as by the most highly engineered and expensive modern machinery for earth-moving, road building, and the like.

Such emphasis on labour-intensity will of course not maximize productivity per farmer or per worker. Indeed, we must recognize that it often constitutes a degree of sacrifice of economic efficiency for the sake of employment. Even in the short run, policy makers must consider the effects of a pro-employment policy upon the viability and competitive efficiency of producing units, and upon capital-formation and further development. In a longer perspective, programmes which tend to restrict growth for the sake of sustaining employment currently may operate at the expense of more lasting gains. In the long run, only a rapid general economic expansion along efficient lines, combined with practices to limit population growth, holds out much hope of raising income and welfare.

[88]Cf. A. P. Thorne, "British Guiana's Development Programme", Social and Economic Studies, Vol. 10, No. 1, March 1961, p. 10.
See also E. P. Reubens, Migration and Development in the West Indies (Studies in Federal Economics No. 3, U.C.W.I. 1961) pp. 69 - 79, citing data on Puerto Rico, Trinidad, Barbados and Jamaica.

APPENDIX A

LIST OF SUGAR ESTATES IN BRITISH GUIANA, 1961 ‡

Location	Owner		Management
	Company	% Share Holding By The Booker Group or by Demerara Co.	
BERBICE			
CORENTYNE COAST:			
Skeldon (F)	Bookers Demerara Sugar Estates Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.
Port Mourant [1] [2]	Port Mourant Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd. [2]
Albion (F)	Bookers Sugar Estates Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.
CANJE:			
Rose Hall (F)	Bookers Demerara Sugar Estates Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.
Lochaber [3]	Lochaber Ltd.	25.2% (Bookers)	Bookers Sugar Estates Ltd.
EAST BANK:			
Providence [4])			
WEST BANK:)			
Blairmont (F))	Blairmont Estates Ltd.[5]	100% (Bookers)	Bookers Sugar Estates Ltd. [6]
WEST COAST:)			
Bath [4])			
DEMERARA:			
EAST COAST:			
Enmore (F))	The Enmore Estates Ltd.	50.089% (Bookers)	Bookers Sugar Estates Ltd.
Lusignan [7])			
La Bonne Intention (F)	The Ressouvenir Estates Ltd.	55.808% (Bookers)	Bookers Sugar Estates Ltd.
Ogle [8]	The Ogle Company Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.

Location	Owner		Management
	Company	% Share Holding by the Booker Group or by Demerara Co.	
EAST BANK:			
Houston [9]	The Plantation Houston Sugar Estates Co. Ltd.	Nil	Bookers Sugar Estates Ltd.
Peter's Hall and Ruimveld [10] [11]	Demerara Co. Ltd. [10]	100% (Demerara Co. Ltd.)	Demerara Co. Ltd. (Georgetown Office) c/o Sandbach Parker & Co. Ltd.
Farm [10]			
Diamond (F)			
WEST BANK:			
Wales (F)	West Bank Estates Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.
Versailles (F)	Pln. Versailles & Schoon Ord Ltd.	Nil	Bookers Sugar Estates Ltd.
WEST COAST:			
Leonora (F)	(Demerara Co. Ltd.)	100% (Demerara Co. Ltd.)	Demerara Co. Ltd. (Georgetown Office) c/o Sandbach Parker & Co. Ltd.
Uitvlugt (F)	Booker Demerara Sugar Estates Ltd.	100% (Bookers)	Bookers Sugar Estates Ltd.

‡ B. G. Sugar Producers Association.
F = Estate with Factory
[1]Port Mourant Factory was closed down after autumn crop, 1955.
[2]It is proposed that by the end of 1961 Port Mourant should be amalgamated with Albion estate for administrative purposes.
[3]For administrative purposes Lochaber estate is treated as part of Rose Hall estate.
[4]Both Providence and Bath are part of Blairmont Estate.
[5]The name of the Company was changed from the Berbice Development Company, Ltd. to Blairmont Estates Ltd. on 13th April, 1956.
[6]Blairmont, Bath and Providence were acquired by Bookers Sugar Estates Ltd. in July, 1955.
[7]Lusignan was incorporated into Enmore in 1954 and is administered as part of Enmore estate.
[8]Ogle estate has been administered as part of L.B.I estate since 1959. Ogle Factory was closed after autumn crop, 1958.
[9]Houston factory was closed after the spring crop, 1955.
[10]Peter's Hall & Ruimveld, and Farm are two sections of Diamond estate and are administered as part of Diamond.
[11]Ruimveld factory was closed in 1953.

APPENDIX B

Statistics of Employment in the industry of British Guiana

Two main sources of data are available on employment in the sugar industry: the published annual reports of the Department of Labour and the compilations of the British Guiana Sugar Producers Association. The two employment series might have been expected to be identical inasmuch as both rely upon the same source. Each month data on employment and wages on each sugar estate are submitted to the B.G.S.P.A. which then issues a monthly summation. This report forms the basis of the Department of Labour's series. Yet the statistics on employment issued by the B.G.S.P.A. and the Department of Labour vary in every category. Usually the B.G.S.P.A. figures are larger than those of the Department of Labour. Moreover, the B.G.S.P.A. has not prepared employment totals for the years prior to 1954 because the earlier raw data is said to have been collected under different instructions and classifications. The Department of Labour, on the other hand, has been publishing annual summations since the 1930s, based at first on reports received directly from the sugar estates. Since 1942 the summaries provided by the B.G.S.P.A. have been used by the Department of Labour.

At no time has the Department of Labour simply reproduced the B.G.S.P.A. employment statistics which are divided into two main categories: field workers and factory or factory-type workers (those who work outside the factory at work not properly field work). The Department of Labour has omitted certain subgroups in both field and factory on the ground that such workers were not found on all estates or that they were not representative of the industry. These exclusions are the major cause of the discrepancy between the two series. Whether the Department of Labour has been entirely consistent in its exclusions since 1949 cannot be ascertained, but it is believed that a uniform system has been in force since 1955.

The exclusions at present made by the Department of Labour from the monthly summaries on field employment consist of weekly-rated field workers and various categories of miscellaneous field workers, including those under 18 years of age. It is not uncommon for these exclusions to result in an average field employment figure of 2,000 less than the comparable figure provided by the B.G.S.P.A. (Table II-4). A much smaller gap exists between the two series with regard to factory employment. (Table II-5). The arithmetic procedures of the two agencies also differ slightly, further widening the discrepancy between the two series.

If a statement is required of the absolute number of workers employed on sugar estates in any recent year — regardless of the type of employment — then the B.G.S.P.A. statistics provide a more accurate measure than the official figures of the Department of Labour. If, however, the object is to measure employment trends over the last decade, then the Department of Labour series must have preference, inasmuch as the B.G.S.P.A. series begins with 1954 in most categories. It is reassuring to observe that since 1954 the trends in both series are very similar.

The manner in which the statistics are assembled and the definitions used create identical difficulties in the interpretation of both series. Each estate keeps weekly work records, with a separate record for each worker. The total number of records in a given week is established and is added to the totals for each week of a given

month, giving a grand total of the gross number of work records for the month. This figure is then divided by the number of accounting weeks in the month to give the average number of individuals at work per week. The B.G.S.P.A. does this operation separately for each category of worker on each estate and adds the results to give the industry-wide average number employed in a given week, while the Department of Labour totals the columns called "gross number at work" and divides the result by the number of accounting weeks.

By either arithmetic procedure, "the average number employed per week" gives as much weight to the man who workd only one day of the week, or merely reported and marked his work, as to the worker who was employed on every day of the week. Each man is a single unit in the accounting. Some senior officials of the sugar companies have suggested that the number of accounting units was swelled in earlier years by the habit of some workers of registering for pay under more than one name, particularly with names beginning with "A", in order to receive their pay promptly. However, an experienced field man on one estate doubted that this was a widespread practice or that such double-counting was usual among field supervisors who knew their men personally.

If "the average number at work per week" is not a fair measure of full-time employment because it counts the man who worked only one day of the week as heavily as the one who worked a full week, then a correction could be applied by the statistics on "the total number of days worked per month". But this figure may also be faulty if it counts as a full day of work any day on which a worker performed a task. One junior official on an estate told us that as little as an hour's work would qualify as a "man-day" in the statistics. However, the Secretary of the B.G.S.P.A., Mr. Harrison, maintains that a day's task usually takes 6 to 7 hours and that it is recorded as a man-day only after its completion. "If the worker decides to ask for less than a day's work he is recorded as having worked a quarter, a half or three-quarters of a day as the case may be". Without a more exhaustive check we cannot say whether there is any serious amount of over-counting in the statistics or whether many estates attribute whole days to workers who have worked part of a day.

On the other hand, overtime work in the field is not tallied. At the height of the harvest season, cane-cutters may be said to work overtime, although they are paid by output and not hours of attendance. In 1949, the Venn Commission found that cane-cutters were apt to work longer than a full day during crop.[89] Today the B.G.S.P.A. is of the opinion that "there is not a great deal of overtime in the field."

The upshot is that statistics of man-days in the field are deficient to the extent that partial days of work count as heavily as full days and that overtime work is not counted. The B.G.S.P.A. regards the statistics of field "man-days" as reliable and accurate. In the case of factory workers, the usual workday will be a full day, except for mechanical breakdown or labour dispute. The statistics specifically add overtime and premium time to the total man-days per month.

The limitations of the "average number at work per week" and the "total number of days worked per month" affect the derived statistics on "average days worked per week." This is computed by dividing the average number of man-days per week by the average number of individuals at work per week. To the extent that man-days include less-than-full-days of work, the figure for "average days worked per week" is spuriously high.

We may now examine the effects of these methods of computing employment statistics on the interpretation of long-run trends. A decline in the average number

[89]Gt. Britain, Col. Office, No. 249, pp. 56-8.

at work per week over a decade may be due not only to declining labour requirements but also, in part, to the fact that workers are tending to work more regularly during the week. At the extreme, one man working every available day of the week might replace six individuals, each working one day a week. In the statistics, such regularization of employment would appear as a sharp drop in the average number of individuals at work per week. However, decasualization or stabilization could not be assumed to have taken place without a corresponding rise in the average number of days worked per week.

The trend of total man-days worked gives a better index of changes in labour requirements. But if a decline in man-days over the decade has been accompanied by a tendency to make each man-day a full working day, the statistics may exaggerate the decline of labour input. In the same way, a rise in the average days worked per week will understate the true rise, if fuller days are worked more frequently than in earlier years. The extent to which such statistical factors actually enter into the observed employment trends cannot be determined, but some allowance shall be made for the way in which the statistics have been collected and defined.

Apart from the basic data on employment in the sugar industry, described above, additional information is provided by occasional employment studies of individual estates and by the operations of various sugar industry welfare programmes. Chief of these are free medical treatment, sickness benefit, and holidays-with-pay. Free medical treatment is provided to sugar workers on the basis of their employment records of the previous year. Some indications of regularity of employment, particularly in the crop season, are provided by the division of recipients of free medical treatment into Grade 1, Grade 2 and Casual workers. Similarly, the qualifications for sickness benefit are set in terms of the amount of employment during the previous year, and since most workers consider this benefit a right to be drawn upon as an extra week of holiday-with-pay, the statistics on the operations of the programme reflect employment patterns among a large number of sugar workers.

The most complete information comes from holidays-with-pay which are granted as a right twice a year on the basis of the employment record during the preceding crop. The crop season for field workers is defined as the period between the date on which the factory started to grind and the date on which the factory ceased to grind. For factory workers, the autumn crop season begins on the first working day of the week immediately following the holiday-with-pay week at the end of the spring crop and continues to the end of the autumn grinding period. To qualify for holidays-with-pay, a worker must have worked on 75 percent of the days on which work was offered to him during the crop. The overall length of the crop season varies from year to year because of climatic and other factors and for the same reasons the total number of days of work during crop season of identical length will differ from year to year. Thus a man cutting cane on 75 percent of the available days in one season might have worked more days than he did in another season when he took 90 per cent of the days offered. However, those qualifying for holidays-with-pay represent the most steadily employed workers during the crop season. Several estates give priority to such workers for off-season employment.

Two residual groups of workers may be distinguished: those who are rated as employees of the estate, but do not work enough days to earn holidays-with-pay; and casual workers, taken on to meet peak labour needs. Some of the latter qualify for holidays-with-pay and may be listed on the employment roster in the next season. Each estate has its own definition of "regular employee". Some, in labour

shortage areas, really have no employment roster but hire any available worker, while others are able to require a very high percentage of work acceptance in the preceding crop season and even to plan on a year-round test employment of eligibility. The statistics of the numbers of workers on the employment rosters of each estate have little meaning as employment data, particularly since the standards for membership have changed from year to year and vary from estate to estate.

With regard to the future collection and publication of data on employment in the sugar industry, some recommendations may be made.

1. There seems to be little reason for the Department of Labour to present figures which exclude certain categories of workers on sugar estates. To provide conformity with earlier years, a **new** and **old** series may be presented for a few years. It would also seem reasonable to use the same arithmetic procedures as the B.G.S.P.A. Possibly the latter could calculate some of the summary figures which the Department of Labour now tabulates for itself. The form of presentation used by the Department of Labour in its annual reports is comprehensive enough for most administrative and research purposes and, if unchanged, will remain useful for historical comparisons.

2. Some improvements might be made in the basic information collected by the B.G.S.P.A. from the estates. With little additional effort or expenditure, it should be possible to present a figure on "man-days" which truly represents full working days. Field work by the piece or job might be tallied in term of the wages earned; the results could be entered as a whole or partial man-day, according to fixed standards. In the same way, individual work records might be tabulated according to the number of days per month worked by each person. Such statistics would be more meaningful than "gross number of work records per month". Some special studies on individual estates have been done in this way, but it would be useful to have an industry-wide series of this type month after month. A true picture of the average number of days worked per week could be constructed from such a series. A far more realistic estimate of underemployment would also emerge.

3. Some consideration might be given to the feasibility of standardizing employment statistics among the members of the British West Indies Sugar Association. Discussions among the members of concepts and measurement techniques might prove mutually beneficial and result in more uniformity.

Note: We are informed that as of January 1962 the Department of Labour's statistics of employment in the sugar industry will agree with those of the B.G.S.P.A.

APPENDIX C.

ACREAGE UNDER CANE AND SUGAR OUTPUT BY ESTATE, 1949 — 50 AND 1959 — 60‡

Estates	Estate Acreages Under Cane at 31/12/49	Total Sugar Made In 1950	Estate Acreages Under Cane At 31/12/59	Total Sugar Made In 1960
Skeldon	4,325	14,230	5,860	23,485
Port Mourant	5,176	15,850	6,152	21,644
Albion	5,610	20,057	6,700	28,344
Rose Hall	5,958	16,408	8,800	30,918
Lochaber	324	1,057	498	1,623
Enmore	6,923	18,697	9,314	36,915
L. B. I.	3,686	12,013	5,288	21,769
Ogle	2,423	7,675	3,122	9,916
Houston	976	1,645	1,637	6,064
Wales	3,563	10,380	6,399	21,520
Versailles	2,349	6,135	3,280	12,320
Uitvlugt	6,261	14,625	9,220	30,990
Blairmont	6,898	17,415	7,922	26,083
Diamond / Ruimveldt	9,410	23,211 / 1,866	10,412	40,323
Leonora	4,651	14,387	5,221	22,527
Total	68,533	195,651	89,825	334,441

‡ B. G. Sugar Producers' Association.

APPENDIX D

NUMBER OF CROP WEEKS 1950 —1960 ‡

Name of Estate	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Skeldon	38	36	40	40	36	37	31	38	38	33	37
Port Mourant	34	38	32	38	30	38	—	—	—	—	—
Albion	38	33	33	37	30	32	39	37	39	32	37
Rose Hall	38	37	33	40	30	34	33	36	39	32	37
Enmore	34	37	39	37	42	37	37	34	42	36	37
La Bonne Intention	31	35	31	33	33	32	29	30	31	35	37
Ogle	29	28	30	32	32	31	36	30	37	—	—
Houston	27	25	26	32	29	—	—	—	—	—	—
Wales	32	25	26	28	26	24	23	22	30	28	32
Versailles	27	27	26	34	33	35	26	23	27	27	29
Uitvlugt	31	26	20	28	30	29	31	29	34	33	36
Blairmont	39	37	36	33	36	32	37	38	40	35	33
Diamond	40	32	33	34	31	30	26	25	32	31	29
Leonora	38	36	34	34	28	25	25	24	27	28	28
Ruimveldt	27	29	32	—	—	—	—	—	—	—	—

‡ B. G. Sugar Producers' Association.

APPENDIX E

Incentive Payment in the Sugar Industry

1. Holidays-with-pay

Introduced in 1950. Provides for one week's holiday with pay to every field and factory worker in each grinding period who works not less than 75 per cent of the days on which work is available in each crop. The holiday pay is equal to the worker's average weekly gross earnings during the crop season plus 25 per cent of such earnings.

2. Week-end Cut-and-Load Bonus

Introduced in 1951. It was designed to encourage workers to cut and load more cane during weekends. To qualify for this special bonus a worker must cut and load cane both on Saturday and Monday, and must, in addition, have cut and loaded cane on the Friday previous to the Saturday and one other day of the pay-week. The bonus per ton of cane was 20 cents in 1950; in 1952 it was raised to 35 cents a ton, which is the present rate.

3. Weekly Production Target Bonus

Introduced in 1952. Bonus of 7 percent of gross earnings to workers directly engaged in production of sugar (cane-cutters, transport workers, factory workers). To be paid each week that the factory meets a pre-arranged target. In 1953, workers indirectly engaged in production became eligible for 3½ per cent bonus. In 1960 and 1961, this bonus was abolished and merged with wage increases.

4. Half-yearly ("Crop-end") Production Bonus

Introduced in 1952. On each estate which met the weekly "target" set for it on not less than 50 per cent of the weeks of the grinding season, a bonus was paid to direct production workers who worked for not less than 50 per cent of the number of grinding weeks on that particular estate. The bonus is graduated from 1 per cent to 6 per cent of a worker's gross earnings during crop, depending on the percentage of weeks in which the target was met. In 1953, indirect production workers were granted this bonus at half the rate allowed to direct production workers. This bonus was abolished and incorporated into wage increases in 1960 and 1961.

5. Annual Production Bonus

Introduced in 1952. A production target is set for the Colony and once it is reached, each worker who worked for 82½ per cent of the days available to his category receives a bonus equal to two days' wages; and if the estate on which he is employed achieved its target, an additional four days' wages is paid as bonus. In 1954, the rules were changed to give each worker three days' bonus if his estate met its target, and three additional days if the Colony met its overall target. Another stipulation provided that workers absent due to injury covered by workmen's compensation should be allowed as days worked up to 10 per cent of the days which would have been available to him but for the injury. In 1957, a change provided that all days of absence through injury should count as "not available". In 1955, two extra days' bonus were added conditional upon the industry's meeting higher production targets.

APPENDIX F

Mechanization and Labour-Saving in Rice Farming

The question of mechanization in rice-farming inevitably is raised whenever attention is directed toward the displacement of labour by machinery in the sugar industry. Not only does the sugar industry maintain that rice-farming is more highly mechanized than sugar, but it is contended that the responsibility for this situation lies with Government which has determined, both actively and passively, the conditions under which rice-farming has developed. Estate managers have gone so far as to complain that mechanization of rice has deprived sugar workers of customary off-season work. The subject cannot be fully explored here, but some aspects relevant to labour displacement will be considered.

One of the chief arguments for the expansion of rice acreage has been its presumed capacity to absorb idle labour. Indeed, many economists concede this as its sole virtue, in view of the capital cost of opening new rice lands, the marketing difficulties if the costs of Guianese rice production were to rise, the relatively low net incomes of small rice farmers, the advantages of mixed and dairy farming, the superior income and employment-generating effect of investment in alternative lines, and the favouritism to rural East Indians implicit in rice schemes.[90] It is therefore fair to question any policies which have diluted the labour intensity of rice cultivation.

Government has set the pattern in several ways. The Government-owned British Guiana Rice Development Company cultivates 2,600 acres in the Mahaicony-Abary Scheme "under conditions of complete mechanisation".[91] This company, the largest rice producer in British Guiana, uses relatively little labour.[92]

Mechanization has also been encouraged among the peasants who have taken up the rice lands which Government opened for cultivation. By allotting each family 15 acres, the size deemed necessary for economic viability, Government set up a situation in which the peasant family is unable to care for the farm with its own labour. But outside labour is difficult to obtain and expensive, especially in the peak periods of demand (the rate for hired male workers is as high as $3 per day[93]).

The inevitable outcome is the resort to tractors instead of bullock ploughs, chemical fertilizers and weedicides instead of hand application, combines instead of human harvesters, and, soon to be widespread, the drill sowing machine instead of transplanting by hand. Even the very small rice farmers — the average rice farm is 7 acres, and many are only an acre or two — have followed the trend, forsaking the intensive use of land and labour characteristic of oriental rice culture.

In fairness to Government, note should be taken of the dilemma posed by the rice-farming scheme. As the Director of Agriculture has explained:[94]

[90]C. O'Loughlin, 'The Rice Sector in the Economy of British Guiana', Social and Economic Studies, Vol. 7, No. 2; Peter Newman, "The Economic Future of British Guiana", Social and Economic Studies, Vol. 9, No. 3; K. Berill, A. P. Thorne, G. E. Cumper, K. E. Boulding, "Comments on 'The Economic Future of British Guiana' by Peter Newman", Social and Economic Studies, Vol. 10, No. 1.

[91]Annual Report of the Director of Agriculture, 1960, p. 7.

[92]The Mahaicony-Abary Scheme in 1959 employed, in field and mill together, 173 persons in April and up to 477 in October. Annual Report, British Guiana, 1959.

[93]O'Loughlin, op. cit.; p. 134.

[94]Letter from the Director of Agriculture, 4th January, 1962.

> . . . I would point out that the policy of Government to award plots of 15 acres to farmers originated from a desire to ensure that the net income of a farmer who has been awarded such a holding would not be less than the income earned from any unskilled alternative employment, for example, on a full-time basis in the sugar industry and in Government.
> The general intention is that the farmer would cultivate manually 5 acres and mechanically 10 acres: 5 acres of manually cultivated rice would yield a net income of $699.20 (including the value of the Farm family's labour). Such an income would not provide a satisfactory standard of living. 10 acres of mechanically cultivated rice would yield a net income of $545.20 so that the total income on this mixed cultivation basis would be $1,244.40. This is considered as a satisfactory income for a peasant family. It would be noted that 5 acres is considered as much as a family can cultivate manually and any additional acreage would have to be cultivated with the help of hired labour (which is not available) or by machine.

Do rice farmers in fact adhere to the Government's plan that they cultivate 5 acres manually and 10 mechanically? It appears unlikely that such a distinction would be made by a farmer owning or renting a tractor. In effect, the 15-acre farms are mechanized.

Government has placed no obstacles in the way of the importation of tractors and combines, nor have any restrictions been imposed on the credit facilities open to farmers who wish to purchase equipment. Bank credit, provided either directly to the farmers or in loans to equipment dealers who in turn extend credit to the farmers, is the chief source of finance for the mechanization of rice.

The effects of all of these policies may be seen in the accompanying table. While rice acreage has almost doubled from 1951 to 1960, and the output per acre has remained fairly constant, there has been a great increase in the number of tractors and combines. According to data for 1956, the increased mechanization had not yet resulted in more profitability per acre for the mechanized farms, owing largely to the burden of overhead charges; but this has been labelled "teething troubles" to be overcome with further experience.[95]

MECHANIZATION OF RICE CULTIVATION IN BRITISH GUIANA‡

	Acres in Rice	Output (tons)	Tractors Acquired[1] (Number)	Combines (Number)	Imported[3] (Value W.I. $)
1951	116,872	66,420	n.a.	n.a.	n.a.
1952	150,800	74,100	n.a.[2]	n.a.[3]	n.a.
1953	112,500	74,975	n.a.	20	n.a.
1954	161,453	89,400	n.a.	24	n.a.
1955	171,900	89,100	n.a.	5	n.a.
1956	136,000	78,500	n.a.	16	n.a.
1957	152,475	57,500	247	31	230,055
1958	183,326	100,519	237	11	168,225
1959	195,776	104,075	314	21	348.141
1960	220,207	126,133	709	128	1,188.665
1961 (Jan. — June only	—	—	(333)	—	—

‡Department of Agriculture, **Annual Reports**; also special tabulation of tractor registrations.

[1]These figures represent tractors acquired each year for agricultural purposes other than in sugar estates and Government. The figures come from a system of officially registering each new tractor when first acquired. Data beginning in 1953 are available for number and value of all tractors imported (believed to be largely for rice cultivation) as follows:

	Number	Value (W.I. $)		Number	Value
1953	251	n. a.	1957	344	1,181,636
1954	331	n. a.	1958	421	2,060,143
1955	175	n. a.	1959	390	1,393,945
1956	252	$1,192,785	1960	777	2,229,454

[2]It is reported that 301 tractors were in use for all purposes in the Colony in 1952.
[3]All combines are believed to be for rice cultivation. In 1952 there were 140 combines in use.

[95]C. O'Loughlin, op. cit., p. 142.

Other observers have been concerned about the under-utilization of the tractors and combines. due to the problems of terrain and the lack of effective co-operative arrangements for the purchase and use of machinery, The possession of a gleaming tractor and its display in the under-space of a modest rural dwelling has become as important as its use in the field; here is conspicuous consumption in an unusual form, or, in the contemporary phraseology, a status symbol.

The milling of rice has also been enlarged in scale and automated in technique. Small, traditional, inefficient mills are being closed down, while the Government has established two large central mills together capable of processing 25,000—30,000 tons of paddy per year and requiring the services of only a few workers.

Thus Government has itself succumbed to the pressures which bring about the substitution of capital for labour, and it has set an example for the small farmers whose entry into rice-farming was primarily designed to relieve unemployment. A policy of maximizing labour-absorption would call for far less capital-intensive techniques, and instead insistence upon a peasant type of cultivation and processing, despite the fact that peasant operations yield a far lower level of living per family.

If rice cultivation is to be permitted to be highly capital-intensive, Government will have to reconsider the advisability of making large expenditures on the development of new lands. It is estimated that Government spends $7,500 to open up a 15-acre farm and another $180 a year per farm for the annual maintenance of the drainage and irrigation works.[96] On the basis of the total capital invested per acre of rice farm under present techniques, it is estimated that the ratio of capital to output is as high as 6 : 1.[97] In addition, the importation of rice-cultivation equipment uses up some of the very foreign exchange generated by rice exports. Given the limited capital available for the economic development of British Guiana, it is a serious question whether the mechanization of rice farming constitutes the best use of the country's resources.

[96]Director of Drainage and Irrigation Department, letter dated 23rd August, 1961. For the 173,000 acres whose development is now contemplated for the period 1962-68, the total cost of development (aside from maintenance) would be over $86,000,000.
[97]P. Newman, **op. cit.**, p. 275.

APPENDIX G

List Of Persons And Organizations In British Guiana Who Co-operated In This Study

BRITISH GUIANA SUGAR PRODUCERS' ASSOCIATION

Mr. R. R. Follett-Smith, C.B.E., B.Sc., A.R.C.S., Chairman
Group Captain G. H. B. Hutchinson, D.F.C., Vice-Chairman
Mr. Arthur Hemstock, Executive Director
Mr. Roy Close, Member of the Board of Directors
Mr. Walter Harrison, B.A., Secretary

SUGAR COMPANIES

Bookers Sugar Estates Ltd.
Demerara Company Ltd.

BOOKERS AGRICULTURAL HOLDINGS LTD., LONDON

Mr. J. A. Haynes, Director

GOVERNMENT

Ministry of Labour, Health and Housing
Mrs. J. Jagan, Minister of Labour, Health and Housing
Ministry of Trade and Industry
Mr. C. C. Low-a-Chee, B.A., Permanent Secretary, Ministry of Trade and Industry

Department of Labour
Mr. F. G. Taharally, B.Sc. (Econ.) Commissioner of Labour (Acting)
Mr. E. A. Richardson, B.Com., B.Sc. (Econ.), D.P.A., A.C.I.S., Barrister-at-Law, Deputy Commissioner of Labour (Acting)
Mr. Joseph A. Tyndall, B.A. Hon., B.Sc. (Econ.) Assistant Inspector of Labour
Mr. V. L. A. Wong, A.I.S., F.S.S., Statistical Officer
The Inspectors of Labour

Other Government Officers
Mr. E. A. Jack, Registrar General
Mr. F. A. E. Hope, B.Sc. (Econ.), A.C.C.S., Statistician (Acting)
Mr. G. B. Kennard, D.I.C.T.A., A.I.C.T.A., Dip. Agric. Econ., Director of Agriculture
Mr. A. R. Baburam, Agricultural Economist, Department of Agriculture

TRADE UNIONS

The Man-Power Citizen's Association
The British Guiana and West Indies Sugar Boilers' Union
The British Guiana Headmen's Union
The Sugar Estates Clerks' Association

Printed by Jamaica Times (Press) Ltd., 141 East Street, Kgn.