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PROBLEMS OF SUGAR INDUSTRY IN INDIA—

SCOPE AND PROSPECTS OF RE-ORGANISATION IN POST-WAR PERIOD

BY

M. P. GANDHI.

Editor: Indian Sugar Industry Annual and Indian Cotton Textile Industry Annual, since 1935; part-time Honorary Professor, Sydenham College of Commerce, and Economics, Bombay; Proprietor, Bombay Commercial Corporation, etc.

[Formerly, Ashburner Prizeman, Bombay University, (1924); Secretary, Indian Chamber of Commerce, Calcutta (1926-36); Secretary, Federation of Indian Chambers of Commerce and Industry (1928-29); Indian National Committee, International Chamber of Commerce (1928-30); Indian Sugar Mills Association (1932-36); Director, Indian Sugar Syndicate Ltd. (1937-40); Member, U. P. & Bihar Joint Power Alcohol Committee (1937-38); Member, Bihar Government Labour Enquiry Committee (1938-40); Member, U. P. & Bihar Sugar Control Board (1939-40); Chief Commercial Manager, Dalmia Group of Industries, comprising sugar, paper, cement, coal, etc., (1937-40); Member, Rural Industries Sub-Committee of the National Planning Committee, (1940); Controller of Supplies, Bengal Circle, Government of India, (1941), etc.

WITH A FOREWORD BY

SIR PURSHOTAMDAS THAKURDAS, K.B.E., C.I.E.

EXTRACT FROM THE FOREWORD

Viewed from this general aspect, I am sure the public in India will more than welcome this publication at this juncture. The author has been issuing Annuals regarding the Cotton Textile, and Sugar industries in India, which have been regarded as standard works of reference and the usefulness of which has been steadily kept up by the untiring zeal with which the author brings out revised and amplified editions every year. I congratulate Mr. M. P. Gandhi on the great industry and care which he has put into the preparation of this work, and I believe that the Indian public will endorse my hope that similar careful studies of other [illegible]ries serving India's needs will be undertaken by students of eco[illegible] in years to come.

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HANDLOOM WEAVING INDUSTRY IN INDIA—

(ITS PAST AND PRESENT POSITION AND POTENTIALITIES IN POST-WAR PERIOD)

BY

Mr. M. P. GANDHI,

Proprietor, Bombay Commercial Corporation; Bombay Agent, Gujarat Paper Mills Ltd.; Editor, Indian Cotton Textile Industry Annual and Indian Sugar Industry Annual; Honorary Lecturer in Cotton Economics, Sydenham College of Commerce & Economics, Government of Bombay; [Formerly, Controller of Supplies, Bengal Circle, Supply Department, Government of India; Secretary, Indian Chamber of Commerce, Calcutta; Secretary, Indian Colliery Owners' Association; Secretary, Indian Sugar Mills Association; Secretary, Federation of Indian Chambers of Commerce & Industry; Secretary, Indian National Committee, International Chamber of Commerce; Chief Commercial Manager, Dalmia Cement Ltd. & Rohtas Industries Ltd.; Head of Credit Department, National City Bank of New York, Calcutta; Director, Indian Sugar Syndicate Ltd.; Member, Bihar Government Labour Enquiry Committee; Member, U. P. & Bihar Joint Power Alcohol Committee; Member, U. P. & Bihar Sugar Control Board; Member, Cottage & Rural Industries Sub-Committee of the National Planning Committee; Member, Advisory Committee, East Indian Railway; Member, Executive Committee, Bengal Textile Institute; Ashburner Prizeman, Bombay University; Examiner in B.Com. Examination of the University of Allahabad, Lucknow, and Bombay.]

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FOREWORD

BY

SIR PURSHOTAMDAS THAKURDAS, K.B.E., C.I.E.

Of the various questions relating to the sugar industry in India discussed by the author in this publication, the one which has an immediate interest for the Indian economic system as a whole at this juncture is the extent to which protection afforded by the Government of India during the period from 1930 onwards has vindicated itself. The production of sugar in India during this period, that is from 1930 to 1944, has gone up, as indicated in Table 3 in Chapter V in the following pages. Cane factory production went up from 158,000 tons to 1,216,000 tons between 1931-32 and 1943-44, and the nett import of sugar into British India went down from 438,000 tons in 1931-32 to 18,000 tons in 1940-41. That in spite of this increase in production, there was scarcity of sugar during the last five years of the war period, and efforts had to be made by the Government of India to control sugar distribution and ration it, has its own lesson to teach. How the masses took to sugar increasingly is evident to anybody conversant with the rural and urban areas in India and the steadily increasing hunger for sugar during this period.

In Chapter III, the author discusses the economics of discriminating protection and tries to meet the arguments advanced by parties interested in imports of sugar from abroad into India, particularly the Bengal Chamber of Commerce, and some economists in India who supported that view. If Sir George Schuster, as Finance Member of the Government of India, had not, as appeared then, taken his courage in both hands and decided to give protection to the sugar industry, the economic history of India during the war period as far as sugar consumers are concerned, and indeed even as far as the requirement of the Army in India is concerned, would have been substantially different. Those who wished to rely upon what they fondly called cheap sugar from Java, would have had the mortification of seeing the Indian public falling back only on local Gur production, and large quantities of sugar would have had to be imported for the British and American troops in India who would otherwise have had to go without sugar.

Thanks to the policy of protection, however, they had a considerably greater ration of sugar than what fell to the lot of the civil consumer in India. It is hoped that the experience of India during the last five years would put an end to controversies regarding the advisability of protection for Indian industry and prevent vested non-Indian interests from misguiding the Indian consumer into opposing a sane protectionist policy for any industry.

It has to be borne in mind that the comparative chaos in organising a proper distribution policy through reasonably honest channels during this period has—and justifiably so—more than irritated the Indian consumer. Those who are of the nationalist school feel that if Indian Ministries responsible to the Legislature were in power in various provinces and the Centre, the story might have been appreciably different. But this may be open to the charge of being mere wishful thinking and need not be pursued at this stage. The distributors and manufacturers must take this lesson to heart. That the consuming public in India, not merely of sugar but also of other articles of local manufacture, have passed through experiences which will rankle in their minds, is but too evident. But, that, instead of being a reason for not building up indigenous industries for local requirements, would indicate that there should be enough manufacturing concerns in the country under Indian ownership and management to fully meet local requirements under any contingency. This is particularly necessary where an Indian industry proves to have been of substantial benefit to the grower of the raw produce required for such industry. And in the case of the sugar industry in India, there should be little doubt left that the protection given to that industry has, to a large extent, been reflected in increased cane production and comparatively better return to the cane producer. As against this, the return to the producers of, say, cotton or oil-seeds in India, which have to find their market abroad in the absence of manufacturing industries in India of sufficient size to consume the major portion of the supplies, is comparatively small. The facts and figures given by the author in this publication go to strengthen the case of reasonable protection to the sugar industry in the event of any attack on it by uneconomic competition from abroad.

Chapter XVI in the following pages deals with the important question of scope for further production and consumption of sugar in India.

The author has brought out, without any vestige of doubt, that there is waste of resources at every point in the sugar industry as carried on at present. The most culpable waste has admittedly been regarding the criminal manner in which molasses have been allowed to be wasted till now. During the war period, a few laudable efforts were made by certain factory owners to get on, in spite of this apparent antagonism of the Government, to the fullest use of molasses, and it is very much to be hoped that what has taken place till now in connection with molasses will not be tolerated any longer. With full economic use of molasses and greater yield of cane per acre of land which, I am convinced, is possible if suitable effort is made in this behalf by the provision of irrigation, manuring, better seeds, etc., there is every chance of increasing the production of sugar without putting additional acreage of land under cane and of sugar being made available to the consumer in India in larger quantities for meeting the nutritional requirements of the people, and at reasonable prices, under normal peace conditions.

A significant feature of the protection granted to the sugar industry is that it benefits not merely the manufacturer of sugar but also the cultivator of sugarcane. In several provinces in India, such as the United Provinces and Bihar, sugarcane forms a most important cash crop, on the proceeds of which the agriculturist depends for meeting his obligations in respect of land revenue, payments to creditors and household requirements involving cash expenditure. The increase in the production of sugar since protection was granted has meant a corresponding increase in the amount of sugarcane which the agriculturist has been able to produce and sell. The sugar industry in this respect is typical of a large class of industries in India and it illustrates the close connection which exists between industry and agriculture and the importance to the agriculturist of a properly conceived policy of industrial development. The idea current in certain quarters that industry can be developed only at the expense of agriculture is one which will hardly bear examination. The development of the sugar industry in recent years has given the lie direct to this contention and the story of its growth, as set out by Mr. Gandhi, is therefore valuable, particularly now when plans for large-scale industrial development are under active consideration in the country.

There is one more aspect of the policy of protection, as exemplified in the case of the sugar industry, which needs to be noticed. The cry of protection for the sugar industry in India was first raised nearly 50 years ago, when bounty-fed sugar in European countries began to menace the older sugar-producing countries in the world. But the Government of India showed no signs of moving in the direction of protecting the Indian industry until as late as 1930. What the country might have saved if suitable action had been taken in time is too obvious to need elaboration. In this respect, again, the sugar industry is typical of Indian industries generally, many of which, with timely assistance, would have established themselves long ago and provided much needed avenues of occupation and sources of income. If Mr. Gandhi's book leads to an awakening of public opinion to the importance of providing prompt assistance to our industries, it will have served a very useful purpose.

Viewed from this general aspect, I am sure the public in India will more than welcome this publication at this juncture. The author has been issuing Annuals regarding the Cotton Textile, and Sugar industries in India, which have been regarded as standard works of reference and the usefulness of which has been steadily kept up by the untiring zeal with which the author brings out revised and amplified editions every year. I congratulate Mr. M. P. Gandhi on the great industry and care which he has put into the preparation of this work, and I believe that the Indian public will endorse my hope that similar careful studies of other industries serving India's needs will be undertaken by students of economics in years to come.

"Suneeta",
Ridge Road,
Bombay.
30-10-1945

PURSHOTAMDAS THAKURDAS

AUTHOR'S PREFACE

The present volume on the "Problems of Sugar Industry in India" is the esult of studies and business activities spread over well-nigh two decades.

Firstly, as a research scholar pursuing my studies in the Benares Hindu Jniversity for the M. A. Degree in Political Economy and Political Philosophy, vhich I took in 1925 after graduating from the Bombay University in 1923, ınd immediately thereafter, for a period of nearly 10 years, as Secretary of leading commercial bodies like the Indian Chamber of Commerce, Calcutta, Federation of Indian Chambers of Commerce and Industry, Indian National Committee of the International Chamber of Commerce, Indian Colliery Owners' Association, I had ample opportunities of indulging in my love of study of Indian economic problems; and I have all along endeavoured to embody from time to time the results of such studies in brochures and monographs on various industries, large and small.[1] But the Indian Sugar ndustry lately came to absorb all my attention, partly because it is unique among protected industries for the multiplicity of its special problems, and partly because of my appointment in 1932 (in addition to being Secretary of the Indian Chamber of Commerce) as Secretary of the Indian Sugar Mills Association, Calcutta[2] as well, up to 1936, and then, even more, due to my appointment as the Chief Commercial Manager—a position of greater direct responsibility—in the Dalmia Combine owning three large sugar mills in Bihar, (in addition to plants for cement, paper etc), for a period of nearly three

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[1] *Vide*, for example:

The History of Cotton Textile Industry in India from the earliest time to the present day, being an essay for which the Ashburner Prize was awarded in 1934 by the Bombay University, to the present author.

M. P. Gandhi's Indian Cotton Textile Industry—Its Past, Present and Future, 1937—with a foreword by Sir Purshotamdas Thakurdas.

M. P. Gandhi's Indian Cotton Textile Industry Annual, 1938, with a foreword by Mr. Subhas Chandra Bose.

" Indian Cotton Textile Industry Annual, 1939, with a foreword by the Hon'ble Dr. Kailas Nath Katju, Minister for Development, United Provinces.

" Indian Cotton Textile Industry Annual, 1940, with a foreword by Mr. Nalini Ranjan Sarker.

" Indian Cotton Textile Industry Annual, 1941, with a foreword by Dr. John Matthai.

" Indian Cotton Textile Industry Annual, 1942, with a foreword by Sir Chunilal B. Mehta, Ex-President, Federation of Indian Chambers of Commerce and Industry.

" Indian Cotton Textile Industry Annual, 1943, with a foreword by Sir Homi Mody, Ex-Supply Member, Government of India.

" Indian Cotton Textile Industry Annual, 1944.

"How to Compete with Foreign Cloth"—a study in the economics of handspinning and hand weaving, and cotton mills, in the cloth production of the country, with a foreword by Sir P. C. Ray, for the English Edition, 1931, and by Mahatma Gandhi, for the Gujerati, Hindi, Bengali and Tamil editions, 1932.

Handloom Weaving Industry in India—Its Past and Present Position, and Potentialities in the Post-War Period, 1945.

[2] The Indian Sugar Mills Association, of which I was the first Secretary, was established at Calcutta, on 30th June, 1932.

years. As a Director of the Indian Sugar Syndicate, Ltd. representing the Dalmia Group for a period of three years from 1937 to 1940, it was incumbent on me to study directly and in greater detail the structure, efficiency, technique and organisation of the sugar industry in India, in its technological, general and statistical aspects.

I have no desire to conceal the origin of my work[8] on the Indian Sugar Industry in circumstances which are not quite favourable to a strictly academic detachment. Professionally, I have been for a long time (about 21 years) an avowed partisan in current economic controversy, and not unoften in the past, my study of a particular problem has been motivated by the desire to strengthen the brief I held. I venture to hope, however, that I have not only shed the dust of controversy, but I have regained the mental detachment of my under-graduate and post-graduate days at the Bombay University and the Benares Hindu University, to which latter I was also attached as research scholar for some time in 1925. The change, I might, perhaps, say, is not abrupt, as I have had the honour of serving as a member on various Public Committees of Enquiry, like the U. P. & Bihar Joint Power Alcohol Committee (1938-39) the Bihar Government Labour Enquiry Committee (1939-40), the U. P. & Bihar Joint Sugar Control Board (1940-41), the East Indian Railway Advisory Committee (1939-41), the Rural Industries Sub-Committee of the National Planning Committee (1940-41) etc., and since 1943, I have again had the opportunity of cultivating an academic outlook since I accepted the position of Honorary Part-time Professor at the Sydenham College of Commerce & Economics, in Bombay.

Broadly, my connections with the industry in the earlier stage were largely as a spokesman of the manufacturing interests, but I have also had the opportunity of understanding the view-point of other interests in the industry i.e., the cultivators, consumers, and labour, during the period of my membership of the Bihar Government Labour Enquiry Committee, the U. P. & Bihar Joint Sugar Control Board, the Rural Industries Sub-Committee of the National Planning Committee, etc. I have also acquainted myself personally with the researches on sugarcane and by-products of sugar being conducted in various places, and have visited several important centres of research, like Pusa (Bihar), Cawnpore, and various factory farms and laboratories in order to gain first-hand knowledge. I have endeavoured all through to evince a non-partisan attitude and all my publications have been the result of my research work year after year, into the various problems of the industry, and the fruits of such research have been presented, statistically supported and in an unbiassed manner, in these various *Annuals* from 1935 till date.

Having thus had occasion to go into the numerous aspects of the sugar industry from various angles, I felt an impulse, as soon as my direct commercial association with the industry came to an end in 1940, to put

[8] *Vide* M. P. Gandhi's Indian Sugar Industry—Its Past, Present and Future—with a foreword by Sheth Walchand Hirachand, 1934.

gether the results of my studies into a more enduring form than the Sugar ndustry *Annual*[4] which I have been bringing out every year during the last ecade commencing from the year 1935, and I have devoted myself to a much letailed and detached study of the problems of this industry during the last years in order to reduce to writing some of the conclusions which I have ormed in regard to the scope and problems of reorganisation of this second argest national industry of India, with which I have been fortunate to be ssociated for a period of nearly 14 years since 1932, when the industry was ranted tariff protection.

This, then, is the *raison d'etre* and genesis of this thesis which may be aid to be the result of years of unbiassed and practical research in and study f the sugar industry in its various aspects from different angles and positions f special vantage.

The statistics appertaining to various aspects of the industry have been ompiled and built up by me with the greatest care and industry, over a series of years, and I venture to claim, are as authoritative and reliable as they can be, bearing in mind the woeful lack of general statistical information in this country, and the defective basis of agricultural statistics, which cannot be too greatly deplored, and which needs to be improved immediately, if proper planning for the country is to be undertaken.

In preparing the present thesis, I have subjected to a critical review the various problems before the industry, including the policy of control initiated in various provinces by the various Provincial Governments, as also the Central Government, since 1937, when the industry has been controlled in a very large measure. I am aware that this thesis leans more on the practical side than on the theoretical side, but my excuse for it is my desire to pass under review the various problems of the industry as they appear to an academic person, with a business man's outlook derived from close and practical contact with the industry for nearly 14 years.

My task, in the first instance, is of detecting the relations between a number of disparate studies on various aspects of the sugar industry which I had undertaken in the past and, secondly, bringing the light of established economic theory to illumine them all. But economic thought, if not economic

[4] *Vide* M. P. Gandhi's
Indian Sugar Industry Annual, 1935
" " " " 1936—with a foreword by Lala Karam Chand Thapar.
" " " " 1937—with a foreword by Sardar Kripal Singh, President Indian Sugar Mills Association.
" " " " 1938—with a foreword by Dr. Rajendra Prasad, Ex-President, Indian National Congress.
" " " " 1939
" " " " 1940—with a foreword by Dr. Syed Mahmud, Ex-Minister, Education and Development, Bihar.
" " " " 1941—with a foreword by Mr. D. R. Sethi, Director of Agriculture, Bihar.
" " " " 1942—with a foreword by Sheth Lalchand Hirachand.
" " " " 1943
" " " " 1944

science as such, is of late so far from being established that it is no longer a matter of applying a particular body of economic laws and doctrines to particular problems. It is even less a matter of wishing for different trends and developments in national or world economy other than what have actually taken place, wishes in which some of the foremost economists are known to have indulged in by way of suggesting a cure for the ills of modern economic life.

I have endeavoured, for my part, to see the development of the sugar industry more in the setting of established trends in world economy than in the setting of economic doctrines, the universality of which seems by no means indubitable. In this approach one detects at least what I may call the rationality of inevitability and can feel oneself led on to the purposeful task of examining the economics as well as the economies of the sugar industry in a realistic spirit instead of an attitude of wishful thinking.

Two facts emerge as a result of this approach. First, that the development of the sugar industry is part of a redistribution of productive activity among the various countries of the world, achieved, superficially and in the initial stages, by protectionist policies and later, and more deeply, by changes in productive technique tending to widen the range of eligible raw material[5] and secondly, that during the last decade, new industries are rightly deemed to be so clearly in the national interest that for all practical purposes they are emancipated from obedience or conformity to the laws of *laissez faire* economics. In other words, the State agrees to take upon itself the responsibility of correcting any social injustce that may result from the encouragement of such new industries instead of leaving the task blindly to the natural forces of the free market. In other words, it is not protectionism but regulationism, if I may coin the term, that is the dominant note of economic policy.

I have shown that the sugar industry is the first of the great industries to be subject to the redistribution of productive activity through the intervention of a substitute raw material, viz., beet, and that in regard to the industry in India, public policy has, as a matter of fact, exceeded the limits of protection as we have understood it till now, and aims at regulation, which is of far wider import. Indeed, as I have shown in Chapters II and III, the development of Indian economy, as indeed of the economy of many other countries, serves only to emphasise the unreality of fiscal controversies along the customary lines of free trade *versus* protection.

Nevertheless, on a critical review of the facts of the case it will be seen clearly that the Indian sugar industry is, from the national point of view, a strictly economic proposition, in the sense that the nation would have been obliged, in the absence of an indigenous industry, to pay higher prices for its requirements of sugar, not to speak of having to do without it altogether in an emergency like the second World War which has just ended.

[5] *Vide* Chapter I.

But the problem of making the most of the sugar industry, now that it is established, is a problem, on the one hand, of improving the quality and method of cultivation, and maximising the quantity of average yield per acre, and on the other, of establishing new industries for the efficient utilisation of by—products of sugar manufacture. These problems have been examined in the appropriate places in detail, while the internal economies of the sugar industry. which are deemed to be of comparatively less importance, have been discussed in brief.

Since popular welfare is the measure of all matters of public policy, a few pages have been devoted to the relation between the sugar industry and the adequacy of so important a dietetic article for the people of the country. Here I have taken the view that the maximisation of sugar consumption in India should be attempted mainly through the full realisation of economies in cultivation and manufacture rather than through abrupt and grandiose schemes of expansion of acreage. It is indeed heartening to find that with such economies and proper planning, production of sugar, inclusive of *gur*, can be easily doubled, if not trebled, without increase of acreage of sugarcane, in a few years, and with the improvement in the standard of living of the people, which is essential and which appears to show signs of accomplishment as a result of the recent acceptance of economic planning by the Government and the people, it is possible to envisage a satisfactory increase in the *per capita* consumption of sugar in India, in keeping with our basic resources and the requirements of adequate nutrition. The means by which our total sugar production, inclusive of *gur*, can be doubled, if not trebled, within the next few years, are examined in Chapter XVI, together with the technological basis of such expansion and an estimate of the capital cost involved therein.

The sugar industry is in many ways different from our other protected industries. The grant of protection to sugar brought in its wake a series of measures for the control of the price of sugarcane in the major sugar-producing provinces of Bihar and U.P. And these entailed a number of administrative devices for enforcing price control. *The sugar industry is again unique in its link with agriculture,*—a link for which there is no exact parallel in the case of other protected industries. Besides, broadly considered, it comprises not only the modern vacuum pan sugar factories, but also the production by villagers of *Gur* and Khandsari *Sugar*. In the production of raw material as well as the utilisation of by-products like molasses and bagasse, there are a number of technical problems which the public will need to appraise, both by themselves and in their relation to the fortunes and progress of the sugar industry. In this, the reader will find this volume a valuable, if not wholly self-contained, help.

It is, however, the problem of protection that is likely to have the widest appeal. Reference may be made here to the special approach to this problem, which is attempted in this work. It is maintained in the first place, that the place of beet sugar in the world sugar industry shows that, given

certain aids and favourable conditions, a substitute like beet sugar can gain as much importance as the natural product and that beet sugar furnishes the first instance of *ersatz*,[6] of which the world must hear more and more in course of time.

Secondly, it has been shown that, in the conditions of world economy and international trade which have obtained since the Depression, the question of the price at which the consumer of sugar in India could have got the imported product, is more than usually hypothetical and that, all the world over, fiscal controversies have an element of unreality which it is unwise to overlook or underrate.

Thirdly, it has been argued that, since comparison with probable import prices is impossible in the altered conditions of world trade, the only test of the success of protection is whether the sugar industry has satisfied the expectations of the Tariff Board and whether the consumer has had to pay a higher price for sugar. That the consumer has paid less than during the pre-protection period is well-known. What is not as well-known is that the industry achieved, even before the commencement of the World War, more than was expected of it by the Tariff Board, *and that further progress did not rest with the industry but with the development of our agriculture and the establishment of industries for the utilisation of by-products.*

And the history of the sugar industry must be deemed to have provided a welcome corrective to the most serious of economic misconceptions in India that economic progress can be achieved by attending to industry or agriculture without regard to the links between the two.

And fourthly, it ought also to be remembered that the reason which weighed most with the Tariff Board in recommending for this industry tariff protection of an unique nature, viz., protection for a period of 15 years—the longest period for which protection has been recommended for any industry so far without making any attempt at the same time to foresee the period when the need for protection would be obviated—was the link between this industry and agriculture. The Tariff Board definitely ignored the theory of protection in its classical form, and in doing so, far from being guilty of lowering the tests of a sound protectionist policy, they only showed a keener grasp of the special requirements of the industry.

We thus come to the most important point, viz., that *in the conditions of India today, nothing can be a graver blunder than to look at the problems of each industry separately from those of others and to consider industrial development apart from the development of our agriculture.* With such a compartmentalised view, the national economy would be imprisoned in a vicious circle, agricultural development waiting for industry to provide artificial fertilisers at sufficiently low prices, and industries unable to compete because agriculture cannot furnish the raw material at economic prices.

[6] *Vide* Chapter I.

The main conclusion, therefore, is that, protection to sugar is an unqualified success in the sense that the country has been recompensed for the aid given to the industry, particularly in the war period, and there is wide scope for future progress of the industry, which can be secured only by co-ordinated development in both industry and agriculture.

I cherish the hope that the Government and the Legislatures will evince the greatest care in safeguarding this industry which has stood by them during the war-period and has supplied sugar at reasonable rates without any attempt at profiteering or improving its own financial condition, in appreciation of the effects of such a policy on the welfare and well-being of the general consumer who has enabled the establishment of this industry. The importance of this great industry in the national economy of the country need hardly be stressed, if it is remembered that it has stopped the drain of about Rs. 16 crores per annum with the complete cessation of sugar imports, is supporting no less than 20 million agriculturists whose interests are indissolubly linked up with the future of this industry, has led to the development of the village industry of gur manufacture, has provided a channel for investment of indigenous capital estimated at Rs. 33 crores, has been responsible for finding employment to no less than 3,000 University men, 1,00,000 labour, skilled and unskilled, and has made the country completely self-sufficient in respect of supplies of sugar, a valuable article on the dietary of millions in the country, and promises to develop further, with the general improvement in the economic conditions of the people.[7]

I earnestly hope that this volume written in an unbiassed manner will be found useful by the readers and I trust that it will be of use to the Members of the Central Legislatures and the Government of India, when the question of devising measures for the further development and stabilisation of this great national industry which has thoroughly justified the grant of protection given to it during the last 15 years, comes up for consideration in March 1946, when the present tariff protection to the industry is due to expire.

I suggest that it would be appropriate if the present tariff protection is continued for a period of three years and in the interval as soon as conditions within the industry return to normal, a Tariff Board should be appointed to conduct the necessary enquiry and to recommend the kind of aid and the period for which it would be necessary in the years to come.

Needless to say, in a work, so complicated and so wide in scope, the need for consultation with scholars and men of affairs was often felt. It is as no matter of form that I acknowledge here my grateful thanks to all those,

[7] *Vide*: the following observations of the Famine Inquiry Committee in their Final Report, 1945, pp. 122 and 123, (to hand when this preface was under print).

"While sugar is a carbohydrate food, containing no protein or vitamins, it supplies calories, *and since there is much undernutrition, calories are needed.*"

"The present *per capita* intake of sugar in all forms in India is much lower than peacetime intake in most western countries and we believe that its production and consumption *can with advantage be considerably increased.*"

Also *vide* pages 255 and 259 of this volume.

literally too many to be mentioned here individually, who have freely given the help and guidance I sought of them. But I may mention particularly Prof. C. N. Vakil and Prof. J. J. Anjaria of the Bombay School of Economics and Sociology who gave me every assistance that their position and equipment enabled them to do. Not less helpful than these academicians have been the editors of the four leading Financial Weeklies of Calcutta, Bombay and Delhi, as the discussions I have often been privileged to have with them have enabled me to give point and sharpness of outline to my views on many questions.

My thanks are also due to Mr. R. C. Srivastava, Director, Imperial Institute of Sugar Technology, Cawnpore, for having gone through a few of the chapters of this thesis in which he was specially interested, and for giving me his reactions thereto.

I must also express my gratefulness to Dr. John Matthai, a distinguished economist, who was for several years a member and President of the Indian Tariff Board and is one of the authors of the Bombay Plan, for the trouble he has taken in reading patiently through this volume, and for his advice and criticism which have been of great value to me in improving my arguments at several places.

I must also refer here to the benefit I derived from the detailed discussions on various subjects pertaining to the industry which I had the privilege to have in the past with Sir T. Vijayaraghavachariar, Ex-Vice-Chairman of the Imperial Council of Agricultural Research, who was engaged in 1936-37 by the Indian Sugar Mills Association to prepare the Industry's case for submission to the Tariff Board, with the Hon'ble Dr. Kailas Nath Katju, and the Hon'ble Dr. Syed Mahmud in 1937-1940 when they were Ministers in charge of Development in the U. P. and Bihar respectively, with Dr. Rajendra Prasad and Mr. R. R. Bakhle, Chairman and Vice-Chairman of the Bihar Labour Enquiry Committee in 1939-40, as also with various other officials, particularly Sir P. M. Kharegat, I.C.S., former Vice-Chairman of the Imperial Council of Agricultural Research and now Secretary, Department of Agriculture, Government of India, Mr. N. C. Mehta, I.C.S., former Sugar Controller for India, Mr. S. Lal, C.I.E., I.C.S., former Secretary of the Development Department, Bihar, and at present Additional Secretary, Labour Department, Government of India, Mr. N. Baksi, O.B.E., I.C.S., Registrar of Co-operative Societies, Bihar, Mr. Vishnu Sahai, I.C.S., Cane Commissioner of U. P. and at present Sugar Controller for India, Mr. V. K. B. Pillai, I.C.S., Cane Commissioner of Bihar, Sir T. S. Venkataraman, late Sugarcane Research Expert to the Government of India and Dr. Shanti Swarup Bhatnagar, who was my colleague on the U. P. & Bihar Joint Power Alcohol Committee in 1937-38 and who is at present Director of the Board of Scientific & Industrial Research, Government of India.

I would be failing in my duty if I did not acknowledge my deep gratitude to Sir Purshotamdas Thakurdas for his very great kindness in going through

this entire volume and for having written a foreword thereto in spite of his present state of health which prevents him from undertaking strenuous work. I am also very thankful to him for the appreciative references he has made in respect of this work as also my *Annuals* on the Indian Cotton Textile Industry, and the Indian Sugar Industry.

For the sake of ready reference, I have given the text of current important Legislative measures relating to this industry, and not less than 35 up-to-date statistical tables in the earlier portion of this book styled as "The Sugar Industry at a Glance". As far as possible statistical tables have been put in this portion, but I must invite the attention of the reader to the fact that as many as 20 interesting tables have been put in Chapter XV entitled "Methods of utilisation of sugar and gur in India."

Chapter XVI on the "Scope of optimum production and consumption of sugar in India" will be found of interest to a large number of readers in view of the attempt made therein to picture the potential development of the industry in India.

There are five appendices, including a brief bibliography. The last appendix contains a complete and up-to-date list of sugar factories in India, showing the location, district, nearest railway and steamer station, the daily cane-crushing capacity, and names and addresses of the Managing Agents or Proprietors of sugar factories, in the various Provinces and States.

A work with so wide a scope, it is hoped, will have as wide an appeal.

"GIRI KUNJ",
11, Hughes Road, Bombay.
5th November, 1945.

M. P. GANDHI

For ERRATA,

please see page xviii.

The only Indispensable & Authoritative Annual Reference Book for the Indian Sugar Industry

THE INDIAN SUGAR INDUSTRY—
(1944 ANNUAL)

Vol. X *Editor:* **Mr. M. P. GANDHI**

306 Pages: September, 1945. Price Rs. 6/8; V.P.P. Rs. 6/14. Sh. 12.

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SCOPE AND PROSPECTS OF REORGANISATION IN POST-WAR PERIOD

By M. P. GANDHI

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Vol. VIII *Editor:* Mr. M. P. GANDHI

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- Review of Govt. measures for Control of Prices of Cloth and Yarn for distribution, production, availability of Standard Cloth, etc.
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STATISTICAL TABLES
IN
"THE SUGAR INDUSTRY AT A GLANCE"
(1944)

(Revised up to 30th June, 1945)

TABLE No. 1

Number of Cane Factories working in India, including States, and Production of Sugar from Cane Factories, Gur Refineries, Khandsari, Net Import of Sugar in British India and Import in Kathiawar Ports during the last 13 years, and estimates for 1944-45 and 1945-46

Year (November-October)	No. of Cane Factories working in India	Cane Factory Production (November-October)	Sugar Refined from Gur (January-December)	Khandsari (Conjectural estimates) (Nov.-Oct.)	Total Production of Sugar in India (Nov.-Oct.)	Net Imports (Excluding Re-exports) of Sugar in British India (Nov.-Oct.)	Imports of Sugar in Kathiawar Ports (Nov.-Oct.)
		Tons	Tons	Tons	Tons	Tons	Tons
1931-32	32	158,781	69,539	250,000	478,120	438,797	95,678
1932-33	57	290,177	80,106	275,000	645,383	321,081	68,649
1933-34	112	453,965	61,094	200,000	715,059	233,366	87,094
1934-35	130	578,115	39,103	150,000	767,218	197,775	113,364
1935-36	137	932,100	50,067	125,000	1,107,167	86,962	45,218
1936-37	137	1,111,400	19,500	100,000	1,230,900	11,160	12,870
1937-38	136	930,700	16,600	125,000	1,072,300	9,410	12,284
1938-39	139	650,800	14,200	100,000	765,000	254,400	76,819
1939-40	145	1,241,700	31,700	125,000	1,398,400	252,000	85,580
1940-41	148	1,095,400	48,500	125,000	1,268,900	18,778	
1941-42	150	778,100	13,400	150,400	941,900	48,637	
1942-43	150	1,070,700	6,370	117,630	1,294,700	563	
1943-44	151	1,216,400	7,706	80,000	1,304,106	...	
1944-45	144	985,100 (Estimated.) *	7,980 (Estimated.)	80,000	1,073,080 (Estimated)	...	
1945-46	150	1,200,000 (Our Est.)	...	...	...	...	...

* *Vide Indian Trade Journal*, p. 289, dated March 15, 1945.

TABLE No. 2

Comparative growth of the Sugar Industry in the various Provinces since 1931-32, the pre-protection year

(No. of Cane-factories Working)

Province	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45
United Provinces ...	14	33	59	65	67	68	68	69	70	70	70	71	70	68
Bihar ...	12	19	33	34	35	33	33	32	32	32	31	31	31	29
Punjab, Sind & N.-W. F. P. ...	1	1	5	6	4	5	3	3	3	4	4	4	2	2
Madras ...	2	2	4	8	8	11	8	7	10	11	11	10	12	12
Bombay ...	2	1	4	5	6	6	7	7	7	8	10	9	10	10
Bengal ...	...	...	2	5	6	6	6	8	9	9	9	8	6	4
Orissa ...	...	...	...	...	...	...	2	2	2	2	2	2	2	1
Indian States ...	...	...	4	5	9	8	9	11	11	12	13	15	18	18
Total for India ...	32	57	112	130	137	137	136	139	145	148	150	150	151	144
Burma* ...	1	1	1	2	2	3	2	2	3	3	(a)	(a)	(a)	(a)

* Burma excluded from 1936-37 onwards from the total for India.
(a) No information available after occupation of Burma by Japan.

TABLE No. 3

Number of Sugar Factories in various Provinces, working in 1943-44, Estimated quantity of cane crushed, sugar produced and Recovery percentage obtained, etc.

(Official Estimates of the Director, Imperial Institute of Sugar Technology, Cawnpore, published in the Indian Trade Journal, dated 5th October 1944, and 15th March 1945.)

Province	No. of Mills Working	Cane Crushed Tons	Sugar Tons	Sugar-cane Recovery per cent 1943-44
United Provinces	70	7,332,400	727,100	9.92
Bihar	31	2,018,400	212,400	10.53
Punjab, Sind & N.-W. F. P.	2	174,200	17,400	9.99
Madras	12	420,400	39,200	9.32
Bombay	10	739,700	81,200	10.98
Bengal	6	175,900	13,600	7.73
Orissa	2	17,600	1,700	9.66
Indian States	18	1,259,200	123,800	9.83
Total ...	151	12,137,800	1,216,400	10.02

TABLE No. 4

Total, and *per capita* consumption of Sugar and Gur in India*

Year (November-October)	Consumption of Sugar in tons	Official Estimate	Consumption of Gur in tons	*Per Capita Consumption lbs.*		
				Sugar	Gur	Total of Sugar and Gur
				lbs. per head	lbs. per head	lbs. per head
1931-32	982,000	,,	2,758,000	6.2	17.2	23.4
1932-33	1,006,000	,,	3,240,000	6.3	20.2	26.5
1933-34	996,000	,,	3,486,000	6.1	21.5	27.6
1934-35	1,059,000	,,	3,701,000	6.5	22.6	29.1
1935-36	1,074,000	,,	4,101,000	6.5	24.8	31.3
1936-37	1,167,000	,,	4,268,000	7.3	26.7	34.0
1937-38	1,159,000	,,	3,364,000	7.2	20.9	28.1
1938-39	1,073,000	,,	2,131,000	6.6	13.1	19.7
1939-40	1,019,100	,,	2,441,000	6.4	18.0	24.4
1940-41	1,100,000	(Our Est.)	3,410,000	6.7	20.6	27.3
1941-42	1,050,000	,,	2,829,000	6.0	18.5	24.5
1942-43†	966,000	,,	3,567,000	5.9	20.1	26.0
1943-44†	1,086,300	,,	3,989,500	6 5	23.8	30.3

* Total value of sugar, including gur, produced in the year 1943-44 may be estimated at about Rs. 118.33 crores.

Price calculated at the rate of Rs. 15-4-0 per maund of sugar and Rs. 9-6-0 per maund of gur as the standard of average for the whole season.

Maund 82.2/7 lbs. Sugar 15¼ Gur 9.1/6

		Tons	Rs. Price
1943-44	Sugar	10,86,300	49,09,65,375
	Gur	39,89,500	69,23,44,479
	Total Value Rs.		1,18,33,09,854

Rs. 118.33 Crores.

† Our estimates.

TABLE No. 5

Per capita consumption of Sugar in various countries

United Kingdom ...	106	lbs.	per head	Cuba ...	88	lbs.	per head
U. S. A. ...	97	,,	,,	Java ...	11	,,	,,
Brazil ...	34	,,	,,	Japan ...	33	,,	,,
France ...	52	,,	,,	Union of South Africa	47	,,	,,
Australia ...	116	,,	,,	Netherland ...	64	,,	,,
Germany ...	52	,,	,,	India ...	27 (including 20 lbs. *Gur*)		

TABLE No. 6

Yearly world production, consumption and the carry-over of stocks of Sugar for the last 10 years in thousand tons (Raw Sugar Value)*

(In Thousands of Long Tons)

Crop year (Sept. 1st to Aug. 31st)	Opening Stocks (Sept. 1st)	Production	Consumption	Closing Stocks (Aug. 31st)	Percentage relation of stocks to Consumption
1931–32	12,362	26,431	26,724	12,069	45.2
1932–33	12,069	24,692	26,193	10,568	40.3
1933–34	10,568	25,709	26,287	9,990	38.0
1934–35	9,990	27,191	27,188	8,993	33.1
1935–36	8,993	28,846	29,231	8,608	29.5
1936–37	8,608	30,818	30,549	8,877	29.1
1937–38	8,877	30,967	29,647	10,197	34.4
1938–39	10,197	29,478	29,406	10,269	34.9
1939–40	10,269	30,753	26,551	11,471	38.8
1940–41	...	30,498	...	...	...
1941–42	...	19,211	...	...	...
1942–43	...	17,908	...	...	...

* Figures are in long tons (Long ton = 2,240 lbs.), (Metric ton = 2,205 lbs.), and (Short ton = 2,000 lbs.).

A glance at the last Table in the 1940 Indian Sugar Industry Annual will show that India leads as the *largest sugar producing country in the world,* since 1931.

TABLE No. 7

Average and maximum percentage of recovery of Sugar in factories in India and Java since 1931-32*

Year	*India* Average	*U. P.* Average	*Bihar* Average	*Bombay* Average	*Java* Average	*India Maximum*
1931–32	8.89	8.59	9.06	...	10.92	10
1932–33	8.66	8.55	8.60	10.00	11.56	10
1933–34	8.80	9.08	8.32	10.00	12.84	10
1934–35	8.66	8.56	8.79	10.37	12.55	11.10
1935–36	9.29	9.60	8.93	10.47	13.23	11.34
1936–37	9.50	9.65	9.20	10.68	12.77	11.43
1937–38	9.38	9.18	9.58	10.97	11.87	11.63
1938–39	9.29	9.14	9.00	11.29	11.77	12.25
1939–40	9.45	9.37	9.29	10.97	12.23	12.31
1940–41	9.70	9.87	9.86	9.94	...	11.15
1941–42	9.69	9.87	10.35	9.87	...	12.45
1942–43	10.28	10.16	10.93	10.64	...	13.35
1943–44	10.02	9.92	10.53	10.98	...	12.84

* *Vide Indian Trade Journal,* **Calcutta, 5th October 1944.**

TABLE No. 8

Capacity of factories and duration of crushing season in India*

	Tons	
Average Cane-crushing capacity of Factory (calculated on the basis of tons of cane crushed per day of actual working) in India	517	1934–35
	568	1935–36
	630	1936–37
	660	1937–38
	630	1938–39
	710	1939–40
	690	1940–41
	640	1941–42
	690	1942–43
	708	1943–44
Maximum Cane-crushing capacity of Factories per day in India	2,012	1934–35
	1,807	1935–36
	1,960	1936–37
	2,000	1937–38
	1,850	1938–39
	1,960	1939–40
	1,980	1940–41
	1,800	1941–42
	1,920	1942–43
	1,903	1943–44

Duration of Cane-crushing Season (October-May)	1933–34 No. of days	1934–35 No. of days	1935–36 No. of days	1936–37 No. of days	1937–38 No. of days	1938–39 No. of days	1939–40 No. of days	1940–41 No. of days	1941–42 No. of days	1942–43 No. of days	1943–44 No. of days
Mean duration of Cane-crushing season in *All-India* ...	106	104	126	138	112	83	129	113	85	101	117
Maximum duration of Cane-crushing season in *All-India* ...	208	172	179	203	181	184	203	264	313	278	255
Mean duration of Cane-crushing season in *U. P.* ...	112	107	134	140	124	77	133	100	78	112	131
Mean duration of Cane-crushing season in *Bihar* ...	105	109	4	150	99	79	136	100	54	96	93
Mean duration of Cane-crushing season in "*All other Provinces*" ...	84	90	112	138	103	97	119	144	117	89	110

* *Vide Indian Trade Journal*, Calcutta, dated 5th October 1944 and previous issues.

TABLE No. 9

Acreage under Sugar-cane, under improved varieties, production of cane per acre, gross production of Gur, and calculated production of Cane-crop* from 1931-32 to 1944-45

Year	Total acreage under sugar-cane in thousand acres	Acreage under improved varieties in thousand acres	Average cane production per acre (in tons)	Gross production expressed as gur (in thousand tons)	Calculated production of sugar-cane (10-11 factors) (in thousand tons)
1930—31	2,905	817	12.3	3,359	35,780
1931—32	3,076	1,170	14.1	4,116	43,316
1932—33	3,425	1,845	14.9	4,859	51,129
1933—34	3,422	2,295	15.3	5,055	52,455
1934—35	3,602	2,433	15.1	5,292	54,346
1935—36	4,154	3,056	15.3	6,102	61,202
1936—37	4,582	3,452	15.6	6,932	67,322
1937—38	3,869	2,968	15.5	5,579	55,637
1938—39	3,130	2,673	15.0	3,572	35,851
1939—40	3,640	2,893	15.0	4,748	47,632
1940—41	4,598	3,480	15.0	5,794	59,090
1941—42	3,515	.....	15.0	4,371	46,030
1942—43	3,600	.....	15.0	5,076	.....
1943—44	4,234	.....	.....	5,848	.....
1944—45	4,134†	.....	.....	5,422 (Estimated)	.....

* *Vide Indian Trade Journal.* The yield of *gur* per acre has increased from .80 tons in 1901-02 to 1.47 tons per acre, due to improved varieties of cane.

† *Vide Indian Trade Journal,* p. 116, 26th April, 1945.

TABLE No. 10

Percentage of Cane used under different heads during the years 1932-33 to 1943-44 (November-October)**

—	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38 (Our Est.)	1938-39 (Our Est.)	1939-40 (Our Est.)	1940-41 (Our Est.)	1941-42 (Our Est.)	1942-43 (Our Est.)	1943-44 (Our Est.)
Cane used in Factories ...	6.5	9.8	12.3	16.0	17.6	17.8	16.2	27.7	19.1	21.2	25.0	25.0
Cane equivalent to *gur* used in refineries ...	3.0	2.0	1.2	1.4	0.5	0.5	0.5	0.9	1.4	1.4	1.0	1.0
Cane used for *gur* manufacture ...	64.7	65.5	66.0	63.8	64.9	62.0	64.0	51.4	57.7	53.4	50.0	50.0
Cane used for other purposes, including *Khandsari*, Chewing, setts for planting etc. ...	25.8	22.7	20.5	18.8	16.9	19.7	19.3	20.0	21.8	24.0	24.0	24.0
Total percentage ...	100	100	100	100	100	100	100	100	100	100	100	100

** *Vide* Reply in the Council of State to Question No. 39, dated 11th November 1941.

TABLE No. 11

Percentage of Cane crushed in factories to the total Cane-crop in various Provinces*

Season	U. P.*	Bihar*	Bombay	Bengal	Madras	India
1934—35	13.6	30.9	8.0	2.7	5.0	12.3
1935—36	17.1	40.4	11.7	4.8	5.4	16.0
1936—37	17.1	49.3	13.0	5.2	6.0	17.6
1937—38 (Our Est.) ...	18.6	62.3	14.0	.....	.....	17.8
1938—39	14.5	44.5	.....	.....	.....	19.5
1939—40	25.5	48.4	.....	.....	.....	27.7
1940—41	13.9	29.3	.....	.....	.....	19.1
1941—42	14.6	.....	.....	.....	.....	21.2
1942—43	21.9	.....	.....	.....	.....	25.0
1943—44	22.3	.....	.....	.....	.....	25.0

* Figures based on Cane Development Department (U. P.) statement showing disposal of cane crop in the U. P. during 1934 to 1942 and on letters from Cane Commissioner, Bihar to Chairman, Sugar Commission, U. P and Behar.

TABLE No. 12

Cost of production of Cane per maund

(*a*) Definite figures are not available. Cost of production varies from Province to Province from annas 0-3-0 to annas 0-7-0 per maund. (*Vide* 1939 Annual.)

(*b*) Enquiry undertaken by the Imperial Council of Agricultural Research in 1934, is concluded. Reports of cost in various Provinces were published in 1938 and 1939, and also referred to in Tariff Board's Report of 1937.

(*c*) Cost considerably increased since 1942, due to inflation, and soaring up of prices.

TABLE No. 13

Estimate of total amount of money paid by Sugar factories to Cane-cultivators and workers, since 1931-32 to 1943-44

Season	Estimated average price per maund of cane in U. P. & Bihar	Estimated amount paid for cane by factories to Cultivators (1)	No. of unskilled workers employed (2)	Estimated amount of money paid to unskilled workers (3)
	Rs. a. p.	Rs.	No.	Rs.
1931—32	0 5 10	1,77,51,000	16,640	998,000
1932—33	0 5 6	3,14,39,000	29,640	1,778,000
1933—34	0 5 6	4,83,98,000	67,200	4,032,000
1934—35	0 5 3	5,97,66,000	78,200	4,680,000
1935—36	0 5 3	8,81,03,000	82,200	4,932,000
1936—37	0 4 5	8,92,19,504	100,000	6,000,000
1937—38	0 5 1	8,57,53,775	100,000	6,000,000
1938—39	0 6 10	8,13,00,988	100,000	6,000,000
1939—40	0 8 5	18,81,09,460	100,000	7,000,000
1940—41	0 4 8	8,96,40,583	100,000	5,650,000
1941—42	0 7 0	6,15,00,000	100,000	4,000,000
1942—43	0 10 0	13,00,00,000	100,000	5,000,000
1943—44	0 12 0	18,00,00,000	100,000	5,500,000
1944—45	0 14 0	26,40,00,000	90,000	6,200,000

(1) Based on statistics received from a large number of factories in U. P. and Bihar.
(2) Based on an assumption of an average factory employing about 600 workers.
(3) Based on an estimate of payment of 0-8-0 per day, (upto 1941-42) and on the average working period of the season. After 1941-42, the estimate is on a 25 per cent higher basis.
(4) Dearness and allowances were increased by 50 per cent in 1942-43 and 1943-44.

TABLE No. 14

Import Duties on Sugar in India and Principal Countries in the World

As there have been so many changes due to the war in regard to the duties on sugar in the various countries, we are not giving the full table here. A reference may be made to the 1939 Annual for the import duties on sugar then existing.

The following table gives the duties in India :—

Import Duty on Sugar in India (1944)

Total Import Duty including 20 per cent surcharge (with equivalent excise duty)		Rs.	11-1-7 1/5	per cwt.
	equivalent to	Rs.	7-1-9 6/7	per maund.
Excise Duty on factory sugar in British India		Rs.	3-0-0	per cwt.
	equivalent to	Rs.	2-3-3	per maund.

The present import duty will continue till 31st March 1946

TABLE No. 15

Excise Duty and Import Duty on Sugar, Sugar Candy* and Molasses in India

On Sugar per cwt.	Protective Import Duty per cwt.	Additional Revenue Duty	Total Import Duty per cwt. Rs.
From 1st April, 1932 to 31st March, 1934	Rs. 7-4-0	Revenue surcharge @ 25% of protective duty Rs. 1-13-0	9-1-0
From 1st April, 1934 to 27th February, 1937 (Rs. 1-5-0 Excise Duty on domestic production of factory sugar)	7-12-0 (0-8-0 being additional margin)	Equivalent excise duty Rs. 1-5-0	9-1-0
From 28th February, 1937 (Rs. 2-0-0 Excise Duty on domestic production of factory sugar)	7-4-0	Equivalent excise duty Rs. 2-0-0	9-4-0
From 1st April, 1939 (Rs. 2-0-0 Excise Duty on domestic production of factory sugar)	6-12-0	Equivalent excise duty Rs. 2-0-0	8-12-0
From 1st March, 1940 (Rs. 3-0-0 Excise Duty on domestic production of factory sugar)	6-12-0	Equivalent excise duty Rs. 3-0-0	9-12-0†
From 1st April, 1942 (Rs. 3-0-0 Excise Duty on domestic production of factory sugar)	6-12-0	Revenue surcharge of 20% amounting to Rs. 1-5-7 1/5 and Equivalent excise duty Rs. 3-0-0	11-1-7 1/5‡

* From 20th February 1934, a revenue duty of Rs. 10-8-0 per cwt. was imposed on *sugar candy* in place of Rs. 9-1-0 per cwt. The rate of import duty on *molasses* is 31¼ per cent *ad valorem* since April 1932.

† The import duty of Rs. 11-1-7½ per cwt. works out at Rs. 7-1-9 per md. and Rs. 3-0-0 excise duty per cwt. works out at Rs. 2-3-3 per md. This import duty has been continued till 31st March 1946.

‡ Total import duty includes surcharge of 20 per cent as from 1st April 1942.

TABLE No. 16

Yield of Revenue from Import Duty on Sugar in India from 1931-32 to 1944-45 (Burma excluded from 1937-38)

Year (April-March)	Yield of Revenue Rs.	Year (April-March)	Yield of Revenue Rs.
1931-32	7,97,63,000	1938-39	45,22,000
1932-33	6,84,79,000	1939-40	3,96,08,000
1933-34	4,72,04,000	1940-41	18,24,000
1934-35	3,81,35,040	1941-42	1,94,000
1935-36	3,24,16,000	1942-43	56,000
1936-37	50,52,000	1943-44	4,14,000
1937-38	25,33,000	1944-45	3,56,000

TABLE No. 17

Excise Duty on all Sugar produced in British India and Yield of Revenue therefrom from 1935-36 to 1945-46 Fiscal years (April-March)

Amount of duty per cwt.	Yield of Revenue from Excise Duty (in Thousand Rupees)										
	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46
Khandsari:	Rs. 60	Rs. 47	Rs. 51	Rs. 59	Rs. 146	Rs. 286	Rs. 443	Rs. 157	Rs. 327	Rs.	Rs.
Factory:	15,824	25,202	33,097	42,244	24,760	39,011	66,827	48,184	67,900	65,000 (Revised estimate)	62,500 (Est.)
Total	15,884	25,249	33,148	42,303	24,906	39,297	67,270	48,341	68,227	65,000	62,500

TABLE No. 18

Average price of Indian and Imported Sugar in India per maund of 82-2/7 lbs.

	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Indian 1st quality Special (Cawnpore market average quotation) (Factory Delivery Basis)	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
	9-6-0	9-0-0	8-4-0	7-0-0	8-8-0	10-12-0	10-8-0	11-0-0	13-0-0	15-0-0	16-4-0 for D24
Imported Sugar (Calcutta market average quotation)	9-13-0	9-13-0	9-12-0	9-10-0	10-8-0	11-0-0	11-0-0	...	...	...	

TABLE No. 19

Average price of Gur per maund in 1940-41, 1941-42, 1942-43 and 1943-44

Gur Market	1940-41 (Nov. to Oct.) Rs. a. p.	1941-42 (Nov. to Sept.) Rs. a. p.	1942-43 Nov.-Oct. Rs. a. p.	1943-44 Nov.-Oct. Rs. a. p.
Madras ...	3 1 6	4 2 6	9 6 10	9 10 0
Ahmednagar ...	3 6 9	6 5 8	14 14 6	15 9 9
Lyallpur ...	2 9 2 (No quotation) May, '41	4 0 6 (No quotation) Feb., June, July, August, Sept. '42	10 7 7	10 4 5
Muzaffarnagar ...	3 0 7	5 13 9	8 15 6	6 12 11
Meerut ...	2 12 11 (No quotation) August, '41	5 12 10 (No quotation) for March and Sept. '42	9 0 1	7 6 0
Bhagalpur ...	3 0 1 (No quotation) for Mar., '41	5 10 3 (No quotation) for May, June, July and Sept. '42	11 4 4	8 5 6
Dacca ...	5 5 4	9 7 7	.....	.....

TABLE No. 20

Approximate Official Estimate of total Carry-over of Stocks of Sugar in India at the beginning of November, since 1931

Year	Tons
1931	32,000
1932	19,000
1933	9,000
1934	30,000
1935	23,000
1936	159,000
1937	211,000
1938	102,000
1939	105,000
1940	390,000
1941	295,000
1942	105,000
1943	133,863
1944	265,802

TABLE No. 21

Approximate Railway Freight on Sugar-cane in 1943-44

Railway	Kind of Wagon	Average Capacity	Distance	Rate per Wagon Rs. A. P.
A. B. Railway ...	4 wheeler	160 maunds	35 miles	8 14 0
E. B. Railway ...	4 wheeler	160 maunds	177 miles	27 0 0
E. B. & A. B. Rly. combined ...	4 wheeler	160 maunds	54 miles	17 8 0
O. & T. Railway ...	4 wheeler	270 maunds	55-60 miles	9 0 0
E. I. Railway ...	4 wheeler	480 maunds	39 miles	10 0 0
			up to 50 miles	14 0 0
			up to 100 miles	25 0 0

TABLE No. 22

Statement showing Expenditure on Sugar Research by the Imperial Council of Agricultural Research*

Year	Amount spent or proposed to be spent	Directions in which generally Spent
	Rs.	
1935-36	4,79,088	Production and testing of new varieties of sugar-cane.
1936-37	3,88,627	
1937-38	3,46,820	Devising and testing systems of cultivation and manuring.
1938-39	3,24,928	
1939-40	3,56,790	Study and combating of insect and fungus pests.
1940-41	3,19,304	
1941-42	3,74,580	Research in use of molasses as manure and cattle food.
1942-43	3,57,446	
1943-44	4,26,828	Sugar Marketing Survey.
1944-45	4,11,700 (Estimated to be spent.)	Utilisation of Bagasse for the paper, and board industry, Etc., Etc.

* Figures collected from official sources and furnished by Secretary, Imperial Council of Agricultural Research, (*Vide* letter No. F. 66(14)|43D dated* 16th January 1945).

TABLE No. 23

Estimated Percentage of Gate-cane to the Total Quantity of Cane (i.e. Gate-cane and Rail-borne cane) crushed in Factories in the various Provinces*

Province	1934-35 %	1935-36 %	1936-37 %	1937-38 %	1938-39* %	1939-40† %	1940-41 %	1941-42 %	1942-43 %	1943-44 %
Bihar ...	48	50	58	53	53	53	65	63	70	70
United Provinces ...	65	66	68	72	66	62	69	80	85	85
Bengal ...	22	26	45	55	54	33	32	52	60	60
Punjab ...	...	51	61	69	57	47	55	80	80	80
Bombay ...	100	100	100	100	100	99	100	100	100	100
Madras ...	...	35	67	71	72	75	67	60	65	65

(approx.) (approx.) (approx.)

* Compiled by the Indian Sugar Syndicate Ltd. in September 1939.

† Compiled by us from the returns made by factories in 1939-40, 1940-41, 1941-42, 1942-43 and 1943-44.

TABLE No. 24

This Table shows the production, consumption and *per capita* consumption of sugar in the different Provinces and Indian States in 1939-40, 1940-41 and 1941-42 (1st November to 31st October). In estimating these figures also, no account has been taken of the differences between opening and closing invisible stocks and imports and exports by road. But it is believed that initial and closing invisible stocks do not differ appreciably and that the volume of inter-provincial traffic in sugar by road is not great. A better estimate of consumption will, however, be possible if statistics of markets stocks improve.

Production, Consumption and *Per Capita* Consumption of Sugar in the various Provinces and States, during the years 1939-40, 1940-41, and 1941-42 (Nov.-Oct.)

Name of Province	1939—40			1940—41			1941—42		
	Production	Consumption	*Per capita* Consumption	Production	Consumption	*Per capita* Consumption	Production	Consumption	*Per capita* Consumption
	Tons	Tons in (1000)	Lbs.	Tons	Tons in (1000)	Lbs.	Tons	Tons in (1000)	Lbs.
Bengal	45,800	161	6.7	64,600	178	6.6	29,400	120	4.5
Bombay	97,200	219	15.2	120,132	260	20.8	113,354	240	19 2
Madras	50,400	94	3.6	67,400	106	4.8	47,448	90	4.1
Bihar	328,800	57	(*a*)3.1	257,100	69	(*a*)3.9	122,300	66	(*a*)3 6
United Provinces ...	783,400	153	6 3	708,592	244	9.8	480,663	159	6.4
Punjab	32,100	169	12.0	51,023	231	15.3	38,120	199	13.1
C. P. and Berar... ...		38	4.3		47	6.3		37	4.9
Assam		16	3.5		20	4.4		11	2 4
Sind and British Baluchistan.		35	14.3		44	19.5		39	17.3
Orissa		8	...		10	...		7	...
N.-W. F. P.		8	3.8		18	13.3		15	11.1
Delhi		20	44.8		22	53.7		14	34 2
Rajputana		38	6.8		48	7.9		60	9.8
Central India		25	4.8		35	6.8		33	6.4
Nizam's Territory ...		20	2.8		27	3.7		23	3.2
Kashmir		2	1.1		3	1 7		4	2.3
Mysore		11	3.5		14	4.3		15	4.6
ALL-INDIA		1,074	6.5		1,376	8.5		1,132	7.0

(*a*) Includes Orissa also.

TABLE No. 25

Total Production, Import and Export of Molasses in India* for the last 13 years

Year Nov.-Oct.	Production of Molasses in India in Thousand Tons				Imports of Molasses into British India (Tons) Apr.-Mar.	Export of Molasses from British India (including Palmyra and cane jaggery) (Tons) Apr.-Mar.
	From Cane Factory	From Gur Refineries	From Khandsari †	Total†		
1931-32 ...	69	46	250	365	40,191	740
1932-33 ...	130	56	275	461	31,991	819
1933-34 ...	190	40	209	430	2,401	1,201
1934-35 ...	234	22	150	406	415	1,153
1935-36 ...	337	33	125	495	Nil	1,026
1936-37 ...	406	10	100	516	Nil	24,195
1937-38 ...	349	8	125	482	5	79,167
1938-39 ...	242	6	100	348	2,160	52,676
1939-40 ...	485	7	125	627	2,000	16,000
1940-41 ...	424	32	100	556	.....	.....
1941-42 ...	293	7	100	400	.....	.....
1942-43 ...	369	11	100	480	.....	.....
1943-44 ...	438	8	100	540	.....	.....
1944-45 ...	341	.....	.....	.....	.....	.....

* After 1936-37, statistics regarding Burma are excluded.
† Official estimates.

TABLE No. 26

Total value of Sugar Machinery imported in British India from 1932-33 to 1939-40*

(In Thousands of Rupees)

Source	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
U. K.	91,48	1,95,87	73,60	49,70	68,49	43,15	30,16	.....
Other Countries ...	61,63	1,40,51	31,84	16,00	26,66	26,21	31,20	.....
	1,53,11	3,36,38	1,05,45	65,70	95,16	69,37	61,36	50,84

* Statistics discontinued after 1939-40.

TABLE No. 27

Calculated Net Production* of Gur in India for direct consumption, from 1937-38 to 1942-43

Year (November—October)	Calculated net Annual Production of *Gur* for direct consumption (in Tons)	
1930-31	2,241,000	
1931-32	2,758,000	
1932-33	3,240,000	
1933-34	3,486,000	
1934-35	3,701,000	
1935-36	4,101,000	
1936-37	4,268,000	
1937-38	4,364,000	
1938-39	2,131,000	
1939-40	2,441,000	
1940-41	3,414,000	
1941-42	2,829,000	
1942-43	3,015,000	(Revised)
1943-44	3,564,000	(Estimated)

* The net production of *gur* is calculated by deducting from the total yield of cane expressed in terms of *gur*, and published in the "Final General Memorandum on the production of the Principal Crops in India", by the Director-General, Commercial Intelligence and Statistics, the *gur* equivalent of the cane used for purposes other than *gur* manufacture. *Vide* letter No. 8002|stat., dated 2nd February 1944, from the Director, Imperial Institute of Sugar Technology, Cawnpore, to the Chairman, Sugar Commission, U. P. and Bihar, Cawnpore, for figures from 1940-41 to 1942-43.

TABLE No. 28

Cane Factory Production of Sugar in U. P., Bihar and All-India (in Tons) from 1931-32 to 1943-44

(Vide Indian Trade Journal, 6th April 1944)

Season	U. P.	Bihar	All-India	Total quantity of *cane* crushed all factories in tons	
1931-32 ...	66,312	75,091	1,58,581	17,83,000	
1932-33 ...	1,40,344	1,28,610	2,90,177	33,50,000	
1933-34 ...	2,73,774	1,39,957	4,53,965	51,57,000	
1934-35 ...	3,15,600	1,84,038	5,78,115	66,72,000	
1935-36 ...	5,30,000	2,50,200	9,32,100	98,01,000	
1936-37 ...	6,08,600	3,29,300	11,11,400	1,10,87,000	
1937-38 ...	5,31,300	2,25,300	9,30,700	99,16,400	
1938-39 ...	3,20,300	61,600	6,50,800	70,04,800	
1939-40 ...	6,59,500	3,22,100	12,41,700	1,31,31,700	
1940-41 ...	5,13,300	2,46,100	10,95,400	1,12,90,900	
1941-42 ...	3,82,900	1,17,300	7,78,100	80,26,300	
1942-43 ...	6,12,500	2,37,400	10,70,700	1,04,18,500	
1943-44 ...	7,27,100	2,12,400	12,16,400	1,21,37,800	(Revised)
1944-45 ...	5,33,500	1,70,600	9,85,100	95,33,400	

TABLE No. 29

The following is the schedule of ex-factory control rates of sugar which have come into force with effect from October 21, 1944:

Price per maund of Crystal Sugar for sale, ex-factory 1944-45 according to grade

—	19	20	21	22	23	24	25	26	27	28
A A A ...	...	...	...	...	16 12 6	16 14 0	17 0 0	17 1 6	17 3 6	17 5 0
A A ...	...	...	...	...	16 10 6	16 12 0	16 14 0	16 15 6	17 1 6	17 3 0
A ...	...	16 2 0	16 4 6	16 6 6	16 8 6	16 10 0	16 12 0	16 13 6	16 15 6	17 1 0
B ...	...	15 15 6	16 2 0	16 4 0	16 6 0	16 7 6	16 9 6	16 11 0	16 13 0	16 14 6
C ...	...	15 13 6	16 0 0	16 2 0	16 4 0	16 5 6	16 7 6	16 9 0	16 11 0	16 12 6
D ...	15 8 0	15 12 0	15 14 6	16 0 6	16 2 6	16 4 0	16 5 6	16 7 6	16 9 6	16 11 0
E ...	15 6 6	15 10 6	15 13 0	15 15 0	16 1 0	16 2 6	16 4 6	16 6 0	16 8 0	16 9 6
F ...	15 5 6	15 9 6	15 12 0	15 14 0	16 0 0	16 1 6	16 3 6	16 5 0	16 7 0	16 8 6
G ...	15 4 6	15 8 6	15 11 0	15 13 0	15 15 0	16 0 6	16 2 6	16 4 0	16 6 0	16 7 6

Type of Sugar	*Maximum Ex-factory Price**	
	Per maund	
Sugar Candy	Rs. 20—7—0	
Bura	„ 17-11—0	
Khandsari	„ 16—4—0	(Wholesale prices in 21 Districts)

* *Vide* two notifications of the Sugar Controller dated 21st October 1944.

TABLE No. 30

Recovery of Sugar from Cane during 1932-35 to 1944-45

Provinces	Recovery of Sugar per cent Cane										
	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45
U. P. ...	8.56	9.60	9.65	9.18	9.14	9.37	9.87	9.87	10.16	9.92	10.36
Bihar ...	8.79	8 93	9.20	9.58	9.00	9.29	9.86	10.35	10.93	10.53	10.70
"All other Provinces" ...	8.77	9.00	9 60	9.77	9.91	9.88	9.34	9.22	9.95	9.94	...
All-India ...	8.66	9 29	9.50	9.38	9.29	9.45	9.70	9 69	10.28	10.02	10.31

* *Vide Trade Journal.* (Second Memorandum on production of cane sugar, in 1944-45.)

TABLE No. 31

Production of Sugar directly from Cane in Modern Factories in India, 1929-30 to 1943-44, and Recovery Percentage for Java

Season	Number of Factories producing Sugar direct from cane	Cane crushed	Sugar produced	Percentage Recovery for India	Percentage Recovery for Java*
		Tons	Tons		
1929-30 ..	27	989,776	49,768	9.07	11.76
1930-31 ...	29	1,317,248	119,859	9.00	10.92
1931-32 ...	32	1,783,499	158,581	8.89	11.56
1932-33 ...	57	3,350,231	290,177	8.66	12.84
1933-34 ...	112	5,157,373	453,965	8.80	12.55
1934-35 ...	130	6,572,000	578,115	8.66	13.23
1935-36 ...	137	9,801,748	932,100	9.29	12.77
1936-37 ...	137	11,687,200	1,111,400	9.50	11.87
1937-38 ...	136	9,916,400	930,700	9.38	11.77
1938-39 ...	139	7,001,800	650,800	9.29	12.23
1939-40 ...	145	13,131,700	1,241,700	9.45	(Not Available)
1940-41 ...	148	11,290,900	1,095,400	9.70	
1941-42 ...	150	8,026,300	778,100	9.69	
1942-43 (Our Est.) ...	150	10,418,000	1,070,700	10.28	
1943-44 (Revised) ...	151	12,137,800	1,216,400	10.02	
1944-45 ...	144	9,533,400	985,100	10.31	

* *Vide* the *Indian Trade Journal*, 23rd September 1943.

TABLE No. 32

Value of imports of Sugar,* Revenue from imports, and Rate of Import Duty on Sugar from 1920-21 to 1944-45

Year April-March	Value of foreign Sugar (net) imported in British India in Lakhs of Rupees*	Revenue from Import Duty on Sugar in Lakhs of Rupees**	Rate of Import Duty
1920-21 ...	1,850	185	10 p.c. *ad valorem*
1921-22 ...	2,750	412	15 p.c. *ad valorem*
1922-23 ...	1,549	487	25 p.c. *ad valorem*
1923-24 ...	1,545	486	" "
1924-25 ...	2,090	578	" "
1925-26 ...	1,520	659	Rs. 4-8-0 per cwt.
1926-27 ...	1,534	744	" "
1927-28 ...	1,450	653	" "
1928-29 ...	1,586	782	" "
1929-30 ...	1,836	846	" "
1930-31 ...	1,047	1,081	Rs. 6-0-0 per cwt.
1931-32 ...	590	798	Rs. 9-1-0 " (Rs. 7-4-0 being protective and Re. 1-13-0 being revenue surcharge from 1st April 1932.)
1932-33 ...	422	685	" "
1933-34 ...	270	472	" "
1934-35 ...	210	381	Rs. 9-1-0 per cwt. (Rs. 7-12-0 being protective & Re. 1-5-0 being equivalent excise duty from 1st April 1934.)
1935-36 ...	190	324	" "
1936-37 ...	23	51	" "
1937-38 ...	18	25	Rs 9-4-0 per cwt. (Rs. 7-4-0 being protective and Rs. 2-0-0 being equivalent excise duty from 28th February 1937.)
1938-39 ...	45	45	" "
1939-40 ...	331	396	Rs. 8-12-0 per cwt. (Rs. 6-12-0 being protective & Rs. 2-0-0 being equivalent excise duty. (With effect from 1st April 1939.)
1940-41 ...	36	18	Rs. 6-12-0 being protective and Rs. 3-0-0 being equivalent excise duty. (With effect from 1st March 1940.) Rs. 9-12-0 per cwt.
1941-42 ...	107	1·9	
1942-43 ...	...	·5	Rs. 11-1-7 1/5 per cwt. with effect from 1st April 1942 (i.e. including 20% surcharge on ordinary import duty of Rs. 6-12-0) and Rs. 3-0-0 being equivalent excise duty.
1943-44 ...	...	4·1**	
1944-45 ...	...	3·5**	

* Annual statement of sea-borne trade (Burma excluded from 1937-38).

** These figures appear to be too large, looking to imports reported to be negligible. On an enquiry, however, we were informed that they represent duty collected in those years on sugar released from Bond out of stock imported during 1941 and 1942.

TABLE No. 33

Java Sugar Statistics from 1935-36 to 1940-41*

(In Long Tons)

Crop Year	Initial Stock on 1st April	Production	Exports	Local Consumption	Final Stock on 31st Mar.
1935-36 ...	1,585,397	505,528	863,356	285,013	942,556
1936-37 ...	942,556	583,029	975,003	309,449	241,133
1937-38 ...	241,133	1,392,151	1,017,276	306,522	309,486
1938-39 ...	309,486	1,376,824	1,163,809	315,922	206,579
1939-40 ...	206,579	1,550,462	1,214,125	304,740	238,176
1940-41 ...	238,176	1,579,697	837,342	351,828	628,703
1941-42 ...	(No reliable	reports availa	ble since occu	pation of Java	by Japanese)

* *Vide Lamborn Weekly Report*, issue of June 24th, 1941.

TABLE No. 34

An interesting Table regarding *Per Capita* Consumption of Gur and Sugar in certain Rural and Urban Areas* in pre-war period (1937-38)

Name of Province	Gur		Sugar	
	Urban areas (lb.)	Total for the Province (lb.)	Urban areas (lb.)	Total for the Province (lb.)
United Provinces ...	13·2 (1)	53·9	58·1 (2)	8·3
Punjab	18·0 (3)	23·3	50·4 (4)	12·8
Bengal	15·4 (5)	22·8	85·5 (5)	6·3
Madras	8·9 (6)	12·1	51·2 (6)	4·4
Bombay	12·4 (7)	14·4	81·4 (7)	16·3
Sind	6·0 (8)	7·2	82·1 (8)	17·8

(1) 22 markets, (2) 29 markets, (3) 6 markets, (4) Delhi, (5) Calcutta, (6) Madras, (7) Bombay, (8) Karachi.

* Report on the Marketing of Sugar published by Central Agricultural Marketing Department (Government of India), 1943, p. 130.

TABLE No. 35

Statement showing Sugar Production and Quotas allotted for Civilian Consumption for the Quota Year 1943-44

Areas	Production during 1943-44 (Tons)	Quota from		Total quota for civilian consumption for 1943-44	Total quota for 1944-45
		Local Production (Tons)	U. P. & Bihar (Tons)		
Assam	.....	.....	16,000	16,000	
Baluchistan ...	.....	.....	4,700	4,700	
Bengal & States ...	13,649	13,649	1,34,351	1,48,000	
Bombay & States ...	1,03,225	80,181	1,27,819	2,08,000	
Central India ...	12,172	12,172	12,828	25,000	
C. P. & States ...	.....	.....	38,000	38,000	(Approx. 9,50,000 tons)
Delhi	.....	.....	19,000	19,000	
Hyderabad ...	17,467	17,467	.....	18,000	
Jammu & Kashmir ...	15	15	5,985	6,000	
Madras & States ...	66,858	66,858	43,042	1,09,900	
N.-W. F. P. ...	6,253	6,253	11,247	17,500	
Orissa	1,695	1,695	6,305	8,000	
Punjab & States ...	28,348	28,348	1,39,652	1,68,000	
Rajputana ...	2,179	2,179	38,821	41,000	
Sind & States ...	.....	.....	31,200	31,200	
U. P. & States ...	7,59,436	1,38,500	.....	1,38,500†	
Bihar	2,12,809	53,500	.....	53,500	
Khandsari Sugar ...	80,000†	.....	.....	.....	
Total ...	13,04,106	4,20,817	6,28,956	10,86,300**	

* Estimated.

** Includes 44,000 tons of khandsari sugar allotted outside the U. P. and 36,000 tons estimated consumption of khandsari sugar in the U. P.

† The U. P. is allotted a further quota of 36,000 tons of khandsari sugar in 1943-44

N. B.—The figures of allotment quota are collected from official sources. But as the cane-crushing season of 1944-45 has not yet been closed and returns of sugar production from Madras, Bengal and Bombay were not available so far, the allotment quotas are provisional and should be taken as such. The quotas have not been finalised at the time this volume has been sent to press and readers may kindly note that there might be some difference in final figures.

NOTE.—Where States are not shown separately their quotas are included in the British Indian Provinces adjoining them.

According to the Sugar Controller of India, Annual quotas for the Provinces and Indian States are fixed by him on the basis of consumption averages during the year 1934-35 to 1938-39. The sugar allowed for civilian consumption in 1942-43 may perhaps be 25 per cent less than the consumption requirements of the country which have appreciably increased as compared with the average of the pre-war years. The population in many towns and cities has increased even as compared with 1941 census figures. There has been a large influx of refugees in the country. The Allied forces stationed in the country have also increased. Again, conditions now are more prosperous than before and this has naturally resulted in a change in the social habits of the people leading to a higher demand for luxury foodstuffs.

Non-varying price for cane in U. P. and Bihar in 1943-44 Punjab and Bengal Fix Higher Prices

Early in November, 1943, the Government announced an increase in the minimum price of cane in U. P. and Bihar from As. 10 a maund which was the price in the 1942-43 season, to As. 12 a maund of cane. At the same time, the factories were directed not to pay the full price to the cane-grower all at once. One-sixth of the price, i.e. two annas a maund, was to be paid in Defence Savings Bonds or Certificates which were to be cashed one year after the war was over. The Government expected that on the basis of production of 9 lakhs tons of sugar in U. P. and Bihar, nearly Rs. 3 crores would thus be withheld from circulation and be of assistance in their anti-inflationary tendencies. The Punjab Government, finding that factories were unable to get cane at Rs. 0-12-0, fixed Rs. 0-14-6 per maund, and the Bengal Government fixed Re. 1 per maund.

Special Reduction in Cane Price towards the fag end of the Season, 1943-44

With effect from 15th May, 1944, the U. P. Government announced a reduction of Rs. 0-2-0 in the price of cane, i.e. to Rs. 0-10-0 per maund, in order to induce factories to continue crushing and produce maximum quantities of sugar. The full amount was to be paid straight to cane-growers.

Discontinuance of Additional Special Cess of Rs. 0-0-6 per maund of Cane in U. P. and Bihar in 1943-44

Additional Cess of 0-0-6 per maund of cane imposed in 1940-41 to repay the deferred excise duty, for which an amount of Rs. 1,50 crores was borrowed from the Government of India, with a view to enable the Governments of U. P. and Bihar to give a temporary rebate of one rupee per maund of the excise duty, was discontinued from 1943-44 season, as the amount was fully collected and as the sum, along with the interest, was repaid to Government of India.

Raising of Ordinary Cess on Cane from 0-0-3 to 0-1-0 per maund in U. P. and Bihar in 1943-44

The rate of ordinary Provincial cess on cane which was 0-0-3 per maund was, however, raised to 0-1-0 per maund with effect from 1943-44, in U. P. and Bihar, in spite of the protests of the industry. The proceeds of this cess will be credited to Provincial Revenues as usual. No portion of this cess is earmarked for any specific purposes. But in 1942-43, the U. P. Government spent a substantial amount from the General Revenues on (*i*) Cane Development Department, (*ii*) the staff for reservation and bonding of sugarcane, (*iii*) the seasonal staff maintained for the administration of the United Provinces Sugar Factories Control Act, 1938, and the rules made thereunder, (*iv*) the Sugar Commission, (*v*) the special staff maintained at the Imperial Institute of Sugar Technology in connection with the technical and statistical work entailed by the Sugar Factories Control Act and Rules, and (*vi*) the staff maintained in connection with the Sugar Control Scheme of the Government of India.

The U. P. Government realized Rs. 61,07,755, as cess on sugarcane during the financial year 1942-43. This also includes the proceeds of the additional cess of 0-0-6 per maund of cane levied in order to recover the loan advanced by the Government of India in the form of deferred sugar excise duty with a view to assist the sugar industry of the province.

The sum advanced by the Government of Bihar to the industry in Bihar a few years ago in connection with Excise Duty has not yet been recovered in full. There was a sum of Rs. 5,70,000 yet to be realized at the end of November 1943. But the special cess on cane was discontinued from 1943-44.

The total amount collected from the Cane Cess in Bihar in 1942-43, was Rs. 22,74,000 of which Rs. 7,58,000 represented the ordinary cess and Rs. 15,16,000 represented the special cess for repayment of loan to the Government of India.

In Bihar also, the income from the cane cess is merged in the Provincial Revenue and no separate account is maintained of the expenditure from cess. The annual expenditure incurred by Government on the Cane Development and other schemes related to sugarcane generally covers a large portion of the proceeds from the ordinary cess.

The Chairman, Sugar Commission of U. P. and Bihar assured the industry, however, (*vide* his letter to the Sugar Mills Association, No. 5784|Com. E-7, dated the 22nd September, 1943) that "the proceeds of the cess though credited to General Revenues will in due course be utilized for the benefit of the industry and the growers".

Cane Prices and Cane-cess During 1944-45 Season in U. P. and Bihar

In October, 1944, the Sugar Controller for India, after consulting his Advisory Committee, announced an increase of Rs. 1-7-0 in the sugar price, thereby fixing the price of sugar of the standard quality (D. 24) at Rs. 16-4-0 per maund. The Governments of U. P. and Bihar on the basis of this increase fixed a cane price of As. 14|-. Thus the minimum price of cane for the season 1944-45 was fixed at annas fourteen per maund of cane exclusive of cess to be paid by all factories. An exception was made in the case of the Gokulnagar Sugar Factory at Kichha, the cane price in the case of which was fixed at 12 annas per maund. As in the previous year, the two Provincial Governments levied compulsory deductions from the cane price for investing in the National Savings Certificates. In U. P. compulsory deductions were as follows:—

		Rs. a. p.
1.	Kichha Factory	0-1-0
2.	Factories in Gorakhpur Division	0-2-0
3.	Ratna and Aira Sugar Factories	0-2-0
4.	All other Factories	0-3-0

In Bihar, the Government at the very commencement of the season fixed a cane price of 14 annas and ordered a uniform deduction of 0-2-0 for National Savings Certificates from the cash price. As the season advanced, it was found that the cane price for ryots seemed low in view of the bad crop in Bihar. As the industry considered the price of Rs. 0-14-0 inadequate, a deputation of industrialists waited on His Excellency the Governor of Bihar towards the beginning of December, 1944. In response to the demand of the industry the Governor agreed to abolish the cess of one anna in the case of Bihar factories and permit this amount to be added on to the cane price. With effect from 16-12-1944 the cess of one anna was abolished and the cane price was raised to Rs. 0-15-0 per maund in the case of Bihar. The compulsory deduction in the case of Bihar was fixed at a uniform rate of two annas per maund.

It may be noted that the Governments of U. P. and Bihar also abolished the compulsory deductions from cane prices paid to the cultivators with effect from 25th January, 1945, in response to the requests of the industry. This salutary measure came none too early as it was recognised to be long overdue, both in the interests of the cultivators and the future of the sugar industry.

Cane Prices in Other Provinces

Madras

The basic minimum prices of sugarcane were fixed by the Government of Madras for the season 1943-44 ranging from Rs. 17 to Rs. 20 per ton in accordance with the costs of transport of cane to the factory from the field. In view of the increase in price of sugar announced by the Sugar Controller, prices for sugarcane for the current season of 1944-45 were fixed at between Rs. 20|8|- to Rs. 24|- per ton.

Mysore

The minimum price fixed for sugarcane in Mysore for the factory at Mandya for the 1943-44 season was Rs. 18 per ton. In view of the increase in the ex-factory price of sugar by Rs. 1-7-0 per maund with effect from 20th October, 1944, a proportionate increase in cane-price was under contemplation of the Mysore authorities before the season could start.

M. P. GANDHI.

Bombay, 30th July 1945.

"THE SUGAR INDUSTRY AT A GLANCE"
(1944)

SUGAR INDUSTRY (PROTECTION) ACT, 1939*

(Present Duties to continue till 31st March 1946)

ACT NO. XX of 1939

An Act to provide for the continuance for a further period of the protection conferred on the sugar industry in British India.

Whereas it is expedient to provide for the continuance for a further period of the protection conferred on the Sugar Industry in British India, and to extend the date before which the Central Government is required under Section 3 of the Sugar Industry (Protection) Act, 1932, to lay before the Indian Legislature the proposals referred to in the said Section;

XIII of 1932

It is hereby enacted as follows:—

Short Title

1. This Act may be called the Sugar Industry (Protection) Act, 1939.

Amendment of Sec. 3 of Act XIII of 1932†

2. In Section 3 of the Sugar Industry (Protection) Act, 1932, for the figure "1939" the figure "1941" shall be substituted.

Amendment of First Schedule to Act XXXII of 1934‡

3. In Item No. 17 of the First Schedule to the Indian Tariff Act, 1934:—

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* Received the assent of the Governor-General on March 31, 1941. For the Sugar Industry (Protection) Act, 1932, and the Sugar Industry (Temporary Extension) Act, 1938, *see* 1939 Sugar Industry Annual, pages 1 to 4.

† As amended, Section 3 of Act XIII, 1932, viz. the Sugar Industry (Protection) Act, 1932, will read as under:—

3. The Governor-General-in-Council shall cause to be made by such persons as he may appoint in this behalf, an inquiry to ascertain if the protection of the sugar industry during the period from the 31st day of March 1941 to the 31st day of March 1946, should be continued to the extent conferred by this Act, or to a greater or lesser extent, and shall, not later than 31st day of March 1941 lay his proposals in this behalf before the Indian Legislature.

‡ As amended, Item No. 17 of the First Schedule to the Indian Tariff Act, 1934, will read as follows:—

17. Sugar, excluding confectionery	Protective	The rate at which excise duty is for the time being leviable on sugar, other than *khandasari* or *palmyra* sugar, produced in British India plus Rs. 6-12-0 per cwt.	Upto 31st March 1946

(*a*) In the fourth column, for the words and figures "plus Rs. 7-4-0 per cwt." the words and figures "plus Rs. 6-12-0 per cwt." shall be substituted;

(*b*) In the last column, for the figures "1939" the figure "1941" shall be substituted.

It is hereby declared that it is expedient in the public interest that Clause 3 of this Bill shall have immediate effect under the Provisional Collection of Taxes Act, 1931.

By the Protective Duties Continuation Act 1942, the import duty on sugar was continued on the same level up to 31st, March, 1944.

By the Protective Duties Continuation Act 1944, the existing protective duties on sugar [as also wood pulp, paper, silk manufactures, gold and silver thread and wire, (including the so-called gold thread and wire mainly made of silver), *and* iron and steel manufactures] *were continued for a further period of two years, that is, upto 31st March, 1946.*

It was observed in the Statement of Objects and Reasons that "in the present unsettled conditions no suitable date on the basis of which enquiries by a Tariff Board can be instituted is available. In the absence of such enquiries it is not possible to ascertain the quantum of protection required during normal years and the object of this Bill is to maintain the *status quo* for a further period of two years, that is, upto 31st March, 1946.

Note:—The total import duty on sugar (including the equivalent excise duty of Rs. 3 per cwt. and the surcharge of 20 per cent imposed with effect from the 1st April 1942) amounts to Rs. 11-1-7 1/5 per cwt. with effect from 1st April 1944. It will be continued upto 31st March, 1946.

SUGAR EXCISE DUTY ACT, 1934

(Incorporating amendments made upto March 1940)

An Act to provide for the imposition and collection of an Excise Duty on Sugar.

(For Text of the Act, refer to earlier issues of the Annual.)

INTERNATIONAL SUGAR AGREEMENT.

India does not join after September 1942.

"India was a party to the International Sugar Agreement which was concluded in 1937 with a view to establishing and maintaining an orderly relationship between supply and demand of sugar and to regulate the world prices of sugar. Under this agreement India undertook to prohibit exports of Indian sugar by sea elsewhere than to Burma.

India was released from this obligation not to export sugar by sea, with effect from 1st September 1942, the Government of India having decided not to join in the proposed extension of the International Sugar Agreement.

U. P. AND BIHAR GOVERNMENTS' ACTS

SUGAR CONTROL BOARD (1944-45)

The following persons have been nominated members of the reconstituted Sugar Control Board of U. P. & Bihar by a Notification dated 26th June, 1944, for a period of one year from 1st July, 1944.

The Adviser to H. E. the Governor of U. P., Revenue; The Adviser to H. E. the Governor of Bihar, Development; Mr. D. R. Narang, Basti Sugar Mills Ltd., Basti; Mr. C. O'Malley, Begg, Sutherland & Co. Ltd., Cawnpore; Mr. R. L. Nopany, Calcutta; Lala Gurusharan Lal, Gaya Sugar Mills Ltd., Bihar; Mr. N. A. Shervani, Etah; Lala Har Sahai Gupta, Shanker Agricultural Farm, Bilari (Moradabad); Raja Raghuvendra Pratap Narain Singh, M.L.A., Gonda; Mr. Nasirullah Rahman Kidwai, Bara Banki; Mr. Jamuna Karjee, M.L.A., Darbhanga, Bihar; Chaudhury Kalika Prasad Roy, Bihar; Mr. Satyapal Varma, Cawnpore; Secretary to the Government of Bihar, Development Department and Employment Department; Secretary to the Government of U. P. in the Agricultural Department.

U. P. AND BIHAR SUGAR COMMISSION

In August 1940, the U. P. and Bihar Governments set up a joint "Sugar Commission, which would be the final authority, subject to Government control, on all matters connected with the production and sale of sugar, as well as other matters regarding cane prices, etc." It may be observed that since the institution of Central Control over the industry, the Sugar Controller for India exercises some of the powers relating to sale, cane price fixation, etc. in the interests of an all-India policy and to that extent directs the Sugar Commission and its Chairman in the discharge of their duties.

The Chairman of the Commission is Mr. K. R. Malcolm, I.C.S., who succeeded Mr. J. E. Pedley in 1944. The Cane Commissioners of U. P. and Bihar are *ex-officio* members of the Commission. They are also *ex-officio* members of the Board of Directors of the Indian Sugar Syndicate Ltd. The office of the Sugar Commission is located at Cawnpore.

The Chairman of the Commission also acts as Provincial Sugar Controller for U. P.

U. P. AND BIHAR SUGAR FACTORIES CONTROL ACT

During 1942 the Bihar and U. P. Governments proposed an amendment to the Control Acts with a view to maintain the continuity of work and to continue the operation of the Acts till the end of the crushing season 1946-47. A copy of the Statement of Objects and Reasons was given in the previous Annual.

In November 1944, the United Provinces Government made certain amendments to the U. P. Sugar Factories Control Rules, 1938. Under the new amendment a Technical Committee consisting of six members was proposed to be

set up to plan and organise and direct the technical problems concerning the sugar industry in U. P. The Director of Imperial Institute of Sugar Technology and the Cane Commissioner of U. P. shall be appointed as *ex-officio* members of the Committee and the remaining four shall be nominated by the Government after consulting the Indian Sugar Syndicate Ltd.

The functions of the Technical Committee shall be to advise the Provincial Government with regard to (*a*) the establishment of new sugar factories in the Province or additions or alterations in the existing plants of the sugar mills (*b*) and to advise on any other technical and incidental matters connected with the sugar mills referred to it from time to time by the Sugar Commissioner or the Provincial Government. The office of the Technical Committee is to be located at Cawnpore.

GOVERNMENT OF INDIA : DEPARTMENT OF FOOD

SUGAR AND SUGAR PRODUCTS CONTROL ORDER, 1943

(As amended upto 30th June, 1945)

No. 1-Sc. (1)/43 :—In exercise of the powers conferred by the Sub-rule (2) of Rule 81 of the Defence of India Rules and in supersession of the Sugar Control Order, 1942, published with the Notification of the Government of India in the Department of Commerce, No. 1-SC(6)/42, dated the 29th June 1942, and modified by subsequent notifications the Central Government is pleased to make the following Order, namely:—

1. (1) This Order may be called the Sugar and Sugar Products Control Order, 1943.

(2) It extends to the whole of British India.

(3) It shall come into force at once.

2. In this Order unless, there is anything repugnant in the subject or context,

(a) "Controller" means the person appointed as the Sugar Controller for India by the Central Government, and includes any person authorised by the Controller to exercise all or any of the powers of the Controller under this Order;

(b) "dealer" means a person carrying on business in the purchase, sale or distribution of sugar or sugar products;

(c) "*ex*-factory price" means price of sugar inclusive of excise duty, packed in accordance with the usual market practice, and loaded at the buyer's option, on buyer's carts, lorries or other means of transport, or into railway wagons at the railway station or siding generally used by the producer, and all incidental charges including those for siding and forwarding, being on account of the *ex*-factory seller;

(d) "producer" means a person carrying on the business of manufacturing sugar or sugar products or both with the aid of electrical energy or any other form of energy which is mechanically transmitted, and is not generated by human or animal agency;

(e) "recognised dealer" means a dealer who has been recognised as such by the Controller for purposes of this Order;

(f) "sugar" means any form of sugar containing more than 90 per cent of sucrose;

(g) "sugar product" means any article manufactured from, and containing sugar not less than 50 per cent of its weight.

3. No producer shall, dispose of, or agree to dispose of, make delivery of, any sugar, except—

(i) to or through a recognised dealer, or

(ii) to a person specially authorised in this behalf by the Controller to acquire sugar on behalf of the Central Government or of a Provincial Government or of an Indian State.

4. (1) If the Controller has reason to believe that the production of special types of sugar or sugar products is likely to affect adversely the production of adequate quantities of ordinary sugar, he may, by general or special order, prohibit, or limit to such quantities as may be specified in the order, the manufacture by any producer or by producers generally of such types or grades of sugar or sugar products as the order may specify, and no producer to whom such order applies shall manufacture any sugar or sugar products in contravention thereof.

(2) For the purposes of sub-clause (1), "producer" includes a person carrying on the business of manufacturing any form of sugar containing more than 90 per cent sucrose including Khandsari sugar, Desi sugar and Bura.

5. Every producer and dealer shall comply with such directions regarding the sales, stocks or distribution of sugar or sugar products as may from time to time be given to him by the Controller.

6. (1) The Controller may, from time to time, fix by notification in the *Gazette of India* the price or maximum price at which any sugar or sugar product may be sold or delivered, and different prices may be so fixed by him for different areas or different types of grades of sugar or sugar products.

(2) Where the price or the maximum price has been so fixed :—

(*a*) the price at which such sugar or sugar product may be sold for delivery otherwise than ex-factory shall not exceed the price or the maximum price as the case may be fixed under sub-clause (1) for sale ex-factory plus such charges in respect of transport to or in specified areas and other incidental charges as are approved by the Controller;

(*b*) no person shall sell or purchase or agree to sell or purchase such sugar or sugar product at a price higher than that fixed under the provisions of sub-clause (1).

7. (1) The Controller may, from time to time—

(i) allot quotas of sugar or sugar products or of both for the requirements of any specified province, or area, or market,

(ii) issue directions to any producer or dealer to supply sugar or sugar products to such provinces, areas or markets or such persons or organisations, in such

quantities, of such types or grades, at such times, at such prices and in such manner as may be specified by the Controller, and

(iii) require any producer or dealer to keep in reserve stocks of sugar or sugar products in such quantities and of such types and grades as he may direct from time to time.

Provided that where price or maximum price of any sugar or sugar product has been fixed in accordance with sub-clause (1) of clause 6 the Controller shall in respect of such sugar or sugar product specify the price or maximum price under para (ii) of this sub-clause accordingly.

(2) Every producer shall, notwithstanding any existing agreement with any other person, give priority to, and comply with, any directions issued to him under sub-clause (1).

8. (1) No sugar shall be transported, or offered or accepted for transport, whether by rail, road or water, and whether by a railway servant, common carrier or other person, except under and in accordance with the terms of :—

(*a*) a general or special permit issued by the Controller in this behalf; or

(*b*) A Military credit note.

Provided that nothing in this sub-clause shall apply to the transport of sugar not exceeding 20 seers as part of the personal luggage of a *bona-fide* traveller.

(2) A permit issued in pursuance of sub-clause (1) shall be returned by the consignor to the Controller on completion of despatch, or on expiry of the period of its validity, whichever is earlier, with the particulars of actual despatches in the prescribed form.

(3) For the purposes of this clause "sugar" means sugar manufactured by any process, including sugar made in vacuum pan factories from cane or gur or palmyrah jaggery, as well as khandsari sugar, sugar candy (misri) and Bura.

9. The Controller may, by notification in the official Gazette, make rules for carrying into effect the purposes and objects of this Order.

10. Notwithstanding the supersession of the Sugar Control Order, 1942, all notifications, rules, orders, authorizations, quotas, requirements, and directions issued thereunder shall, so for as they are not inconsistent with this Order, be deemed to have been made hereunder, and they shall continue in force until rescinded or modified hereunder.

11. If any person contravenes the provisions of this Order, then without prejudice to any other punishment to which he may be liable, any court trying the offence may order that any stocks of sugar or sugar products, together with the packages and coverings thereof, in respect of which the court is satisfied that the offence has been committed, shall be forfeited to His Majesty.

GOVERNMENT OF INDIA: DEPARTMENT OF FOOD

GUR CONTROL ORDER, 1943

(With amendments up to date)

No. 11-S.C.(6)/43-I :—In exercise of the powers conferred by sub-rule (2) of rule 81 of the Defence of India Rules, the Central Government is pleased to make the following Order:—

1. (1) This Order may be called the Gur Control Order, 1943.

(2) It extends to the whole of British India.

(3) It shall come into force at once.

2. In this order, unless there is anything repugnant in the subject or context,

(a) "Controller" means the person appointed as Gur Controller for India by the Central Government, and includes any person authorised by the said Controller to exercise all or any of the powers of the Controller under this Order;

(b) "dealer" means a person dealing in the purchase, sale, or distribution of Gur;

(c) "producer" means a person carrying on the business of producing Gur;

(d) "Gur" means articles commonly known as Gur, Gul, jaggery, palmyra jaggery, shakkar and rab, and includes raw sugar as also uncrystallised sugar in any other form comprising of original and convertible molasses and other impurities, inherent or foreign, prepared by boiling cane or palmyra juice;

(e) "Sugar" means any form of sugar containing more than 90 per cent of Sucrose.

3. The Controller may, from time to time, fix by notification in the official Gazette for any specified area the maximum prices at which Gur may be sold or delivered, and different rates of prices may be so fixed by him for different areas or different types or grades of Gur.

4. Every producer and dealer shall comply with such directions regarding the production, sales, delivery, stocks, distribution or prices of Gur as may from time to time be given by the Controller.

5. If in the opinion of the Controller the unregulated production of Gur in any area is likely to affect adversely the production of sugar in quantity which in his opinion is required for the needs of the community, he may, by order published in the official Gazette, provide for all or any of the following matters:—

(a) prohibit or restrict the export of sugarcane to any place outside that area;

(b) direct that cane growers in that area shall deliver sugarcane to a specified sugar factory or factories in accordance with such conditions in regard to quantity, price, and time of delivery as may be specified by the Controller;

(c) prohibit, or restrict to such quantities or qualities or both as may be specified by the Order, the manufacture of Gur by all or any class of producers in the said area.

6. (1) The Controller may, from time to time—

(i) allot quotas of Gur for the requirements of any specified province or area, or of any specified market, and

(ii) issue directions to any producer or dealer to supply Gur to such areas or markets or such persons or organisations, in such quantities, of such types, or grades, at such times, at such prices and in such manner as may be specified by the Controller.

(2) Every producer or dealer shall, notwithstanding any existing agreement with any other person, give priority to, and comply with, any directions issued to him under sub-clause (1).

7. No Gur, shall, after such date and from such area as the Controller may notify in this behalf, be offered for transport by railway or in any manner whatsoever by land or river by a consignor or accepted by a railway servant or by any person whatsoever for transport or trasported by rail, road or river except under a permit issued by the Controller in such form and subject to such conditions and in respect of such areas as he may from time to time prescribe:

Provided that this clause shall not apply to the transport by railway or in any manner whatsoever by land or river of Gur (a) by a *bona fide* traveller as part of his personal luggage or (b) under and in accordance with military credit notes or (c) under and in accordance with a permit issued by a Provincial authority before the date of this Order.

Explanation.—For the purposes of this clause Gur not intended for the personal use of the traveller and members of his family shall not be deemed to be his personal luggage.

8. The Controller may, by notification in the Official Gazette, make regulations for carrying into effect the purposes of this Order.

9. If any person contravenes the provisions of this order, then without prejudice to any other punishment to which he may be liable, any court trying the offence may order that any stocks of gur, together with the packages and coverings thereof, in respect of which the court is satisfied that the offence has been committed, shall be forfeited to His Majesty.

Control over Movement of Gur

Under a Food Department Notification No. II S.C. (9)/44 dated the 25th March 1944, Gur Controller for India announced that no gur shall be offered for transport by railway by a consignor or accepted by a railway or transported otherwise by land or water from any place outside the area specified by him to any other place except under a permit issued by the Gur Controller for India.

The specified areas are Gur surplus areas from which no gur could be moved to other provinces except under a permit from the Government. The order placed a ban on all private movement of gur from one area or province to another.

THE UNITED PROVINCES MOLASSES CONTROL ORDER, 1944

With a view to regulate the prices and disposal of Molasses in U.P., the Government promulgated by a notification dated the 13th March 1944, the United Provinces Molasses Control Order. Similarly the Bihar Government

also instituted control over molasses and directed disposal of them. A summary of the important provisions of the U. P. Molasses Control Order is given here:—

Clause 3 of the Order reads:—

(i) Every owner or occupier of a sugar factory shall furnish to the Excise Commissioner, U. P., in a specified manner returns relating to stocks of molasses in his possession as required.

(ii) Any person, other than the owner or occupier of a sugar factory, holding stocks of molasses shall furnish to the Controller such returns relating to the stocks of molasses in his possession as required.

Clause 4 of the Order lays down that no person shall export, or cause to be exported by rail, river or road, molasses outside the United Provinces except on such terms and conditions as may be prescribed by the Excise Commissioner or Controller as the case may be.

Under clause 6 of the Order no person shall move by rail or river from any place in the United Provinces to any other place in the United Provinces except with the permission of the Excise Commissioner or Controller as the case may be.

In pursuance of clause 8 of the United Provinces Molasses Control Order, 1944, the Governor was pleased to direct that the molasses mentioned in the statement below shall not be sold or offered for sale in the area noted against each at prices higher than those mentioned against it. The prices are ex-factory prices and inclusive of the cost of loading a tank wagon where transport is by rail and of filling the containers where transport is (*a*) by rail but not in a tank wagon or (*b*) by any means other than by rail.

Serial No.	Kind of Molasses	Area	Maximum Price per maund	
			Ordinary or liquid molasses	Cheeta or concentrated molasses
			Rs. a. p.	Rs. a. p.
1	Cane molasses the final residual by-product of sugar factories manufacturing sugar from sugar foctories.	Meerut Division.	0 6 0	1 0 0
2	Cane molasses the final residual by-product of sugar factories manufacturing sugar from sugar-cane served by railway stations on the Broad Gauge or by stations both on the Broad Gauge & the Metre Gauge.	Any place in U.P. except the Meerut Division.	0 4 0	0 12 0
3	Cane molasses the final residual by-product of sugar factories manufacturing sugar from sugar-cane served by railway stations on the metre gauge only.	Do.	0 2 0	0 8 0
4	Gur molasses the final residual by-product of sugar refineries operating on vacuum pan system.	Any place in U.P.	0 6 0	1 0 0

INDIAN CENTRAL SUGAR-CANE COMMITTEE FORMED IN 1944

The Government of India announced their decision to set up a Central Sugar-cane Committee by a resolution No. F 41-24/43A dated 6th June 1944, of the Education, Health and Lands Department.

The following is the text of the Government resolution, dated 6 June 1944, published in the *Gazette of India.*

Taking into account the expansion of sugar-cane research work and envisaging considerable further developments in the near future and the need for post-war re-adjustments, the Sugar Committee of the Imperial Council of Agricultural Research in October 1941, recommended that a Central Sugar Committee should be constituted on the lines of the Indian Central Cotton Committee and with somewhat similar powers and functions. This resolution was endorsed by the Governing Body of the Imperial Council of Agricultural Research in July, 1942. The Government of India agreeing with the Sugar Committee and the Imperial Council of Agricultural Research, have eccepted this recommendation in principle and decided to set up a Central Sugar-cane Committee, which will be a body corporate registered as a society under the Registration of Societies Act (XXI of 1860) with Head Quarters at Delhi or such other place as the Committee may decide.

Functions :—The functions of the Indian Central Sugar-cane Committee will be to undertake the improvement and development of the growing, marketing and manufacture of sugar-cane and its products in India and of all matters incidental thereto. This includes items such as agricultural, technological and economic research on sugar-cane, gur, sugar and their by-products, the improvement of crop forecasting and statistics, the production, distribution and testing of improved varieties, the adoption of improved cultural practices, enquiries and recommendations relating to banking and transport facilities and transport routes, the maintenance of an Institute of Sugar Technology and other similar matters. The control over the Institute of Sugar Technology will vest in the Committee along the lines indicated later. The Committee will also advise the Central and Provincial Governments concerned on any points which may be referred to it by them, provided the subject matter of the reference falls within the prescribed functions of the Committee.

Constitution :—It is desirable that the growers, the manufacturers and the traders should be fairly represented on the Committee. Subject to a reserve power of nomination by the Governor-General-in-Council so as to permit of appointments to the Committee to meet requirements that may vary from time to time, the Committee will be constituted as follows :—

(1) The Vice-Chairman, Imperial Council of Agricultural Research, who shall be *ex-officio* President of the Committee.
(2) The Agricultural Commissioner with the Government of India.
(3) The Director, Imperial Agricultural Research Institute.
(4) The Director, Imperial Institute of Sugar Technology.
(5) The Agricultural Marketing Adviser to the Government of India.

(6) The Imperial Sugar-cane Expert.

(7)-(14) The Directors of Agriculture, Madras, Bombay, Bengal, United Provinces, Punjab, Bihar, Mysore and Hyderabad or their nominees.

(15)-(16) The Cane Commissioners, United Provinces and Bihar.

(17)-(25) Nine representatives nominated by the Indian Sugar Mills Association, of whom at least two shall be representatives of the Indian Sugar Producers' Association, one representative of the Deccan Sugar Factories Association, one of the Indian Southern Provinces Sugar Marketing Board and one of the Bengal Sugar Mills Association.

(26) One representative of Sugar Factory Owners nominated by the Governor-General-in-Council.

(27)-(30) Four representatives of the Gur and Khandsari Industry nominated by the Governor-General-in Council.

(31)-(38) Eight non-officials representing agricultural interests, one nominated by the Government of Madras, one by the Government of Bengal, two by the Government of United Provinces, one by the Government of Punjab, one by the Government of Bihar and two by the Governor-General-in-Council to represent other areas.

(39)-(41) Three representatives of Sugar Trade—one nominated by the Bombay Sugar Merchants' Association, one by the Cawnpore Sugar Merchants' Association and one by the Indian Sugar Syndicate.

(42)-(44) Three representatives nominated by the Governor-General-in-Council to represent the consumers.

(45) One representative of Sugar Technologists nominated by the Governor-General-in-Council.

The tenure of the appointment of the members of the Committee other than those who are appointed by reason of the office or appointment they hold, will be three years with effect from the 1st April of the year in which they are appointed or such lesser period as may be specified in the notification.

The Secretary of the Committee, who will not be a member of it, will be appointed by the Governor-General-in-Council, but he will be paid from the funds of the Committee. The Director of the Institute of Sugar Technology will continue to be a servant of the Government of India. His salary and allowances will also be paid from the funds of the Committee, but the Government of India have agreed to meet his leave and pension contribution. The Committee will continue to employ at the Institute of Sugar Technology from its own funds such staff as has been tent to the Institute by the Government of the United Provinces on the same basis on which they are at present employed by the Government of India, as also such other staff as are at present on contract till such time as contracts expire.

The Committee will continue to maintain the Imperial Institute of Sugar Technology both as a teaching and as a research institution and will be responsible for the maintenance of sugar standards. Returns under the Sugar Production Rules, the maintenance of sugar trade information services and any special work

that may be required by the Central or by any Provincial Government will be directly under the control of the Director of Institute of Sugar Technology.

Funds of the Committee:—The Government of India will finance the Committee by placing at its disposal the entire proceeds of the Sugar Excise Fund; the amount so credited shall continue to be one anna per cwt. of white sugar produced in British India out of the excise duty levied on it. The question of increasing this amount will be considered after the war. If the amount placed in the Fund in any year falls short of the needs of the Committee, the Government of India will automatically grant a loan free of interest to cover the deficit and enable the Committee to incur expenditure upto a limit of Rs. 11.75 lakhs in the year subject to the condition that the first charge on any surplus occurring thereafter will be the repayment of this loan. The Committee will meet all the present liabilities of the Fund and take over all its assets.

COMPOSITION OF THE INDIAN CENTRAL SUGARCANE COMMITTEE

Under Department of Education, Health and Lands Notification No. F. 41-1/44A, dated the 11th October 1944, it was announced that the following persons had been nominated as Members of the Indian Central Sugarcane Committee.

The first sixteen seats of the Indian Central Sugar-Cane Committee are given to the Officials of the Government of India and the Provinces. The non-official members representing various interests are:

Lala Gurusharanlal, Mr. R. L. Nopany, Mr. K. K. Birla, Lala Shanker Lal, Mr. D. R. Narang, Mr. C. W. Tosh, Mr. Lalchand Hirachand, Mr. A. A. Khan, Mr. B. P. Dalmia, Dr. Chr. H. Nielsen, Mr. Nasirullah Rahman Kidwai, Mr. Banchhanidhi Kar, Sardar Iqbal Singh of Iqbalnagar, Mr. Jagdish Saran Agarwal, Mr. V. T. Ramaswami Ayyar, Mr. Hamidul Haq Chowdhury, Raja Raghvendra Pratap Narain Singh, Lala Har Sahai Gupta, Sardar Santokh Singh of Shakot, Jullunder, Mr. S. Bose of Hasanli concern, Rao Bahadur Shembhedkar, Mian Abidul Huq, Seth Maneklal Ujamshi, Lala Daya Ram, Mr. Karamchand Thapar, Mr. G. V. Deshmukh, M.L.A., Sir Muhammad Yamin Khan, M.L.A., Hon. Mr. Hossain Imam, Sir T. S. Venkataraman.

Lala Shanker Lal was elected Vice-President.

RESOLUTIONS OF INDIAN SUGAR MILLS ASSOCIATION, 1944

Some Important Resolutions passed at the 12th Annual General Meeting of the Indian Sugar Mills Association held on 16th September 1944.

Shrinkage in Cane Acreage

This Association views with grave concern reports of shrinkage in cane acreage for the season, 1944-45 particularly in Bihar and Eastern U. P. as a result of low sugar and cane prices fixed last year by the Central and Provincial Governments as compared to the general rise in prices of other competitive food crops. The Association regrets that while Government did not agree to increase

the cane prices inspite of Association's several warnings about the possibilities of shrinkage in cane acreage, hardly any steps were taken to ensure that there was no such fall in the area devoted to cane plantation. As a result, this Association apprehends a considerable curtailment in the sugar production of the country in general and in Bihar in particular, and, therefore, urges the Government of India to take immediate steps to maximise sugar production during the season 1944–45, and to ensure that there is an adequate increase in the cane plantation for the season 1945–46.

Distribution of Sugar

This Association regrets that inspite of three years' Government control over the distribution of sugar, its shortage continues and that, at many places people have to pay more than the controlled rates for their requirements. This Association is of considered opinion that besides the necessity of increased production the existing machinery of distribution, which works through official channels and seeks little co-operation from the industry and public, needs a thorough renovation. This Association, therefore, strongly urges the Government to take immediate steps in this direction.

Molasses Control Order in U. P. & Bihar

This Association regrets that the Governments of U. P. and Bihar have promulgated Molasses Control Orders to control the movement of molasses although even the elementary conditions necessary for the control of a commodity, such as shortage in supply or an abnormal rise in prices etc., are completely absent. This Association has all along been opposed to the institution of any control on molasses, because

(1) the supply of molasses in the U. P. and Bihar is far in excess of even the increased demand for molasses.

(2) the average price of molasses obtained by the factories in these two provinces was below the level of the prices of other commodities.

(3) the restriction on the movement of molasses has resulted in the accumulation of huge stocks thereby putting the factories to serious difficulties as regards its shortage, particularly, when new tanks cannot be constructed due to scarcity of materials.

This Association, therefore, urges the two Governments to withdraw the Molasses Control Orders forthwith.

Levy of an Export Duty on Molasses in U. P. & Bihar

This Association protests against the action of the U. P. and Bihar Governments in levying an export duty of Rs. 2/- per maund which has been lately reduced to Re. 1/- per maund. This Association is of the considered opinion that even the reduced duty is disproportionately high as compared to the low prices of molasses which vary between -/2/- to -/8/- per maund.

Restrictions on the Transport of Cane

This Association regrets that the Railways and the Provincial Governments propose to impose restrictions on the transport of cane during the next crushing season which are likely to curtail the cane supplies to the factories very considerably.

This Association invites Government's attention to the peculiar conditions prevailing in the Sugar Industry such as the perishable nature of the raw material, the seasonal nature of its working and the continuous process of manufacture which render it essential that the crushing operations must be carried out within certain time-limits and without any interruptions. This, in the opinion of the Association, is possible only if the Government extend to the sugar factories the necessary transport facilities.

This Association, therefore, urges the Government not to enforce restrictions on transport of cane.

RESOLUTION ON THE MAXIMISATION OF SUGAR PRODUCTION (1945)

The Government of India, Food Department, convened at New Delhi, a Conference of all the representatives of sugar interests and Provincial and State Governments on the *5th February 1945*, to consider measures for the maximisation of sugar production in the country. The Indian Sugar Mills Association was represented at the Conference by Lala Shankerlal, Mr. K. K. Birla, Mr. C. W. Tosh and Mr. Gulabchand Hirachand. The Conference adopted a number of resolutions detailing the steps to be taken for the maximisation of sugar production in India in the immediate post-war years. It is understood that the Government of India have promised to take necessary action to implement the decisions arrived at the Conference.

A summary of the main decisions arrived at the Conference is given below:—

1. That it is the intention of the Government to maximise sugar production in India during the current season and the coming season. Steps shall be taken to step up production during the next season of 1945–46.

2. That efforts would be made to arrange adequate supplies of the following manures for the cane growers: (a) ammonium sulphate, (b) caustic cake, (c) groundnut cake, (d) superphosphate, and (e) neem cake.

3. That Government would also undertake distribution of subsidised manures to cane growers through the factories.

4. That efforts would be made to provide adequate irrigation facilities to the cane growers. In this connection, it was urged that the Government of U. P. be urged to withdraw the increase in the irrigation charges, as enforced by them for the cane growers only.

5. That agricultural machinery such as tractors, etc. would be made available to the factories running their own farms.

6. That the Co-operative Societies undertaking the supply of cane to the sugar factories should resort to selective harvesting, that is, selecting cane cording to maturity so that factories receive fully mature cane giving maximum recovery. This would enable factories to obtain higher recoveries.

7. That the minimum cane price would be declared in early *September* every year.*

8. That facilities would be arranged for the factories which were shifting from deficit cane areas to surplus cane areas to enable them to catch the next season.

9. That the Provincial Governments would not take any action without previous reference to the Government of India, which might adversely affect the sugar production. *In this connection, it was also agreed that the Government of Bombay be urged to exclude the cane growers, whether companies or individuals, from the operation of the Bombay Growth of Food Crops Act, 1944, as that was likely to curtail sugar output of the province during the 1945-46 season.*†

10. That the lack of tranport constituted a serious bottleneck in obtaining cane from outstations and, therefore, efforts should be made to arrange for adequate supplies of trucks, petrol, tubes and tyres and to increase wagon supply on the respective railways with a view to enabling the factories to draw as much cane as possible.

It was also agreed, in this connection, that only a free supply of wagons could improve production during the current season of 1944-45.

11. That steps would be taken to control both the price and movement of Gur effectively.

12. *That the sugar prices would be revised, if necessary, in the light of the recommendations of the Joint Sugar Control Board of the U. P. and Bihar at the end of this crushing season but with retrospective effect.*

———:o:———

A WORLD SUGAR PICTURE AND INDIA'S POSITION THEREIN

DO YOU KNOW (it would be interesting to know) that:

1. Sugar is one of the cheapest, most universally used and palatable seetening agent of proved high calorific value, unique for quick conversion into energy, contains 100 per cent carbohydrate and its value as a prime and vital food is enhanced due to the shortage of carbohydrate in general all over the world.

2. The world production of sugar 1944-45 was only of the order of 19 million tons as compared with 30 million tons in the pre-war year.

* The Editor of this Annual Mr. M. P. Gandhi, when he was a Member of the U. P. & Bihar Sugar Control Board moved such a Resolution in 1938 emphasizing the necessity of an announcement of cane prices, early in September, every year.

† We hope the Bombay Government will do this in the interest of the sugar industry in the Province.

3. It is essential for India to produce larger quantities of sugar both for meeting the increased internal requirements and also for exporting to neighbouring countries which are starved of sugar.

4. The drive for an all out production of sugar can easily result in production of about 15 lacs tons of sugar with the existing capacity of factories in India. When need for further increase in capacity is felt, it would be desirable to locate further factories outside U. P. and Bihar in order to arrange for a proper dispersal of the industry all over the country.

5. If the industry continues to be encouraged, India may eventually become a world sugar market, being one of the greatest sugarcane producers.

6. Approximately two-thirds of the sugar produced in the world is from sugarcane and balance from beet. (90 per cent of the beet sugar comes from the European countries.)

7. Production of sugar (including Gur) in India approximates to 26 per cent of the total cane sugar production of the world and to 16 per cent of the total sugar production in the world, both from cane and beet. (This refers to pre-war period.)

8. The area under cane in India, i.e. 4 million acres, which is only 2 per cent of the cultivated area in India, is approximately 35 per cent of the world's sugar cane area.

9. Taking Gur and sugar together, India is the largest single sugar-producing country of the world.

10. The total quantity of sugar transported by railways in India per year comes to about one-thousandth of the total quantity transported by railways, viz. 90 crores tons.

11. A Sugar Research Foundation has been established in New York in 1943, comprising growers and processors of cane and beet sugar for research work in increasing the consumption of sugar through the development of new industrial uses, and establishment of a proper place of sugar in the diet.*

12. It is worthwhile to explore the possibilities of production of sugar and gur through palm trees in India.†

13. The number of factories, working by the sulphitation process, in India is 144 as compared with 17 working by the carbonatation process which latter can produce superior quality of sugar at a slightly higher cost.

14. The Indian Sugar Industry—the second largest national industry of the country—represents investment of capital to the extent of about Rs. 33 crores.

15. The total annual value of sugar and Gur produced is about 100 crores.

16. The industry gives employment to 3,000 graduates, 1,00,000 skilled and unskilled workers, and interests not less than 20 million cultivators, and helps to retain in the country a sum of Rs. 16 crores which was being sent abroad.

M. P. GANDHI

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* Vide Chapter XIV.
† Vide Appendix III.

PROBLEMS OF SUGAR INDUSTRY IN INDIA

SCOPE AND PROSPECTS OF REORGANIZATION IN POST-WAR PERIOD

By M. P. GANDHI

CHAPTER I

THE INDIAN SUGAR INDUSTRY IN WORLD PERSPECTIVE

THE development of the modern sugarcane industry in India[1] during the last decade from very small beginnings to a commanding position both in the internal economy of the country and in the world's sugar industry is popularly acclaimed as an outstanding achievement of the policy of "discriminating" protection which has literally revolutionised the industry. India's progress during a short period from being a country mainly dependent on imports of sugar to becoming the largest sugar-producing country in the world with an output equal to, if not in excess of, its requirements[2] is, no doubt, a matter for great satisfaction, and of inestimable advantage as an insurance against conditions arising in times of war, like the present world war, and other emergencies such as the possibility of shortage of supplies leading to abnormally high prices. But behind this spectacular development lie a variety of economic phenomena which are important not only to the sugarcane industry in India and abroad, but to the Indian and world economy as well. It is hardly necessary to say that the solution of the problems of the sugarcane industry in India, whether they are of the technical kind connected with the improvement of the recovery percentage or the utilisation of molasses, or of the yield of sugarcane per acre, or whether they are of the quasi-political kind such as provision of a fair price for the cane-grower, or competitive development of this industry in various Provinces, is of the utmost national importance. But it is not as well appreciated as it should be that the development of the world's sugar industry during the last fifty years is in itself an epitome of the problems and developments characteristic of the period of transition through which world economy is now passing. An understanding of the nature of these problems and developments is of vital importance for a proper comprehension of the present phase of the transition and also of the special problems which India will have to face in the future in connection with her sugarcane industry.

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[1] The term "The Indian Sugarcane Industry," in this thesis should be taken to include all the three interests concerned in it, viz. the manufacturer of white sugar, the manufacturer of *Gur* and the grower of sugarcane, in India.

Also *vide* Representation of the Imperial Council of Agricultural Resarch, dated 5th February 1930, to the Government of India, Commerce Department, in Vol. I of the Indian Tariff Board's Report on the Sugar Industry, 1932, page 18.

[2] *Vide* Report of the Tariff Board, 1938, *et seq.*

Variety of Economic Phenomena in the History of the World Sugar

The changes that have occurred in the world's sugar industry have, in spite of their revolutionary character, attracted but little attention among economists, statesmen, and businessmen. The problems of the world's sugar industry have been dealt with by the governments concerned and by International Sugar Conferences as little different from the problems of overproduction, of which the post-war world had a surfeit. In reality, the problem of overproduction in sugar which the Brussels Conference of 1902 had to deal with was in a very essential respect vastly different from the problem of overproduction in tin or rubber or wheat. For *overproduction was the result, not of an increase in the productive capacity of the original sources of supply, but of the success in the attempts of some of the consuming countries to find a substitute for cane-sugar.* Thus, although from the practical point of view, the problem of overproduction in sugar is not different from that in other commodities, the trends and features which have been characteristic of the development of the world's sugar industry will, I venture to think, be characteristic of an increasing number of industries in the future.

Special Features of Overproduction in Sugar

Before proceeding to describe these trends and features, it is necessary to examine the distinctive characteristics of the growth of overproduction in the sugar industry. The development of commercial production of sugar from beet in the years of the 1st world war of 1914-18, is, in all essential respects, different from the increase in the production of wheat or rubber or cotton goods in the same period. For, in the latter the increase occurred solely through the additions to the necessary capital equipment or the expansion in the productive capacity of the pre-existing centres of production or the establishment of new producing centres. The same thing could be said of sugar, only if the difference between cane and beet, which are the chief raw materials for production of sugar, is altogether overlooked. As a matter of fact, beet as a raw material for commercial production of sugar industry is not even on a par with palmyra juice. The beet root, as it was found in the beginning of the last century, was hardly eligible for utilisation in the commercial production of sugar, as compared with cane which is by far the older source of supply, its sucrose content then being only about 5 per cent. It was only by careful nursing and development of a virtually new species extending over half a century that the sucrose content of beet was raised to 16 per cent, a level at which it could compete with cane as a source of sugar production, though not without the aid of high subsidies or other forms of protection like direct protective duties or preferential duties in its favour.

Invention of a Substitute — Beet, the First Ersatz Industry

Beet, then, is the first instance of a substitute for an original gift of Nature. And the beet sugar industry in itself and in its relation to the industry manufacturing the natural product, viz. cane, is, if one may put it that way, the first *ersatz* industry. The rapidity with

which beet sugar was perfected—white sugar from cane and beet, when fully refined, is identical in the sense of being, for all practical purposes indistinguishable[1]—has served to obscure its essentially *ersatz* character. And the wide distribution of production of beet sugar and the determination of the nations concerned to foster beet sugar production at home have tended to create the impression that the beet sugar industry is an instance either of the infant industry which is considered to be the legitimate object of protection, or of the kind of perverse economic nationalism which is supposed to have brought about the great depression.

But if one looks closely into the matter, one will find that the history of the world's sugar industry in the last fifty years and more is the history of the invention of a quasi-artificial substitute for cane sugar, its development through stages to a commercial basis, and its establishment, side by side with the natural product, in the national economy of the countries concerned, and in world economy. It is against this background of the development of a substitute that even the establishment and progress of the sugar industry in India must be viewed. For in essence, both are part of the same development by which the monopolistic position of a few favoured producers is broken down by the inevitable rise of substitutes and the exploitation of resources of each nation for the production of sugar. It might even be suggested that because far deeper evolutionary forces were behind that diffusion of productive effort in the sugar industry, that India's attainment of self-sufficiency in this respect was achieved in what would otherwise be an incredibly short period. That is, no doubt, to take an unduly teleological view of developments in the modern sugar industry. *But the fact remains that earlier than any other industry, sugar saw the rise of what in essence is an artificial substitute and the consequent break-up of the old geographical division of labour and the creation of a wide diffusion of productive effort.* More and more modern industries are today being subject to similar trends. It is no longer fanciful to suggest that the textile industries as we have known them till now will have to function in competition with fabrics made of artificial material of different kinds of origin. Rayon is a well established industry. But its best days still lie ahead of it. Glass bids fair to become a source of textile material, and perhaps soon after the present war, it may be a keen competitor of cotton in spinning mills. In the dye industry, artificial dyes developed so rapidly that the natural product has been driven out of the field. The possibilities of plastics hold out distinct threats to many an industry which today would otherwise have good reason for complacency. In the living present, the emergence of Buna a synthetic rubber produced by uniting two chemicals Butadiene (75%) and Styrene (25%) which has given encouraging performances in 1942 in the United States almost unquestionably means that natural rubber will be a "deader" commodity at the end of World War II, than natural nitrates were at the end of the World War I of 1914-18. The cost of the Buna programme will "meet and lick natural rubber". The reason why this synthetic rubber industry was not established till now, is due to cheapness of natural

[1] *Vide* U.K. Sugar Industry Inquiry Committee Report, 1915, page 4.

rubber. It was felt in the United States upto 1941, by those in Command that unless U.S. was cut off from the Far East, synthetic rubber would be a waste of public money.[1]

Changes in Sugar are Symbolic of Changes in World Economy

In the economics of the sugar industry, one should therefore expect to find an exemplification of the phenomena relating to the rise of artificial substitutes and their establishment in the face of competition from their natural rivals. Sugar brings out clearly the simple fact that the impulse to find a substitute comes from the prevalence of war or the anticipation of or preparation for it. The impact which the production of a substitute makes on world economy is capable of being viewed from the standpoint of economic theory, as similar to that of an infant industry, which the Government concerned decides to nurse to health and efficiency.

Difference between Infant Industry and Substitute Industry

It is true that, theoretically, the efforts made to develop a substitute industry, the repercussions of these efforts on national and world economy, the problems of costs and prices are all more or less wholly similar to those connected with the protection of an infant industry. But between the two, there is this difference, that a substitute industry is closely linked to the problem of national security, through the provision of a requisite of warfare or a necessity of civilian consumption. The claims of an infant industry, as economic science understands it, rests on its potentiality for competition in the free market. But the substitute industry starts on its career with a full emancipation from the bonds of free competition. Though its capacity for free competition may be as considerable as in any known instance of an infant industry, State policy is on the whole indifferent to this aspect of the matter. The practical result of that, is, that nations cling more tenaciously to a substitute industry than to an industry ordinarily protected.[2] The subsidies which the beet sugar industry in Britain has obtained from the Exchequer are out of all proportion to what may be termed its objective value. And Continental nations would have more readily given in to the claims of free trade, so far as sugar is concerned, but for the fact that the beet sugar industry was the only safeguard they had against their being famished for sugar during a period of war. Even in India, where Government have been not known for their willingness to help indigenous industries, the sugar industry obtained a margin of protection so wide that the acceleration of progress in respect of its expansion was phenomenal.

The difference between a substitute industry and a protected industry is not only in the matter of the sentiment attaching to either. A more vital difference lies in the fact that the infant industry is part

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[1] *Vide* "Time", Weekly News Magazine from the U.S.A., July 20th, 1942.

[2] "The most striking general characteristic of the sugar industry is the extensive State encouragement of sugar production"—U. K. Sugar Industry Inquiry Committee, Report, page 10.

Also *vide* Encyclopædia Britannica—Volume XXVI, 1921 Edition, page 44.

of and subject to the dictates of Nature in respect of the distribution of raw material and, through it, in respect of the distribution of productive activity. The substitute industry, on the other hand, signifies the attempt of industry to get over the limitations imposed by Nature. When a substitute is found, it is, in the nature of things, capable of being produced over wider areas of the world than the natural product. It is in contravention of the "natural" division of labour and the established distribution of productive activity. One can, therefore, look for a wider diffusion of productive activity as a result of the successful evolution of a substitute.

Effects of International Trade

When such a wide distribution of production is brought about by the addition of a substitute to the natural product, international trade in that commodity is naturally reduced to negligible proportions. The changes in the importance of the main articles of direct human consumption are a characteristic feature of the evolution of international trade in the last fifty years or more and particularly of the depression and the post-depression periods. It is interesting to reflect that a small volume of international trade relatively to total world population may be a characteristic as well of an advanced state of world economy as of a primitive state. Before sea communication was established on a considerable scale, every locality had to rely more or less wholly on what it grew or produced within its own limits. Exchanges, with the pre-requisite increase in the production of each locality, is possible only in an age of reliable international communication. International trade assumes proportions only when the value of geographical division of labour is consciously understood or instinctively felt by the producing nations. With the growth of settled political conditions, and the improvement of the technique of production and exchange, international trade blots out of perspective every other feature of world and national economy, till geographical division of labour with the consequent interdependence among the nations appears to be permanently ordained and free trade seems an instance of a law of the Medes and the Persians in the realms of Nature.

Trend towards Self-sufficiency

But economic organisation, whether it is viewed nationally or internationally, is indisputably conditioned by the objective conditions of economic life. If productive technique decrees at one stage of its evolution an intricate international division of labour, it may also at a later stage force down the unwilling throats of Governments and of peoples a measure of self-sufficiency which more or less negates all the notions appropriate to an earlier period. How far the progress of scientific invention and productive technique may enable the nations to push farther on the path of self-sufficiency, no one can tell. The question is difficult enough, even apart from the need to peer into the misty future of world politics. But if the developments in world economy of the last two decades are not a flash in the pan, it seems safe to suggest that over vast areas of the earth's surface, self-sufficiency in main articles of direct consumption has been very nearly achieved. The wider distribution of wheat production since the last war, and the development of

the modern Sugar industry, to mention only a few, are instances in point.

In the case of sugar, the trend towards diffusion of production has been helped in the main by what I have ventured to call the development of a substitute. It is impossible in the nature of things that the production of sugar should become world-wide, when Nature limits the production of the main raw material, viz., sugarcane, to the tropical and sub-tropical regions of the earth's surface. The invention—it has been pointed out already that it is no less—of beet sugar has made it possible for almost every country in the world to aspire to being a producer of sugar. There is, however, the simple fact that, while the beet sugar producers were striving hard to foster the beet sugar industry, countries like India, which are fitted by nature for the production of cane sugar, were doing little to utilise their natural advantages. The dominant position which Cuba and Java enjoyed till the growth of the sugar industry in India only serves to show that till a recent time, sugarcane and sugar had to be classed, from the point of view of economic organisation, with rubber and tin rather than rice or wheat or groundnuts. Agricultural staples, which lend themselves to the kind of organisation indicated by the term "plantations", afford scope for the growth and entrenchment of economic interests which are not easily weakened by adverse trends of deliberate economic policy or of natural economic evolution.

It will be seen, therefore, that to the development of a large measure of self-sufficiency in regard to sugar, two distinct, but not altogether unrelated, tendencies had to make a large contribution. One is the development of the beet sugar industry in the countries which can grow beet root, and the other is the growth of the cane sugar industry on the strength of adequate protection in countries like India and the Philippines.[1] To both these forces, the World War of 1914-18 gave a strong impetus. The result of these tendencies on world production and consumption of sugar can be easily seen in Table No. 1 on next page, which gives statistics of the percentage of consumption and production of sugar in various important countries of the world during the years 1935-36 to 1939-40, upto which such comparative figures are available.

Indian Sugar and World Sugar — A Possible Parallelism

A glance at this table will show that in the case of almost all the countries mentioned therein, the difference between production and consumption (expressed as percentages of the world totals) is exceedingly small, which means that the sugar which enters into international trade and which is known as the "free market" is but a small fraction of the total production. For instance the "free market" for the year 1936-37 was estimated by the International Sugar Conference of 1937, at 31,70,000 Metric tons.

The assumption that the sugar industry has an innate tendency to resist localisation and to spread itself as far as natural conditions permit

[1] The United Kingdom Sugar Inquiry Committee (1935), observe in their report, page 10: "There are accordingly very few important countries in the world which do not produce some sugar." It adds: "Sugar beet can be grown in most temperate countries, and sugarcane in most tropical and sub-tropical countries."

TABLE No. 1

World Sugar Production and Consumption on Percentage Basis

	1935-36		1936-37		1937-38		1938-39		1939-40	
	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption
Grand Total—long tons, raw ...	28,846,000	29,231,000	30,818,000	30,549,000	30,967,000	29,647,000	29,478,000	29,406,000	30,974,000	29,819,000
	%	%	%	%	%	%	%	%	%	%
NORTH AMERICA:										
United States	5·15	20·33	5·26	20·66	5·27	18·33	7·39	20·53	6·47	20·96
Cuba	8·97	·51	9·78	·49	9·75	·54	9·36	·53	9·09	·52
Total North America ...	25·35	24·25	25·58	24·48	25·51	22·36	27·36	24·78	25·67	25·47
SOUTH AMERICA:										
Brazil	3·52	3·06	2·87	2·95	3·11	3·34	3·67	3·47	3·80	3·58
Total South America ...	7·17	5·63	6·44	5·60	6·56	6·17	7·67	6·36	7·87	6·72
EUROPE:										
France	3·16	3·54	2·81	3·64	3·08	3·46	2·84	3·64	3·28	3·74
Germany[1]	5·78	5·70	5·77	5·88	7·04	5·94	7·12	7·65	8·49	8·33
Russia[2]	8 53	6·76	6·39	5·89	7·94	8·10	7·68	7·48	8·12	8·18
United Kingdom	1·78	7·79	1·83	7·79	1·35	7·88	1·09	8·12	1·67	6·50
Total Europe ...	30·84	36·74	28·08	35·86	30·88	38 95	29·14	40·07	30·40	37·03
ASIA:										
China	1·06	2·21	1·17	2·26	1.19	2·19	1·32	2·24	1·26	2·01
INDIA	20·48	20·64	21·06	21·27	17·44	18·32	12·86	13·49	14·68	15·63
Iran (Persia)	·03	·18	·05	·25	·06	·37	·08	·38	·09	·37
Japanese Empire	3·79	3·60	3·87	3·55	3·89	3 87	5·64	4·56	4·26	3·73
Java	1·84	·93	3·86	1·05	4·59	1·03	5·18	1·09	5·22	1·06
Total Asia	30·34	29·35	33·28	30·07	30·23	27·79	28·27	24·07	28·78	25·17
AFRICA:										
Total Africa ...	3·51	2·54	3·62	2·54	3·86	3·10	4·27	3·11	3·92	2·90
OCEANIA:										
Australia	2·29	1·16	2·52	1.11	2·51	1·21	2·83	1·21	2·96	1·28
Total Oceania ...	2·79	1·49	3·00	1·45	2·96	1·63	3·29	1·61	3·36	1·70
Grand Total ...	100 00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

Note.—The basic figures which are on a crop year basis starting September 1 and ending August 31, were taken from Lamborn's Sugar Statistical Bulletins.

[1]For 1938-39, includes Austria and Sudetanland district of Czechoslovakia; for 1939-40 includes Austria, Sudetanland, Danzig and portion of Poland. [2]Includes portion of Poland and Finland during 1939-40. *Vide* Lamborn's Sugar Market Report for 13th May 1941.

opens up a fruitful line of thought. For, what is true of the world as a whole cannot be mysteriously negated in the case of a vast sub-continent like India. If the history of the world industry has any lesson to offer, it inevitably suggests the possible emergence, sooner or later, of similar tendencies of diffusion within the frontiers of India.

Development of Beet Sugar in Europe

To see the Indian Sugar Industry in world perspective, it is necessary to understand two important changes, firstly, the growth of the beet sugar industry, and secondly the decline in the position of Java and Cuba. As regards the former, it is useful to remember that sugar from beet was first extracted in the middle of the 18th century, and although the industry originated in Germany, the first important development was witnessed in France, where as a result of the interruptions of supplies of cane sugar owing to the wars of the period, Napoleon initiated investigations and in 1811 instituted a definite scheme of State assistance for the production of beet sugar. The policy of subsequent French Governments varied from time to time, but some measure of tariff protection was maintained throughout, and for half a century France was the largest producer of beet sugar. Then followed Austria, Hungary, Netherlands, Belgium and Germany, which developed various systems of open or disguised bounties for the export of beet sugar.[1] And by the end of the 19th century, thanks to the system of export bounties, in several European beet sugar producing countries, production was found to be in excess over domestic requirements. It is no wonder, therefore, that after strenuous efforts the Brussels Convention of 1903 was concluded (as a result of protracted negotiations set about by the British Government, which saw in the bounty-fed exports a great danger to her Colonial canesugar producers, and her own refining industry). The abolition of all direct export bounties and the limitations of other methods of State assistance, which were the principle stipulations of the Brussels Convention failed, however, to arrest the growth of the beet sugar industry. During the period of the first World War of 1914-18, the Brussels Convention lapsed in practice, and the Treaty of Versailles officially brought it to an end. After the World War of 1914, beet sugar experienced a remarkable recovery. And the production of cane sugar, too, which was increased during the war as a result of the shortage of beet sugar, by bringing large areas of new land under cane, (especially in Cuba) continued to be maintained, and very soon amounted to three-fourths of the world's total output of sugar.

Under the influence of the Brussels Convention of 1903, a stage of equilibrium was reached and the beet industry shared about equally the total world production of sugar. The first World War, however, reduced very considerably the production of beet sugar in Europe, owing partially to military operations in important areas of cultivation, and partially due to the general disorganisation of production and, as pointed

[1] *Vide* Encyclopædia Britannica, Volume XXVI, 1921, page 14—"Under the bounty system by which the protectionist countries in Europe stimulated the beet sugar industry by bounties on exports, the production of sugar in bounty-paying countries was encouraged and pushed far beyond the limit it could have reached without State aid."

out before, this reduction in the European output provided an incentive to increase sugar production elsewhere (mainly in cane sugar producing countries), and by the crop year 1920, nearly 4/5 of the world sugar production was of sugarcane origin, the European output being only about 1/3 of its pre-war average. After the first World War there was a rapid recovery in European production stimulated in many cases by renewed State assistance and by 1927 it had recovered to approximately its previous level. At the same time the development of cane sugar production continued, partly due to the new lands being placed under cane cultivation, especially in Cuba as observed before, and partly due to the phenomenal success which attended the sugarcane breeding experiments of which the most notable example is the success of the new variety of cane in Java, P.O.J. 2878, which helped very largely to raise the yield of sugar in that country.[1] The policy followed in important countries in the world, before the war, of promoting production of sugar on agricultural grounds as also for reasons of national safety in times of war, was vigorously continued. In addition to those countries which grew beet before the war, Great Britain at present accounts for the production of very nearly 6 lakhs tons, while Russia achieved a programme for the extension of beet cultivation from 56,000 tons of sugar in 1921-22 to over 2,300,000 tons in 1938-39. For similar reasons, Japan also pursued this policy of sugarcane development in Formosa, where the production approximated to 15,23,000 tons in 1938-39.

But as the position became alarming due to the relatively small free market comprising largely the deficit of the beet sugar producing countries by 1926, and in order to correct the balance between production, which had outstripped consumption, attempts were made to secure an agreed restriction of output. The initiative in the matter was taken by Cuba, which was then the largest single producer. In 1926 the Cuban crop was restricted by 10% and restriction in that country alone was continued in 1927 and 1928. Endeavours were made to widen the scope of restriction by persuading other countries to take similar action, but agreement was not then possible and it became clear that restriction in Cuba alone would not be effective. By 1931 the surplus of export sugar approximated to one-third of the annual world production and the stocks reached alarming figures.

The Chadbourne Restriction Scheme

The depression in the sugar industry owing to the persistent increase of production and keen competition between cane sugar and beet sugar which was helped by tariff and other aids, was, as may be imagined, very acute and severe,[2] and the position called for immediate attention.

[1] *Vide* Tariff Board Report on Sugar, 1931, page 1.

[2] *Vide* Tariff Board's Report, 1931, page 7, where they observe: "Generally speaking, tariff and protective legislation is more intimately connected with the beet sugar industry than with the cane sugar industry. Most cane sugar is produced where there is only a small home market and consequently has always to face a world competition. The manufacture of beet sugar has always been started primarily to meet a home demand and export of beet sugar is a development of subsequent growth. As a consequence the beet industry has always been heavily guarded and no beet sugar is now placed on the market except under some system of protection. All important cane sugar countries have also introduced protective duties but as most of them have but a small home market, the question that is of importance is what treatment their products receive in the export markets."

In May, 1923, the sugar position was referred to the Economic Committee of the League of Nations for examination and a meeting of experts was held in 1929. The deliberations of this Committee facilitated negotiations between representatives of producers for a more comprehensive scheme of regulation, although at first these efforts failed owing to the continued refusal of Java to participate. Ultimately, however, Java producers came to terms with Cuban producers and in concert with the European countries and Peru, an agreement known generally as Chadbourne Agreement was concluded in 1931. This agreement had two objectives in view, both closely related, the first being to correct the statistical position of the sugar exporting countries, as a preliminary condition for obtaining the second objective, viz., stabilisation of a world price at a reasonably remunerative level. A joint restriction of exports and production with a view to liquidating existing stocks within 5 years was agreed upon. Cuba, Java, Czechoslovakia, Germany, Poland, Belgium, Peru, Jugoslavia and Hungary, 9 of the chief sugar producing countries participated in this agreement. Although the preliminary purpose was accomplished, as is proved by the fact that surplus stocks were eliminated, it did not have the expected beneficial effect on prices partly because consumption did not expand as anticipated, and partly because sacrifices made by the parties to the agreement, particularly Java and Cuba, were nullified by increase of production in countries outside the agreement, particularly the United States of America (and dependencies), and the United Kingdom including its colonies and India. On the termination of the plan, the representatives of the " Chadbourne Group " countries suggested to the United Kingdom the convening of a world sugar conference, as the British Empire constituted the largest sugar producing area. At about this time the British Government made a statement in the Parliament of July 30, 1936,[1] to the effect that they believed " that the sugar producing countries can only hope to set the industry upon an economic basis *by means of an international agreement* for the adjustment of supplies to the requirements of the world market " and that " their own domestic policy is in full accordance with this view." This statement was very encouraging, coming as it did, from a country, which was both a large producer of sugar in its own territory and colonies as well as a large importer of sugar.

International Sugar Conference 1937-42

The International Sugar Conference of 1937 concluded a comprehensive agreement in November 1937 for the regulation of world price and production for a period of 5 years.[2] India was made a signatory to this agreement against the wishes of the industry and she was prohibited from exporting sugar by sea to any other country except Burma for a period of 5 years ending on 31st August 1942. Since 1st September 1942 India has been released from this obligation as the Government of India decided not to join the proposed extension of the International

[*Contd. on page* 13.

[1] *Vide* page 33 of the Proceedings of the International Sugar Conference, published by the League of Nations, Geneva, 1937 (Discussions on the second preliminary meeting).

[2] The text of this agreement will be found in the Sugar Industry Annual of 1938, by Mr. M. P. Gandhi.

Cane vs. *Beet*

It will be interesting to see the relative production of beet sugar and cane sugar during the years 1900-01 to 1938-39 from the following table, which has been compiled from "World Sugar Statistics" published by F. O. Licht of Magdeburg in 1939, the latest year for which statistics are at present available :—

TABLE NO. 2

World Production of Sugar 1900/01 — 1938/39

Campaign-year	World production of Sugar	Beet Sugar	Cane Sugar	Beet %	Cane %
1900-01 ...	11,258,855	6,005,868	5,252,987	53·3	46·7
1901-02 ...	12,643,448	6,880,875	5,762,573	54·4	45·6
1902-03 ...	11,543,974	5,699,912	5,844,062	49·4	50·6
1903-04 ...	12,101,316	6,066,623	6,034,693	50·1	49·9
1904-05 ...	11,184,759	4,919,599	6,265,160	44·0	56·0
1905-06 ...	14,003,288	7,274,098	6,729,190	51·9	48·1
1906-07 ...	14,348,633	7,224,550	7,124,083	50·4	49·6
1907-08 ...	13,705,575	7,062,551	6,643,024	51·5	48·5
1908-09 ...	14,358,031	6,985,539	7,372,492	48·7	55·3
1909-10 ...	14,690,241	6,648,082	8,042,159	45·3	54·7
1910-11 ...	16,823,817	8,667,980	8,155,837	51·5	48·5
1911-12 ...	15,517,728	6,947,131	8,570,597	44·8	55·2
1912-13 ...	18,008,380	9,039,006	8,969,374	50·2	49·8
1913-14 ...	18,714,726	9,053,561	9,661,165	48·4	51·6
1914-15 ...	18,213,442	8,311,701	9,901,741	45·6	54·4
1915-16 ...	16,721,086	6,110,774	10,610,312	36·5	63·5
1916-17 ...	17,037,676	5,864,508	11,173,168	34·4	65·6
1917-18 ...	16,863,065	5,153,113	11,709,952	30·6	69·4
1918-19 ...	15,880,098	4,428,150	11,451,948	27·9	72·1
1919-20 ...	15,212,872	3,350,392	11,862,480	22·0	78·0
1920-21 ...	16,831,079	4,906,266	11,924,813	29·2	70·8
1921-22 ...	17,869,580	5,129,597	12,739,983	28·7	71·3
1922-23 ...	17,857,295	5,356,950	12,500,345	30·6	70·0
1923-24 ...	19,579,214	6,059,212	13,520,002	31·0	69·0
1924-25 ...	23,201,423	8,295,493	14,905,930	35·8	64·2
1925-26 ...	23,758,502	8,617,960	15,140,542	36·3	63·7
1926-27 ...	23,211,177	7,896,189	15,314,988	34·0	66·0
1927-28 ...	25,117,767	9,164,489	15,953,278	36·5	63·5
1928-29 ...	26,800,799	9,612,881	17,187,918	35·9	64·1
1929-30 ...	26,730,327	9,348,802	17,381,525	35·0	65·0
1930-31 ...	27,853,321	11,910,883	15,942,438	42·8	57·2
1931-32 ...	24,997,311	8,781,604	16,215,707	35·2	64.9
1932-33 ...	22,736,208	7,994,375	14,741,833	35·2	64·8
1933-34 ...	24,272,206	9,159,470	15,112,736	37·7	62.3
1934-35 ...	24,633,795	9,791,624	14,842,171	39·7	60·3
1935-36 ...	27,079,057	10,375,892	16,703,165	38·3	61·7
1936-37 ...	28,912,934	10,231,429	18,681,505	35·4	64·6
1937-38[1] ...	29,409,387	11,120,047	18,289,340	37·8	62·2
1938-39[2] ...	28,605,066	10,553,393	18,051,673	36·9	63·1

[1] When comparing the above figures with those published in the table "World Sugar Statistics", one must bear in mind that in the above table some important cane and beet countries (Java, Italy, etc.) are represented by their national production figures, whilst in the other table all figures are based on the campaign-year September/August.

[2] Preliminary figures.

The following table gives the estimate of the world sugar production from beet and cane during the years of 1931-32 to 1936-37 :—

TABLE NO. 3

Estimate of the world sugar production by Dr. Gustav Mikusch — Campaign year September to August

(In 1,000 metric tons raw sugar value)

—	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37
A—BEET SUGAR						
(*a*) EUROPE						
Germany	1,596	1,091	1,428	1,673	1,676	1,800
Danzig	22	22	26	33	...	...
Czechoslovakia	814	634	517	638	571	725
Austria	163	165	170	223	206	145
Hungary	125	103	136	120	117	137
France	874	1,022	946	1,223	924	910
Belgium	205	265	247	269	241	245
Netherlands	172	240	290	243	236	245
Poland	493	417	342	447	444	460
Denmark	122	192	254	90	245	220
Sweden	144	235	305	272	295	305
Italy	363	319	300	345	321	328
Spain	402	260	242	349	198	250
Jugoslavia	83	85	74	63	90	98
Rumania	48	53	145	107	135	74
Bulgaria	26	29	45	2	18	10
Switzerland	6	7	9	10	8	9
United Kingdom	284	373	523	694	549	548
Irish Free State	6	27	35	75	89	97
Finland	4	6	7	12	9	11
Latvia	10	27	33	61	50	40
Lithuania	7	31	9	17	24	29
Turkey (European & Asiatic) ...	16	18	78	66	60	72
Azores	3	3	3	3	3	3
Soviet Union	1,689	796	1,460	1,460	2,612	2,000
(*b*) AMERICA						
United States	1,175	1,363	1,648	1,178	1,188	1,300
Canada	54	67	66	57	60	62
Argentina	...	4	4	4	5	3
Uruguay	1	1	1	1	3	3
(*c*) AUSTRALIA						
Victoria (Maffra)	6	6	6	6	5	6
(*d*) ASIA						
Japan (Hokkaido)	27	27	26	39	34	62
Manchuria	2	5	4	4	5	5
Turkey (Anatollia)	10	12	...	...	...	...
Iran	...	3	1	9	17	20
China	...	...	...	...	1	1
Total Beet Sugar Production ...	8,952	7,896	9,124	9,791	10,439	10,231

[1] Figures marked for the year 1936-37 have been taken from Dr. Gustav Mikusch's forecast of the world sugar production, Facts about Sugar, February 1937.

Estimate of the world sugar production by Dr. Gustav Mikusch—Campaign year September to August—(Contd.)

(In 1,000 metric tons raw sugar value)

—	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37*
B—CANE SUGAR						
(*a*) EUROPE						
Spain	21	19	15	18	19	15
(*b*) AMERICA						
Louisiana and Florida	166	240	232	245	345	342
Porto Rico	900	757	1,010	710†	843†	885
Hawaii	933	943	866	877	852	950
Virgin Islands	4	4	5	...	...	...
Cuba	2,678	2,053	2,340	2,611	2,603	2,900
Trinidad	99	123	107	120	157	150
Barbados	85	94	81	47	107	100
Jamaica	64	56	74	78	93	96
Antigua, St. Kitto, St. Lucia and St. Vincent.	46	58	57	56	61	61
Martinique and Guadeloupe ...	91	96	85	92	92	92
Dominion Republic and Haiti ...	457	390	414	467	495	446
Mexico	262	190	209	285	331	330
Guatemala, Costa Rica, Hondurus, Nicaragua, San Salvador & Panama	66	48	41	44	48	58
(*c*) SOUTH AMERICA						
British Guiana	128	151	144	134	181	185
Dutch Guiana	25	18	18	17	18	18
Argentina	346	348	316	342	386	431
Brazil	975	950	969	994	1,034	916
Peru	409	410	420	383	389	400
Venezuela, Colombia, Equador, Bolivia and Paraguay.	92	90	93	74	73	74
(*d*) ASIA						
British India...	3,521	4,174	3,106	3,228	3,696	3,825
Java	3,004	2,760	1,504	701	564	610
Japanese Empire	1,154	797	802	1,156	1,088	1,190
Philippine Islands	999	1,152	1,434	630	902	985
China, Indo-China	262	270	264	423	451	455
(*e*) AFRICA						
Egypt	147	170	154	152	147	160
Mauritius	167	251	265	183	285	250
Reunion	43	54	77	64	91	60
South African Union	296	326	355	325	379	605
Mozambique	71	93	68	84	66	72
Angola, Madeira, Madagascar, Kenya, Uganda, Somaliland, Belgian Congo and Cape Verde.	56	58	77	89	102	107
(*f*) AUSTRALIA						
Queensland and New South Wales	615	541	677	653	657	715
Fiji Islands	73	139	118	115	134	153
Total Cane Sugar Production ...	18,256	17,823	16,397	15,397	16,689	17,517
World Sugar Production ...	27,208	25,719	25,521	25,188	27,128	27,748

* Figures for the year 1936-37 have been taken from Dr. Gustav Mikusch forecast of the world sugar production (Facts about Sugar, February 1937).

† Figures marked with † include figures for Virgin Islands also.

Please see **ERRATA**

after Contents on page xviii

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INDEX

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Substitute Chapter VIII on page 78

for Chapter IX (wrongly printed)

Contd from page 10]
Sugar Agreement, which is to be continued either for the duration of the war and for one quota year after the date of termination of hostilities or for a period of two years from August 31, 1942, whichever be less. India will be thus free to export her sugar to any country she likes by sea or by land, e.g. Ceylon, which was so far dependent upon Java for her supplies. The Burmese market to which Indian sugar was being sent is also now lost to India, but this loss would be made up if it is possible for her to export sugar to Ceylon, where the approximate consumption is annually about 85,000 tons. Exports of sugar to Ceylon were prohibited, however, in 1942, by a Notification by the Government of India, pending clarification of certain issues.

A perusal of Table No. 2 will show (1) that the production of sugar spread throughout the world; (2) that roughly 2/3 of it is from cane from tropical and sub-tropical countries; (3) that 1/3 is from beet in countries situated in the temperate zone. It is also of interest to review here, in passing, the many methods of State assistance adopted either singly or in combination by the various countries of the world for developing their sugar industry. The following may be noted:—[1]

(*a*) The complete reservation of the internal market by the prohibition of imports (e.g. Australia).

(*b*) Protective Tariffs. This method is almost universal in European countries and is also employed in the United States of America and its dependencies, British India, Japan and other countries as well as the United Kingdom.

(*c*) Tariff preference enjoyed in countries other than the country of production (e.g. the Colonial preferences already mentioned and the preference enjoyed by Cuba in the United States of America).

(*d*) Direct subsidy (e.g. in the United Kingdom, the Irish Free State and the Netherlands).

(*e*) Other differential advantages (e.g. the rebate of trade taxes as in Czechoslovakia).

A glance at Table No. 2 in this chapter will also show that there are very few important countries in the world, which do not produce some sugar.

Three groups of countries may be distinguished, viz.: (*a*) Countries which have specialised in sugar production for export and in which sugar forms an important proportion (sometimes nearly the whole) of their exports. These include Cuba, Java, Peru, Santo Domingo, certain British Colonies (Mauritius, Fiji, British Guiana and some of the West Indian Islands) and the U.S. dependencies of Porto Rico and the Philippine and Hawaiian Islands.

(*b*) Countries where sugar is grown primarily for internal consumption but which normally have an exportable surplus. These include several European countries (notably Czechoslovakia and Poland) Australia, and the Union of South Africa.

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[1] *Vide* United Kingdom Sugar Industry Inquiry Committee Report, 1935—Page 11, also 1931 Tariff Board Report—page 4.

(c) Countries which produce sugar but have no exportable surplus (e.g. the United Kingdom, the United States, and France). The total production of this group accounts for the greater part of the world's output. Some of them, such as France, normally import or export only small quantities. Others, like the United Kingdom and the United States, produce substantial quantities but also require large imports.[1]

Beet Sugar Costs Higher than Cane Sugar

At this stage, a comparison of the cost of sugar produced from beet and from cane would be useful and interesting. The report of the United Kingdom Sugar Inquiry Committee, 1935, makes the following interesting observations in this connection :

" At present, the lowest cost of producing beet sugar in any country is put at between £12 and £14 per ton. The lowest cost at which cane sugar can be produced, e.g. in Java, Santo Domingo, or Peru, appears to be between £5 and £7 per ton, that is, about half as much, while a number of other cane growing countries, for example, Cuba and our own Colonies, can produce very large quantities of sugar at prices much below the lowest cost of beet sugar. *Both beet and cane costs have varied considerably in the past, but at all times there has been a margin in favour of cane.* We understand that no beet sugar industry has ever been brought into existence without artificial support and a beet sugar industry, even when established, has only rarely carried on in free competition with cane. *Today no beet sugar industry in any country in the world is able to stand without support.* It has been suggested that biologically, sugarcane, growing in tropical countries, is a more efficient instrument for the production of sugar than the sugar beet growing in temperate climates and it appears clear that, in default of some revolution in framing or manufacturing technique, or some major economic change, cane sugar will remain the cheaper. Even ignoring cane sugar, there seems no reason to suppose that this country (the United Kingdom) is likely ever to be a specially cheap producer of beet, having regard to the labour requirements of the crop. While, therefore, actual costs and prices may vary widely in future, it is to be anticipated that, taking a long view, assistance will always be needed to maintain a beet sugar industry in this country and that assistance will, on the average, have to be on a considerable scale."

Before passing to the main problems of sugar industry in India, we may refer briefly to the position of the sugar industry in Cuba and Java.

The Sugar Industry in Cuba

The sugar industry in Cuba was developed with special reference to the United States of America. Cuba was practically assured a market there by the reciprocity treaty as against all other foreign sugars, but

[1] United Kingdom Sugar Industry Inquiry Committee 1935 Report. The position of India is now changed, however, due to the great expansion in her industry since 1937, when her production largely exceeded her consumption and she acquired an exportable surplus of sugar.

since 1920, owing to the increase in home production, the United States of America increased the import duties in 1920, 1921 and 1929, the result being that production in the United States, Porto Rico, Hawaii and the Philippine Islands increased rapidly. In 1930, the Philippine sugar was also made duty free and the limit of 3 lacs tons per year upon the imports of Philippine sugar was removed. This gave a great impetus to the sugar industry in the Philippines, and the production increased from 229,000 tons in 1913-14 to 11,64,000 tons. The increase of the Philippine sugar supplies in the United States markets necessarily meant the exclusion of Cuban sugar. The table below gives the statistics of sugar production in Cuba from 1930 to 1939 :—

TABLE NO. 4

Sugar Production in Cuba[1]

Year	Number of Centrals operating	Sugar Production (Raw Sugar in thousand long tons)
1930 ...	157	4,671
1931 ...	140	3,122
1932 ...	133	2,603
1933 ...	125	1,995
1934 ...	135	2,274
1935 ...	133	2,537
1936 ...	147	2,588
1937 ...	157	2,971
1938 ...	158	2,950
1939 ...	157	2,697

The production in Cuba has been reduced from 46,71,000 tons in 1930 to only 26,97,000 tons in 1939. The number of sugar factories has remained about the same. The home consumption of sugar in Cuba is only about one lac tons per year.

The United States of America is Cuba's best customer. In 1930, she supplied about 44 per cent of the sugar consumed in the United States of America. The total sugar consumption of the United States of America was 55,99,000 tons in 1930 and 56,49,000 tons in 1939. The *per capita* consumption in 1930 was 99 lbs. and in 1939, 96 lbs. The percentage of the United States' requirements of sugar supplied by Cuba was 44 in the year 1930 and only 25 in the year 1939. The prosperity of the Cuban sugar industry is largely dependent on the condition of sugar trade in the United States of America's market.

Let us now review the position of the sugar industry in Java. The following table shows the number of factories operating, the areas under cane in acres, and cane and sugar production in Java from 1930 to 1939 :—

[1] *Vide* Indian Trade Journal, dated 7th May 1942.

TABLE NO. 5

Number of Factories Working, Areas under Cane, and Production of Cane and Sugar in Java [1]

Year	No. of Factories operating	Area under Cane in acres	Cane harvested		Sugar produced		
			Tons	Tons per acre	Tons	Tons per acre	Percent Cane
1930 ...	179	489,984	25,253,775	51·54	2,969,269	6·06	11·76
1931 ...	178	493,721	26,019,096	52·70	2,842,642	5·76	10·92
1932 ...	166	423,924	22,573,953	53·25	2,610,782	6·16	11·56
1933 ...	99	208,947	10,909,122	52·21	1,401,327	6·71	12·84
1934 ...	47	93,613	5,149,651	55·01	646,245	6·90	12·55
1935 ...	39	66,515	3,881,374	56·65	513,554	7·49	13·23
1936 ...	35	85,076	4,640,045	54·54	592,390	6·96	12·77
1937 ...	81	211,788	11,910,957	56·24	1,414,500	6·68	11·87
1938 ...	80	210,799	11,880,631	55·36	1,398,927	6·64	11·77
1939 ...	84	234,480	12,875,296	54·91	1,575,353	6·72	12·23

Java Industry Ruined in 1942 ; its Repercussions in the Future

A glance at the above table will show that the number of mills working in Java has been reduced considerably from 179 in 1930 to only 84 in 1939. The production has also suffered a considerable fall from the peak of 1930 when it was 2,969,000 tons. The production was lowest in the year 1935 when it fell to 513,000 tons. It is understood that the production of sugar in Java in 1942 would have been about 17 lacs tons, but as a result of the surrender of Java to Japan early in 1942, a large number of factories, warehouses and transport facilities in Java were destroyed, the consequence being the almost complete annihilation of the century old and celebrated Java sugar industry, the absence of which will have a very serious repercussion on the future supplies and development of the sugar industry in the world.[2]

Principal Features of World's Sugar Industry

To recapitulate : The principal features of the history of the world's sugar industry may be said to be the rise of a virtual substitute enabling the extension of sugar production from the most tropical and the sub-tropical countries (from cane) to all the most temperate regions of the world (from beet), the rise of a system of State aid to sugar both from beet (as for example, in Germany, France, Czechoslovakia, Soviet Russia), and from cane (e.g. India, Japan and Formosa), the continued undermining of the position of the big producers of cane sugar and last but not least, as the present World War drew nearer, anxiety to develop domestic sources of sugar as fully as possible as a result of the world wide policy of State assistance to this industry, both as a measure of insurance against shortage and development of an agricultural industry.

One has only to state these features to see in the rise of the Indian sugar industry, under liberal protection, a natural denouement of these century old developments all over the world.

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[1] These figures have been taken from the Supplement to the *Indian Trade Journal*, dated 7th May 1942.

[2] Also *vide* International Sugar Journal, London, Monthly issues of 1943.

CHAPTER II

UNREALITY OF FISCAL CONTROVERSIES

A STRICTLY objective account of the origin and growth, together with the vicissitudes of the Sugar industry can by itself reveal little either of the forces which brought about the establishment of the industry or of the nature of the problems regarding its future. For one thing, a strictly objective account is not easily formulated or prepared. To the average Indian, the position of India as the largest producer of sugar seems so natural that any different state of affairs indicates the operation of unnatural and, to that extent and, in that sense, uneconomic, factors and forces. It is true that India is the home of the sugarcane industry.[1] It is true, too, that at no time was this country an altogether insignificant producer of sugarcane. But the fact remains that it was only during the last decade that India attained a prominent position in the world's sugar industry, and that, too, by methods which are by no means unexceptionably economic.

Protectionist Polemics

The place of fiscal protection in the economic development of India, which is the principal obstacle in the way of formulating a strictly objective history of the sugar industry, has provided the most happy hunting ground of economic theoreticians. Just as at the present time it is a moot problem of economists whether protection to the Sugar industry has been adequately or even reasonably recompensed, in the period before the grant of protection, the claims of the industry to such State-aid were disputed by all but the most enthusiastic protectionists. Of those, as for example, the Indian Sugar Committee, which advocated the development of the Sugar industry in 1920, not a few were actuated by quasi-political motives like those of adequacy of internal supplies during times of war. This is hardly a matter for surprise; for, in every case of claim for protection, plenitude of raw material and other natural advantages form an argument which really cuts both ways. For, while the protectionist may see in it a call to the Government to take on hand the exploitation of these advantages, the free trader is tempted to warn the authorities against ignoring the obvious inferences to be drawn from the fact that over centuries these advantages have been more or less wholly infructuous.

The Rival Schools

This applies in toto to the sugar industry and it is necessary to clarify the relation which the fiscal controversies in their century-old form bear to the problem of the sugar industry in India. It would serve little or no purpose to go over the beaten track of such controversies.

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[1] *Vide* Indian Sugar Industry, Its Past, Present & Future, by M. P. Gandhi, p. 1. Also Encyclopædia Britannica—Vol. XXVI.

What is important is the limits and limitations of theoretical reasoning, the validity of the assumptions made by each school both in their statements of pure theory and in its comparatively concrete applications to particular cases. On the side of the free trader, there is always the tendency to overlook the fact that the free trade theory is valid only in conditions of full employment and that even in conditions of full employment, fortuitous advantages like those derived from political power or from removable handicaps of possible rivals may serve to perpetuate an intrinsically uneconomic division of labour among the nations. Likewise, protectionists, at any rate in India, are not anxious to estimate costs of protection except for purposes of current controversy. Where estimated costs are out of proportion to the certain benefits of protection, they do not hesitate to press into service extra economic arguments like those covered by the term "political considerations". There is, above all, the subjective value which nationalists of all shades attach to the possession of an industry within the borders of one's own country.

The Free Trader in Modern Conditions

Protectionists and free traders in India have not, therefore. come to grips. Changes in economic policy during the last one decade and, what are more, the economic exigencies created by the developments of international politics, have had the effect of keeping free traders at bay. It must be said to their credit, however, that they are only too eager to fight with their backs to the wall. But the trends of world and national policies will be such that free trade theories may not have for a long time to come a fair chance to vindicate themselves. The more State policies deviate from *laissez faire*, the more impractical and visionary will seem the advocacy of free trade doctrines. The free trader will be hard put to it to prove his point to the hilt and the protectionist will complacently assume the honours of the battle.

State Interference — A New Factor

It is precisely in such conditions that the merits of the free trade should be given careful consideration. For, the value of the free trade theory lies not so much in its wholesale applicability to particular claims for protection or for other forms of State aid as in its emphasis on the importance of a wise distribution of scarce means among competitive ends.[1] With the increasing interference of the State in economic life, the conscientious free trader can do no more than make an increasingly forlorn plea for the resuscitation of *laissez faire* in each country and for the resumption of free trade in international commercial relations. His ability to demonstrate the wastefulness of protection in each instance must necessarily dwindle, when the major part of the economic life of all nations is State-regulated. *Pari Passu* with this decrease in the strength of the free trader, the protectionist feels, not quite reasonably though, the ground stronger under him.

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[1] Lionel Robbin's definition of economics as the science which deals with the distribution of scarce means among competitive ends rescues economics from its dependence on "free" markets as an indispensable presupposition of economic thought. The relevancy of free trade theories to a communist economy can be seen only in the light of such a wide definition of *The Scope and Nature of Economic Science.*

The Problem of Costs — A New Approach

But this is no reason for the feeling that an economic regime of a totalitarian kind has no problem of costs to face, or that the problem of costs changes from one of calculation of costs in terms of given monetary standards to one of checking up the inventories of stocks in communal storehouses. For, the problem of costs arises not from the availability of the requisite materials during a given period, but from the possibility that these materials may have a more fruitful venue of productive activity than what the authorities may be having in mind. In the absence of revolutionary or astounding changes in productive technique, such a possibility is easily tested in the light of the structure of prices in conditions of economic freedom. The need for this guidance increases in direct proportion to the increase in State interference in economic life. It is thus the duty of even those who are protectionists in regard to particular economic problems, not to speak of unswerving free traders, to impress upon the public and on the governments alike the importance of deferring to the truths contained in the free trade theory.

Assessing the "Cost of Protection"

At the same time, it must not be overlooked that with the growing regulation of economic life in accordance with the requirements of economic security and progressive standards of life, the question of distributing scarce means among competing ends must be deemed to pass more and more into the hands of technicians and research workers. The control which the price system of free markets imposes on productive activity and the economic fortunes of the human race as a whole and of particular communities appears to the free trader as an unexceptionable means of rationalising economic life. But few attempts are made to estimate the costs of this control even in terms of prices, not to speak of the intangible values indicated by the term, "Social costs". The free trader is precluded by his own hypothesis from such an attempt. It is only the modern technocrats that have formulated for themselves an objective scale with which to measure the balance of regress and progress in the alternations of depression and boom or to gauge the difference between the actual achievements of the individualistic system in production and consumption on the one hand and on the other the capacity of the existing capital equipment of each nation. The protectionist is but an amateur technocrat who takes into account not the equipment of plant and machinery but the fertility of fallow land and the capacity of idle hands. The protectionist argues that when industries are fostered by the State, costs should be reckoned not in terms of the price of imported products, but in relation to economic stability and the multifarious benefits which the nationals of a country can derive from a well established large scale industry. The benefits of such industries are not restricted to the goods which they directly produce. They are, in fact, a long chain of economic activities which come into being and bear fruit only over a long period. Such benefits cannot be even envisaged fully by a Tariff Board in its initial enquiries.

It is important to note that in the conditions of the last decade, even these calculations of restricted scope cannot be made with any approach

to accuracy. It is only when the major part of the world preserves the policies of *laissez faire* and free trade, that the costs of particular proposals of protection can be accurately appraised. When prices have ceased to be a reliable yardstick of objective economic values, the old controversy of free trade *vs.* protection loses all but an elemental academic value.

Post-Depression Thought

The period which followed the great depression is remarkable for the evangelical zeal with which free trade doctrines were preached by orthodox economists and not less for the tremendous pressure which the developments in world economic life were exerting on national policies in the direction of economic nationalism. It is no doubt true that this pressure was itself the result of the deviations from *laissez faire* which the nations had been guilty of in the pre-depression period. But nothing can be gained by denunciation of economic heresies, and the student of human history as a whole. as distinct from the purely economic part of it, may well wonder whether in economics, too, as in religion or politics, the heresy of one generation may not become the orthodoxy of the next. In this context, it is not without significance that an economist like Sir J. M. Keynes has begun to see a new wisdom in the discarded Mercantilism of the middle ages. Subjective estimates of the relative value or benefits of rival policies can by themselves do little, where the destinies of vast aggregations of men are concerned. It is no solution of the problem of war, to embark on refinements of pacifist doctrines. The fact must be recognised that free trade has come to bear the same relation to national and international economic life that pacifism bears to the problems of international politics. The value of any theory to Governments and social leaders lies not in its internal consistency but to the closeness of its relation to the objective facts of life. For, it is only when the theory has such a close relation that it can be employed as an instrument of the desired change. In the case of free trade, it was at one time a description of conditions which obtained in one part of the world, at another it was indistinguishable from the croakings of a Cassandra. This is by no means a refutation of the theory of free trade; for free trade can hardly be refuted, being in the main tautological expositions of premises in their inter-relation. In fact, the whole of equilibrium economics is a mental construction of which the practical economist has to make wise use without either denying its validity or exaggerating its application to real life.

The Applicability of the Three Theories to Present conditions

Like all products of man's logical mind, equilibrium economics has a degree of correspondence with the facts of life. But the free trade doctrine often suffers from a confusion between temporary states and permanent states and between the hypothetical and the laudably ideal. It is one thing to presuppose *laissez faire* as a hypothesis of equilibrium economics. It is quite another to regard it as the bedrock of sound economic policy. When the facts of economic life are quite opposed to the pre-suppositions of equilibrium economics and aspirations of human societies reach higher than the claims that can be theoretically

made for the policy of free trade, it is no wonder that the familiar controversy of free trade *vs.* protection has lost nearly all reality. Today it is not alone free trade that is at stake, it is the whole concept of governmental functions signified by the term *laissez faire* that is thrown overboard by a race increasingly conscious of man's ability to control his economic destinies. Likewise, it is not protection that is the aim of those who clamour for the establishment of new industries. The demand is for the fullest development of economic resources and the regulation of economic life as a whole.

The Rise of Dumping and the Shift in Protectionist Argument

The chasm between the free trader and the "protectionist" has thus hopelessly widened. For, theoretically, the infant industry argument is the uncontested common ground of both the free trader and the protectionist. It is in perfect accord with the whole body of equilibrium economics. The free trader concedes nothing when he concedes the claims of infant industries to State protection during the initial period. In the same way, the protectionist did not seek to storm the citadel of *laissez faire* when he advanced the claims of infant industries. But what distinguishes the post-depression from the pre-depression period is that protectionist claims surpass the bounds of moderation set on them by the admitted claims of infant industries, because the distinctive feature of international trade during this period is the rise of dumping on a large scale and in an acute form. So long as competition is fair, and the rules of international commerce recognise the right of a government to afford protection to an infant industry, protective duties can be so fixed as to preserve competition between the protected industry and the importer. Such a handicap tournament has both an economic and æsthetic value. But, once dumping raises its head, the industry advances the claim to what is termed adequate protection, which, in concrete terms means, a level of duties which can completely shut the importer out of the home market. Public opinion, with its emphasis on security, is far from being unwilling to support the new claim. Once the claim is conceded, anti-capitalist sentiment seeks vent in laying new obligations on the protected industry. Thus is the inroad into free trade converted into a breach in the walls of *laissez faire*. The growth and development of the sugar industry and the problems connected with it can hardly be followed, unless it is remembered that the industry came in in the post-depression period.

Sugar — A Typical Post-depression Industry — The Contrast with Cotton Textile, Steel, Etc.

All the tendencies described above are fully reflected in the history of the sugarcane industry in India. For, the sugar industry is, in every respect, an offspring of the economic policies of the post-depression period. Though the first official enquiry into its possibilities was made soon after the last war, i.e. in 1920,[1] it came on the list of protected industries only in 1932. Its birth and growth have little in common with those of the great protected industries of India like cotton textiles or iron and steel. In the case of the last two, protection was grudging

[1] *Vide* the excellent and detailed Report of the Sugar Committee, 1920.

and halting. It took nearly twenty-five years for a second steel company to be formed. In cotton textiles, the pre-eminence of Bombay and Ahmedabad was not shaken by an outburst of new mills in other parts of the country till the early 'thirties of the century' and that too to a small extent. And till the outbreak of the present World War II, neither the cotton textile nor the iron and steel industry was able to achieve the same degree of self-sufficiency for the country as the sugar industry in respect of its products.

Liberal Protection to Sugar not an Accident

For no Indian industry has the same pace of growth to show as sugar. If the high level of protective duties is a necessary and sufficient explanation of it, it must be remembered that the grant of such duties is by no means a historical accident. Not only would it be inconceivable in any earlier period, but it was made possible by that nexus of political, financial, economic and broadly social circumstances which characterised the post-depression period. While the Government soon came to depend on the sugar industry for a considerable amount of revenue in the shape of the sugar excise duties, the public, too, came to regard its link with agriculture as the starting point of the much needed rationalisation of Indian agriculture. In fact, the policies of the U. P. and Bihar Governments in respect of the price of cane and the organisation of the industry in respect of sales are even more characteristic of a new industry of the post-depression period than even the high level of protective duties. The controversy regarding the right of the various provinces to encourage their own sugar mills regardless of the fate of the U. P. and Bihar Mills may be viewed as the repetition of the history of the world sugar industry within our frontiers.[1]

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[1] *Vide* Discussion at the Simla Conference of 1934, referred to in a later chapter.

CHAPTER III

ECONOMICS OF DISCRIMINATING PROTECTION — SOME CRITICISMS ANSWERED

THE most important and noteworthy fact about the development of the sugar industry during the first seven years of the period of protection is that the progress it has been able to make has not sufficed, though it has exceeded the sanguine expectations of the first Tariff Board, to reduce the extent of protection required to meet the competition of Java. As we have shown elsewhere, that is due to the further reduction in the price at which, according to the Tariff Board, Java sugar could be landed at the Indian ports. Here, then, is the issue of protection *vs.* free trade in a very illuminating facet. The orthodox free trader and the passionate opponent of protection in India would naturally argue from this that, the possibilities of improvement in Java's costs are unlimited, and that, therefore, the Indian industry can never catch up with Java and must be content for ever to walk on protectionist crutches. As we have pointed out in another chapter, the reduction in the price at which Java sugar can be landed at Indian ports in the present conditions is in itself an unreliable guide to the price which the Indian consumer would have to pay for imported sugar in the absence of a sugar industry at home. Nothing that Java can do with her costs of production can alter the basic facts of the economic situation in India, which, taken by themselves and in juxtaposition to the facts of the sugar industry in other countries, form a strong case for the attempt to develop an Indian sugar industry according to the principles and methods laid down by the Fiscal Commission.

It would be apposite and relevant at this stage, generally to examine the policy of discriminating protection, and particularly in relation to the criticisms that have been made against it in recent years. The Fiscal Commission laid down three conditions which industries applying for protection have to satisfy: (1) that the industry possesses natural advantages, (2) that without the help of protection it is not likely to develop at all or not so rapidly as is desirable, (3) that it will eventually be able to face world competition without protection. These three conditions are only a translation into the practical terms necessary for administrative application of the principles underlying the well-known infant industry argument. But the Fiscal Commission claims that its policy of discriminating protection is an advance on the infant industry argument. It should be remembered that the infant industry argument, strictly speaking, cannot make a difference between a big industry and a small one. Wherever there are, demonstrably, potentialities of unaided competition with imported goods, protective aid must, according to the infant industry argument, be deemed to be due. But the Fiscal Commission was concerned less with economic theory than with the question of ensuring the industrial development of India in consonance with the country's natural resources. The Commission, therefore, laid down that the volume of employment which the protected industry

would be capable of creating should be considerable. It is interesting that there have been instances of industries whose application for protection was turned down on the ground that the extent of new employment that would be created was too small to warrant the imposition of protective duties.

The emphasis on the extent of employment, which the Fiscal Commission laid down and which the Tariff Board has scrupulously followed has, however, led to the idea that the employment which a protected industry is capable of creating constitutes the main defence of the policy of discriminating protection.[1] In this form, it becomes one of the familiar and fallacious arguments in favour of protection, one which the free trader finds it so easy to dispose of. In the context of Indian economic development during the last two decades, the argument becomes even more puerile. In a country in which the population is in the vicinity of 400 millions and industrial workers number only two millions, it is ludicrous to suggest that the additional employment which any one protected industry can immediately create or even all of them in any one specific period, can create, can be an adequate cure for the colossal unemployment and under-employment prevailing in the country. Foreigners, who cannot hide their interest in the import trade, but who claim to look at the whole question from the point of view of India, have always sought to discredit the protectionist policy by calculating the additional employment which might be created in the country if all the imports of cotton textiles, sugar, iron and steel and other products of industries which enjoy protection in India were to be produced at home. By making out that the addition to employment would be negligible, while the repercussions of a fall in imports on India's export trade and economic well-being would be incalculable, they try to establish that the whole policy of discriminating protection is a wasteful and dangerous folly.[2]

Indian economists like Dr. H. L. Dey and Mr. B. P. Adarkar have trailed the path of the Bengal Chamber with additions appropriate to their academic attainments. There can be no doubt that claims for protectionist policies are always apt to be pitched too high. On the one hand, applicants for protection not only exaggerate their case, but the public, too, is rarely able to follow the merits of each case. The arguments against protection are usually of the kind which make the educated classes suspicious of the indigenous industrialist and the ordinary man uncritically enthusiastic in his opposition to import of manufactured goods. The argument that protection tends to increase employment is one that appeals to the masses. Likewise, the free trader's reply that more is lost in other spheres of productive activity than what is

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[1] Prof. B. P. Adarkar has calculated the extent of additional employment provided by the sugar industry in his excellent volume on "The Indian Fiscal Policy," and has propounded the view that the total *direct* or primary employment comes to 130 lakhs of workmen, and that out of this at least 25 lakhs of persons may have been provided *new* employment by protection. He estimates further *indirect* employment at 25 lakhs of workmen, and concludes "Is this not a result worth achieving at the cost of the considerably smaller burden on the comparatively richer element in the population which consumes sugar in India?"

Vide B. P. Adarkar's "Indian Fiscal Policy", p. 202 *et seq.*

[2] *Vide* Pamphlet of the Bengal Chamber of Commerce, "Economic Milestones."

gained in one industry leaves the educated man who sympathises with indigenous industry in great confusion about the merits of the question.

It is time, therefore, that the relation between the volume of employment and the claims of an industry to protective aid was precisely understood. An examination of the various reports of the Tariff Board will show that the volume of employment was regarded rather as a criterion by which to judge the importance of an industry, than as a major item in the calculation of costs and returns of the policy of protection. At the time the Fiscal Commission was appointed, there was not only the eagerness to speed up industrial development, but also the fear that the adoption of a protective policy might lead to a repetition in India of the abuses of the tariff system in the United States of America. The Fiscal Commission was careful to emphasise the dangers of protection. It was specific and emphatic on the point that the contribution of the protectionist policy to the solution of employment should not be exaggerated. Likewise, the Fiscal Commission did not make the mistake, which is attributed to it by Dr. H. L. Dey, of regarding the establishment of industries through protection as reducing the incidence of famine on the masses of this country. It is essential to stress these facts firstly because much of the criticism of the policy originating with the Fiscal Commission accepts without question the economic crudities commonly attributed to the supporters of protectionism. Such an assumption renders it easy to criticise the policy with an air of superior academic wisdom. It is interesting that Dr. Dey devotes a number of pages in dispelling the supposed misapprehension that industries can relieve the hardships of famine.[1] The Fiscal Commission observe on the other hand, "It is necessary, therefore, to recognise that industrial development alone will not solve the problem of famine. The real remedy lies in the development of irrigation, and the scientific development of agriculture to which industrial development by raising the general economic level of the country is only supplementary."[2] It is difficult not to believe that the temptation to make the opponent's case conveniently easy was too strong for Dr. Dey to resist.

Nevertheless, the volume of employment has been regarded throughout the history of the Tariff Board as an important criterion of judging the fitness of an industry for the grant of protection. Indeed, it was specifically laid down by the Fiscal Commission that new industries should not as a rule be granted protection. In these circumstances, one can only conclude that the emphasis on volume of employment is a logical consequence of the principle of discrimination which was to qualify and modify the policy of protection that was recommended for the Government's acceptance. Once it is laid down that no industry can lay claim to protection unless its importance in the economic life, both at present and potentially in the future, can be demonstrated by the volume of employment it can create, the mad rush of applications for

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[1] *Vide* Dr. H. L. Dey, "The Indian Tariff Problem", p. 27.

[2] It should perhaps be pointed out here that the principle of employment was clarified and established by the successive Tariff Boards, since the Report of the Fiscal Commission has no specific references to it, though there are passages which suggest that the Commission was aware of its importance as a guiding principle.

protection which every country with an indiscriminate policy of protection has experienced would be provided against.

The Fiscal Commission expected protectionist policy in India to be effectively discriminating through (1) the choice of industries for grant of protection, (2) the regulation of the protective duties at not more than the requisite level, and (3) the certain prospect of termination of protection.

It may be said, as indeed, many of the critics of the Fiscal Commission have said that the authors of protectionist policies all the world over have made similar claims which subsequent experience has wholly disproved. Such an argument, it is necessary to point out, would only show an unfortunate failure to grasp the spirit in which the Fiscal Commission approached its problem. A perusal of the report will show that it is one of the most unpretentious of documents which have determined the economic history of any country. Nowhere in its 200 and odd pages is there any attempt on the part of its authors to display anything like profound knowledge of economic theory. The fact that the Commission had to do without the counsels of so eminent an economist as J. M. Keynes may probably explain it. But the fact remains that the Commission was content to refer in a few pages to the Free Trade *vs.* Protection controversy and to accept what is at once sound commonsense and impeccable theory, the infant industry argument. The Commission, in fact, took one more step in the direction of caution. It applied the infant industry argument not simply to infant industries, but to what may be called the infant industrial nation. Hence the deduction that protection is to be accorded to industries which are not merely infant industries in themselves, but which are also capable of securing the development of an infant industrial nation. It would not do if the industry could some day hold its own against foreign competition. Its development must be a definite aid to the industrial development of the country. Unemployment is sought to be cured, not immediately nor by the establishment of a few industries, but by the ultimate industrialisation of the country which no one could envisage, nor can even today, without a policy of discriminating protection. It is unfortunate that this sapient and prudent provision about the volume of employment should have exposed the authors of the policy to this criticism. If it is realised that addition to employment on the scale sufficient to relieve unemployment is not one of the claims made for the policy of discriminating protection or the industries which it has led to, then it will be seen that the attack on the policy on the score of poor employment is altogether misdirected.

Yet, the opponents of protection in India, used as they are to the protectionist controversies in the advanced industrial nations of the West, repeat the arguments not only to make their reasoning internally sound, but also to spare themselves the trouble of thinking out the Indian economic problem realistically, and, in the true sense of the word, originally. They thus overlook the emphasis which the policy of discriminating protection, both in its original conception by the Fiscal Commission and in its subsequent application by successive Tariff Boards, has laid on buttressing the infant industry argument with what I have ventured to call the infant industrial nation argument. The

essence of the latter idea lies in the fact the establishment of industries, which can use our resources on about the same scale on which Nature has endowed this country with them, will help to initiate that process of industrialisation which, when it works itself out fully, will solve those problems of famine and unemployment which neither a free trade policy nor a protectionist policy as it is ordinarily understood can ever solve. It is well at this stage to note that the starting point of the enquiry of the Fiscal Commission is not the unreasoned lament of the economic nationalist that the country is flooded by foreign manufactures, but that " the industrial development of India has not been commensurate with the size of the country, its population and its natural resources and that a considerable development of Indian industries would be very much to the advantage of the country as a whole."

As I said, the Commission did not aim at any stage at sharpness of theoretical outline either in the apprehension of the problem or the formulation or exposition of their remedies. They were content to see, on the one hand, the enormous poverty of the country, the large extent of unemployment and economic want, and on the other, the vastness of certain kinds of economic resources. They were alive, too, to the large body of highly respectable economic thought which urged the illusiveness of all hope of adding to the wealth of a country through protected industries. Prompted by sound commonsense, which often obviates the need for close scrutiny and fine calculation, they availed of the infant industry argument to find themselves a way out of the dilemma in which economic theory and the facts of Indian economy contrived to place them. They were careful to make no exaggerated claims for the policy which they recommended. At the same time, they provided more than one safeguard against the pitfalls with which the path of protection is reputed to be only too full. If that policy has failed to fulfil the hopes which its authors entertained of it, the reason is to be sought in the errors of its application or its working and nothing can be gained by attributing to the Fiscal Commission errors which they were careful to disown and guard against as far as they could.

To examine the defects in the working of the policy of discriminating protection is outside the scope of this work. But it is relevant to point out here that, if the aim of the Fiscal Commission, viz., to shorten the period of protection by timely and appropriate revision of the protective aid, had been faithfully pursued and if unnecessary delay had not been caused in the establishment of industries, new or related to those in existence, the results of the policy during the last two decades would have been far different.

Inasmuch as the policy of discriminating protection has not been followed as a consistent policy with organically inter-related parts, but has been allowed to be seen as desperate attempts to establish a few industries through protective aid, opponents of the policy have found nothing wrong in employing the apparatus of free trade thought to criticise the policy as a merely protectionist policy, without consideration either for the special circumstances of India or for the qualifications specified by the Fiscal Commission. It is as a rule assumed that emphasis on the special circumstances of a country is a betrayal of ignorance of the universality of the laws of economics. It is forgotten

that while the laws of economic science have unquestionable universal validity, prescriptions of practical policies based on the suggestions *a priori* of economic laws in their simple forms can have no such universal validity. Equilibrium economics is so much a body of hypothetical reasoning that it is as unhelpful to emphasise its logical consistency and compactness as it is idle to look for fallacies in it. If this body of reasoning suggests *laissez faire* and free trade as obviously the best economic policy for nations and governments to follow, it can in the nature of things mean no more than that these policies have the least risk of being vitiated by errors and illusions which people unequal to following closely the labyrinthine course of economic causes and effects are bound to make. The free trade doctrine can, therefore, expect to have no more than a *prima facie* case set up for it by the science of classical economics. Economic science can only set up a presumption in favour of *laissez faire* and free trade. The finest analysis cannot destroy the importance of the facts of a situation or provide adequately for the changes in the human factor. For the free trader to presume that economic science is on his side or assume that every supporter of protective duties is, regardless of the conditions of the support, ignorant of, or purblind to, the truths of economic science is to betray a serious misunderstanding of the nature and content of scientific economic thought.

It will be realised, therefore, that if the advocacy of *laissez faire* and free trade came closely in the wake of the formulation of economic thought, it was not because the relation between the two was as logically close as it is thought to be by the opponents of protection in India, but because *laissez faire* and free trade suited admirably the conditions in which they were recommended. It suited the conditions of the countries to which those economists belonged; and though they were careful in formulating the principles of the theory without bias, they were enthusiastic in establishing and preaching them because they were in their country's interest. It should not be forgotten that, though spatial limitations like countries are not important in the formulation of theory, in the advocacy of practical policies, their respective countries become important, for, as Sidgwick aptly points out, "it is only in the case of foreign trade that the investigation of the conditions of favourable interchange excites interest." (Quoted by Jacob Viner: Studies in the Theory of International Trade, p. 599). The early free traders like John Stuart Mill, who saw this relation clearly, sought to provide for the difference in circumstances by the evolution of the theory in regard to infant industries. This part of classical economic thought has unfortunately come to be known, not as an important part of the structure of economic thought, albeit unimportant in the structure as it had then been completed, but not designed, but as an unimportant proviso which will rarely, if ever, become operative. This result is to be attributed to the frequency and widespread nature of controversies between free traders and protectionists. As a result of these controversies, what was intended to be a warning against a heedless application of hypothetic reasoning to concrete situations came to be known merely as the "infant industry argument", a sort of spurious exhibit in a vexatious piece of litigation.

An element of empiricism is often sought to be provided by the reference to the working of protective policies in other countries. But it is significant that in no country is the protective policy said to have failed to achieve its purpose of bringing about the establishment of an industry to which the country is suited by its natural resources. Such an allegation must be deemed to be implicit in the contention that no country has found it easy to remove protective duties once they have been laid. But it is obvious that the non-removal of protective duties after a reasonable time can be held to be a charge rather against the political system and the system of government of the country concerned, than against the economic character of encouragement of young industries through protection. And it may be observed in passing that the danger of protective duties overstaying their popular welcome and economic justification is the least of the political dangers against which this country has to be on guard. That danger compares so favourably with the danger of palsy setting in on the limbs of India's body economic! How far the Indian political system will be able to resist the poisons which its fiscal system may generate is a question on which it is both futile and inexpedient to be dogmatic. But it is certain that according to this criterion of facility of timely removal, a system of bounties has no advantages over a system of protective import duties. Dr. Dey in his impatience for the end of protection avers that "it is much easier and more practicable to terminate a system of bounties than one of protective duties." Considering the financial strain which the Government of India has experienced during the last one decade and more, it is perhaps a matter for satisfaction that protective duties were as a rule preferred to bounties and Indian industries were not brought to an untimely end on the score of financial stringency. Few in India would care to dispute Dr. Dey's contention about bounties so far as the conditions of the last decade and more are concerned. But if it is suggested that, in the kind of political constitution that is indicated for the future, bounties will be easily ended in the interest of the general taxpayer and to the detriment of a profiteering industrialist, Dr. Dey's honours as a prophet will certainly be so many gains to the country. Such optimism, however, is not given to all.

Whether protective aids are or are not discontinued in time is a purely political problem which, though it is not irrelevant to practical decisions on fiscal policies, should not be allowed to prejudice the merits of the purely economic issue between free trade and protection. And it should not be forgotten, too, that the continuance of protective duties after they have ceased to be indispensable for indigenous industry may often be inspired by the desire for security from the intrusions of foreign competitors who are not unlikely to adopt questionable methods of competition. In such cases the fleecing of the consumer is not an inevitable result of the failure to remove the protective duties; for, in a large country like the U.S.A. with a big home market, internal competition may achieve for the consumer all the benefits which the free trader seeks to ensure for him through obvious risks to the stability of the indigenous industry and all that it can serve. This is a simple fact which free traders conveniently overlook; and it is interesting to recall *The Economist's* contention in the recent controversies on the safeguarding of industries that the

protectionist in Britain should not quote the U.S. example in his favour, since the U.S., by virtue of its being the largest area over which complete freedom of trade prevails, constitutes an impressive illustration of the virtues of free trade. It should be readily recognised that what *The Economist* said of the U.S. is true in a large measure of India, too. If internal competition has not secured the same advantages of progressively lower prices, the reason is to be found not in the uniqueness of economic phenomena, but in the simple fact that productive efficiency is at an inordinately low level.

The economic problem of India is the incomparably low efficiency of all factors of production. And this is at the root of all the ills of India, whether it be the average incidence of famine, the low returns of agricultural pursuits or our incapacity for competition in industry. If this were the whole of the picture of our economic position, then economists as well as politicians could advise the people to resort to a Stoic resignation to the poverty that is inevitable. They could themselves look on with philosophic equanimity on the processes of Nature working themselves out remorselessly on the teeming millions of this country, reducing them, through Malthusian checks, to the minimum which can make a bare living by scraping the surface soil. But side by side with this appalling inefficiency, and in spite of the enormous age of agricultural land, there is a plentitude of natural resources and aptitude of the people for an infinite variety of economic occupations, which counsel against Stoic resignation to the drift of things.

While on the one hand, the natural resources suggest that the problem of improving the efficiency of the people can be faced and solved, on the other, the potentialities for further deterioration of the economic position through the growing hiatus of productive efficiency of India and other countries suggest that the problem can be neglected only at grave peril to the life of a country as a whole. For opponents of protection who forget that the aim of the policy is industrialisation and not a mere handful of industries, do not appreciate this vital difference between India and the various countries which in the past have resorted to protection for the development of their industries. Only in the case of the U.S.A. in the early decades of the nineteenth century, could it be said that the aim was industrialisation. In the case of Germany specific industries were aimed at, though of French economy it could be said that it inclined too heavily on the side of agriculture, which called for correction. But none of these countries was faced with the problem which we in India have of a general inefficiency, born of the failure to study the technique of productive activity as such in all its phases and details and to acquire the capacity to effect timely improvements therein.

From this standpoint the distinction between agriculture and industry, which free traders in India employ as a handle to turn against protection is altogether unreal, even if it has a semblance of logicality. This distinction has passed unquestioned despite its unreality merely because of the fact that India has a considerable export trade in a few agricultural staples, while in the sphere of industry, she uses manufactured goods which are either imported from abroad, or produced at home by protected industries. But the existence of an export trade

only serves to mark the inefficiency of the factors of production in agriculture. It is an incontrovertible fact that, wherever India's agricultural products have had to meet the challenge of foreign competition, they have not been more successful than the products of Indian industry. The efficiency of land and of the cultivator is not more in his sphere than the efficiency of the industrialist and the industrial worker in industry. The export trade has been made possible more by the peculiarities of agriculture as an occupation than by the competitive capacity of the Indian agriculturist. The reports of Indian Trade Commissioners invariably stress the point that Indian exports have been losing ground wherever they have to contend against the competition of rival sources of supply. When it is said that the appeal of the Indian product is its low price, meaning thereby not a competitive price for comparable values, but the attractions of mere unrelative cheapness, it will be realised that from the point of view of competition which alone concerns the free trader, the Indian agriculturist, will soon be, even if he does not seem to be now, in a position not materially different from that of the industrialist. The consequences of the collapse of our export trade in agricultural staples when it comes about can only be imagined. Those who suggest that in the absence of protected industries, India will develop her agriculture as the pursuit in which she has natural advantages, are guilty of a parrot-like repetition of text-book lessons. They forget that what free trade can ensure is the division of avenues of productive activity according to natural and differential advantages, that, even as the law of Nature of which it is only a derivative, it will send the productively inefficient to the wall. For, those who are equally inefficient in all branches of production, cannot expect to have anything allotted to them in the division of labour which free trade will ordain.

Given this productive inefficiency in agriculture not less than in industry, how is the problem to be tackled ? In so far as productive inefficiency may be traced, not to lack of intelligence, but to lack of familiarity with scientific methods, lack of organization and most of all, to the lack of an environment in which efficiency is prized, sought after and assiduously developed, industry, and not agriculture, is marked out as the sphere in which efforts at improvement can be usefully and hopefully begun. For, agriculture by its very nature, its diffuseness of operations, the amorphous character of the producing classes, its more tenacious attachment to tradition and proneness to conservatism does not lend itself to the inculcation of a new spirit. If Indian agriculture is ever to become scientific and progressive, it will be only because the scientific spirit, begotten and nurtured in the sphere of industry, invades with irresistible force the adjacent realms of agriculture. In industry, the scientific attitude to production can grow more easily because there, unlike in agriculture, it is not a matter of choice, but of compulsion, it appears not as an extraneous imposition but as the very essence of the productive processes. When industry grows and industries increase and expand, the environmental conditions, in which productive efficiency is prized, sought after and assiduously developed, are created ; and agriculture catches the infection, firstly because some departments of our agriculture are closely related to

industry and, thereafter because of the very pervasiveness of the scientific spirit.

The cost of promoting the scientific spirit, therefore, is one which the whole country has to meet as, without it, its very survival is threatened. The efforts to raise productive efficiency through the development of industry is a charge on the whole of the national income. List saw the possibility of such conditions and allowed himself to transcend the narrow boundaries of economics ordinarily understood, when he said, "The nation must sacrifice and give up a measure of material prosperity in order to gain culture, skill and powers of united production; it must sacrifice some present advantages in order to insure to itself future ones."

John Stuart Mill expressed the same idea in comparatively narrow terms, "The superiority of one country over another in a branch of production often arises only from having begun it sooner. There may be no inherent advantage on one part or disadvantage on the other, but only a present superiority of acquired skill and experiences. A country which has this skill and experience yet to acquire may in other respects be better adapted to the production than those which were earlier in the field."

It will be obvious from the above that the original thinkers of classical economics were not unaware of conditions like what obtain in India. But it may be asked whether, if industry holds the key to productive efficiency, it necessarily follows that protection is the best method of promoting industry. Dr. H. L. Dey, who is one of the few opponents of protection who have tried to tackle the economic problem of India instead of merely expatiating on the familiar theoretical aspects, has approached the question from two different points.

On the one hand, he considers the cost of protection as an expenditure out of the annual national income and examines the priorities among the various charges on the national income. On the other, he argues that there are other methods, which he claims far less costly and far more efficacious and effective, in bringing about the establishment of industries. On both these points, Dr. Dey's views merit careful consideration. Taking for convenience the latter, namely, that there are better ways of securing industrial development than the imposition of protective import duties, Dr. Dey argues that "the competitive weakness of Indian industries is largely traceable to grave defects in the principle and structure of business organization, inadequate and unsatisfactory technical equipment both in personnel and machinery, the failure to adopt modern methods of marketing, and last, but by no means least, over-capitalisation and the consequent excessive burden of fixed charges. Since these deficiencies are obviously, in a large measure, the inevitable result of the lethargy, thoughtlessness and mistakes and miscalculations of those who are individually and collectively responsible for the management of industrial enterprises in India, it is hardly necessary to labour the point that the application of the principal remedies must also be initiated and carried out by them. These remedies, as has been indicated in connection with each one of the three industries examined in the previous chapters, are

largely matters of intelligent planning and effective co-ordination in respect of production and distribution both for the individual units of an industry as well as for the industry as a whole. In fact, it is necessary for the industrial leaders of India to replan and reconstruct wholesale the industrial structure of India by adopting, in full measure, the new technique of business organisation, known as 'rationalisation', which was unanimously recommended by the leading business and economic experts of the world at the International Economic Conference of 1927, and which is being applied with increasing success by the ablest and foremost business organisers in the U.S.A., Germany and Great Britain, and also by the State in the U.S.S.R."

It is difficult to find in the above any concrete remedy capable of being adopted by those who are anxious to provide against the dangers indicated by India's productive inefficiency. We have shown that productive inefficiency is not confined to industry ; and though in a different context Dr. Dey shows himself aware of the danger to agriculture, he has confined inefficiency to industry and comes out with the suggestion that the only way to remedy it is to remove the evil. Dr. Dey can hardly complain if those, who look for concrete remedies, regard his observations only as an elaborate form of *petitio principii.*

However, there is one concrete suggestion in regard to the question of the sugar industry which, in so far as it is capable of application to other industries, may be deemed to be a comparatively precise prescription of Dr. Dey for the ills of Indian industry as a whole. Dr. Dey argues : "The evidence of history as well as the data of comparative costs would thus strongly indicate that the protective tariff is neither the most effective nor the most expeditious instrument for the development of the sugar industry in India. On the other hand, as is so well shown by the examples of Java and Hawaii, an appropriate organisation for guiding, controlling and co-ordinating extensive and continuous research and experiments on the different phases of the agriculture and the manufacture of the sugar industry will undoubtedly function as a much more efficient and trustworthy machine for achieving the desired development."

It is not unfair to deduce from the above that according to Dr. Dey the remedy for competitive weakness lies in instituting research into the problems which the protected industries are expected to solve during the period in which they are helped to keep themselves alive by the protective duties. The cost of such research will compare most favourably with the cost sustained by the nation in the attempt to develop industries through the imposition of protective duties over a long period. No one can deny that ; but the question is not how best to reduce the immediate outlay of the nation on industrial development, but how to secure industrial development. Industrial development and the growth in the people of India of qualities, which will render them more fitted for the struggle for life, and enable them to acquire competition are large scale social developments which can be brought about only if the appropriate stimuli and responses are evoked in the people at large. To most free traders, the growth of industry is a simple result flowing from the working of certain simple laws of economics. But the industrialisation of a country, even the birth and growth of particular

industries are complex social phenomena; and the facts pertaining to them, which form the subject of study for the economist, can only be said to have been abstracted for the purpose of the study. It is necessary, therefore, that even an academic economist, when he enters the field of practical policy and tackles a specially difficult problem such as the inculcation of the spirit of competitive efficiency in the Indian masses and classes, should note the more important deviations of life from the more or less unreal abstractions of his study and try to see how the processes he recommends will work in actual life. It is clear that Dr. Dey has not troubled to visualise the actual working of the remedy he advocates. To suppose that an industry with the maximum competitive efficiency can be brought into being all of a sudden, if all the pre-requisite research is completed in advance, is to show that the idea has neither been reasoned out fully from the arm-chair nor tested in the light of recorded attempts in that direction.

While the case of India may be regarded as too crude to serve as an illustration in this regard, there have been cases even in advanced industrial nations like Great Britain where the lead in some of the new industries has been gained by others who have had the advantage of being the birth-place of the original inventions. The United States, for instance, has enjoyed such a lead in some of the new industries like the radio and motor cars. Germany had the lead in the dye industry. Knowledge among the British scientists and technicians of the facts pertaining to these manufactures did not obviate the need for expensive trials and failures and in some cases such as motor cars for even protective tariffs. The lead that America secured in the film industry could not be made up by the British industry except by the adoption of quotas. That such was the case with advanced industrial nations shows clearly that the actual utilisation of technical knowledge in effective and successful functioning of industry is materially different from its acquisition in a laboratory. The birth and growth of an industry, the actual experiencing of different problems and their progressive solution in the course of the industrial operation, the training of men in numbers appropriate to the needs of each stage and the acquisition on their part of the skill necessary for their operations, the incorporation of that skill into the complex personality of the worker and the subtle creation of what may be called the atmosphere of industrialism, all these are vast, fundamental and complex changes, which are neither circumvented nor short-circuited by compressing the problems of a hundred factories into the four walls of a laboratory. To suppose that a modern industry can be produced all of a sudden in a country like India, like Pallas Athene from the head of Zeus, is to mistake the essential nature of industrial development.

It would be useful to illustrate the point in reference to the sugar industry; and it is fortunate that Dr. Dey's prescription is specially intended for the problems of the Indian sugar industry. Dr. Dey argues: "It is more than a decade ago that the Indian Sugar Committee outlined a well-devised scheme for the organisation of a representative Sugar Board, which would promote a Sugar Research Institute and a Sugar School. It may also be mentioned that the Sugar Committee's outline scheme was based upon the accumulated experience

of the principal cane-sugar-producing countries of the world. That scheme has been so long held in abeyance largely no doubt on account of the lack of necessary funds. But since it has now been decided to accelerate the growth of the sugar industry through a large measure of public assistance, and since that assistance can be rendered more effectively for the industry concerned and more economically for the taxpayers of the country at large, through the proper functioning of an organisation like the Sugar Board than by means of a protective tariff, there is at present a much stronger case for the establishment of the Sugar Board with the Associated Research Institute and School than there was ten years ago." It may be doubted whether Dr. Dey realises that the failure of the Government to implement the recommendations of the Sugar Committee is an argument that is more in favour of protection than of the position taken up by him. The Sugar Committee was appointed when the memories of the sugar shortage of the last war were quite green in the public mind. The Committee went into the question and made specific recommendations. Dr. Dey suggests that the failure to adopt them was due to lack of funds. But whatever the reason, it may be reasonably held to suggest that economic problems of practical importance are tackled, whether by the people or by the Government, only under stress of practical expediency created by industries in existence and not worked abstractly like mathematical problems in the seclusion of a laboratory. Besides, it is not accurate to suggest that the findings of the Sugar Committee were altogether overlooked. The work in the Coimbatore farm owes its inspiration directly to the Sugar Committee, and the evolution of the improved varieties of cane, while it has enabled a surprising improvement in the recovery percentage of the sugar factories also brings out the fact that no experimental farms, however ably conducted, can wholly anticipate the problems which will be thrown up by actual working on commercial lines. If this is true of the agricultural side of the industry, how much more true should it be of industry itself ?

Laboratory and research, invaluable in themselves, are not a short-cut in industrial efficiency ; and in a country in which among other causes, financial stringency stands in the way of adequate provision for them, it is futile to point to them as an alternative to the apparently costly methods of helping industries to function in real life through the provision of protective aids.

It is necessary to refer to the other approach of Dr. Dey to the problem of productive efficiency in India. The strategy he adopts in his attack on protection may be best described, in the language of modern warfare, as a pincer movement. On the one side, he argues that with the national income and national expenditure as they are, the expenditure incurred on protection as a means of industrial development is not only heavy, but takes an unjust precedence over prior necessaries of national existence such as education. On the other side, he argues that more expenditure on education can be relied on better to cure the people of productive inefficiency than the large scale expenditure incurred through protective import duties. Perhaps, it is too much to expect anyone to delineate in some detail the system of education which can so induce efficiency as to eliminate the need for

protection. But in the remoteness and circuitous nature of its relation to productive efficiency, this remedy of education bears a striking contrast to the directness with which preliminary research is supposed in another part of Dr. Dey's book to bring efficient industries into existence overnight.

The truth, however, is that attempts to evade the unquestionably enormous price which a backward nation has to pay for economic development must land one in patently unsuitable suggestions which will not bear a moment's scrutiny. It is as absurd to suggest that the cost of protection is recovered by the gains of additional employment as to contend that there are other and far less costly ways of teaching an economically primitive people to function as an industrially regimented modern nation. The bill is there for the nation to foot; and the hoary wisdom of the very authors of free trade theories has laid down that, "a protecting duty, continued for a reasonable time, is the least inconvenient mode in which the nation can tax itself for the support of such an experiment" (John Stuart Mill). Soviet Russia had to go without some of the common necessaries of life before she could push her Five Year Plans to success. And in India, we have so far made no heavier sacrifice for our industrial development than a higher price for some of the luxuries of life. And since the consumers of sugar and cotton textiles come from the very intelligentsia which is most insistent on economic Swaraj, even the charge of taxation without representation or consent cannot be laid against the protective duties in India.

The charge of being an odious form of regressive taxation is, however, laid against them by Dr. Dey. No supporter of protection in India need feel called upon to hold a brief for the system of taxation in this country, which is yet to acquire the features of a progressive system either in its technical or in its ordinary sense. But it is surprising that after noting the fact that the successive increases in the import duty in sugar led, not to decrease, but an increase in the imports of sugar, Dr. Dey should proceed to argue that the import duties lay the burden of taxation on shoulders least able to bear it.

It will be seen that the more attempts are made to find simple alternatives to protection, the more strongly will the conclusion emerge that for the industrialisation of a backward country there is no means except the establishment of industries; and since industries are not started in a spirit of selfless national service and cheerful preparedness for certain loss, protective duties will have to be levied. The need for them in a country like India is all the greater and all the more indubitable, because inefficiency is not confined to one or two classes of people or producers nor one or two departments of productive activity. In the case of the sugar industry, as we shall show at greater length in a later chapter, competitive efficiency does not rest with the factory alone, but also with the cultivators, with those who supply them with seeds and manures, with the general background of industrial development in the country as may be evidenced by the ability to utilise by-products. This nexus of relations can be seen and appraised and the problems issuing therefrom tackled only in the context of the actual working of a large scale industry. To simplify these problems

in terms of prices of imported products and cost to the consumer may be useful as correctives to undue exaggeration of the value of rival systems of thought. But it should be realised that the justification of the policy of discriminating protection lies, not in the mere decline of prices but in the creation of an atmosphere of scientific application to the problems of production, without which not only Indian industry, but also Indian agriculture, in fact, the whole of the national economy, must sooner or later experience a complete collapse. We shall have occasion to show that in the sugar industry the industrial and agricultural problems appear together in an illuminating and practically useful conjunction ; and if only for this reason, the claims of the sugar industry to protective aids is unquestionable. And as for the contentions of the free traders, which are no doubt weighty in their narrow compass, we have, for our part, maintained at the outset that in the conditions of internal trade and world economy today, the old controversy between free trade and protection has a sterile unreality, that in the calculations of the price paid by the consumer and the loss sustained by him as a result of protection, there is an element of speculation about the price he would have to pay in the absence of an indigenous industry, speculation which must necessarily vitiate the arguments ; that, on the whole, taking all circumstances into account, there is good reason for suggesting that the consumer has not been hard hit and that, last but not least, the gains of protection should be judged from the national standpoint and not from any narrower standpoint.

CHAPTER IV

HISTORY OF SUGAR INDUSTRY IN PRE-PROTECTION PERIOD— A COMPARATIVE STUDY

ENOUGH has been said in the last two chapters of both the world's sugar industry and of Indian economic policy in the post-depression period to indicate what distinctive features are to be looked for in the history of the sugar industry in India. It has been observed that as the sugar industry is the offspring of the post-depression period, public policy in respect of its protection was actuated by aspiration of a far reaching kind. That, however, is in regard to the present and the recent past. Sugar production has, however, been carried on in India from an immemorial past.[1] And among the great protected industries, sugar has much in common with the cotton textile industry and little or nothing with iron and steel. For, sugar is at once the oldest and the newest of India's great industries. The position differs from that of cotton textiles, in so far as the manufacturing processes of spinning and weaving are in essence the same both in the cottages and in the factories. In sugar, on the other hand, the methods of modern sugar mills are a far cry from the manufacture of *gur* which, one may reasonably presume, has been carried on by more or less the same methods for nearly two thousand years. It is probably because of this difference that the cotton textile industry was an applicant for protection, while protection had, so to say, to play the midwife at the birth of the sugar industry in India. The difference cannot obscure or alter the fact that both the sugar and the cotton textile industries are natural growths in the Indian soil. For sugar mills were not lacking even in the pre-protection period, though neither in number nor output can they compare with the cotton mills of the last century. Both have strong links with agriculture, though Indian cotton has only recently developed a high degree of dependence on the home market and improved sugarcane has been to some extent a creation of the mills' demand. A comparative study of Indian cotton and sugarcane may yield a number of points to economic statesmanship ; but it can hardly be attempted here. Suffice it to say that there was nothing in the case of sugar manufacture in the past which could serve in the same way as handlooms in the case of cotton textiles which formed a link between the methods of the past and the advanced manufacturing technique of modern times. At the same time, the sugar industry lent itself to that combination of plantation and factory which gave enormous advantage to the interests which developed the sugar industry in Cuba and Java. This made it impossible for unaided private enterprise to build up the sugar industry upto a point and then make an irresistably importunate demand on the Government for protection. The sugar industry could not, therefore, develop on the lines of the cotton industry. Nor was it like iron and steel of such vital importance to warfare that

[1] *Vide* Indian Sugar Industry, Its Past, Present & Future, 1934, by M. P. Gandhi.

it could enjoy the spontaneous solicitude of the Government. The logic of events more than the logic of facts or of argument had to be felt before the sugar industry could be enabled to take a long step forward.

Hoary Past of Indian Sugar

Though there is room for diversity of opinion as to when exactly the manufacture of sugar began in this country, the word occurs in the *Atharva Veda* and in more than one place in the *Ramayana* and it is thus indisputable that sugar was known to the Hindus earlier than to any other race. Sugarcane has thus been known to India for at least 3,000 years; and there are, besides, several indications that Northern India is the home of sugarcane.[1] The earliest reference to this in Western countries dates back to 627 A.D. when sugar figures among the spoils taken by the Byzantines after their conquest of Dastagerd in Persia. It is also on record that the Chinese Government during the reign of Emperor Tai Tsung (627 to 650 A.D.) sent a batch of Chinese students of agriculture to Bihar to study the method of cultivation of sugarcane and manufacture of sugar. From the Mahommedan writers we learn that sugarcane was introduced by the Arabs into Sicily about 703 A.D. and that it spread from there to other Western countries, especially Spain, as early as 755 A.D.

About the thirteenth century, sugarcane cultivation spread over all the countries round the Mediterranean; and these places became the sources of supplies of cane sugar to Europe and Africa. It also appears quite certain that, about the time of the second voyage of Columbus, cane was introduced into America; and it is extremely probable that the local type now used only as chewing cane in Brazil was the variety known as "Puri" in Bengal. Later, with the introduction of sugarcane cultivation in many parts of America by the Spanish, the Portuguese and Dutch, the production of sugar increased so rapidly that it became an article of common consumption.

The sugar industry in India throve fairly well up to the time of Napoleon, i.e. up to the beginning of the nineteenth century, and a large quantity of sugar was exported to European countries even then.[2] But, when Napoleon was starved of sugar supplies from outside owing to the naval blockade, he engaged scientists to select from out the sweet vegetables growing in Europe a crop capable of producing sugar. This research and the subsequent improvement in cultivation led to rapid

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[1] Etymologically 'sugar' is of Indian origin, the earliest form of the word being, Sharkara in Sanskrit, and Sakkara in Prakrit. Thence it can be traced through all the Aryan languages, as Schakar in Persian, Sukkar in Arabic, Suicar in Assyrian and Phœnician, Saccharum in Latin, Azucar in Spanish and Portuguese, Zuchero in Italian, Sucre in French, Zucker in German, etc. *Vide* The Indian Sugar Industry—Its Past, Present and Future, 1934, by M. P. Gandhi.

[2] Up to the 17th century, cane-sugar was the only kind known in commerce. But in 1747, Margraf demonstrated the existence of about 6 per cent sugar in beet-root; and in 1795, Achard manufactured beet sugar on his own farm in Silesia, and presented leaves of refined sugar to Frederick William III of Prussia in 1799.

expansion of sugar-beet cultivation which proved an obstacle to further growth of manufacture of cane sugar in India. But even at the end of the nineteenth century almost all the villages in India produced a sufficient quantity of crude sugar for their wants. With the spread of civilisation, however, the people of India gave up their prejudice against imported sugar and started consuming it in preference to the indigenous sugar, which was more costly. The increasing importation of cheap refined sugar from abroad operated to the detriment of the sugar manufacturing industry of India. The history of modern sugar may be said to begin from 1791, in which year, the massacre of almost all the white population in the black rebellion in Hayati and San Domingo, led to the disappearance of the largest producers and exporters. The price of sugar rose rapidly ; and the East India Company took advantage of this rise to export sugar from India to England, not as producers but merely as merchants, buying in open market and exporting. In 1791 four parcels were exported from Bengal to serve as loaf sugar for tea. This sugar was sold at Rs. 88-6-0 to Rs. 150-6-0 per cwt. Even then the East India Company lost money on the first parcel and gained only 6 per cent on all the four.

The economic policy of the British Empire now began to influence the sugar industry in India. There were two groups of producers, the West Indian Merchants and Planters and the East India Company. The former seemed to have been more influential because the duties favouring the West Indian producers were in force for many years. An *ad valorem* duty of £37-16-3 was levied on sugar, being a manufactured article. This was much in excess of the duty specifically levied on West Indian Sugar. In 1821 there was a modification of the duty and in 1836 East and West Indian Sugar entered England on equal terms.

Following the emancipation of the slaves, the West Indian Planters were faced with the dislocation of business and this change of policy naturally evoked a violent protest from that quarter. As a consequence of the equalization of duties, considerable capital was invested in India, and West Indian and Mauritian planters were attracted here. So much so that by 1846 the export of sugar from India to Britain had reached 60,000 tons. Factories were established at Azizpore, Motihari Balsund, Barachakia, Gorakhpore, and Rosa in the West Indian plain, for producing sugar direct from sugarcane.

Enterprises depending on *Gur* Refinery were started in Bengal and of this, those at Doobah at Cossipore, Albion and Ballicoll seem to have been the largest. Doobah, which in one year turned out 7,000 tons of sugar was believed to be the largest and the best equipped in the world. About this time enterprises were started in Madras under Messrs. Parry & Company, which still exist and the Aska Factory which was started by Messrs. Binny & Company in 1865 developed into the first cane-sugar diffusion factory.

In 1846, under pressure of the Manchester School, British tariff policy swung violently towards free trade ; the slave-grown sugar was admitted into Great Britain on equal terms with that produced by free

labour ; and in a few years the industry in India entirely disappeared.[1] It took another 50 years for a revival of interest in the sugar industry of India. Modern sugar factories were started in Bihar, from about 1903. Since then there has been a slow and steady growth of the industry, although it must be said that no help was given by the Government either by a protective tariff or by any other means. The imports were increasing considerably from 1,900 onwards and the only check that they suffered was in the war years when the import was reduced considerably, due to high prices. The imports in 1914-18 averaged 5,31,713 tons valued at Rs. 13.48 crores as compared with an average of 7,23,915 tons valued at Rs. 12.71 crores during 1910-14. But the tendency to expansion of imports began again in 1923-24 and reached the highest figure 9,39,600 tons in 1929-30.

With these preliminary observations, we may now turn to the history of the industry during the twentieth century, to the tariff duty on the imports of sugar during this period, to the circumstances which led the Government to investigate into the possibility of the establishment of a sugarcane manufacturing industry in the country.

Import Duty upto March 1932

Let us see the changes in the import duty on sugar till 31st March 1932. The import duty on sugar in India from 1894-95 to 1915-16 was only 5 per cent and was a revenue duty. In March 1916, the duty on sugar was increased to 10 per cent. In March 1921, it was again raised to 15 per cent, and in March 1922, to 25 per cent. In June 1925, the import duty on sugar which was on an *ad valorem* basis, was converted into a specific one and the rate was raised to Rs. 4-8-0 per cwt. This remained in force up to February 1930. It was raised to Rs. 6 per cwt. in March 1930, and to Rs. 7-4-0 per cwt. in April 1931, by the Finance Act, 1931. It was raised to Rs. 9-1-0 from 1st September 1931, by the supplementary budget. Even up to March 1932, the duty was Rs. 9-1-0 per cwt. of which Rs. 7-4-0 was the protective duty, and Re. 1-13-0 constituted the surcharge duty of 25 per cent imposed for revenue purposes since September 1931.[2]

The only change introduced by the Sugar Industry (Protection) Act[3] 1932, passed on 8th April 1932, in the duty on sugar was to transfer sugar and sugar candy from the revenue to the protective tariff. These duties were, in the first instance, to have effect upto 31st March 1938,

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[1] The export of sugar during 1874-75 to 1878-79 was as follows :—

	Cwt.	Rs. (*In thousand*)
1874-75 ..	.. 498	31,92
1875-76 ..	.. 420	25,39
1876-77 ..	.. 1,093	92,51
1877-78 ..	.. 844	74,58
1878-79 ..	.. 279	20,43

The sugar exported was of a very inferior quality used mostly in brewing in England.

[2] *Vide* The History of the Indian Tariff (1924-39) by B. P. Adarkar, being a bulletin issued by the office of the Economic Adviser to the Government of India, in 1940.

[3] The full text of the Act is given in the Sugar Industry Annuals, 1935, 1936, 1937, 1938.

but statutory provision was made for offsetting duties, if at any time during the currency of the Act, it was found that foreign sugar was being imported at a price likely to render the protective duty ineffective.

TABLE NO. 1

Sugar excluding confectionery	Protective duty from April, 1932
1. Sugar, crystallised or soft 23 D.S. and above	Rs. 9—1—0 per cwt.
2. Sugar crystallised or soft inferior to 23 D.S. but not inferior to 8 D.S. ...	
3. Sugar below 8 D.S. and sugar-candy ...	
4. Molasses	*Ad valorem* 31-1/4 per cent
Molasses:	*Tariff values—from 1-1-1934*
1. Imported in bulk by tank steamer ...	Rs. 1—2—0 per cwt.
2. Otherwise imported	Rs. 1-10—0 per cwt.

For duties in subsequent years, see Table No. 1 in Chapter IV

We may now see the statistics of the quantities of sugar imported from 1920-21 to 1939-40.

TABLE NO. 2

Imports of sugar in India during the Post-war period. (Sugar of all kinds, excluding molasses)

Period	Quantity in Tons	Value in lakhs of Rupees
1920-21 to 1922-23	4,09,000	...
1923-24 to 1925-26	5,82,000	...
1926-27	8,26,900	1,836
1927-28	7,25,800	1,450
1928-29	8,68,800	1,586
1929-30	9,39,600	1,551
1930-31	9,01,200	1,054
1931-32	5,16,100	601
1932-33	3,69,500	412
1933-34	2,61,300	270
1934-35	2,22,900	211
1935-36	2,01,157	189
1936-37	13,979	9
1937-38	12,698	14
1938-39	33,470	42
1939-40	2,46,681	311

Table No. 3 on next page shows the value of imports of sugar, revenue derived from imports, and the rate of import duty from 1920-21 to 1940-41.

TABLE NO. 3

Value of Imports of Sugar, Revenue from Imports, and Rate of Import Duty on Sugar from 1920-21 to 1942-43.

Year April-March	Value of foreign sugar (net) imported in British India in lakhs of Rupees	Revenue from Import Duty on Sugar in lakhs of Rupees	Rate of Import Duty
1920-21	1,850	185	10 per cent *Ad valorem.*
1921-22	2,750	412	15 " " "
1922-23	1,549	487	25 " " "
1923-24	1,545	486	25 " " "
1924-25	2,090	578	25 " " "
1925-26	1,520	659	Rs. 4—8—0 per cwt.
1926-27	1,534	744	" " "
1927-28	1,450	653	" " "
1928-29	1,586	782	" " "
1929-30	1,836	846	" " "
1930-31	1,047	1,081	Rs. 6—0—0 per cwt.
1931-32	590	798	Rs. 9—1—0 per cwt. (Rs. 7—4—0 being protective, Rs. 1-13—0 being revenue surcharge from 1st September, 1931).
1932-33	422	685	" " "
1933-34	270	472	" " "
1934-35	210	381	Rs. 9—1—0 per cwt. (Rs. 7—12—0 being protective, Rs. 1—15—0 being excise duty from 1st April, 1934).
1935-36	190	324	" " "
1936-37	23	51	" " "
1937-38	18	25	Rs. 9—4—0 per cwt. (Rs. 7—4—0 being protective, and Rs. 2—0—0 being equivalent excise duty from 28th February, 1937).
1938-39	45	45	" " "
1939-40	331	396	Rs. 8—12—0 per cwt. (Rs. 6—12—0 being protective, Rs. 2—0—0 being equivalent excise duty. With effect from 1st April, 1939).
1940-41	36	18 (April to January, 1941)	Rs. 9—12—0 per cwt. (Rs. 6—12—0 being protective, Rs. 3—0—0 being equivalent excise duty. With effect from 1st March, 1940).
1941-42	107	1·9	...
1942-43	...	·5	Rs. 11—1—7 1/5 per cwt. with effect from 1st April, 1942 (including 20% surcharge).

It should be observed here that from 1916 onwards sugar has been subjected to an increasingly heavy duty in India; and further it can be seen from Table No. 2 that the increase in the quantity of sugar imported from abroad has taken place in spite of a heavy import duty. As can be seen from Table No. 3, the import duty on sugar has yielded a vast amount of revenue to the Government of India. In 1900-01 it yielded only Rs. 53,000 whereas the amount produced in 1929-30 was

[1] *Vide* Trade Journal, 30th May 1940.
Burma excluded from 1937-38.

Rs. 870 lacs.[1] The quantity and value of imports as also the revenue show a rapidly declining tendency after 1929. It may be noted that the highest value of imports of sugar was Rs. 18 crores in 1929-30. It must be observed here, however, that the high duty on the import of sugar in India is by no means exceptional, as still higher duties are found in various other countries of the world. A statement has been given in Table No. 4 below, showing the import duty on sugar in several countries of the world. Recently, various countries have increased the import duties, i.e., the United Kingdom, many of the Continental European States, Canada and China, while several others have adopted more far-reaching methods of regulation through state monopolies or the adoption of quota systems for the regulation of imports, e.g., Soviet Union, Australia, Turkey and Latvia.

TABLE NO. 4

Import Duties on Sugar in the Principal Countries in the World

GREAT BRITAIN *

Exchange Rates	General Duty per cwt.	Preferential Duties uncertificated per cwt.	Dominion Colonial Certificated per cwt.	Excise Duty per cwt.
GREAT BRITAIN	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Sugar of Polarization exceeding 99° ...	14 0 (Rs. 7 8 0)	8 2 (Rs. 4 0 0)	4 8·7 (Rs. 2 5 0)	4 7 (Rs. 2 3 11)
Do. 98° not exceeding 99°	14 0 (Rs. 6 13 9)	7 12 (Rs. 3 7 8)	3 10·3 (Rs. 1 14 3)	3 7·1 (Rs. 1 12 2)
Do. 97° „ „ 98°	10 8·8 (Rs. 5 4 2)	6 9·5 (Rs. 3 5 3)	3 7·6 (Rs. 1 12 6)	3 6 (Rs. 1 11 5)
Do. 95° „ „ 96°	10 2·0 (Rs. 4 15 9)	6 5.2 (Rs. 3 2 5)	3 5·2 (Rs. 1 10 11)	3 3·8 (Rs. 1 10 0)

Note.—Assistance afforded to the farmers is included in the best price paid by the factories which was based on sugar contents. The actual rate of assistance to the factories is related to a price for raw sugar in the open market of 4*s.* 6*d.* per cwt. *(Table contd.)*

[1] The yield from import duty is consistently decreasing, as will be seen from the following Table. During 1931-32 it only yielded Rs. 7.97 lacs, in 1933-34, Rs. 4.72 lacs, in 1940-41, Rs. 18 lacs, and in 1942-43, Rs. 56,000 only.

Year Apr.-Mar.	Yield of Rev. Rs.	Year Apr.-Mar.	Yield of Rev. Rs.	Year Apr.-Mar.	Yield of Rev. Rs.
1931-32	7,97,63,000	1935-36	3,24,16,000	1939-40	3,96,08,000
1932-33	6,84,79,000	1936-37	50,52,000	1940-41	18,24,000
1933-34	4,72,04,000	1937-38	25,33,000	1941-42	1,94,000
1934-35	3,81,35,040	1938-39	45,22,000	1942-43	56,000

Burma excluded from 1937-38.

* *Vide* International Sugar Journal, May 1939, and subsequent increase in duty in Great Britain in September 1939, as a war measure.

TABLE NO. 4—*Contd.*

Import Duties on Sugar in the Principal Countries in the World

UNITED STATES

	Rates of Duty in cents per lb.			
	Raw—96° polarisation		Refined	
	Full Duty	Cuban Duty	Full Duty	Cuban Duty
UNITED STATES 4·90 dollars = £1 according to the latest federal Legislative Act, September, 1934	1·875 (Rs. 4 3 2)	·90 (Rs. 2 0 3)	1·9875 (Rs. 4 7 2)	·954 (Rs. 2 2 2)

Note.—Hawaiian sugars have been admitted to the United States free of duty since 1876.

CUBA

		In pesos per 100 Kilos	
		Minimum	Maximum
4·90 pesos = £1 sterling.	Import Duty Raw Sugar... ...	1·0 (Rs. 1 0 3)	2·0 (Rs. 2 0 6)
	Refined Sugar	0·9375 (Rs. 0 15 3)	1·875 (Rs. 1 14 6)

II. Preferential duty: Not existing.
III. Consumption tax: 1.50 centavos per Spanish pound of refined sugar and sugar exceeding 96½ degrees (Rs. 3-5-0 per md.)

GERMANY, HOLLAND, ITALY, RUSSIA

Exchange Rates	Country	Original Currency					
		Import Duties		Consumption taxes to be paid for imported sugar		Total charge imposed by duties and charges	
		Raw	Refined	Raw	Refined	Raw	Refined
12·18 marks = £1 ...	Germany	Reichmark 27 Rs. (11 0 6)	32 Rs. (13 1 2)	Reichmark 21 Rs. (8 9 3)	21 Rs. (8 9 3)	Reichmark 48 Rs. (19 9 9)	53 Rs. (21 10 5)
68 guilders = Rs. 100 ...	Holland	Guilders 2 40 Rs. (1 5 1)		Guilders 27 Rs. (14 13 1)	33·75 Rs. (18 8 4)	Guilders 27 Rs. (14 13 1)	36·15 Rs. (19 13 5)
93·02 Lire = £1 ...	Italy	Paper Lire 110·10 Rs. (5 14 3)	165·15 Rs. (8 13 4)	Paper Lire 364 Rs. (19 7 6)	380 Rs. (20 5 3)	Paper Lire 474·10 Rs. (5 5 9)	545·15 Rs. (29 2 7)
	Russia	*Ad valorem* 80%	150%	*Ad valorem* 85·87%	83·86%	*Ad valorem* ...	...

Note.—There have been several changes in the Import Duties on sugar in various countries since the outbreak of the World War in 1939.

TABLE NO. 4—*Contd.*

Import Duties on Sugar in the Principal Countries in the World

JAPAN

		Rate of Import Duty	Specific Duty by Law No. 4 of 1932
		Yen per 100 kin	Rs. per maund
17 Yen = £1	(*a*) Under No. 11—Dutch Standard ...	2·50	1 3 3
	(*b*) Under No. 22 „ „ ...	3·95	1 14 6
	(*c*) Other	5·30	2 8 10
	(*d*) Rock candy, sugar, cube, loaf sugar and similar sugars	7·40	3 9 1

Appointment of the Indian Sugar Committee in 1929

Although a high revenue duty existed on sugar, its effects on the sugar manufacturing industry of India were not examined by the Government before 1929. The national importance of sugar in the country was not paid any attention to until after the Great World War, when the desirability of utilising the sugar resources of India were examined without any tangible result by the Government of India.

In February, 1919, Mr. Wynne Sayer of the Indian Agricultural Service was appointed to compile relevant data, statistical and otherwise, as regards the best method of exploiting the advantages which India possessed in respect of sugarcane. Immediately after that in 1920 the Governor-General-in-Council appointed the Indian Sugar Committee. The resolution of the Government dated 2nd October, 1919, in appointing this Committee stated that regarding the desirability of expansion of the sugarcane and sugar manufacturing industry, there could be no doubt, that the annual consumption had been increasing steadily for many years in India no less than elsewhere. It was also recognised that the sugarcane was indigenous to India which until very recent years stood first of all countries in the world in the area under cane. It was also notorious that the yield both of cane and raw sugar per acre and the percentage of available sugar extracted from cane were depressingly low. While, therefore, India should be in a position, as she was in the past, to produce a surplus of sugar for export, she had, in fact, had to supplement her own supplies by imports, whose tendency to increase had been checked only by the War. The Government were also aware of the difficulties in extending the sugar industry, apart from the difficulties attending the cultivation and manufacture of cane sugar in all countries. There were several problems with which the Indian industry was confronted and which were peculiar to India. The systems of land tenure exhibited great variety and were complicated by the customary laws of inheritance and joint ownership. The bulk of the sugar produced in India was consumed in its crude state as Gur or Jaggery and this fact had also a bearing on the prospects of a successful venture for the production of factory sugar in any particular locality. The Government of India felt that the time was opportune for the appointment of a representative Committee to investigate into the problem in all its bearings and to advise whether a definite and co-ordinated policy could

be laid down for the promotion of further development and appointed a Committee under the Chairmanship of Mr. J. MacKenna, Agricultural Adviser to the Government of India, to examine the various sugarcane growing tracts of India with a view to determine the nature of the expansion possible in such tracts either by the development of a factory industry or by improvements in the existing indigenous methods; to review the position of India with regard to the world's sugar supply and to formulate recommendations for the improvement of the position, etc. The Sugar Committee submitted a very favourable and comprehensive report laying great stress on the importance of sugar in the national economy of India.

The next stage in the progress of the Industry opened in 1929 due to the existence of the remarkably high revenue duties on sugar imports. The high import duty on sugar subsisted for many years, but it must be observed that the Government never comprehended the full significance of the development of sugar-manufacturing industry to the agricultural, rural and industrial economy of the country. They did evince some interest in this matter spasmodically, but no sustained effort was made to raise the sugarcane and the sugar industry to their legitimate place in the national economy. The Imperial Council of Agricultural Research, however, deserves credit for persistently drawing the attention of the Government to the feasibility and necessity of the establishment of this industry in the country.

Imperial Council of Agricultural Research

The establishment of the Imperial Council of Agricultural Research may well be regarded as an epoch-making event in the history of agricultural improvement in India. The inaugural meeting of the Council was held in June, 1929, and at this meeting representatives of the various provinces reported the progress made by the provincial governments in the preparation of a scheme for assisting the Sugar Committee. In this Committee the Council has a qualified and a representative body to which are referred all questions affecting the welfare of the sugarcane industry in the country. The Sugar Committee[1] met generally once a year, and has had fourteen sittings till December, 1941. This Committee received a general mandate from the Council to examine and report on measures, necessary for the development of the sugarcane industry in India. One of the recommendations of this Committee, which met for the first time in October, 1929, was that the Government should be asked to institute a Tariff Board enquiry into the question whether protection should be given to the Indian sugarcane industry. This recommendation was accepted by the Council and its representations were successful in inducing the Government to order a Tariff

[1] This Committee consists of 12 members, and includes representatives of manufacturers, agriculturists, and of Government. The Committee has also co-opted about 10 members to maintain its representative character. In 1933, the Committee co-opted two members representing the Indian Sugar Mills Association of Calcutta. A few more additional members have been taken since 1938. Its present strength is 30.

NOTE:—This Committee was dissolved in 1944, owing to the appointment of the Indian Central Sugarcane Committee, (consisting of 44 members) in 1944. For details, see M. P. Gandhi's Indian Sugar Industry Annual for 1943, page lxiv.

Board enquiry into the question whether protection was required, and if so in what measure for the Sugar Industry in India. This enquiry was referred to the Tariff Board in May, 1930. In making this application, the Imperial Council of Agricultural Research had taken into consideration the fact that the three provincial governments, which were widely interested in the sugar industry, viz., the United Provinces, the Punjab, and Bihar and Orissa, (representing 80 per cent of the sugarcane area in British India) together with the Government of Bombay, had asked for a Tariff Board enquiry.[1]

The Sugar Committee of the Imperial Council recognised in 1929 the fact that a steady increase in the import of White Sugar had occurred in spite of the existence of a certain measure of protection which had been afforded by the specific duty on Sugar. Despite an increase in the cane area, and the yield per acre in some tracts and the amount of the White Sugar manufactured in the country, India was very little nearer to being self-supporting in 1929 in regard to sugar produced, than in 1919 when the Indian Sugar Committee submitted its report. The magnitude of the issue will be clear from the fact that the area under sugarcane in India in 1929 was 2.3/4 million acres or about 25 per cent of the total area under sugarcane in the world. The value of sugarcane products produced in India in 1929, on the basis of the prices prevalent in that year was approximately Rs. 48 crores, while in addition, about Rs. 21 crores were paid annually for imported sugar.

The Sugar Committee also considered that the time had come when the Import Duty should definitely be made a protective duty instead of a revenue duty, and further that definite protection to the sugarcane growing industry should be given for a period of 10 years or so in the first instance. They also felt that Indian agriculture was passing through a period of reconstruction and the time was opportune for the development of the Indian sugarcane industry. It was also pointed out that a good deal of the preliminary work, necessary for placing the Indian Sugar industry on a sound foundation, had been carried out. As a result of the work of the Coimbatore Cane-Breeding Station, the Shahjahanpur Sugar Research Station, and the Sugar Bureau, Pusa, seedling canes of real merit had been produced, and distributed and were being grown on considerably wide areas.

Within two years of the great depression, the stage was thus set for the grant of protection to the sugar industry and for the achievement of a rate of growth unparalleled in the history of Indian industry. The two forces which were working in this direction are firstly, the increase, under phenomenal financial pressure, of the import duties on sugar, and secondly, the notable evolution of improved varieties of cane by the Coimbatore Research Station. Thus did History shove the file of "Protection to Sugar" on to the table of the Hon'ble Commerce Member of the Government of India.

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[1] *Vide* Volume of written evidence before Tariff Board, 1931.

CHAPTER V

HISTORY OF SUGAR INDUSTRY IN POST-PROTECTION PERIOD (1932 ONWARDS)

ENOUGH has been said in the last chapter to show that by the time the question of protection to sugar was referred to the Tariff Board, the revenue duties had grown so high that the question had almost a faintly academic tinge. But the formal grant of substantive protection after an expert enquiry into the extent of protection needed is a matter of the greatest import to a nascent industry; and the earlier developments can only be reviewed as calculated to weaken and break down the usual resistance of the Government of India to proposals for protection.

The First Tariff Board Enquiry, 1930

It is only to be expected, therefore, that when the Tariff Board submitted its report in 1931, its recommendations were accepted by the Government, though, as usual, with certain alterations. An important point of dissent was the guarantee of protection to the industry for a period of fifteen years. The Tariff Board recommended that the industry was to enjoy protection for a period of fifteen years from 1932, and that in the first seven years, the duty on imported sugar was to be Rs. 7-4 per cwt. and for the remaining period Rs. 6-4 per cwt. But the Sugar Industry (Protection) Act, 1932, provided for a protective duty at the rate of Rs. 7-4 per cwt. on all classes of sugar till March, 1938, when a further enquiry was to be made to ascertain whether the protection to the industry during the period from April, 1938, to March, 1946, should be continued at the same level or to a greater or lesser extent. The Governor-General-in-Council was also empowered to increase the duty imposed by the Act if he was satisfied after such an enquiry that sugar was being imported into British India at a price which was likely to nullify the benefits intended to be conferred by the protective duties.

The Table [1] on next page indicates the numerous changes that took place in the tariff on sugar since the grant of protection in 1932 upto 1943 :—

Recommendations

The recommendation of the Tariff Board to levy a duty of Rs. 7-4 per cwt. was only of a formal character, and the revenue duty was formally declared a protective one without any change in the level. The levy of the surcharge of 25 per cent according to the supplementary budget of September, 1931, gave considerable impetus to the development of the industry.

[1] Also *vide* Table No. 17, M. P. Gandhi's Indian Sugar Industry Annual, 1941; for the duties in the period before 1932, *vide* M. P. Gandhi's Indian Sugar Industry —Its Past, Present and Future, 1934, p. 350.

TABLE NO. 1

Changes in Duty (Import and Excise) on Sugar from 1932 to 1942.

Year	Rate of Protective Import Duty Per cwt.	Additional Revenue Duty or Excise Duty	Total Import Duty Per cwt.
	Rs. a. p.	Rs a. p.	Rs. a. p.
1932-33 (31st March)	7 4 0	1 13 0	9 1 0
1933-34	7 4 0	1 13 0 (Equivalent Excise Duty)	9 1 0
1934-35 (27th Febr.)	7 12 0 (0-8-0 being additional margin)	1 5 0 ,,	9 1 0
1935-36	7 12 0	1 5 0 ,,	9 1 0
1936-37	7 12 0	1 5 0 ,,	9 1 0
1937-38 (31st March)	7 4 0	2 0 0 ,,	9 4 0
1938-39	7 4 0	2 0 0 ,,	9 4 0
1939-40 (29th March)	6 12 0	2 0 0 ,,	8 12 0
1940-41 (31st March)	6 12 0	3 0 0 ,,	9 12 0
1941-42 (1st April)	8 1 7·1/5 (including 20% surcharge)	3 0 0 ,,	11 1 7·1/5 (Roughly equivalent to Rs. 7-1-9 per maund)

The duties were applied to sugars of all kinds and sugarcandy without any gradation (excluding confectionery). The difference in the amount of the protective import duty in the years 1934-35 to 1936-37 is due to the levy of the emergency surcharge of eight annas; and had this surcharge not been in force, the industry would have claimed additional protection in 1937. According to a recommendation of the Tariff Board, the Government were empowered to levy an additional duty of eight annas per maund if the ex-duty price of Java sugar imported in Calcutta fell below Rs. 4 per maund. (Sugarcandy was separated for purposes of levy of duty from sugar from February, 1934, and importers had to pay a revenue duty of Rs. 10-8 per cwt. on sugarcandy).

The rapid progress of the industry behind the Tariff wall caused a decline in imports and the revenue from this source declined progressively from Rs. 10 crores in 1930-31 to Rs. 25 lakhs in 1937-38, (*vide* "Gandhi's Indian Sugar Industry Annual, 1941", Table 42).[1] Government, therefore, wanted to recover to a certain extent a portion of the lost revenue from this source. Legislation for the fixation of minimum price of cane was also considered necessary.

Accordingly, an excise duty of Re. 1-5 per cwt. was levied in 1934. The amount of the excise duty was determined according to the following method. It was not considered prudent that the whole of the revenue surcharge of Re. 1-13 should be levied as excise duty. After allowing for the additional protection of eight annas, the figure of Re. 1-5 was reached. There was naturally considerable opposition to the imposition of the excise duty on a nascent industry when protection

[1] In 1942-43, the revenue was only Rs. 56,000.

was in force. The Government pointed out that the duty was only intended for revenue purposes and that this indirect tax could be passed on to the consumer. The countervailing duty of Re. 1-5 which left the total import duty at the same figure of Rs. 9-1 per cwt., they said, did not affect the measure of protection. Before the industry could settle down and adjust itself to the new tax on production, there was an increase in the excise duty to Rs. 2 per cwt. in March 1937, with the result that there was a considerable dislocation. With large over-production and a high level of duty, the industry was almost on the verge of collapse. This crisis was met by concerted action of members of the industry and the support lent by the Provincial governments of U. P. and Bihar.

The total import duty at the end of the first period of seven years of protection was thus Rs. 9-4 per cwt.

The Second Tariff Board Enquiry, 1937

As originally proposed by the Government, a Tariff Board was appointed in March 1937 to go into the question of protection for the remaining eight years and review the progress achieved in the first seven years. The Board completed its enquiry in December 1937 and submitted a report, which however did not see the light of day before March, 1939. It was decided that the duty then existing should be continued till March 31, 1939. Accordingly, the Sugar Industry (Temporary Extension) Act, 1938, was passed.

The second Tariff Board based their recommendation of a duty of Rs. 7-4 on the basis of the cost of production of sugar of Rs. 6-13-10 per maund *plus* 9 annas per maund for freight and 5 annas per maund for the difference in quality. As the ex-duty price of Java sugar was Rs. 2-7 per maund, the difference between the two prices, viz. Rs. 5-5 per maund or Rs. 7-4 per cwt. was recommended as the protective duty for the rest of the period of protection.

The main recommendations of this Tariff Board were as follows :—

The fair selling price of Indian sugar was Rs. 6-13-10 per maund, to which was added 9 annas per maund for freight and 5 annas for quality, making roughly Rs. 7-12 per maund. Java sugar could be landed at Rs. 2-7 per maund, and the protection required was, therefore, Rs. 5-5 per maund or Rs. 7-4 per cwt. This amount of protection was to be granted for a period of eight years.

Permission should be accorded for the manufacture of power alcohol on the understanding that it was to bear the same rate of duty as petrol.

No special protection was considered necessary for the "gur" industry, apart from the protection granted to sugar.

Research work on the agricultural side was considered inadequate, and an allotment of 3 annas per cwt. from the excise duty was recommended to be made for central research and assistance to provincial agricultural departments.

A marketing survey of the sugar industry was also recommended to be undertaken. (This was completed in 1942, and a report was published in 1943.)

Government's Criticism of the Tariff Board's Recommendations

The Resolution[1] published by the Government of India along with the Tariff Board report pointed out that the "figures proposed by the Board for certain items, notably manufacturing costs and profits and for adjustment of the difference in quality are susceptible of reduction. They also considered it questionable the assumption that Java sugar, the fair selling price of which so vitally affects the measure of protection, could be sold ex-duty at as low a figure as Rs. 2-7 per maund. The Board's figure was based on special and purely temporary conditions in Java and is no longer accurate." The inclusion of a minimum price of Rs. 2-7 per maund for Java sugar by the Board, as the Government of India points out, was not based on special and purely temporary conditions in Java. At the time the enquiry was being made, the quotation for Java sugar in Calcutta was Rs. 3-15-2 (26th August, 1937). But the Board pointed out that with the cost of production as low as Rs. 2-7 including freight, interest on capital and taking into account the progress of the industry in Java since the last enquiry, it was quite likely that, for the duration of the remaining eight years of protection, Java sugar offered keen competition.

The Government's comments on the Tariff Board's observation on the effects of the excise duty were not quite justified. The Tariff Board pointed out: "The additional excise duty levied in 1937 has had unfortunate consequences for the cane grower and manufacturer. At the prevailing level of prices, the present rate of excise duty is out of proportion. It cannot be denied that the excise duty had a disorganising effect on the industry in 1937 and that the incidence of the duty was mostly on the cane-grower and manufacturer. To deny that the incidence of the duty was heavy on the cane-grower and the manufacturer on account of the unduly low level of prices consequent on overproduction does not improve the position."

The Effects of the Excise Duty

The excise duty was levied, according to the Government, to check over-production, but it only added to the confusion in the industry; and but for the general improvement in world markets in subsequent years, it would have been very difficult for the industry to get over the shock. The contention that "in the absence of foreign competition it is the natural inevitable tendency for indirect taxation to be borne ultimately by the consumer" cannot hold good. It is not in every case that it is possible to pass on the duty to the consumer. It depends on the nature of the demand for the article on which the duty is levied. If, by reason of the increase in the price to the extent of the duty, there is a contraction in demand, the incidence of the duty is both on the consumer and the producer.

The Government were extremely touchy regarding the observations of the Board about the excise duty which was levied purely for revenue

[1] For the text of the Resolution of the Government of India No. 127-TC2/387 dated 30th March, 1939, (*Vide* Gandhi's Sugar Industry Annual, 1939 and 1940).

purposes, and which was, therefore, outside the scope of the enquiry. If the excise duty had the effect of nullifying to a certain degree the measure of protection afforded to the industry, it cannot be denied that the Board was justified in examining the effect of the excise duty on the progress of the industry. To levy a high level of duty on internal production at a time when the industry was in a formative stage and the demand for sugar had to be stimulated, appeared to be tantamount to watering down the policy of protection, if not a complete negation thereof.

Moreover, in para 305 of the Fiscal Commission's Report, it is pointed out that one of the Board's ordinary functions is " to consider the effects of the excise duties on Indian industries." The Tariff Board was, therefore, quite correct in including within the scope of its enquiry a consideration of the effect of the excise duty on the growth of the industry and was justified in its observation that " the additional excise duty levied in 1937 had unfortunate consequences for the grower and manufacturer."

The Government did not however agree with the findings of the Tariff Board and pointed out that a very low price for Java sugar had been assumed and that conditions in the world sugar market had considerably improved. At the same time, there were developments within the industry which, according to Government, called for a lower level of protection.

The figure of Rs. 6-12 per cwt., eight annas below the figure recommended by the Tariff Board, was therefore fixed from 1st April 1939. With the outbreak of the World War in September, 1939, and the need for more revenue, the excise duty was increased to Rs. 3 per cwt. from 1st March, 1940, and the total import duty therefore came to Rs. 9-12 per cwt. A further increase was effected in the import duty from 1st April, 1942, as a result of the imposition of a general surcharge of 20 per cent on all imports (with certain exceptions), and the total duty on sugar was thus Rs. 11-1-7.1/5 per cwt. At the time when it was decided by Government that there should be a reduction in the level of the protective duty from Rs. 7-4 to Rs. 6-12 per cwt. they also announced that there would be another enquiry before the end of 1940. The Sugar Industry (Protection) Act, 1939, gave effect to this decision. But as a result of the outbreak of war in 1939, it was announced by the Government in September 1940 that no further enquiry was to be undertaken in the abnormal conditions. This duty was continued at the existing level, first up to 31st March, 1940, and then up to 31st March, 1942. In April, 1942, the duty was further increased by 20 per cent and was fixed at Rs. 11-1-7.1/5 per cwt. up to 31st March, 1943. It is certain that no Tariff Board enquiry will be made in the industry before 1946.

To gauge the progress of the industry after 1932, one has only to look at the following Table (Table No. 2) showing value of sugar machinery imported during the eight years ended 1939-40. Publication of statistics of value of imports of sugar machinery after 1930-40 is stopped by the Government of India.

TABLE NO. 2

Total Value of Sugar Machinery Imported in British India
(In thousands of Rupees)

Source	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
U. K. ...	91,48	1,95,87	73,60	49,70	68,49	43,15	30,16	...
Other countries ...	61,63	1,40,51	31,84	16,00	26,66	26.21	31,20	...
Total ...	1,53,11	3,36,38	1,05,45	65,70	95,16	69,37	61,36	50,84

The above Table is an indication of the pace at which the Sugar Industry grew after the requisite stimulus of protection was given by the Government in 1932. More direct evidence is furnished by the following Table (Table No. 3) which gives not only the number of factories and the volume of production, but also the imports of sugar from year to year from 1931-32 to 1941-42 : —

TABLE NO. 3

Number of Cane Factories working in India, including States, and Production of Sugar from Cane Factories, Gur Refineries, Khandsari, Net Import of Sugar in British India and Import in Kathiawar Ports during the last 11 years, and estimates for 1943-44

Year (Nov.-Oct.)	No. of cane factories working in India	Cane factory production (Nov.-Oct.)	Sugar Refined[1] from Gur (January-December)	Khandsari (Conjectural estimates (Nov.-Oct.)	Total Production of sugar in India (Nov.-Oct.)	Net Imports (Excluding Re-exports) of sugar in Br. India (Nov.-Oct.)	Imports of sugar in Kathiawar Ports (Nov.-Oct.)
		Tons	Tons	Tons	Tons	Tons	Tons
1931-32	32	158,781	69,539	250,000	478,120	438,797	95,678
1932-33	57	290,177	80,106	275,000	645,383	321,081	68,649
1933-34	112	453,965	61,094	200,000	715,059	233,366	87,094
1934-35	130	578,115	39,103	150,000	767,218	197,775	113,364
1935-36	137	932,100	50,067	125,000	1,107,167	86,962	45,218
1936-37[4]	137	1,111,400	19,500	100,000	1,230,900	11,160[5]	12,870
1937-38	136	930,700	16,600	125,000	1,072,300	9,410	12,284
1938-39	139	650,800	14,200	100,000	765,000	254,400	76,819
1939-40	145	1,241,700	31,700	100,000	1,373,500	35,260[3] (11 months)	28,856 (5 months)[6]
1940-41	148	1,095,400	48,500	125,000	1,268,900	5,000	...
1941-42	150	778,100	13,800	150,000	941,900	...	...
1942-43	150	1,070,000	10,000	214,000	1,294,700	...	...
1943-44[2]	152	1,260,000	10,000	100,000	1,370,000	...	...

[1] Figures of *gur* production for calendar year 1932 are added to figures for 1931-32, and so on.
[2] Our estimates.
[3] Figures of gross imports (not net) available ; Statistics discontinued.
[4] Factories in Burma, and production of sugar in Burma, are excluded from 1936-37 season.
[5] Imports in Burma excluded from April, 1937 onwards.
[6] Statistics discontinued from March, 1940.

With the beginning of this decade then, India may be safely regarded as having achieved complete self-sufficiency in regard to sugar. Indeed, the stage was reached when the action of the Government in making India a party to the International Sugar Agreement was bitterly resented as imposing an unmerited handicap on the expansion of the Indian Sugar Industry. The nightmare of shortage of sugar which the last war raised was dispelled just when the approach of the present war should have made it more harrowing than ever to the public at large. That the industry was sometimes troubled by the nightmare of over-production and large carry-overs is, however, a different matter. What is important is that the aim of utilising India's resources to develop an indigenous sugar industry and to render the country self-sufficient in this respect, which was formulated during the first World War, was realised, if somewhat belatedly. That all this was done within less than a decade may not be a matter of unmixed satisfaction to the Indian people considering that the tariff walls were raised to insurmountable heights and the consumer was made to pay prices far higher than the imported product. But the satisfaction that so important a provision for war time was made, as it were, at the last moment, will not be toned down by considerations of cost which lose much of their force, even if they are not irrelevant, in a war economy. For good or otherwise, India now possesses a sugar industry which is the second largest industry in the country. India, it should be remembered, is the biggest producer of sugar (including Gur) in the world since 1931. (*Vide* Gandhi's Sugar Annual, 1941, Table No. 7). The industry has wide-spread ramifications, in agriculture, in government and in the politics of important political parties. It has, doubtless, its problems, some of them as thorny as one could imagine. Nevertheless, the stage has been reached when the familiar slogan of "Mend or End" has to be dropped once and for all. For the "end" of the sugar industry on the ground that dubious comparisons of costs seem to suggest such a course is outside the pale of serious discussion. Once the sugarcane industry forms so large a part of the fabric of our national economy, there are only three tasks to which practical statesmanship has to turn: (1) To appraise past experience, in respect of costs and yields so as to give restraint and guidance to similar aspirations in the future. (And this is where the apparatus of economic reasoning suggested by free trade theories is most useful, provided it is judiciously handled.) (2) To investigate the technical problems of the working of the industry in its narrow sense, and in a larger sense, of its functioning as a part of our economic machinery, and (3) To examine and solve from time to time the questions of policy which arise from the position and prospects of the industry. To these we may now turn our attention.

CHAPTER VI

THE COSTS OF PROTECTION TO SUGAR INDUSTRY

WE have so far dealt with the growth of the sugar industry since the grant of substantive protection in 1932 and the preceding changes in the revenue duty which made of protection more or less a *fait accompli* when the Tariff Board was instructed to enquire into it. If the rate of increase in revenue duties was particularly high and the tariff walls well nigh insuperable, the growth of the sugar industry, too, exceeded all expectations. There are thus special features of the sugar industry for which adequate explanation can be sought only in the broader historical trends of recent times alike in national and world economy.

These trends were delineated and examined in the earlier chapters of this thesis, and the conclusion emerged that in the conditions of national and world economy, in the depression and post-depression periods, the old controversy between free traders and protectionists had lost much of its reality, that while free trade was tending to be more and more a forlorn cry, protectionism was gravitating towards more complete forms of industrial regulation and that, in these circumstances, the question from the practical point of view was how to derive the utmost benefit from an established large-scale industry. It was insisted, however, that the general apparatus of reasoning invented by equilibrium economies should be employed to make sure that no serious blunders have been committed, or persisted in, in the distribution of scarce means among competing ends. It is to this task of appraising the costs and yields of protection to sugar that attention must now be turned. But it is well to remember while on this enquiry firstly, that in the economic conditions of modern times, the absence of free prices serves to complicate the task and secondly, that any enquiry into costs of protection is of necessity limited to a comparison of prices of the indigenous product and of the imported product and that it cannot take into account all the potentialities which the new industry may be deemed to have opened before the nation. To a large extent, the free trader's test is the more or less crude test of results.

It is idle to cavil at such an attitude. For an enquiry into the costs of protection has not necessarily to be carried out at a certain point of time; and the actual achievements up to that time alone can be taken into account. While the protectionist may reasonably argue that the enquiry is premature and therefore unjustified, and that the industry must have more time to prove its worth, he cannot calculate the results of protection on a purely imaginary basis. It is in this respect that the advocates of industrial regulation, as distinct from mere protection, are on surer ground.

In the case of the sugar industry, the Tariff Board of 1931 may be said to have taken a position midway between the protectionists of the old school and the regulationists of modern times. While the Board satisfied itself that at the end of the period of protection which it recom-

mended "the cost of manufacturing white sugar in India should not exceed that in any other country except Cuba and Java"[1] it also envisaged a general diffusion of the benefits of protection to agriculture and the realisation of a number of indirect benefits to the national economy. Inasmuch as the date of the second tariff enquiry was hastened by action of the Government by as much as eight years, it might well be contended that an enquiry into costs of protection within six years of the grant of protection is premature and can neither be fair to the industry nor light the path of its future. Such a view can only serve to emphasise the importance of bearing these considerations in mind while enquiring into the costs of protection. It is also useful in stressing the difference between results so far achieved and the potentialities that still remain.

After all, little is gained by shirking, with whatever justification or under whatever pretext, the acid test of costs. And all that can be urged from the point of view of the protectionist is that the cost to the consumer should not be confused with the cost to the nation. For it is just possible in certain cases that, while the consumer pays more for a protected article than he might have had to pay for the imported product, the nation as a whole may be a gainer from the establishment of the protected industry. In the latter event, criticism of protection on the ground of cost to the consumer would prove to be misdirected, as it would only be a criticism of the system of distribution. And it would also serve to illustrate the fact that what may appear uneconomic according to the criterion of "costs to the consumer" will be seen from the wider standpoint of the national economy as a whole to be fully justified. In fact, the price paid by the consumer is the narrowest view to take of the results of protection; and by itself is invalid as a test of the economic character of the protection granted to the industry. For the price may, for various reasons, be a distortion of the cost of production, actually incurred by the industry. Taxes and other factors originating in State action, defective marketing and other circumstances tend to render prices as distinct from costs uneconomic. Even when prices bear a reasonable relation to costs, they have to be compared to the price which the consumer would have been obliged to pay, had there been no national industry. The reasoning has thus a hypothetical and even speculative character and opens the door to a flood of uncertainties that weaken the claims of this comparison to ready acceptance on all hands.

It will be seen from all this firstly, that the advocate of protection has a number of preliminary objections to the case being taken up at all at any rate, by the tribunal of the moment, that he puts forth his arguments without prejudice to certain crucial contentions of his and that he is all the time stressing the importance of the supreme consideration of national, as distinct from consumer or other sectional, interest. Here, in this chapter, it is the arguments in the case, for and against, that are the preliminary concern. The various criteria may be set down, however, for convenience in the ascending order of importance: (1) The price paid by the consumer. (2) The cost of production compared

[1] Tariff Board Report 1931, p. 37.

to costs in producing countries which are similarly placed. (3) The benefits flowing from protection, no matter by what channels, to the nation at large together with the privations. (4) Further potentialities of the industry. Costs of protection in the widest sense of the term can be assessed only if all these different points are adequately considered.

Taking first the question of the price paid by the consumer, and keeping in mind the fact that it has only a bearing on, and cannot be conclusive of, the case for or against protection, we may begin by noting here the considered finding of the Tariff Board, 1937, that "the consumer has every reason to be satisfied with the policy of protection. He is paying less for sugar than he paid before the advent of protection. The price of sugar in India is today cheaper than in any country in the world except Cuba, Java and Brazil."[1]

Protectionists are prone to exaggerate the value, for their purposes, of this statement. For in these terms, the Board's defence of protection can hardly carry conviction to the ardent free-trader. For, according to him, the consumer could feel satisfied only when he obtains the goods at the lowest price which is economically possible. Even the certainty of supplies during war time which must weigh with the average consumer as a human individual and not a mere abstraction of the economist is to the free-trader an altogether irrelevant consideration. To say that he is paying less for sugar than before the advent of protection is, therefore, no proof of the contention. Nor does it suffice that the price of sugar in India is today cheaper than in any country except Cuba, Java and Brazil. For it is precisely from the first two—the third is not an exporter of sugar—that the free trader would have the Indian consumer meet his needs of sugar. And the admission that the *costs are higher* than the costs in Cuba and Java may be tantamount to giving up the whole case for protection.

The Tariff Board's remark, then, is no tower of strength to the protectionist, so far as this particular issue of cost to the consumer is concerned. It would be more effective, at any rate, more to the point, if the protectionist emphasises that the price of sugar in India ought to be compared with what the price of sugar might be in the absence of sugar production in India. It would then be open to him to draw attention to the predominantly hypothetical character of such comparisons and to insist that nothing can be proved by speculation on the possible level of prices of imported sugar. In ordinary economic discussions, attempts are, no doubt, made to exhaust all possibilities by taking into account every recognisable factor of change, while making the requisite calculations. It is easy enough to add the revenue duty and railway freight to the c.i.f. price of imported sugar. The actual ex-factory price of Java or Cuba sugar at a given time is also easily computed. But he would be a bold man who would be dogmatic about the costs and prices of foreign sugar in certain hypothetical conditions, e.g. in the absence of a large-scale industry in India, and in the decay of the subsidised beet sugar industry in some, if not all, of the various countries of Europe. Who can say what allowance should be made for the increase in the

[1] *Vide* Tariff Board Report, 1937, Summary, p. 167.

bargaining strength of the producing countries consequent on the decrease in competition and the increase in demand ? The diffusion of sugar production in the world reduced Cuba and Java to a desperate plight and led in turn to the phenomenon of dumping ; and nothing is so characteristic of dumping as the lack of any relation between costs and prices. In the same way, the rise of a quasi-monopolistic position for Cuba and Java may bring about a similar absence of relation between costs and prices, and in the direction of unconscionably high prices instead of unconscionably low prices as in the case of dumping.

Apart from the subjective factor of the attitude and policy of the manufacturers, there is the objective fact that, as the scope for economy in production is extremely limited in the case of Cuba and Java, they cannot meet the increase in demand without subjecting themselves to the law of diminishing returns.

Bearing in mind these important considerations, we may take note of the more important of the facts relevant to the question of price to the consumer. The following Table gives the retail prices of sugar in the principal countries of the world in 1938 :

TABLE NO. 1

Retail Prices of Sugar (1938)

(From *International Sugar Journal*, April 1939, p. 160.)

Country	Price in Rs. per maund converted at the then exchange rate		
	Rs.	a.	p.
Argentina	12	12	7
Brazil	6	14	8
Chile	9	9	4
Cuba	7	13	5
Egypt	12	3	3
South Africa	14	15	8
Australia	14	13	2
Dutch East Indies	6	12	7
Philippines	6	7	2
China	12	10	5
Japan	12	12	11
Czechoslovakia	21	3	3
France	16	0	6
Germany	30	9	8
Italy	35	3	6
Netherlands	27	6	6
Norway	16	0	6
Poland	19	0	2
Switzerland	9	13	3
United Kingdom	10	7	4
Canada	13	3	4
U.S.A.	12	1	5
India	10	0	4

The countries mentioned in the above Table fall into three natural divisions : (1) those which produce for internal consumption, (2) those which produce mainly for exports, and (3) those which maintain protected industries at home and have to supplement the internal production with imports from abroad. Prices in countries belonging to the

last category obviously do not lend strength to the anti-protectionist case as they are twice as high or even more than those in India. If we may distinguish the United Kingdom and the Dominions from the Continental beet sugar countries, even they, it will be seen, cannot claim to have obtained their requirements of sugar, at prices which compare favourably with the price to the consumer in Inida. The cane sugar exporting countries alone remain for comparison with Indian prices. Here it should not be forgotten that the marketing policy is not in favour of uniformly economic prices in all the foreign markets. Lower prices in one market are offset by higher prices in protected markets in certain other countries. The consumer can have no grouse against protection to sugar only on the ground that his counterpart in some other country is able to get sugar at a lower price. That fact by itself can prove nothing. The question is whether in the absence of a protected sugar industry in India, the course of events would have led to the satisfaction of the Indian demand at substantially lower prices. That, it has been repeatedly emphasised, is an unduly hypothetical or speculative question. Even the most cautious and circumspect reasoning would have to be wound up with a distressingly large dose of dogmatism. For purposes of national policy which takes account of consumer interest only in a broad view, it should suffice, firstly, that the Indian price is less than the price in all but the more important exporting countries; secondly, that the two countries which produce sugar more cheaply than India cannot be depended upon in the absence of an Indian sugar industry, either to retain in full the differential advantages in production which they now have or to pass on their benefits substantially to the Indian consumer; and thirdly, that the consumer pays less for his sugar than before the advent of protection. That is as good a case for a protective policy as one could wish.

Hitherto the results of protection to sugar have been considered from the standpoint of the price to the consumer. The question of cost of production is clearly distinguishable from price to the consumer, not only because prices and costs are not identical but also because this question opens up a vista of other considerations as well. Here, again, a mere comparison of the costs of production in India and in some other sugar-producing country, or between the Indian sugar industry today and some time ago will hardly suffice for the purpose of determining whether protection to the sugar industry is justified or not. For the cost of producing any particular commodity does not depend solely on the producers of that commodity or on their efficiency. Apart from the efficiency of the labour employed in the industry which can improve only with time, there is the cost of the raw material and the facility for economies afforded by industries which can utilise its by-products. The cost of the raw material, too, is not wholly a function of the efficiency of its producers. It reflects also the relative bargaining strength of the buyer and the seller. And when the seller has behind him the sympathy and support of the State, the price paid for the raw material may tend to distort the picture of changes in costs of production of the finished product. In the case of the sugar industry, the fixation of minimum prices for sugar disables the manufacturer to a great extent for achieving a progressive reduction of costs. A higher price for cane, like the higher price for sugar, does not necessarily betoken a fall in

productive efficiency. On the other hand, some economy has been already achieved by the Indian cane-grower through the utilisation of improved cane. The higher price paid for cane is the result of governmental action aimed at improving the position of the cultivator without regard to the other aim of cheapening the sugar for the consumer. The ethics and economics of minimum prices of sugarcane will be discussed at a later stage. Here it should suffice to note that the test of progress is to be found not so much in prices at different times as in the technical criteria of yield per acre or extraction percentage. The unreliability or obsoleteness of the old methods of testing productive efficiency is again brought out in this instance.

It is, however, worth while comparing the results of the two Tariff Board Enquiries that have so far been carried out. Here one fact stands out in somewhat disquieting relief, that the second Tariff Board Enquiry recommended the same amount of protection as the first, viz. Rs. 7-4 per cwt., though the 1931 Board seemed fairly confident that after the first seven years the extent of protection could be reduced to Rs. 6-4 per cwt. At first sight, it would seem that no progress of any kind has been achieved by the Indian industry during the first half of the period of protection. But one must not overlook the fact that while the Tariff Board of 1931 estimated "the fair selling price of white sugar manufactured in a typical factory in India" at Rs. 9-5-9 per maund and also observed that at the end of the protective period (15 years) "this fair selling price should have fallen to Rs. 7-12-5 per maund, the Tariff Board of 1937 found that "the cost of manufacture in a representative factory including overheads and profit is Rs. 6-13-10 per maund." Likewise, in regard to cane, the previous Tariff Board estimated a fair price for cane of Annas 8 delivered at factory. The corresponding figure in the second enquiry is 5 as. 6 ps. per maund. This compares with the price of As. 6 which the first Tariff Board envisaged at the end of the period of protection. These figures give a fair idea of the improvement in efficiency in the production of the raw material and its manufacture into white sugar.

This picture, which, one must concede, is by no means too disheartening, is distorted when it is seen from the angle of the price paid by the consumer. For this price is shaped by the duties paid by sugar, whether the duty is an excise duty and its consequent countervailing duty or whether it is a mere protective import duty. The extent of protection required which we have noted is the same in 1931 and 1937, is determined not alone by the cost of production at home nor even by the cost of production of the competing sources of supply abroad, but the rate at which the latter could land sugar in India. The protective duty, therefore, remains unchanged not because the Indian industry has failed to secure any economy of costs but because the 1937 Board thought it "possible that Java sugar could be landed at ports at a price of Rs. 2-7 per maund" against Rs. 4 assumed by the Board of 1931. It should hardly be necessary to repeat here the danger of exaggerating the value of this fall in the import price to any sapient judgment of the cost or efficacy of the protective policy.

We may now examine the value of protection to the country as a whole. Once he is rid of the straight jacket of consumer's price or cost

of production, the protectionist may breathe more freely. He can point with pride to the fact that as against the former imports of sugar to the value of Rs. 15 crores per annum, we have now indigenous production of sugar (including Gur) of Rs. 75 crores per annum. The fixed capital invested in the industry may be valued at about Rs. 32 crores. The sugar industry ranks as the second biggest national industry in the country. It has provided employment for 1,00,000 skilled labourers and for no less than 3,000 technical men, and 20 million agriculturists are associated with its development.[1] It has thus given a great fillip to agriculture. Not only has it increased the total area under sugarcane from 2,905,000 acres in 1930 to 4,200,000 acres in 1940, but the yield per acre has also increased as a result of the increasing area under improved varieties of cane, which has gone up from 8,17,000 acres in 1930, to 34,80,000 acres in 1940. It has taught the cultivator the value of utilising improved seeds, of expedition in taking his product to the manufacturer, of taking care about the value of his produce, of an increasing yield derived from improved methods of cultivation, etc.[2] And there is still much more to be done. A large bunch of technical problems both in regard to cane cultivation and sugar manufacture still remain to be solved. One of the greatest handicaps of the Indian sugar industry is the short duration of the crushing season, the low quality of the raw material at the beginning and at the end of the season, and the low yield per acre, which compares very unfavourably with Java and other countries, where an acre yields about 50 tons per acre, as compared with the low average yield of only about 16 tons in India. The evolution of late ripening and early ripening varieties of cane has been taken on hand and when better results are produced, their value to the sugar industry can be easily imagined. Considering that the recovery percentage has gone up steadily during recent years and that further progress depends almost solely on the improvement of the quality of the cane, the possibilities on the cultivation side must be considered the most fruitful venue of research for which ample funds should be set apart.[3]

At the other end lies such problems as the utilisation of by-products and the establishment of industries which can achieve that end. The manufacture of power alcohol, the use of bagasse for better purposes than as fuel, these are some means of economy which lie beyond the power of the sugar industry. It may well be that the manufacturing process still leaves some scope for economy. Complaints have been voiced about sugar mills failing to choose the best men available. But whatever that may be, costs of manufacture are not everything in the costs of producing a manufactured article. The efficiency of the producers of the raw

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[1] *Vide* Mr. M. P. Gandhi's speech at the Rotary Club of Bombay, on 13th October, 1942. (*Annual* for 1942). *Vide* 1943 Annual, for his speech at the Rotary Club of Ahmedabad on 3rd December 1943.

[2] The Imperial Council of Agricultural Research assessed the total value of the increase due to improvement in the sugarcane crop at Rs. 2½ crores *per annum* (*vide* Gandhi's Sugar Annual, 1941, page 194).

[3] In their Report, the Tariff Board recommended (page 143) that the Government should allot three annas per cwt. from the excise duty, for research work. We agree with this recommendation entirely and also endorse the Tariff Board's recommendation that "the only hope of the industry ever being able to compete on equal terms with other countries, is a reduction in the price of the raw material."

material and the alacrity with which industries for utilisation of by-products are established are often more important factors. They are all, even like the acquisition of technical skill in the industry, necessary conditions for the success of an industry. But necessary conditions are not exactly conditions precedent for such success. In industry, as much as in any facet of social life, progress in all the various department goes hand in hand. It is tempting to suggest that the technical progress painfully achieved by a protected industry can as well be aimed at by *ad hoc* research at much less cost than what the nation has to incur through the protective duties. The difference in costs must have a strong appeal.[1] But the logical sequence is not the sequence of historical events. And those who suggest that industries should be established only after the solution of technical problems in a laboratory or in experimental factory or farm not only overlook the difference between experiment and actual working but fail to realise that to ask for such encouragement of research in India as she is situate today, is to ask for the moon. When funds for research are not obtainable even with such large stakes in protected industries, it is idle to think that the Government would undertake research as a preparation for new industries.

It will be seen that the costs of protection to the sugar industry relatively to the returns are not as unconscionable, as they are made out to be by writers like H. L. Dey and B. N. Adarkar in their books on "The Indian Tariff Problem", and "The Indian Tariff Policy" respectively. At the same time, it is futile to swell the credit side of protection. Prof. B. P. Adarkar in his excellent volume on "Indian Fiscal Policy", somewhat naively suggests, though he hardly says it explicitly, that the fall in the price of *Gur* which followed the grant of protection to the sugar industry may be deemed to be one of the benefits of protection. Less scholarly writers, not to speak of avowed partisans, are apt to exaggerate the value of protection. If one is not too much of a doctrinaire or a partisan, one should find little difficulty in recognising that protection to the sugar industry is amply justified, though the results assuredly are not all that one would desire.[2] At any rate, there should be little difficulty in recognising that protection must be judged as a national policy aiming at far more than the replacement of foreign by Indian sugar and that a broad question of policy cannot be solved by transforming it into a piece of complicated arithmetical computation. For no calculation, however carefully made, can suffice to eliminate the element of speculation involved in determining the price at which the Indian consumer would obtain his requirements of sugar in certain purely hypothetical conditions.

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[1] *Vide* Dr. H. L. Dey in "The Indian Tariff Problem", p. 279, where he says: "When this vastness and complexity of the task of cane improvement in Northern India is realised, it would become clear that the principal problems facing the sugar industry are to be solved mainly by means of organised research on an elaborate scale and for a fairly long period of time."

[2] Even Prof. H. L. Dey admits in "The Indian Tariff Problem", page 255, "We should admit at the outset that the real importance of the cultivation of sugarcane is that it gives a greater monetary return per acre than almost any other staple crop in India. This is certainly of great advantage to a densely populated country like India."

Both the Tariff Boards in their Reports have laid considerable stress on the agricultural grounds for justifying protection to the industry.

CHAPTER VII

BENEFITS OF SUGAR PROTECTION TO CANE CULTIVATION

IN the last chapter, an attempt was made to examine how far the actual results of protection to the sugar industry during the first seven years justify the protectionist policy. It was emphasised that this question ought to be approached from the standpoint of the consumer and the nation at large, as also from the near and the long view. Nevertheless, the enquiry was restricted to the viewpoint of the consumer and to what may be called the near view. At the same time, it was found that appreciable as were the actual results, the potentialities were more significant, if only because they open up wide vistas of possible development in the improvement of cane cultivation on the one hand and the development of industries for the utilisation of by-products, on the other. Public opinion in a predominantly agricultural country like India is naturally more solicitous of the welfare of the agriculturist and wistfully looks forward to the benefits which a policy of protection to industry may have to offer to the cultivator. The sugar industry, too, feels impelled by motives of enlightened self-interest to aid the improvement of cane cultivation; for, as has been pointed out in an earlier chapter, the further progress of the technical efficiency of the sugar mills depends predominantly on the improvement of the quality of the cane and a reduction in its cost of production. The Tariff Board, too, in its first enquiry emphasised the importance to agriculture of protection to the sugar industry.[1] In this it reacted to the prevailing climate of economic opinion in the country which had learned to think in terms more of economic planning than of protection to industries which satisfy the criteria laid down by the Fiscal Commission. The Tariff Board report raised high expectations of appreciable progress in agriculture, at any rate in the cultivation of sugarcane as a result of protection to the sugar industry.

It is necessary therefore to examine the effect which an expanding sugar industry has had on cane cultivation and how far improvements in the latter can be expected to help the former to grow in strength and stability. The nature of this impact has been to some extent indicated in the previous chapter while examining the costs and yields of protection to sugar. And it will be clear that with the efficiency of cane cultivation is bound up the economy of sugar production in India. It should also have been seen that progress has so far been in the direction of expansion of acreage and wider use of improved cane. But the essence of the problem in regard to cane cultivation lies in the

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[1] *Vide* Tariff Board's Report, 1931, page 27, *et seq.* It said: "The future of the sugar industry depends mainly on the cost of producing the primary material, viz. cane, and the problem is, therefore, one of protecting a particular branch of agriculture until such time as improvements in methods of cultivation and development in research enable the agriculturist to increase his yields per acre and thereby effect a substantial decrease in the cost of cane, while maintaining or increasing his own profits."

fact that cane is the raw material for a protected industry which is called upon to outgrow, as fast as it can, the need for protection. Since competitive capacity is determined by conditions in a cane producing country like Java, the task which we are faced with is to approximate, as near as we possibly can, the conditions in India to conditions in Java.

It is in this respect, that India's agricultural problem in regard to cane is different from the problem in respect of other agricultural staples. India's agricultural products are, as a rule, staples of our export trade. Though our productive efficiency in these lines has not been wholly reliable and India has often been in danger of being elbowed out of her export markets, there is no hiatus between the Indian exporter and his foreign competitors such as there is between the Indian grower of sugarcane and his compeers abroad. The Indian exporter is helped either by the monopolistic or quasi-monopolistic nature of his position or by his advantage over his rivals in what are termed " price markets ". The threat to Indian jute has not yet emerged, though certain people have cried " wolf " quite often. Our monopoly of shellac still remains unshaken. Indian groundnuts would continue to flow into foreign markets after the war, despite their low quality. And the lower yield of cotton per acre as compared with Egypt or America will not seriously affect our export trade in short staples. But Indian sugar is differently placed in that it has to provide the raw material for an industry which subsists on a high level of protective duties and will be called upon to compete with countries which have both natural and organisational advantages.

In another respect, too, sugar is different from our other agricultural products. Inasmuch as sugarcane has to be taken to the factory without loss of time for fear of dryage and consequent loss of sucrose, cane cultivation is more of an integral factor in the rationalisation of the sugar industry than, say, jute in the jute industry or cotton in the cotton industry. Cane, then, comes under the category of what may be called " plantation " industries rather than agriculture ordinarily understood. This, in fact, is what gives Java and Cuba an enormous advantage over Indian sugar and makes the competition between them so forbiddingly unequal. On the one hand, there are large plantations under the control of the manufacturers with every advantage that can be expected of modern large-scale enterprises, on the other, there are just small holdings of land that have suffered for centuries an uninterrupted process of fragmentation[1] and cultivators who are too conservative and poor to respond actively to new methods of scientific cultivation. There are besides quite a large collection of technical problems which can be solved only by patient research. And in the conditions of this country to get the cultivators to adopt newly invented methods is a problem by itself, sometimes more serious and more knotty than the invention of these methods.

[1] In order to remedy this position the factories need assistance in acquisition of land in the vicinity of factories, although there are bound to be insuperable difficulties in the Legislatures agreeing to any such proposal which would dispossess the small holder of land in India, where liability of cultivation is traditional. *Vide* Tariff Board's Report, 1937, page 148.

Happily, in the case of sugarcane, a great deal of research in cane cultivation had been carried out principally by the Coimbatore Station before the Government of India decided to grant substantive protection to sugar manufacture. The evolution of special varieties of cane through careful crossing of indigenous with foreign types of cane enabled the spread of improved cane over wide areas of cane cultivation. Not that it has been easy for the Agricultural Departments to secure the use of improved cane. But six years have sufficed to produce presentable results. The following table will be informative in this connection.

TABLE No. 1

Acreage under Sugarcane, under improved varieties, production of Cane per Acre, gross production of Gur, and calculated production of Cane-crop.

Year	Total acreage under sugarcane in thousand acres	Acreage under improved varieties in thousand acres	Average cane production per acre (in tons)	Gross production expressed as gur (in thousand tons)	Calculated production of sugarcane (10-11 factors) (in thousand tons)
1930 31	2,905	817	12 3	3,359	35,789
1931-32	3,077	1,170	14·1	4,116	43,316
1932-33	3,425	1,845	14·9	4,859	51,129
1933-34	3,422	2,295	15 3	5,055	52,455
1934-35	3,602	2,433	15·1	5,292	54,346
1935-36	4,154	3,056	15·3	6,102	61,202
1936-37	4,582	3,452	15·6	6,932	67,322
1937-38	3,869	2,968	15·5	5,579	55,637
1938-39	3,130	2,673	15·0	3,572	35,851
1939-40	3,640	2,893	15·0	4,748	47,672
1940-41	4,598	3,480 (Our est.)	15·0	5,794	59,090
1941-42	3,515	...	...	4,371	46,030
1942-43	3,600	...	...	5,076	...
1943-44	4,113	...	...	5,696	...

And the Second Tariff Board of 1937 writes with obvious exultation :—

"The figures speak for themselves ; we add, however, a few explanatory comments. In 1917-18 the area under sugarcane in India was approximately 3 million acres and during the next fifteen years fluctuated round this figure without material alteration. It was not till 1933-34 that as a result of the policy of protection any considerable expansion in acreage occurred. During 1935-36 and 1936-37 the figures exceeded 4 million tons but fell to 3,855,000 acres in 1937-38.

"Concurrently with the expansion of cultivation, there has occurred an equally marked improvement in the quality of cane. The acreage under improved varieties of cane has increased from 817,000 acres, in 1930-31 to 3,341,000 in 1936-37 and the average yield per acre from 12.3 tons to 15.6 tons. The supply of improved varieties of cane is now generally adequate for the requirements of factories but this should not be taken to imply that the limit of improvement in quality has been reached or is even in sight."

Since the Second Tariff Board enquiry, there was a further increase in the proportion of the area under improved cane varieties to the total area under sugarcane (which, however, has been fluctuating from year to year[1]) and the process would have gone on uninterrupted, but for the difficulties experienced by the industry in recent years. (*Vide* table above.)

While the progress regarding acreage and the yield of cane has been substantial, much more has to be done with a view to reducing costs. Here, too, some improvement in costs of cultivation is noticeable. The 1931 Tariff Board estimated that the cost of cultivation of cane in Northern India was between 4 and 5 annas a maund. After allowing for interest on working capital, insurance against damage to crop, cost of transport at one anna a maund, they fixed eight annas per maund as the fair selling price for a factory. They expected that, at the end of the period of protection, there would be a reduction in the price to six annas a maund. That the Board was liberal in its estimate of the cost of production of cane per maund will be evident from the fact that the second Tariff Board have estimated the all India average cost at 3 annas 9 pies per maund when the average cost per maund for cultivation in U.P. was 3 annas and 7 pies. Including 6 pies for transport, the "fair selling price" is 4 annas and 3 pies. The original expectations have therefore been more than fulfilled. The tendeney towards reduction in costs would have perhaps gone further but for the policy of fixation of minimum prices in U.P. and Bihar in recent years. It will be noticed from the table given above that there has been no increase in the average yield of the crop since 1936-37 which has been more or less stationary at 15.6 tons per acre.

The area under the crop also has tended to fluctuate violently. Till 1936 the increase in the area under the crop was quite in accordance with the growth of the industry. But since 1936, as remarked above, there has been a considerable fluctuation in the area. While the fluctuations in the acreage have been due partly to the condition of rainfall during the period of plantation, the prevailing prices of sugarcane, the price of *gur* as also the returns from alternative crops and the prospects and the price likely to be received from the cane crop in the next season, the fixation of inordinately high prices in U.P. and Bihar had a stimulating influence. The continuance of the policy of fixing high minimum prices could not discourage cane production though there was a glut in that season pulling the other way. As a result, in 1940-41 the production of sugarcane was again on a large scale and the surplus cane had to be burnt in many cases as with the policy of restriction in production, which was enforced in view of the huge carry-over of sugar, and absence of outlet in any export markets, all the cane grown could not be utilised. The reduction in area in 1940-41 and 1941-42 was mainly due to the notifications to the growers in advance, of the proposed reduction in the manufacture of sugar and the fixation

[1] The fluctuations in the area under cane are due to conditions of rainfall, the prevailing prices of sugarcane, the price of Gur, as also the returns from alternate crops, and prospects and prices likely to be derived from cane in the following season, depending considerably on the policy adopted by Government for restricting the total production of sugar, from time to time.

of *uniform* minimum prices for the season (not varying with the price of sugar, as was the practice in the past).

Apart from the problem of regulation of production of sugar and sugarcane, attention has to be paid to a further reduction in the cost of production of cane. No appreciable progress in this regard has been made during the past few years. If Indian sugar should be in a position to compete effectively, this is absolutely necessary, especially as the cost of the raw material in the manufacture of sugar is as much as 53 per cent[1] of the total production costs and the principal competitor, Java, has during this period been able to secure a further reduction of costs.

It was thought in 1931 by the First Tariff Board that the limit of technical efficiency had been reached by Java. Much as they were justified in their assumption owing to what seemed at that time to be ridiculously low level of costs, their finding has to a considerable extent been falsified. There has been an increase in the average rate of recovery to 13.21 per cent in 1935-36 from 10.46 per cent in 1931-32 and during the three seasons ending 1937-38, for which figures are now available, it has averaged 12 per cent. The yield of cane per acre in Java has also increased from 50 to 55 tons. With an average recovery at 12 per cent and the production costs at Rs. 2 per maund including profit, interest on capital, etc. the price paid for cane is 2 annas per maund or even less. In Java most of the cane is cultivated in the company's own farms. Though Java possesses special advantages, and the same results may not be secured, the scope for progress in India can hardly be denied.

The question of bringing down the cost of production, however, bristles with many difficulties. With a varying climate, different methods of cultivation and different kinds of taxation for irrigation purposes, it is not possible to adopt any common policy for the cultivation of higher yielding varieties. It is significant that though the South has larger yields per acre, higher costs of production are incurred by the cane growers in Bombay and Madras. As the Tariff Board Report, 1937, points out, the standard of cultivation in the Bombay Presidency is exceptionally high and both the cost and yield per acre are above the figures of almost every other part of India. The high cost is due partly to the practice of heavy manuring but mainly due to the high rates charged for irrigation from canals. In Madras the cost of cultivation varies with different parts of the Presidency but for the whole province the average cost of production is estimated at 5 annas per maund.[2]

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[1] The 1931 Tariff Board estimated it at two-thirds of the cost of producing sugar (*vide* page 27), while the 1937 Tariff Board estimated it at 53 per cent. Also see Gandhi's Sugar Annual for 1939, 1940, 1941, 1942 and 1943.

[2] It is very interesting to note the observation made by Mr. N. L. Dutt, Government Sugarcane Expert, in charge of the Imperial Sugarcane Station, Coimbatore, in an erudite contribution on "The present position of thick Coimbatore sugarcanes" in the September, 1942, issue of *Indian Farming*. He says: "As regards cost of production per ton of cane, it was found at one of the experimental stations in Madras that the cost of Co 419 was Rs. 6 per ton (equal to about 3.1/2 annas per maund of 82 lbs.) against Rs. 8 and Rs. 9 per ton of J 247 and POJ 2878 respectively. The use of Co 419 in the estimation of the grower and the factory has been rapid. That is why it is already one of the outstanding canes in the Bombay-Deccan. In Madras, it is fast becoming prime favourite in several areas.

Thus, reduction of the costs of production of cane with a view to improve the competitive capacity of the Indian sugar industry bristles with innumerable difficulties. The discovery of improved varieties of cane can by itself provide no solution. If Madras and Bombay have to incur high costs on account of the irrigational facilities, the U.P. and Bihar also experience in some measure the need for such facilities. There are besides the insect pests to be combated; and this is a more important task in the sense that it is more immediate. The danger to cane crops as a result of diseases in cane cannot be over-emphasised.

Diseases in Cane and Pests must be Eradicated

Great harm is done to the crop not infrequently by insect damage in various provinces computed at millions of rupees to the agricultural community in the country. In 1939-40 for instance, there was a widespread outbreak of redrot and wilt in the cane-growing belt of Bihar, and it appeared that the infection was worst where the largest areas were kept under Ratoons. The Bihar Government issued a press communique in July 1940 pointing out the great danger of infection to the cane crop from Ratoons and they also observed that it was their intention to fix considerably lower prices for Ratoon cane than for plant cane. The Imperial Council of Agricultural Research also issued a note regarding the pyrilla pest and observed that the best time to prevent pyrilla damage was early in the year when sugarcane plants were generally young and not high or leafy to prevent labourers from going into the fields. They also stated that the records showed that the pyrilla was a particularly bad pest which occurred in 4 or 5 years and as the last outbreak was in 1937, the years 1940 and 1941 were considered dangerous for the recurrence of the pest. They, therefore, recommended that widespread publicity should be given amongst sugarcane growers and they should be asked to keep a close watch on the sugarcane fields for any appearance of pyrilla in numbers, to collect and destroy immediately all leafs so affected and to avoid Ratooning as far as possible in 1940.

Valuable Educational Effect of Cane Crop in India

Sir John Russel, F.R.S., a distinguished British Scientist, in his Report on the work of the Imperial Council of Agricultural Research in applying Science to Crop Production in India, published in October 1937, observed that the Imperial Council can justly claim credit for the great success in its activities in connection with the production and utilisation of the cane crop. *Though the total area under sugarcane is only about 3½ million acres out of 277 million acres cultivated in India, the importance of the sugarcane crop is out of all proportion to its acreage. So far as the cultivator is concerned, sugarcane has a valuable educational effect.* In the words of Sir John Russel, "He (the cultivator) learns the advantages of modern varieties of crops, of fertilizers, of proper cultivation; the need to watch for plant diseases and to seek advice when he is in difficulties. The Agricultural Officer has more chance to come in touch with a sugarcane grower than will an ordinary small cultivator. From the national point of view, India is a heavy consumer of sugar including *gur*, of course, standing second

amongst the nations of the world and being surpassed only by the U. S. A.[1]

Improvement in Yield Possible in India

It is true the yield of cane in the main sugarcane producing provinces is still far from satisfactory as compared with the yields obtained, say, in Java. But it is definitely proved from the work of the Indian Research Stations, as also from the experience of factories growing canes, that high yields are possible. Experiments conducted with Co.-360 and POJ-2878 at three sugar factories, one Government Farm and three cultivators' fields in different parts of Deccan Canal area in 1935-36 showed encouraging results. On the Ravalgaon Sugar Factory, 50.5 tons of the former and 41.4 tons of the latter was the yield per acre. In a competition organised by the Maharashtra Chamber of Commerce in 1935-36, yields of 80 to 100 tons of cane per acre were obtained without any reduction of the sugar value. In Mysore, in 1935-36, H.M.320 yielded as much as 36.86 tons per acre while H.M.606 yielded 51.88 tons per acre and H.M.607 yielded 50.40 tons per acre. These results are no ground for despair.[2]

Education of Cultivators by Demonstration of Improved Methods

Apart, however, from the immediate and important task of research work in connection with the problem of pests, referred to above, there is a great need for undertaking other measures which would bring home to the cultivator the necessity and the desirability of effecting improvements in the conditions of cultivation. The average cultivator in India is hardly aware of the latest improved methods of farming or manuring or crop rotation or selection of varieties suitable to the soil, and he simply carries on the old and traditional methods of cultivation from year to year without worrying about the importance of effecting any improvement in the quality or the quantity of the cane grown on his fields. Sugarcane is one of the most important crops of the country, the annual value of which has been estimated at over 60 crores of rupees and the prosperity of the second largest industry of the country is closely linked with it. The growth of the sugar industry adds substantially to the resources of the ryot and even in the midst of a period of depression it has enabled him to pay his rent or land revenue, his irrigation dues, and other taxes. It is, therefore, the duty of the Government to devise suitable means of imparting to the ryot instruction in modern methods of cultivation and to make available to him the fruits of organised research. It is satisfactory to note the work done in this connection by the Sugarcane Research Stations at Coimbatore, Shahjahanpur and Muzaffarnagar, Karnal, Padegaon in the Deccan Canal area, Mushari (B & C), Pusa, Dacca, Mysore, the Jorhat Experimental Station in Assam, at Risalewala and Jullundur in the Punjab, at

[1] The consumption of sugar in the U. S. A. in the year 1934-35 was estimated at 5,870,000 metric tons, in the United Kingdom at 2,283,000 metric tons and in British India at 3,350,000 metric tons.

[2] *Vide* in this connection the observation of Mr. N. L. Dutt in an article on *Indian Farming*, in its issue of September, 1942, already referred to, where he says: "The yield of Co. 419 in Bombay and Madras was of the order of 55 to 60 tons of cane per acre."

Bangalore, Anakapalli, Madras, Hyderabad and other places, for growing thick canes which have an importance of their own in India, and for improving the quality of cane generally and evolving suitable canes for particular areas by cross-breeds, etc.[1] Although improvements are slowly being effected in the quality of cane grown in the various provinces, the time has definitely arrived when we should redouble our efforts to establish more intimate contact with the cane cultivator and to acquaint him by actual demonstration with modern methods of farming. For this purpose, it is essential to establish a series of demonstration farms and nurseries in all cane-growing provinces in order that they may devote their energies to the propagation of cane of higher sucrose content, of higher tonnage, of early and late-ripening varieties for the extension of the crushing season, of increasing the yield by suitable crop rotation, by provision of a suitable supply of water through irrigation or tube-wells, etc. These demonstration farms and nurseries should also serve as centres from where trained agriculturists would tour round the surrounding districts in order to show or demonstrate efficient methods of cultivation and manuring suitable to the soil in the various places and would distribute disease-free seed amongst the cultivators. An important function of these farms would be to conduct researches into the best method of combating cane diseases and pests. In addition to the establishment of such farms, it is also necessary for the provincial governments to undertake other allied tasks, of effecting improvement in the cane cultivation by educating the ryot in the use of irrigation water, by providing better facilities of irrigation, by extension of canal system, and by affording suitable assistance in tapping the subterranean sources of water supply.

Future Trend of Canes in India

Among the new canes, Co.419 is fairly on the road to becoming somewhat of a universal cane in several parts of tropical India, while Co.421 is likely to prove of great utility in certain tracts of Northern India. The spread of Co.419 and Co.421 has been quick and pales into insignificance when it is known that in Java POJ.2878, "Wonder Cane" which was evolved in 1924, and which revolutionised the Java industry, occupied by 1929 (within a period of five years) 95 per cent of the area under cane in that country. Among other canes showing promise of development in particular areas are Co.290, a medium-thick cane, Co.360, Co.413, Co.426. Co.421 has yielded in Northern India, where it is found suitable, a yield of about 950 maunds (35 tons per acre) at the Experimental Stations—Muzaffarnagar, Shahjahanpur and Gorakhpur in the United Provinces. Vide *Indian Farming,* issue of September 1942, pp. 473-477.

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[1] Excellent work done in this direction of providing thick canes suited for tropical regions is narrated in an excellent article in the July, 1942, issue of *Indian Farming* by Mr. N. L. Dutt, Government Sugarcane Expert who recently succeeded Sir T. S. Venkataraman who has immortalised himself by his epoch-making crosses between sugarcane and sorghum, and more recently between sugarcane and bamboo, which will confer everlasting benefits on Indian cane cultivation. The name of Sir T. S. Venkataraman should be written in letters of gold for his successful efforts in the improvement of cane-crop in India.

Tube-well Project in U.P.

The first extensive tube-well project in this connection was sanctioned in the U.P. in 1939. It seeks to provide irrigation facilities in the dry tracts of the seven western districts of U.P. where for various seasons canal irrigation is not possible. They represent an investment of 52 lakhs of rupees. This project will cover nearly 1½ million acres which will now be fully protected. About 1,300 tube-wells are now working and each one has been so located that it can command an area of two square miles with an approximate average of 1,000 acres of cultivable area.

A fresh drive to organise the cane development work in the U.P. was launched by the Provincial Cane Development Department in 1941. The new plan of development, which has been formulated by Mr. R. L. Sethi, the newly appointed Cane Commissioner, seeks to give a fillip to the development work so that it receives due consideration.

The plan among others, includes provision for the following :—

1. Development of compact zones round factories ;
2. Selection and propagation of tested varieties ;
3. Provision of suitable manures and tried cultural methods ;
4. Zone trials, and
5. Systematic regulation of seeds.

The Cane Development Scheme was started towards the end of 1935 with the help of contribution from the Government of India. The U.P. Sugar Factories Control Act provided for the reservation and assignment of areas and since 1938 that system has been in vogue.

There was no increase in the number of zones in 1939-40 which was the same as in 1938-39 at 136 but the number of villages covered was considerably higher at 13,826, against 9,594 in the previous year.

The scheme now extends to the areas of almost all the sugar factories in the province.

For the successful working of the scheme the province has been divided into three ranges—western, central and eastern. The total expenditure incurred by the Government on the scheme was Rs. 10,19,823.

Over 32,00,000 maunds of improved seed were distributed to the cane growers.

Manuring

Progress was made in improving manurial practices. A consciousness was created amongst the cultivators of the necessity of proper manuring not only for getting immediate better yields but even more for preserving and increasing the fertility of the soil.

Improvement of Communications

Special attention was paid by many societies towards improvement of the communications in their areas. The societies spent about Rs. 67,359 for the improvement of communications in the western range. Over and above this 349 pucca and 99 temporary culverts were constructed. This expenditure was made from contributions from the societies, the growers and the factories. Other rural development activities of the department included the improvement of irrigation facilities, improvement of the quality of live-stock and propaganda for the improvement of sanitary conditions of the villages.

Marketing

There were 66 central cane supply unions and 839 primary cane societies for the development of cane and its supply to the factories. The total quantity of cane supplied by these societies during the year was 18,77,00,000 maunds, that is, 79 per cent of the total cane crushed by the factories in the province. In the western range the societies supplied as much as 88 per cent of the cane crushed by the factories.

We have digressed somewhat from the main argument of this chapter, but only to show on how many different fronts the battle for lower costs of production has to be fought. The efforts of the U.P. Government in this regard cannot however reflect in full the complications of this problem as, in the nature of things, administrative action can be attempted only on points on which experts are fairly agreed as to the correct solution. Even in the programme outlined above, two important issues, viz. ratooning and zoning are matters of controversy.

Ratooning

Ratooning is a subject on which there has been a good deal of controversy, particularly since there is some evidence that ratooning causes an increase in insect pests. The period of profitable ratooning varies greatly in different localities and depends on the soil, variety and the treatment which the crop receives. Ratooning, as at present practised, has acquired a bad name, perhaps because the crop is often neglected. Canes differ to some extent in their performance as plant canes and as ratoons. On the whole thin canes are better suited for ratooning than thick canes although thick varieties have also been found to ratoon well in certain places. This subject was discussed at the Sugar Committee Meeting in July 1936, where it was noticed that opinions of Directors of Agriculture of factory owners and of cultivators were divided as to the increase of insect pests in cane as a result of ratooning. The question is at present receiving the attention of the Imperial Council of Agricultural Research. It seems to be generally held that first ratooning is permissible, but that ratooning of cane crop beyond one season does not find much favour amongst the factory owners. It is now being realised that ratoons are easily susceptible to disease and should be discouraged as much as possible.

Zoning of Areas of Cane

Of like importance to the efficiency of cane farming is the question of zoning. The main feature of this system is the allotment of a definite

area of supply to each factory from which it can draw at least the major portion of its cane supply and on which no other factory can encroach. At first sight zoning seems to be of the very essence of rational co-relation of cultivation and manufacture. But the first Tariff Board took exception to it on the ground that it eliminated competition and that the grower was at the mercy of the manufacturer in the absence of any rules regarding the payment of minimum prices. The Second Tariff Board[1] had no difficulty in recommending the system of zoning in U.P. and Bihar as according to the Sugarcane Act, 1934, minimum prices were in force and the idea was particularly suitable to these two provinces owing to the large areas under sugarcane and the close proximity of mills.

The advantages claimed for the zoning system are that it makes the regulation of production of cane possible and avoids the possibility of overproduction in any one particular area if the factories notify in advance their requirements of cane for the season. Again, factories will develop an interest in the area allotted and try to improve the crop. This incidentally helps the problem of bringing down costs. The tendency to improve the cane crop develops in the knowledge that there will be no competition from the adjoining factories and that the factory concerned will be free to enjoy the fruits of its labour. Regulation of cane supplies is possible by the sowing of early and late ripening varieties. The factories will also be able to work a longer crushing season.

Economy in Transport Essential

While all this remains to be done, Java, too, is forging ahead with further economies. The leeway between her and India is still considerable ; and in the absence of protection, it might be found impossible to compete with Java sugar. The cost of production for Java sugar is estimated at Rs. 2-1-7 per maund before providing for interest on working capital. Including freight, the cost of Java sugar was estimated at Rs. 2-10-0 per maund. Allowing for the difference in quality of Indian sugar, 5 annas per maund and freight 9 annas, the difference between the two costs of production was therefore Rs. 5-4-0 or Rs. 5-5-0 per maund, equivalent to Rs. 7-4-0 per cwt. Even according to the Government who pointed out that production costs were assumed on a liberal basis, the difference between Java sugar and Indian sugar was as much as Rs. 3-4-10 per maund. During the remaining period of the years of protection it was highly improbable that the industry could go without a high level of import duty. The Tariff Board, however, never believed that it would be impossible to compete at any time on equal terms with Java and Philippines. While the manufacturing side is not without scope for economy, it is cultivation that has to bear the brunt of the problem, by reducing the cost of cane through the cultivation of cane with a higher sucrose content and heavier yield per

[1] *Vide* Tariff Board's Report, 1937, pages 44-46. It observed, however, that "if a zoning system is introduced, it will be necessary to control the erection of new factories and extension of existing factories by some licensing system." This was done in U. P. and Bihar by the Sugar Control Act, in 1937.

acre. To the extent that minimum prices blunt the spur to improvement, they must be held to delay progress. In these circumstances it may be said that the assumption of state cultivation of cane and the taking over by factories of farm cultivation may not only minimise costs of transport of cane but enable the crop to be improved and harvested at the proper time to prevent wastage of sugar content. It has been found that some mills have an efficiency equal to Java as judged by their recovery figures, but their loss percentage of sucrose is higher as compared with that of Java which is 1 to 1.5 (*vide* Tariff Board Report, 1937, p. 72). The difficulties in the way of such a development are many and it is futile to dilate on the question here. As far as possible, efforts should be made to reduce the cost of transport of cane by intensive development of areas round factories and proper zoning with due safeguards. State research should be intensified and greater attention paid to the manufacturer's point of view. The concentration of the industry in two provinces has created special difficulties[1] and these will have to be satisfactorily got over.

Another important factor to be considered in the discussion regarding the possibility of reduction in costs is the duration of the crushing season and the size of the factory. If the size of a factory is fairly big, it may be possible to effect a considerable reduction in overheads and it has to be remembered that this item is equal to the expenditure incurred in the manufacturing process. Unfortunately, the difficulty of getting adequate and proper supplies of cane makes it impossible to work mills for a period longer than five months. The early and late ripening varieties have not proved successful. In the early part of the season, mills get cane which is under-ripe; and towards the end of the season, cane which is over-ripe. It is difficult to have a longer season with different crops as it will not be possible for the ryot to grow other crops. Some reform in this direction is therefore necessary.

Regarding the economic size of the factory, the larger the size of the mill, the lesser the incidence of overhead charges. But the main points to be taken into consideration are the availability of cane in required quantities without any increase in transport costs, the ability to work mills for a longer season and greater access to markets. The first Tariff Board took the size of the economic unit at 400 tons crushing capacity per day as they were afraid that supplies of cane would not be available within a given radius.[2] The difficulties in this regard have been to a considerable extent overcome in U.P. and Bihar but the advantages in respect of markets have been offset by the growth of factories very close to one another.

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[1] One such defect came to notice prominently in June, 1942, when owing to wagon shortage and transport difficulties, sugar could not be transported to long distances, and this led to scarcity of sugar, long queues of men for getting small quantities of sugar, black markets, etc. If this industry was developed more uniformly over the various areas, it would have been possible to arrange for a better distribution of sugar.

[2] The Tariff Board of 1937 adopted a factory with 500 tons capacity as a reasonable economic unit for the whole of India. *Vide* pages 60-61.

Average Cane-Crushing Capacity

In recent years there has been an increase in the average crushing capacity of mills. The following table will show that there has been a gradual increase in the crushing capacity during the years 1934-35 to 1940-41 and that in 1939-40 it was as much as 710 tons. In 1936 out of 140 factories 26 had a capacity below 250 tons and 50 below 500 tons. The majority of the factories had, therefore, capacity below 500 tons. Comparison should not, however, be made with the average actual crushing capacity, as the potential crushing capacity is something very different and is affected by the length of the crushing season. Considerable extensions to plant have been affected in recent years to effect an increase in the production of sugar and a decrease in the cost of manufacture. Till 1934, this country had the smallest economic unit. The following table will be of interest : —

TABLE NO. 2

Cane-crushing Capacity of Factories in India.[1]

Year	Average cane crushing capacity of Factory (calculated on the basis of tons of cane crushed per day of actual working) in India	Year	Maximum cane crushing capacity of Factories per day in India
1934-35	517	1934-35	2,012
1935-36	568	1935-36	1,807
1936-37	630	1936-37	1,960
1937-38	660	1937-38	2,000
1938-39	630	1938-39	1,850
1939-40	710	1939-40	1,960
1940-41	690	1940-41	1,980
1941-42	640	1941-42	1,800

From the foregoing it is very clear that, in spite of the considerable progress made in recent years, there is still a lot of ground to be covered. The difficulties in the way have been discussed in detail in this and other chapters. One of the important aspects of the question, the utilisation of molasses and by-products has not been given proper consideration till very recently, and the need for a power alcohol industry is grudgingly realised. With the continuance of the war, this question may be given greater consideration and Indian sugar might perhaps be in a position to take advantage of the present circumstances. The period given to the industry to prepare itself to face competition may be only five years, as protection will expire in March 1946, but the actual time available may be much more. Her only three serious competitors are the Philippines, Cuba and Java, but of these three, two countries, Philippines and Java, are under enemy occupation and the state of the sugar industry at the time of the cessation of hostilities cannot be precisely forecast. But on the assumption that the factories might have been damaged or razed out of existence, it may take some time after the conclusion of peace for the industries in these two countries to prove serious rivals to India. Cuba, of course, is far removed to be

[1] *Vide* Indian Trade Journal, Calcutta, dated 17th September, 1942, and previous issues.

a serious competitor to India. Besides, Philippines and Cuban sugar are mostly taken up by the U.S.A. With the additional time available and the possibility of great progress being made in the by-products industries, the entrepreneur would be in a position to economise in costs and if the Governments, Central and Provincial, are also sympathetic in their attitude, post-war competition need scarcely unnerve the Indian sugar industry.

The immensity of what remains to be done in the sphere of cultivation should not be allowed to blind us to the solid achievements of the past or to their significance to progress in the future.

CHAPTER VIII

FIXATION OF CANE PRICES

THE effects on agriculture of the policy of protection to the sugar industry were examined in the previous chapter from the point of view of cheapening the cost of production of this all-important raw material. And it was found that the picture was on the whole one of presentable results and more or less impressive potentialities. To invent by patient research the best kinds of cane and the best methods of cultivation, to persuade the cultivators to adopt such methods and secure a heavy yield of good quality cane, all this is one thing; it is quite another to provide the mills with cane which will enable them to compete on equal terms with Java. For Java is delectably free from that problem of securing a fair distribution of benefits between the grower and the manufacturer which in India has proved the source of controversy and of complication. In Java, the cultivation of cane is, for the mills, only one stage in the manufacture of sugar, while in India the price paid to the cane grower is the focal point of a large social, besides being an economic problem. When the Tariff Board emphasised the importance of the sugar industry to agriculture, it was understood to hold out a means of improving the economic well-being of the cane growers in the provinces concerned. This hope came in the wake of a decade of sullen discontent among popular politicians with the ways of the captains of India's protected industries. And the Central Legislature persuaded itself to pass measures enabling regulations to be framed for securing a fair price for the cultivator.[1] The fixing of minimum prices for sugarcane came in thus as essentially a piece of social relief, but so wedged in between the two processes of agriculture and manufacture that at times it may be said to have acted to the detriment of both. In the progress of the Indian sugar industry in relation to world developments, it is unquestionably a forbidding hurdle to be cleared; and an understanding of this is necessary before we can pass on from the agricultural to the manufacturing side.

Needless to say, the fixation of minimum prices did not come on the industry all of a sudden. At the outset, the Central Legislature did not contemplate any more than a few safeguards against the illiterate cultivators being duped by the agents of the millowners. And the mills were at first required by the Provincial Governments to do no more than affix notices in conspicuous places near the entrances of the sugar factories showing the prices at which sugarcane was being bought at the factories. This was done by the U.P. Government in

[1] *Vide* The enabling measure introduced in the Legislative Assembly on 13th March 1934, and subsequently enacted as the Sugarcane Act, 1934, which permitted the Local Governments to fix a minimum price or prices for the purchase of sugarcane intended for use in any factory. The Statement of Objects and Reasons appended to the above Bill and the Text of Bill will be found on page XXXV in Appendix II(c) of the Indian Sugar Industry, Its Past, Present and Future, by Mr. M. P. Gandhi, published in 1934.

November 1933, by publishing rules[1] under powers conferred on them by Section 6 of the Sugar Industry (Protection) Act, 1932. (For the text of this Act, *vide* Gandhi's *Sugar Industry Annual*, 1940).

Such publicity, it was thought, was sufficient to offset the disadvantages of the poor cultivators of cane. From the obligation to put up such notices every fortnight, to being obliged to pay prices dictated by the provincial governments, was, indeed, a far cry, and it must be observed that minimum prices were not brought into force by the Governments of both the U.P. and Bihar without some searchings of the heart on their part and strenuous opposition on the part of the sugar millowners. It is useful and instructive to follow the controversy as it brought out the principal objections from the practical point of view to the adoption of this policy of fixation of minimum prices of cane.

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[1] These rules were brought into operation from 1st December, 1933. In a Press communique, the U. P. Government stated that these rules did not enforce the payment of any prescribed prices or fix the rates which the factories should pay for the cane purchased by them. It was also added that they were intended primarily to educate public opinion and to provide cane-growers with data which may enable them to ascertain what a fair price for cane should ordinarily be. It was also made compulsory for factories in the U. P. to publish along with the price paid for the purchase of cane, a figure of price of cane worked out according to the following formula :—

$$C = \frac{S \times P}{200} \quad \text{where}$$

C = the price in annas per maund of cane delivered at the factory gate, including charges or allowances for transport, dryage, commission and supervision ;
S = a figure fixed by the Government for each season for anticipated percentage of extraction of sugar which does not vary by more than 0.25 from the average percentage of extraction of sugar from cane for all sugar factories in the province during the three previous working seasons. (For 1933-34. This figure was fixed at 8.7.)
P = the average fortnightly price in annas per maund as announced by the Director of Industries, United Provinces, Cawnpore, in the local *Government Gazette* based on the *highest wholesale price quotation* for white factory sugar made in the United Provinces on a f.o.r. *Cawnpore basis minus* four annas a maund.

Although these rules did not fix the price of cane, it will be clear that they were definitely unfair to manufacturers. For instance, it is preposterous to take the *highest wholesale price quotation* for white factory sugar (leaving second and third quality sugar alone), and again not the *ex-factory* but the Cawnpore price with the addition of Railway freight, as a basis for calculating the minimum price of cane to all the factories in the U. P.

What is more, when the rules were first published by the U. P. Government, they suggested, for the value of "P" the average price of Java white sugar in the *Cawnpore market* (not even the Calcutta market as was recommended by the Tariff Board), as the basis. The Cawnpore price for Java sugar was notably higher than the price of sugar made in U. P. for various reasons including the keen international competition as a result of the growth of factories, the competition of Khandsaris, the low price of *Gur*, the addition of freight and Customs charges in the transport of Java sugar from Calcutta to Cawnpore which amounted to Re. 1-9 per maund, and the superior quality of Java sugar. As a result of protests from the mills, these rules were revised as stated in the above paragraph.

While we are in general agreement with the adoption of formula $C = \frac{S \times P}{200}$ we feel that it would be fair if the fixation of the price of sugar would be based on *average* wholesale ex-factory price of sugar of all qualities.

For details of the various objections to the formula, *vide* pages 166/170 of the Indian Sugar Industry, Its Past, Present and Future, 1934, by Mr. M. P. Gandhi.

In July 1933, a Sugar Conference was convened by the Government of India at Simla comprising the representatives of various interests, namely, the Central as well as Provincial Governments, millowners, cane growers, etc. At this Conference, various important questions like cane price fixing, zoning, licensing, control of cane cultivation were brought up for consideration.

The Chairman of the Conference pointed out that any intervention by the Government in any of the above matters must involve legislation. The present position, the Chairman described, was that a man could establish any factory when he liked, where he liked and could buy cane wherefrom he liked and pay what price he liked. Similarly, the sugarcane producer could bring under sugarcane such areas as he liked, give up producing sugarcane if he liked, and sell it at whatever price he could get. That is, the policy of *laissez faire* prevailed on both sides, and things were left to adjust themselves.

The champions of the cultivators who felt that the cultivators had been robbed of their legitimate profits and were being paid too low a price for their cane, and had the feeling that the manufacturers were reaping a rich harvest of profits, suggested that in order to increase the price of cane, minimum cane prices should be fixed, by legislation, as then alone the interests of the cultivators could be safeguarded. Others suggested that it would be unwise for the Government to intervene in the interplay of economic forces and that, if things were left to themselves, they would adjust themselves in the course of time.

Speaking on the subject of fixation of minimum prices, the Hon'ble Dr. Gokul Chand Narang, Minister for Local Self-Government (in charge of the Industries Department), Punjab, observed that *Khandsaris* were known to be paying only 0-3-0 or even less per maund of cane to the cultivator and it was wrong to penalise the factory industry, which consumed only 5 per cent of the total quantity of cane produced in the country. He also stated that 0-6-0 per maund of cane was an economic price and that it represented cent per cent profit on investment. Mr. H. C. Prior, Revenue Secretary of the Bihar Government, also suggested that in the opinion of the Bihar Government, distribution of profits was not unfair. In fact, he stated that the factories had paid for cane about three times the price paid by the indigenous *gur* manufacturer. He cited an instance that the average price of *gur* made from cane in South Bihar was Rs. 2 a maund, and that it represented a price of about 1½ annas per maund of cane, as against about 5 annas per maund paid by factories. A representative of the Indian Sugar Mills Association enquired what the position of the sugarcane grower would have been, if it had not been for the capitalists who had sunk their money and taken all the trouble they had in setting up the sugar factories. He further argued that even in areas where sugarcane had been planted, and grown for the factories, and factories had not been able to buy those supplies, the sugarcane grower had not been able to get in the very same locality, more than 1½ anna per maund for the cane which had been converted into *gur,* or had been used in *khandsari* factories. He observed that the fact remained that, as a result of the development of the industry, the sugarcane grower had benefited, to the extent that he has been getting over 5 annas per

maund instead of 1½ anna or so, for his cane. Besides, the cultivator had improved his quality of cane, thus getting a better return per acre, and he would not have gone in for the improvement of the quality but for the establishment of the factories.

The Government of the United Provinces were strongly inclined to favour legislation for zoning factories and fixing a minimum price of cane. Sir Jwala Prasad Srivastava, Minister for Education, United Provinces, observed that in spite of the well-known defects of zoning, he felt that zoning would be an advantage to the cultivator and the factory, and along with zoning he suggested that there should be a minimum price of cane which should be arrived at with the help of a suitable formula, and further that there should also be a system of licensed contractors from whom alone the factories should purchase their cane, in order to guard against evasion of prices by factories. He observed and with considerable truth that there were numerous factories which paid a fair price, which, however, did not reach the cultivators.

In a memorandum circulated at the Simla Conference by Sir Jwala Prasad Srivastava, it was suggested that there was no difficulty in the United Provinces about laying down what the minimum price to be paid for sugarcane should be. The generally accepted formula laying down that the price of cane in annas per maund should be $\frac{S \times P}{200}$ where p is the price of sugar in annas per maund, and s the average extraction of sugar from sugarcane of all vacuum pan factories in the province during the previous year, would be, he observed, suitable for the province, and there was perhaps no objection to laying down a uniform price for the whole province and that, if necessary, the figures could be varied with the time of the year at which the cane is delivered, though a uniform rate throughout the season would be better. The real point, however, he observed, was not in laying down the rate but enforcing it. The danger was that even in such conditions the price might not reach the growers, and therefore he suggested a system of zoning, as also a system of licensed contarctors who should, by legislation, be compelled to pay at least 90 per cent of the price they received, to the actual growers. He further stated that the fixation of a minimum price was a complicated matter, and lent itself to numerous abuses.

It may be useful to note here how the proposal was viewed by the representatives from various provinces, and by the different interests represented at the Simla Conference. Mr. H. C. Prior, speaking on behalf of the Government of Bihar and Orissa said : " The view of my Government is that any legislation for zoning, licensing of factories, or fixation of cane prices is impracticable and will go against the interests both of the cane growers and of the development of the industry." He observed, " The sugarcane was then the most profitable crop for the raiyat to grow." He also added that a fair price was generally paid for cane and it seemed likely that in North Bihar the ordinary rules of supply and demand would result in a fair price being paid in the future. He concluded by saying that the Bihar Government considered that it would be absolutely impracticable to endorse by legislation the

payment of any minimum price. Dr. G. P. Hector, Director of Agriculture, Bengal, gave expression to the Bengal Government's view that legislation was not necessary. All that they were anxious about was that nothing should be said or done at this stage of the industry to frighten away capital. The Hon'ble Diwan Bahadur Kumaraswami Reddiar, Minister of Education and Excise (in charge of Industries), Madras, remarked that so far as the Madras Government were concerned, they had at that time no intention of introducing legislation in the local legislature. Speaking on behalf of the Bombay Government, Mr. V. V. Gadgil said that they had not so far considered, nor had they under contemplation, any Bill for fixing of prices, or zoning or licensing. The representatives of manufacturing interests, it need hardly be said, were also opposed to the proposal of legislation. Let us see what views were expressed on the question of fixation of minimum prices of cane by the Sugar Committee, and the Tariff Board of 1931.

Practical Difficulties in Legislation

The Indian Sugar Committee, too, discussed the system of the scales of payment for cane, and came to the conclusion that in Indian conditions, a sliding scale based on a price of cane equal to half the price of sugar manufactured from it, subject to a minimum of 6 annas per maund would be suitable.

But the Tariff Board was sceptic about this proposal and came to the conclusion: "It is clear that no direct measures can be taken to ensure that a definite rate for cane is paid to producers." They further observed, "Conditions differ so widely in India, as regards the output of cane per acre, the cost of cultivation and the sucrose content of the cane that no one scale of payment would be suitable to all conditions."

The Tariff Board also remarked that even if a scale could be devised which would be suitable for the very varied conditions of cane cultivation in different parts of India, the methods of evasion are so numerous that it is improbable that this would be successfully enforced. The Tariff Board concluded: "But we must leave it to the good sense of factory owners and to their realisation that eventually the interests of the factory and of the cultivators are inseparably connected, to ensure adequate payment to the agriculturist for his cane."

We may now discuss the practical difficulties then envisaged and pointed out in enforcing legislation for fixing minimum price of cane. In the first place, it is not easy to determine a standard quality in terms of which the price could be fixed. For instance, should a factory buy cane giving a smaller yield of sugar at the same rate as cane giving a larger yield? How are disputes regarding quality to be settled? What will the grower of the inferior cane do with it if he cannot sell it to the factory at a lower rate? Would not a fixed price take away the incentive to improve the quality of cane? Is the law to apply to people who buy cane to make *gur* or manufacture sugar as *khandsaris*? How can it be discovered whether a middleman bought cane to sell it to a factory or a *gur* maker or of *khandsari*?

It was also argued that such a law would prevent direct contact between the factory and the cultivator, which was so desirable, and increase the number of middlemen.

The Factor of Railway Freight

There were also to be considered the disadvantages suffered by some factories in comparison with others, in the matter of railway freights. In some cases, the difference in railway freight between two factories amounts to 6 annas per maund of sugar, which is equivalent to a difference of half an anna in the price of sugarcane. Is it not unjust that a factory which is subjected to the handicap of a higher railway freight should have to pay compulsorily the same rate for cane as a factory more advantageously situated in this respect ?

The difficulties as to what variations should be permitted in regard to quality or variety of cane or season of supply, and as to what might be done when the minimum price fixed was found to be in excess of the price of disposal of cane in any other manner, were serious, and it was difficult to devise an acceptable and equitable solution. There is, above all, the fact that the authority which fixes a minimum price for cane should also be able to assure the manufacturer of a minimum price for his sugar.

Methods of Payment of Cane in Various Countries

Methods of payment of cane vary from country to country in accordance with its peculiar conditions. A system found suitable in one country may be utterly unsuitable in other countries, due to differences in conditions of production, etc. Cane is raised in one of the three ways :—

(1) Entirely by independent cultivators (as in India).

(2) Entirely by mills themselves.

(3) Partly by the mill and partly by cultivators.

It is hardly necessary to add that the most economic method is found where cultivation of cane and manufacture of sugar are controlled by the same hands as in Java, because the smooth and efficient working of a mill depends on a well-regulated supply of cane of adequate quality. But that system is not practicable in India today for the obvious reason that agricultural holdings have suffered undue fragmentation owing to our laws of inheritance.

Methods of payment must necessarily depend on the peculiar circumstances of each country, and it would be foolish to attempt to adopt any system prevalent in another country, without considering the differences in conditions.[1] For example, we cannot adopt the practice in Java where 50 per cent of the sugar recovered is paid to the planter for his cane, because sugar factories in Java do not buy cane from planters, and plant, cultivate, and harvest their own cane on land temporarily hired for the purpose ; nor can we adopt the method of

[1] *Vide* page 16 of Maxwells' "Economic Aspect of Cane-sugar Production."

Queensland, where the price of cane is fixed by the Cane Price Board, and the price of sugar is controlled by the Government and fixed at a very high level; nor of the Hawaiian Islands, where also the great bulk of the cane is raised by plantation companies. In Mauritius, where there are a great number of small planters, the cane is bought at a fixed rate per ton. The rate thus fixed varies according to the quality of the canes, the locality, and other circumstances. There is also a system in vogue in which the planter is paid on the extraction of first grade white sugar or alternatively, on all sugars, per ton of cane delivered. The actual quantity of sugar paid to the planter under this system varies from 60 to 72 kilos according to the factory, its location, and its efficiency.

Some Methods of Fixing Price of Cane in India

In this country, cane has to be purchased by the factories as a rule from growers (except in Bombay where factories own their cane), either direct or through contractors, in accordance with the rules and regulations fixed by the Government of the Provinces concerned. Till 1934, the price of cane was fixed on the basis of Demand and Supply, and there was no Provincial Legislation fixing minimum prices of cane till 1934.

Sliding Scale of Cane Prices Suggested in 1933

To overcome the various objections pointed out before, a formula of sliding scale of cane prices was first suggested by the Sugar Technologist of the Imperial Council of Agricultural Research, in 1933. The principle of the sliding scale of cane prices suggested was that the price paid for a maund of cane should be equal to half the price of sugar made therefrom.

The formula suggested by him is $C = \frac{S \times P}{200}$ where

C—Price of cane (in annas per maund).

S—Extraction of sugar per cent, and

P—Price of sugar (in annas per maund).

The extraction percentage, it was stated, could be fixed for each province every year or for five years in advance, and was to represent the anticipated average extraction during each year. Thus the figure of 8.7 was fixed for percentage of extraction of sugar for 1933-34 by the United Provinces Government in accordance with the Rules published by them in November 1933. Similarly, other provinces, could fix a percentage to suit their own conditions. The percentage might vary, from province to province, and from year to year, according to the average extraction.

For the sake of illustration, a table is given below showing the to different prices of sugar and different extraction percentages, calculated according to the formula $C = \frac{S \times P}{200}$.

TABLE NO. 1

Price of Cane corresponding to different extraction percentages

Price of Sugar	Price of cane (Annas per maund)				
	Extraction	Extraction	Extraction	Extraction	Extraction
Rs. a. p.	8·5	8·75	9·0	9·25	9·50
8 0 0	5·44	5·60	5·75	5 92	6·08
8 8 0	5·78	5·95	6·12	6·29	6·46
9 0 0	6·12	6·30	6·48	6·66	6·84
9 8 0	6·46	6·65	6·84	7·03	7·22
10 0 0	6·80	7·00	7·20	7·40	7·60
10 8 0	7·14	7·35	7·56	7·77	7·98
11 0 0	7·48	7·70	7·92	8·14	8·36

The advantages claimed for this formula was that it has only one variable, viz. "p", i.e. the price of sugar, and could therefore be understood even by the grower. It was also claimed that it would give some advantage to an efficient factory with a higher extraction percentage.

The price of sugar, it is suggested, should be fixed periodically by some suitable authority, who would issue a statement showing the average wholesale price for factory delivery of *first grade* white sugar manufactured in India, during the preceding fortnight.

The price paid by the factory for cane would then be calculated on the basis of the average price of sugar ruling in the nearest or most representative market for which official figures are published.

The price of cane (value of "C") for purposes of sliding scale should, it is suggested, be for cane delivered *at the factory gate,* including transport charges, dryage, commission, supervision charges, all being taken at their actual figures, subject to a maximum, in the aggregate, of one anna per maund.

It was observed by the Sugar Technologist that the difficulties, on the score of methods of evasion which are easy and numerous in regard to the enforcement of any scale of prices fixed by law, were not serious. He also stated that the real sanction would be the knowledge by the grower that he is entitled to a certain price for his cane. Hence, he suggested that the factories should post notices at all places where cane was being purchased, by or for them, giving full particulars of price calculated according to the prescribed sliding scale, as well as of the charges on account of cartage, railway freight, etc. Any disputes might be referred to Cane Marketing Boards set up for groups of 5 or 6 factories.

Let us now review the attempts made and methods adopted from year to year, for fixation of minimum prices of cane in the various provinces since 1933.

United Provinces Sugar Industry (Protection) Rules, 1933

The United Provinces Government was the first to frame rules under the Sugar Industry (Protection) Act, 1932. These rules were brought into operation from 1st December 1933.

The United Provinces Government stated in a press communique that they did not seek to enforce the payment of any prescribed prices or fix the rates which factories should pay for the cane purchased by them. They were intended primarily to educate public opinion and provide cane growers the data to enable them to ascertain what a fair price for cane should ordinarily be.

These Rules[1] regulated the affixation of notices at conspicuous places near the entrances to the sugar factories, on the 1st and 16th of every month in Nagri and Urdu scripts, containing information as to (i) the rates at which cane is being purchased (either by new contracts or under previous contracts) at the factory (including its several purchasing centres) together with transportation and other charges, and (ii) price of cane worked out according to the formula $C = \frac{S \times P}{200}$ where C = the price in annas per maund of cane delivered at the factory gate, including charges or allowances for transport, dryage, commission and supervision;

S = a figure fixed by the Government for each season for anticipated percentage of extraction of sugar which does not vary by more than 0.25 from the average percentage of extraction of sugar from cane for all sugar factories in the province during the three previous working seasons;

P = the average fortnightly price in annas per maund as announced by the Director of Industries, United Provinces, Cawnpore, in the local Government Gazette based on the highest wholesale price quotation for white factory sugar made in the United Provinces on a f.o.r. Cawnpore basis *minus* four annas a maund.

From this hesitant exhortation to active enforcement of minimum prices was not a far cry. The minimum price for the purchase of cane was fixed by Legislation in the U.P. and Bihar for the first time during 1934-35, with a view to secure a fair price to the growers, under Sugarcane Rules framed under the Sugarcane Act, 1934.[2] The following schedules which were adopted by the respective Provinces for fixing the minimum price of sugarcane for each fortnight according to variations in the price of sugar, during the season 1934-35, continued to operate in 1935-36 and in 1936-37, provision was also made for minimum price of cane corresponding to an average price of sugar between Rs. 6 and Rs. 6-8-0 in view of the fall in price of sugar during 1936-37.

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[1] Any contravention of the rules shall be punishable with a fine which may extend to Rs. 50.

[2] This act was repealed in the U.P. and Bihar in 1938, when the U.P. and Bihar Sugar Factories Control Act was passed and Rules were introduced in 1938. These have been subsequently amended, as found necessary.

TABLE NO. 2

Fortnightly varying Sliding Scale of Cane-prices, in operation from 1934-35 upto 1936-37

Bihar				The United Provinces			
Average price of sugar		Corresponding minimum price of sugarcane intended for use in		Average price of sugar		Corresponding minimum price of sugarcane intended for use in	
		Open Pan Factories	Vacuum Pan Factories			Open Pan Factories	Vacuum Pan Factories
Rs. a. Above	Rs. a. To	As. p.	As. p.	Rs. a. Above	Rs. a. to	As. p.	As. p.
6 0	6 8	2 3	4 0	6 0	6 8	2 3	4 0
6 8	7 0	2 6	4 3	6 8	7 0	2 10	4 3
7 0	7 8	2 8	4 6	7 0	7 8	3 0	4 6
7 8	8 0	2 10	4 9	7 8	8 0	3 2	4 9
8 0	8 12	3 0	5 0	8 0	9 0	3 4	5 0
8 12	9 4	3 2	5 3	9 0	9 8	3 6	5 3
9 4	9 12	3 4	5 6	9 8	10 0	3 8	5 6
9 12	10 4	3 6	5 9				

Irreducible Minimum Price Fixed for the First Time in 1937-38, *for the entire Season*

During the 1937-38 season, the minimum price for cane was not fixed every fortnight varying with the price of sugar both in the U.P. and Bihar. The minimum cane price schedule which was in force till 1936-37 was established in the beginning of 1937-38. In Bihar and U.P. the *irreducible minimum price* of sugarcane was fixed for *the entire season of* 1937-38 at annas 0-5-3 per maund for gate cane, and annas 5 per maund for rail borne cane.

In November 1938 the Governments of U. P. and Bihar issued Notifications (8683-A/RIIA dated 17th November 1938, and No. 2017-D dated 16th November 1938) respectively, announcing the minimum cane price for Vacuum Pan Factories during the whole crushing season 1938-39. The following were the cane prices thus fixed :—

No.	——	Per standard maund of 82-2/7 lbs.
		Rs. a. p.
1.	Cane purchased at the factory (or within a radius of 5 miles therefrom in Bihar only).	0 6 9
2.	Cane purchased at outstations and transported by railway or other means at the cost of the factory exceeding 5 miles but not exceeding 28 miles	0 6 6
3.	Cane purchased at outstations and transported by railway or other means at the cost of the factory for distance exceeding 28 miles	0 6 3

On the 13th January 1939, Government of U. P. increased the minimum price of sugarcane, with effect from January 15, 1939, upto

0-7-9, and with effect from 3rd March, upto 0-8-9 due to rise in the price of sugar. The Bihar Government increased cane prices from February 1939, upto 0-7-0 per maund.

During 1938-39, in the Province of Madras in the Hospet area, the Government fixed a minimum price of cane at about Rs. 9-8-0 per ton, roughly equivalent to 0-5-7 per maund. During 1939-40 the minimum price in the Hospet area was fixed at Rs. 12 per ton for all varieties of cane. In Mysore, the minimum price was fixed, varying with the price of sugar, in 1939-40, as in the previous years.

The Mysore Government fixed a minimum price of Rs. 12 per ton on all cane supplied from February 1940 to the end of May 1940. From August 1940 the minimum price was reduced to Rs. 11 per ton and further reduced to Rs. 10 per ton from October 1940.

Levy of Cess on Cane at 0-0-6 per maund in the U. P. and Bihar and revenue therefrom

The Government of U. P. and Bihar levied a cess on all sugarcane purchased by factories, with effect from the 1938-39 season, commencing from 16th November 1938. The revenue derived from the cane-cess in 1938-39 in the U. P. was Rs. 27,81,280 and in Bihar Rs. 14,34,000. In 1939-40, the revenue from the cane-cess in U. P. amounted to Rs. 40,04,350 and in Bihar to Rs. 17,86,000. The revenue from the source has not been funded or assigned either in U. P. or Bihar. It is understood, however, that large sums are spent annually on sugarcane and its development and also on roads particularly in the vicinity of factories.

Sliding Scale of Minimum Price of Cane recommended by Sub-Committee in U. P. and Bihar in 1939-40

At a meeting of the U. P. and Bihar Sugar Control Board held at Patna on the 29th April, 1939, a Sub-Committee was appointed to report, *inter alia*, on the scheme of minimum price of sugarcane, and to consider the feasibility of a sliding scale of cane and sugar prices. This Sub-Committee consisting of two representatives of the Government, two representatives of the manufacturing interests, and two representatives of cane cultivating interests met at Nainital on 18th June 1939 and recommended to the Sugar Control Board for adoption, the following sliding scale of minimum price of sugarcane linked with the price of sugar:—

The basis of calculation of sugar prices will be the same as when the previous sliding scale was in use (i.e. in 1936-37).

The scale was unanimously accepted on the assumption of the existing rates of sugar excise, viz. Rs. per cwt., Cess viz. 0-0-6 per maund of cane, and co-operative commission (for supply of cane to factories varying from 0-0-1 to 0-0-3 per maund) being maintained.

As a result of the unanimous recommendations of such a sliding scale, the Governments of U. P. and Bihar decided to abandon their previous practice of fixation of a non-varying minimum price of cane for the entire season, and to re-introduce a system of fixing the

TABLE NO. 3

Sliding Scale of Minimum Prices recommended by Sub-Committee

Price of sugar per maund						Price of cane per maund		
Rs.	a.	p.		Rs.	a.	p.	Rs.	a.	p.
7	12	0	and under				0	5	0
7	12	0	to	8	0	0	0	5	3
8	0	0	,,	8	4	0	0	5	6
8	4	0	,,	8	8	0	0	5	9
8	8	0	,,	8	12	0	0	6	0
9	0	0	,,	9	4	0	0	6	6
9	4	0	,,	9	8	0	0	6	9
9	8	0	,,	9	12	0	0	7	0
9	12	0	,,	10	0	0	0	7	3
10	0	0	,,	10	4	0	0	7	6
10	4	0	,,	10	8	0	0	7	9
10	8	0	,,	10	12	0	0	8	0
10	12	0	,,	10	15	0	0	8	3
10	15	0	,,	11	2	0	0	8	6
11	2	0	,,	11	5	0	0	8	9
11	5	0	,,	11	8	0	0	9	0
11	11	0	,,	11	14	0	0	9	6
11	14	0	,,	12	1	0	0	9	9

minimum price of cane, every fortnight, varying with the price of sugar according to the above sliding scale or such modifications thereof as they wished to make, with effect from the commencement of the cane crushing season in November, 1939.

As has been stated above, during the season 1934-35, 1935-36 and 1936-37, cane prices were fixed fortnightly in U. P. and Bihar according to the then accepted schedule, which was more favourable to the manufacturers than the schedule in force in 1939-40.

Minimum Cane Price Sliding Scale adopted by Bihar and U. P. in 1939-40

On 27th October 1939, the U. P. Government issued the following Press Note in connection with the fixation of minimum price of cane.

The Sugar Control Board appointed a Sub-Committee to examine the question of suitable minimum sugarcane prices payable by vacuum pan factories, and this sub-committee, which included representatives both of sugar manufacturers and cane-growers, unanimously recommended that the minimum price for sugarcane should be fixed every fortnight in accordance with a sliding scale linking the cane price to the average price of sugar calculated as formerly on the basis of the ten highest price quotations at Cawnpore,[1] for first grade sugar manufactured in the United Provinces for delivery by factories on an F.O.R. basis. The Government have accepted this recommendation, but have on consideration of all the relevant circumstances slightly modified the scale of sugarcane prices recommended by the Sub-Committee. The scale decided upon by the Governments of the U.P. and Bihar was as follows:—

[1] This was amended on 7th December 1939, and instead of ten highest prices, "the average of all available market quotations of first grade sugar" was taken.

TABLE NO. 4

Scale of Cane Prices adopted by Governments in 1939

Per maund of sugar							Per maund of sugar		
	Rs.	a.	p.		Rs.	a.	p.	Rs.	a.	p.
Under	7	10	0					0	5	0
	7	10	0	to under	7	14	0	0	5	3
	7	14	0	,,	8	2	0	0	5	6
	8	2	0	,,	8	6	0	0	5	9
	8	6	0	,,	8	10	0	0	6	0
	8	10	0	,,	8	14	0	0	6	3
	8	14	0	,,	9	2	0	0	6	6
	9	2	0	,,	9	6	0	0	6	9
	9	6	0	,,	9	10	0	0	7	0
	9	10	0	,,	9	14	0	0	7	3
	9	14	0	,,	10	2	0	0	7	6
	10	2	0	,,	10	5	0	0	7	9
	10	5	0	,,	10	8	0	0	8	0
	10	8	0	,,	10	11	0	0	8	3
	10	11	0	,,	10	14	0	0	8	6
	10	14	0	,,	11	1	0	0	8	9
	11	1	0	,,	11	4	0	0	9	0
	11	4	0	,,	11	7	0	0	9	3
	11	7	0	,,	11	10	0	0	9	6
	11	10	0	,,	11	13	0	0	9	9
	11	13	0	,,	12	0	0	0	10	0

On the 7th December, 1939, the U. P. and Bihar Governments decided to make an allowance of 0-4-6 per maund of sugar on account of the rise in the price of raw materials as a result of the war and to deduct this amount from the average sugar quotations before correlating it to the price of the cane.

After the increase in the excise duty on sugar from Rs. 2 to Rs. 3 per cwt. with effect from the 1st March, 1940, the U. P. and Bihar Governments decided to reduce the minimum price of cane by 9 pies per maund (working out the cane prices in accordance with the schedule which remained unaltered).

From 11th April 1940, the practice of fixing minimum price of cane with reference to the sliding scale schedule given above was abandoned and the price of cane was fixed at a flat rate with a provision for payment of a higher price to the cultivators if the factories were able to sell sugar at a higher rate thus introducing virtually the system of deferred payment for cane.

Opening Minimum Cane Prices in 1939-40

The minimum price for sugarcane for the period from November 1 to 15, 1939, was fixed as follows in the U. P.:—

No.	——	Per standard maund		
		Rs.	a.	p.
1.	For purchase at the factory	0	8	9
2.	For purchase at Railway stations within 28 miles ...	0	8	6
3.	For purchase at Railway stations beyond 28 miles ...	0	8	3

The minimum cane prices in Bihar from 1st November to 15th November, 1939, were as follows:—

No.	——	Price per standard maund of 82-2/7 lbs. avoirdupois
		Rs. a. p.
1.	Cane purchased at the factory or within a radius of 5 miles therefrom	0 8 9
2.	Cane purchased at outstations and transported by railway or other means at the cost of the factory for distances exceeding 5 miles but not exceeding 28 miles ...	0 8 6
3.	Cane purchased at outstations and transported by railway or other means at the cost of the factory for distances exceeding 28 miles	0 8 3

The above prices were exclusive of the cane-cess of 0-0-6 per maund both in U. P. and Bihar.

Minimum Sugarcane Prices in the Season 1939-40

For ready reference we are giving a table showing the cane prices per maund in U. P. and Bihar for the entire 1939-40 season:—

TABLE NO. 5

Cane Prices in 1939-40

Date	Cane prices	Deduction Granted
	Rs. a. p.	Rs. a. p.
November 1 to December 15, 1939	0 8 9	...
December 16 to December 31, 1939	0 9 9	0 0 6[1]
January 1 to January 15, 1940	0 10 9	0 0 9[1]
January 16 to January 31, 1941	0 10 3	0 0 9[1] 0 0 6[2]
February 1 to February 15, 1941	0 10 0	0 0 9 0 0 6[2] 0 1 0[3]
February 16 to February 29, 1941	0 9 0	As in the first fortnight of February.
March 1 to March 2, 1941	0 9 9	
March 3 to March 15, 1941	0 9 0	
March 16 to March 31, 1941	0 9 0	0 0 6[1] 0 0 6[2] 0 0 9[3]
April 1 to April 10, 1941	0 8 9	As in the previous fortnight.
April 11 to April 30, 1941	0 6 3	0 0 9[2]
May 1 onwards	0 5 6	0 0 9[3]

[1] For the districts of Bahraich, Gonda, Fyzabad, Gorakhpur, Basti, Azamgarh and Ballia. Relief is for all cane.

[2] Relief for "Desi" cane in Basti and Gonda districts between 26-1-40 to 31-5-40 and in Gorakhpur districts between 3-2-40 to 31-5-40.

[3] Relief in Gonda district only.

Date	Cane prices	Deduction granted[1]
	Rs. a. p.	Rs. a. p.
November 1 to December 15, 1939	0 8 9	...
December 16 to December 31, 1939	0 9 9	0 0 6[1]
January 1 to January 15, 1940	0 10 6	0 0 6[1]
January 16 to January 31, 1940	0 10 3	0 0 6 (*a*) and 0 1 6 (*b*)
February 1 to February 15, 1940	0 10 0	0 0 6 (*a*) and 0 1 6 (*b*)
February 16 to Februry 29, 1940	0 9 9	0 1 6 (*b*)
March 1 to March 2, 1940	0 9 9	...
March 3 to March 15, 1940	0 9 0	...
March 16 to March 31, 1940	0 9 0	...
April 1 to April 10, 1940	0 8 9	...
April 11 to April 30, 1940	0 6 0	...
May 1 onwards	0 5 6	...

The above prices were exclusive of the cess on cane of 0-0-6 per maund levied from the commencement of the season in 1939-40 upto 10th April, 1940, after which the Government decided to forego the cess.

Non-varying Cane Prices in the 1940-41 *season, in U. P. and Bihar*

The Governments of U. P. and Bihar decided to fix a non-varying minimum price for the purchase of cane for the entire season, thus abandoning the previous practice of varying the minimum prices of cane according to the sliding scale in use during the season 1939-40. The Government of Bihar issued a notification on the 4th December fixing the minimum price of cane during the crushing season 1940-41 at 0-4-6 per maund. The Government of U.P. issued a notification on 6th December fixing the minimum price of cane at 0-4-6 per maund with effect from 15th December, 1940. On the 23rd December the Government of Bihar issued a notification fixing the minimum price of cane at 0-4-3 per maund with effect from the 23rd December, 1940, for the crushing season 1940-41, while the Government of U. P. issued a notification on the same date reducing the minimum price of cane to 0-4-3 per maund for factories situated in Gorakhpore, Gonda, Bahraich, Basti and Fyzabad Districts to 0-4-3 per maund. The minimum price of cane in the other Districts was kept at 0-4-6 per maund.

Difference in price between gate-cane and rail-cane abolished

It must be noted that the difference prevailing between *gate-cane* and *rail-cane* hitherto has been abolished and the same price is fixed both for gate-cane and rail cane.

[1] For the districts of Champaran, Saran, Darbhanga and Muzaffarpur. From 17-12-39 to 11-1-40.

(*a*) For the Sadar Sub-Division of the district of Saran and the districts of Darbhanga and Muzaffarpur from 12-1-40 to 31-1-40.

(*b*) For the Bettiah Sub-Division of the districts of Champaran and Gopalgunj Sub-Divisions of the district of Champaran and Gopalgunj Sub-Division of the district of Saran from 12-1-40 to 29-2-40.

N.B.—Relief is for Co-210 and Co-213 cane.

Cane cess and additional cess on cane

For the 1940-41 season, the Government of Bihar issued a notification on the 25th November fixing the cess of 9 pies per maund on all cane purchased by factories in Bihar (out of this 9 pies 0-0-3 represented the usual cane cess and 0-0-6 represented the repayment of the excise loan given to factories in previous year.) The Government of Bihar issued a further notification on the 23rd December increasing the cess from 9 pies per maund to 12 pies per maund (0-0-6 per maund being the cess on cane and 0-0-6 per maund being the repayment of the excise loan) and reduced the cane prices as stated above by 3 pies per maund. The Government of U. P. issued a notification on the 6th December announcing the levy of a cess on cane at the rate of 3 pies per maund together with an additional cess of 6 pies per maund being the repayment of the excise loan given last season to the factories and they issued a further notification on the 23rd December announcing the cane cess at 12 pies per maund, 6 pies being the cess on cane and 6 pies being the additional cess for cane purchased by all factories in the Province. The Government of U. P. reduced the cane prices in the few districts stated above to 0-4-3 per maund with effect from 24th December, 1940. The minimum price of cane in other districts in U. P. was fixed at 0-4-6 per maund.

The total cess on cane in 1940-41 was 0-1-0 per maund.

The reason of the U. P. Government for reducing the price of cane in the districts mentioned above was that there was likely to be a considerable amount of cane left standing in those areas when the quotas of canes allotted to factories had been crushed. The price of cane in those areas was therefore reduced and the cane cess raised by 3 pies so that the proceeds of this extra cess of 3 pies might form the nucleus of a fund to which the Governments would respectively contribute and from which compensation would be paid to tenants whose cane was left standing at the end of the season.

A reduction of 0-0-6 per maund of cane was given in March, 1941, to some factories in Bihar which drew their cane from areas where there was surplus cane.

Non-varying minimum price for cane in U. P. and Bihar in 1941-42[1]

After the successful practice adopted in 1940-41, it was found advisable by the Governments of U. P. and Bihar to fix again a non-

[1] In the 1942-43 season, in view of the poor cane crop and the high prices prevailing for *gur*, the U. P. and Bihar Governments fixed the minimum price of sugar at As. 8 per maund but it was increased with effect from 1st January 1943 to As. 10 per maund, a relative increase in the price of sugar having also been announced with effect from that date.

In the 1943-44 season, the minimum cane price in U. P. and Bihar was further increased from As. 10 per maund to As. 12 per maund, but it was stipulated that the additional two annas was to be paid in Defence Savings Bonds or Certificates which were to be cashed one year after the war was over.

A recent announcement by the U. P. and Bihar Governments for the 1944-45 season fixes the minimum price of cane at As. 14 a maund out of which As. 2 per maund are to be invested in Defence Savings Bonds. The price of sugar was also increased by Rs. 1-7-0 per maund in order to enable the factories to pay an additional sum of As. 2 per maund of cane.

varying minimum price for cane, though at a slightly higher level, for the 1941-42 season. It was thought desirable to offer a greater return to the ryot in view of the smallness of the crop for the season. Thus, the minimum price was fixed at five annas per maund against 4½ annas per maund. The relative selling price for standard sugar was fixed at Rs. 9-10 per maund. Deferred payments were to be made to the growers if the selling price exceeded Rs. 9-12-0 per maund.[1]

Price fixation militates against efficiency

It will be seen from the above history of price-fixing in the provinces which adopted it and particularly those of U. P. and Bihar that the motive behind these measures was that the State should lend its strength to the cultivator to get his share of the prosperity of the industry. Obviously the Governments were not activated by a desire to handicap the industry in its progress towards greater efficiency. The idea that State intervention in the interest of the cultivator can only create complications for the industry and ultimately defeat its own purpose is beloved of orthodox economists and is quite in accord with the theory of *laissez faire*. The issues arising from this view will be considered from the theoretical standpoint at a later stage. Here it should be noted that the working of price-fixing during these years is not calculated to inspire the enthusiasm of honest well-wishers of the cultivators. It could hardly be considered unfair to the authors of price-fixing if it is suggested that there was more enthusiasm than practical knowledge behind these measures.

What is a "fair price"

Whatever definition one may give to the phrase "fair price of cane" it is certain that no price that involves loss to the industrialist can be considered to be fair. Any price paid under the dictates of political authority, and not according to the indications of value offered by prices in a free market, can be proved to be fair or unfair only by the ultimate fate of the finished product. The price of sugar being subject to many unforeseeable factors, there is always the possibility that what seems at the start to be fair to the cultivators may prove to be a case of serious injustice to the industrialist. This possibility is inescapable, except when the amount paid to the cultivator at the time of purchase of cane is only a part of the price and the accounts are left to be adjusted after the sugar is marketed and the sale proceeds are realised by the millowner concerned. So long as such a system is not adopted—and it is not easier to adopt than any other available alternative—any stipulated price has the danger of proving unfair to the cultivator or the industrialist.

In the case of price-fixing in the U.P. and Bihar, it was more than a theoretical possibility and was often the nearest approach to certainty. Measures to secure minimum prices for the agriculturist have always to reckon with reluctant psychological effects on the cultivators. All

[1] On the basis of sugar prices fixed, after the Sugar Control Order of the Central Government came into force on 14th April, 1942, the cane-grower was to get the balance of the deferred payment for his cane supplies, the total price being 0-7-0 per maund, exclusive of cesses in U. P. and Bihar.

schemes of agricultural regulation in the post-depression period have as a rule tackled the problem from the two ends of volume of production and supply on the one side and prices on the other. In the case of sugarcane, the effects of the price paid in one year on the production in the next have been overlooked. And even if the authorities had been aware of it, it is more than doubtful whether they would have undertaken the restriction of production.

A chain of consequences

But, as things were, price-fixing measures have led to a chain of mishaps for the industry which are not easy to avoid, once the Government accepts the responsibility for fixing the price of cane. Criticism of the prices awarded by the Governments has generally been based on a comparison of such prices with prices paid by *Khandsaris* or by the manufacturers of *gur*. Such criticism cannot be expected to appeal to the authorities who hold that an industry which has obtained protection on the ground of its importance to agriculturists ought to pay a fair price for the agricultural raw material which it consumes. All other standards would appear to the Governments as extraneous. Criticism to be valid must fasten on the fact that cane prices tend to increased cane production, larger carry-overs, frequent crisis in the sugar market and that such elements of instability cannot be to the advantage either of the cultivator or of the industry.

An inversion

If the mills are asked to pay a higher price for their cane than other consumers of it, then the agriculturist may be said to have his dividend in his pocket before production has begun. It is an inversion of the logical and chronological order in which events must occur and the effect of such inversion would be to prevent such events from occurring at all. Once the industry gets stuck in a depression, it will be long before it is able to pay the same " fair " price to the cultivator, so that every year of " fair " price is bound to be followed by two or three years of " unfair " prices. Indeed, this has been proved by recent experience. And official regulations regarding price-fixing must inevitably be in the direction of decreeing a tentative price, leaving final adjustments to be made at a later stage after the results of the prices of the entire production of the season are available.

Price-fixing not entirely to blame

One word of caution has, however, to be uttered while appraising the experiences of price-fixing during the last few years. For, its opponents will naturally be eager to attribute all the difficulties of the sugar industry, not merely to the rates decreed by the authorities for cane, but to price-fixing as such. Theoretically, there ought to be a certain price which is fair even according to *laissez faire* theories, though the fairness must be proved by the event of ultimate sale of the finished product. And that price cannot become unfair merely because it happened to have the support of a provincial Government. Even if such a price had been fixed from year to year, it can hardly be concluded that the sugar industry would have been wholly free

from the problems with which it was faced. The problem of carrying over large stocks produced at high costs into a period of low prices is by no means peculiar to the sugar industry; and it is perhaps, too late in the day to argue, even if it were practicable, that the sugar mills should get cane by the same methods by which jute mills get their raw jute; when the experiences of fixation of cane prices are examined, it must be borne in mind that the price-fixing has a comparatively small share of the blame for the over-production of the sugar industry. But one thing is certain, that price-fixing has queered its own pitch, so to say, and that it will be a long time before it gets a fair chance to prove its worth. Also the methods by which the principle of a tentative price can be brought into application have to be worked out in a manner which would be equitable to both the interests.

Pros and Cons of Price-fixing

It remains now to consider whether price-fixing is necessarily deemed to be a costly and dangerous futility. The position of the *laissez faire* economist hardly needs to be stated at length. For, it is no more than the contention that the laws of supply and demand being natural laws, any interference with them will bring on that terrible vengeance which nature wreaks on man whenever he stupidly seeks to secure a triumph over her. Besides, to impart rigidity to one part of the structure of costs because the market is otherwise free is to condemn the structure to ruin. All this is as valid as it is intelligible. But those who advocate fixed prices for cane have certain presuppositions of their own; and as has been observed earlier, criticism by extraneous standards can claim little validity for itself. In this case, the presuppositions are that the market for sugar is a closed market; that prices of sugar cannot fluctuate beyond certain limits, that the price of cane can be altered from year to year, while the responsibility for regulating production according to the state of the market must rest with the industry. It is argued, therefore, that price-fixing need not stand in the way of the industry increasing its efficiency, that the cane prices need not raise costs or endanger fair prices for sugar.

A Problem of Costs or of Distribution?

It is not difficult to appreciate this point of view. The difference between the two parties arises mainly from the fact that, while the *laissez faire* economist views the price of cane as a question of costs and of production, the advocate of price-fixing regards it as a problem in distribution. The latter only insists that, when the millowner pays the price for cane, the problem of distributing the profits or other advantages of a protected industry should be solved at least so far as the cane-grower is concerned. Empirically, when a price is paid for cane, it is not only the cost of the raw material but also the cultivator's share in the advantages created by the grant of protection to the industry. So far as the millowner is concerned, there are other items in his costs and the computation of his profits or his share in the advantages of a protected industry can be done much later. But, for the cultivator, the price he gets for his cane closes his accounts in this regard. The question, therefore, is whether this price can be so fixed that this closing of accounts can be indubitably equitable to him. To

award a tentative price with room left for a final adjustment at a later stage is to postpone the solution of the problem of distribution envisaged here. But that is precisely the line on which the Sugar Control Act attempts to solve the problem.

The Structure of Costs

But the gravamen of the charge against price-fixing, from the side of economic theory, is that it imparts rigidity to costs and incapacitates the industry for its main task of reducing costs of production. The emphasis on lower costs arises from the anxiety that the stage of removal of protective duties and resumption of free trade should be reached as soon as possible. The means by which costs are lowered rarely worries the economist; for he never concerns himself directly with the problem of distribution. The same laws which ensure economy in production and costs are expected to bring about fair distribution as it is understood by *laissez faire* theory. But the post-depression period is remarkable for a growing scepticism towards such theories and a refusal to wait for their slow working for the economic security of men and women. Theories of under-consumption are in the main a reaction from the over-emphasis, which orthodox economics has laid on the production side and particularly on the reduction of costs of production. While there can be no question that increased efficiency both of labour and of plant and machinery, of men and material, ought to be ceaselessly striven for, the tendency to include wages as only an item in the costs schedule to be cut as relentlessly as any other is strongly to be deprecated. It is no accident that, while protection in India is awarded with a view to bring new industries into being, protection in the advanced industrial countries of the west is given with a view to maintain standards of living. The conflict between lower costs and standards of living, *laissez faire* ignores. While theoretically it may be resolved in the long long run and in ideal conditions of free trade, the conflict is real in real life. To ask the sugar industry to reduce costs regardless of what the cane grower gets for his pains is to believe that the only way of distributing the benefits of protection is to cheapen the goods for the consumer. Much indeed can be said against this view: firstly, the "consumer" is an unreal abstraction, and what the cane-grower may get by way of cheaper sugar will be poor compensation for what he loses by the drive for lower costs. And the cane-grower is not a consumer of white sugar! Secondly, there is no guarantee that cheaper raw material would lead to proportionately lower costs of sugar production or that the benefits of lower costs will be passed on to the public. The demand for fixed cane prices is a demand that the mills should not monopolise the benefits of protection and that when the "consumer" cannot be helped to get a share of them, at least the cane-grower can and ought to be.

Anticipatory Solution

Price-fixing ought to be viewed as a severely limited objective It is in essence a half-hearted, piece meal, slipshod way of solving the problem of distribution so far as it concerns the cane-grower and is to be condemned-or supported as such. But when such attempts are

seen to flow from any ambitious scheme of regulation which oversteps the limits set by free trade theories, it is necessary to see the bearings of such anticipatory solution of the problem of distribuion.

The Human Factor in Cutting Costs

It has been observed already that the insistence on wage standards and on fair prices for agricultural raw materials is only a case of such anticipatory solution. In so far as distribution is attempted before the productive processes are completed and the results of productive activity can be known, it is a reversal of the correct order of events and must be attended by some risk of eventual unfairness. But opponents of price-fixing or wage-fixing condemn them not so much on grounds of possible unfairness, as on the ground that those regulations will interfere with the industry's attempt to cut down costs and cheapen the product for the large mass of consumers in the country. It is in relation to this laudable aim of progressive decrease of costs that these measures have to be considered. The question to be considered in this connection is whether the cheapening of a product through relentless cutting of costs, regardless of what the human factor gets in return for the pains, is the only or the best means of securing economic progress. Experience of the last two decades has shown that such decrease in costs is more often than not a pyrrhic victory for the capitalist, for the industry and for the community. When the reduction in costs is accomplished in a number of industries at the expense of labour or the growers of the agricultural raw material, a crisis in consumption occurs inevitably. One is therefore driven to the position that economy from a communal standpoint, as different from that of the investors in an industry, consists in the most effective use of material in the production of goods and services and that somewhat different standards have to be applied to the labour involved.

The Crisis in Consumption and Maladjustments thereof

If it is true that the adoption of the same attitude to men as to material leads to a crisis in consumption, then it is necessary that the industry should be told that savings at the expense of labour will not be regarded as genuine economy in production. Logically, the distinction between men and material, so far as production costs are concerned, wears thin indeed. For, it would mean that labour-saving devices are the very reverse of economy in production. Nevertheless, it should not be difficult to recognise that when such devices throw men out of employment, the resulting maladjustments are highly uneconomic, at least temporarily from the standpoint of the community as a whole. In other words, what may be economy from the point of view of the production side is " diseconomy " from that of the distribution side.

Lower Costs not an Unmixed Blessing

Orthodox economics refuse to regard this even as a possibility; and the whole structure of the science is such that it cannot compromise with the logical proposition that when economic life is free, there is no problem of distribution as such to be faced. But in real life, problems

of distribution call for at least as much attention as problems of production. The assumption that the race for lower costs has only to be run for the best results to be achieved is seen to be unwarranted. Lower costs are no longer regarded as the unquestionable or unmixed blessing they were formerly said to be; and problems of distribution are, therefore, frankly faced.

Price fixing an "ad hoc" solution in distribution

However, the solution of these problems is not easy. Problems of distribution are inextricably inter-woven with questions of ethics: and solutions are limited by what is politically practicable. The decrees of political authority in regard to distribution are usually dictated by political considerations. Except in the impossible conditions of absolute economic equality such decrees can only be an unhelpful tinkering with the problem. But they are important because they signify the growing element of regulation in economic policy. They are tokens of social determination that problems of distribution ought not to be allowed to accumulate in one uncontrollable crisis of underconsumption. They indicate, too, that there is a large mass of opinion which would much rather face the consequences of interference than lay up a huge problem for future generations by letting everything alone. Above all, it is a bland assertion that a cut in wages or in the price paid for agricultural raw material is no economy at all. It is a sharp rebuke to the capitalist that if he is so intent on cheapening sugar for the consumers, he had better show his mettle in other directions.

It should not be thought, however, that price-fixing for cane necessarily implies indifference to the cost of production of cane or that the industry is called upon to pay a price for cane which leaves a fair margin of profit for the cultivator regardless of his efficiency as a producer. When the Tariff Board observed that the provision of cheap cane is vital to the growth of the sugar industry they did not mean that the cultivators should provide cane to the millowners at a loss, but that the cost of cultivation should be reduced by the adoption of improved methods of cultivation and securing higher yields of cane per acre and of better quality. Both the cultivator and the millowner have thus a score of technical problems to face and solve, and price-fixing must be viewed as an interim award by an "ad hoc" tribunal for distribution.

CHAPTER IX

ECONOMIES IN PRODUCTION BY UTILISATION OF BY-PRODUCTS

We have seen in Chapter VII what the protection to the sugar industry has done for cane cultivation and, what is more important, what agriculture so aided and revivified can do for the sugar industry. We have also noted, somewhat parenthetically, how agriculture has, to some extent, through official fixing of price for cane, retarded the progress of the sugar industry towards lower costs of production. All this is important in as much as the further cheapening of Indian sugar rests more with agriculture than with industry. We must now turn to the other end of sugar manufacture, and consider the utilisation of by-products. It is a common-place of text-books of economics that the utilisation of by-products is a main source of economy in large-scale industry. It is, in fact, a scientific rendering of the common adage "waste nothing, want nothing." This adage is, however, one which the country, rather than any particular industry should take to heart, particularly when it sets about establishing new industries at great cost to the consumer. We have said before that in India the problem is to make the most of every new industry established by means of high protective duties, rather than one of ticking off the results of actual working as each year passes in the stipulated period of protection. While this is true, at the same time the sugar industry has been handicapped not a little by the fact that it has been obliged to waste its valuable by-products and thus forego one of the means of cheapening its costs.

Utilisation of By-products, (Molasses and Bagasse): Molasses, most important by-product

Molasses is the most important by-product of the Sugar Industry, from the point of view of the factories as also of indigenous small-scale manufactures. Molasses is that liquid substance or syrup which remains after the massecuite has been cured. It is often boiled again for making lower qualities of sugar, and the molasses finally obtained is exhausted and contains very little sucrose. The other by-product is bagasse or as it is sometimes called megasse. This bagasse is the residue of fibrous matter which remains after the cane is crushed. Out of 100 maunds of cane about 10 per cent of sugar and 3.6 per cent of molasses are recovered by the factories and about 5.2 per cent of sugar and 4.5 per cent of molasses are recovered by the Khandsaris.

Precipitous Fall in Price of Molasses

Formerly, the molasses produced by the factories and khandsaris was consumed largely in the tobacco industry and in the manufacture of plain country spirits. The consumption of molasses in both these ways has fallen by more than 75 per cent at the present time. While

there has been such a heavy fall in the consumption of molasses, its production has naturally increased considerably since 1931, as a result of the establishment of a very large number of factories. The production of molasses in India was estimated at 269,000 tons in 1930-31 and 366,000 tons in 1931-32. And in 1939-40 it amounted to as much as 625,000 tons.[1] The molasses obtained in the khandsari sugar factories is richer in sucrose than factory molasses and is either sold direct to the consumers or made into second class eating *gur*. The sudden increase in the production of molasses with a concomitant decrease in its consumption has created a problem of first rate importance and should engage the anxious attention of all sugar manufacturers. At present, it is not possible to realise even one anna per maund for the molasses while a price of Rs. 2-12-0 was obtained in the year 1930-31. When the Tariff Board reported they assumed in their calculations that the factories would be able to realise about Rs. 1-8-0 per maund for their molasses. The Indian Sugar Committee stated unequivocally that "the time is remote when the sugar manufacturer in India need anticipate any difficulty in disposing of his molasses." This has however proved to be incorrect, since 1934.

Impossibility of throwing away Molasses

It is really unfortunate that a situation has developed whereby not only can this most important product of the sugar industry not be profitably utilised, but it involves expenditure for its disposal. If the molasses are thrown in the adjacent river or watercourse, there is no doubt that the water will be polluted. If it is allowed to run into pits, it would prove a serious nuisance to the neighbourhood. The situation is one in which a certain source of wealth is turned into a loss to the manufacturer and a possible menace to public health in the neighbourhood of the factories.

Outlets for Molasses

The problem therefore should be examined very closely in order to remove a great handicap of the industry almost since the very first year of the regime of protection. The quantity used in curing tobacco will decline further, owing to the increasing use of biris and cigarettes, and decrease of hookah and chilam. We must therefore think of other outlets for disposal of molasses. These are :—

(i) Methylated spirit.
(ii) Cattle food.
(iii) Production of the yeast as a source of food.
(iv) Fertiliser.
(v) Road-surfacer.
(vi) Cheap confectionery.
(vii) Fuel.
(viii) Alcohol for power in partial substitution of petrol.

These channels, we shall now consider.

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[1] In 1942-43, it was 469,000 tons and 1943-44, it was 538,000 tons.

Methylated (Denatured) Spirit, and Potable Spirit

A glance at the Import trade statistics will show that about a million gallons of methylated or denatured spirit are imported annually from Java. During the year 1932-33 the import was 8,56,800 gallons, valued at Rs. 8 lakhs, as compared with 10,52,400 gallons valued at Rs. 10 lakhs in 1931-32. During 1937-38 the import was 379,010 gallons, valued at Rs. 3,14,042. An increase in the duty from 7½ per cent *ad valorem* to about 25 per cent would make it possible to shut out its import completely and to substitute the same by the indigenous product. An outlet for a part of our production of molasses can thus be found in the development of the Indian Spirit Industry. Spirit can be manufactured from molasses. A large quantity of it is used by the various industries, e.g. Lac Industry, Varnish Industry, Paint and Furniture-polishing Industries. As a result of the great fall in the price of molasses it would be possible to encourage the distilling industry in the country without affecting in any way the industries consuming spirit, and to supply the country's requirements from internal production cheaply owing to the tremendous fall in price of molasses. The loss to Government's revenue will be only about Rs. 75,000 per year.

The production of country spirits in India has decreased considerably, during the last 12 years. About 1920, the quantity of molasses consumed for making potable spirit was 4 times the quantity used in 1938. But the excise duty has resulted in the consumption being scarcely large enough to justify the operation of distilleries. At present (1939) the distilleries suffer due to lack of an outlet and have hardly enough work for 6-7 months in a year. This is partly due to the Government's policy of reducing the consumption of potable spirituous liquor, and of deriving maximum revenue from minimum consumption. One result of the excessive taxation has also been the increase in the practice of illicit distillation of liquors by the poorer classes. Distillation could be increased, if the increase were socially desirable. But inasmuch as the popular parties are wedded to a policy of prohibition, the solution of the problem of molasses has to be sought along other lines than that of liquor production.

Cattle Food

The scope for the use of molasses as cattle food does not appear to be great due to the difficulty in marketing combined with a traditional conservatism of owners of most of the cattle in India, as they are used to free grazing with hardly any expenditure on other foodstuffs. But now the molasses can be given away without cost by factories, a certain amount can thus be consumed. This may solve the problem of disposal, but it is not a means of finding a market for this by-product of the sugar industry.

Yeast

The use of molasses as a source of yeast is new to Indian ideas, and is not likely to develop very much.

Fertiliser

It is possible to use molasses as a fertiliser in its raw state, but our cultivators will have to be educated to its use and ample supplies of water would have to be provided in order to dilute the molasses before it could be put on the land.

Used in a small quantity, it tends to improve the land; Sir T. Vijayaraghavachariar recently observed that he had seen molasses being used as manure. This avenue of use for molasses should therefore be explored and the Agricultural Department should carry on research in regard to the same. It is also possible, we are informed, by using a particular Plant to recover the potash from molasses and to produce ash with a high content of potash therefrom.

Potash is necessary to plant-life in order to enable starch, sugar cellulose and carbo-hydrates to be produced. Potash plays a large part in the development of leaves and woody parts of the stems of plants and gives the plant more resistance to attacks of fungous diseases or the like.

Sugarcane on an average extracts from the soil about 100 to 150 pounds of potash per acre and it is desirable that this should be replaced either by potash recovered from molasses or from fresh resources, if the land is not to be impoverished and the yield of crop maintained. It is possible to return the available potassic content of molasses in an easily assimilable form to the land and to use it for the fertilisation of sugarcane or other crops.

One essential for this invention is a furnace to burn molasses at the lowest temperature and recover the highest possible yield of potash. There has also to be provision for burning waste molasses from cane sugar factories or *gur* refineries comprising a furnace into which the said waste product suitably pre-heated is introduced into or a revolving drum from which it falls as drops or threads to be burned as it falls. It has been estimated that the working cost for dealing with 12,000 maunds of molasses in 24 hours works out to 1½ annas per maund of molasses. Taking the average ash contents of molasses to be about 9 per cent, 100 maunds of molasses will yield 9 maunds of ash which may have an approximate potash content of 34 per cent or 3 per cent of valuable fertiliser value. Such a product based upon other potash products will have a value of Rs. 2-12-0 per maund at the factory. Reduced to one maund of molasses the estimated value of the product will come to about 4 annas from which the cost of treatment will take away 1½ annas. The estimated profit will therefore be at least 2 annas per maund of molasses thus treated. For the whole season this will give a substantial profit.

Utilisation of Molasses for Reclaiming Usar Lands

During the year 1938, the Government of U. P. appointed a Committee to report on the suitability of the methods advocated for the reclamation of Usar lands with special reference to the use of molasses etc. The Committee submitted its final report to the Government in December 1939. The Committee considered very carefully the feasibility of utilising molasses for reclamation of Usar

land. It also critically examined all the data available in U.P., Bihar, Punjab, Madras, Bombay and Mysore, and came to the conclusion that molasses could be utilised with advantage for reclamation of Usar areas, but for the fact that the cultivators might find the cost of the treatment to be distinctly prohibitive. The majority of the members of Usar Lands Reclamation Committee found it a little difficult to recommend this method for places which are not within 10-12 miles of a sugar factory. The Committee also felt that there was need for further work both in the field and laboratory so that the question of molasses as a reclaiming and fertilising agent might be critically tested. In short, wherever the cost of treatment permits it, mixtures of molasses and pressmud in different proportions can be utilised in reclaiming alkali lands.

Road Surfacer

Another use, though comparatively insignificant, to which molasses can be turned, is for road surfacing, by mixing it with a certain amount of Pitch. Experiments in this direction are far from complete; and it still remains to see how far this can be a commercial success, in competition with other products.

Confectionery

Molasses were used for cheap confectionery in the villages, but since the decline in the price of *gur* and sugar, its consumption has considerably decreased.

Fuel

Molasses can also be used as fuel. Some experiments were carried out in Java, and a few factories burnt a mixture of bagasse and molasses. In Australia several mills burnt molasses as fuel in their furnaces. Molasses mixed in small proportion with bagasse burns well and produces profitable calories. This practice is followed in many centres in the Philippine Islands when there is a shortage of bagasse or when this has only a small calorific power, which happens as the requisite quantity of molasses is too small for this purpose to solve the problem of its disposal.

A countless number of furnaces have been proposed for the burning of molasses alone in the Philippine Islands, but none of them to our knowledge has given satisfactory results. Besides, the construction of special furnaces, its repair and maintenance entail heavy expenses for which there is no compensating benefit. The possibilities of this, however, should be investigated in India.

In some factories the press-cakes are mixed with slack coal and brickets are manufactured. These bricks are used for burning.

Power Alcohol

It is certain, however, that the best and most promising outlet in India for the molasses would be in its manufacture as power alcohol. The entire scientific world is unanimous in its recognition of the fact

that the fuel of the future for engines of internal combustion is alcohol. This can be produced from vegetable materials with which nature provides us generously and there is no danger that they will be exhausted in the course of time. The development of this industry is of considerable importance in the industrial development of this country; it is vital because of the possibility of providing the country with a motor fuel which is both cheap and easily obtainable. Alcohol has many advantages over gasoline. One of these is the fact that its source is not a wasting asset. The raw material for it is produced annually, and alcohol is the only fuel which can be produced without danger that its existing natural source of supply will be exhausted.

The manufacturer of sugar finds in molasses first class material for the production of alcohol.[1] The future development of the alcohol industry can easily go beyond the limits of the imagination of the great enthusiasts, not because its growth can be achieved easily but because of the constant and increasing demand for motor fuel at low prices.

The value of alcohol as a fuel for internal combustion engines has been recognised in various countries, e.g. France, Germany and America. In Germany alcohol was used during the last World War in very great quantities by the army for motor transport, for which purpose it was mixed with benzol. The importance of alcohol as a fuel depends on its possibilities in the future as a substitute for kerosene or petroleum.

Alcohol has a lower caloric power than kerosene or benzol or benzine; but since it requires less air to effect combustion, less caloric power is lost, and since its resistance to compression is greater, it is of more value as a fuel than the other two substances. Kerosene or petroleum is not a chemically pure substance but a mixture of great number of substances. Its properties cannot be determined definitely, since they vary as the grade of petroleum varies. While alcohol is low in caloric power, it possesses an ignition temperature around 270 degrees and can be used only with a pressure of from 70 to 90 pounds per square inch. Due to this the thermic efficiency can be increased from 22 per cent to 30 per cent.

The start of engines burning alcohol offers no difficulty, and engines burning alcohol develop 20 per cent more power than the same engines when they burn gasoline. The combustion of alcohol is perfect and the escaping gases do not exude an offensive smell. Pure alcohol offers great advantages. Since alcohol contains oxygen in molecules, it requires less air for combustion than gasoline does. Another outstanding feature in favour of alcohol which should not be lost sight of, is its clean combustion. The carbon formation is practically nothing. The cleanliness of alcohol as fuel, compared with gasoline, can be demonstrated by burning a small quantity of gasoline and a small quantity of alcohol and holding a cold piece of metal or a glass object over the flames of each product. Alcohol which is of uniform compression and contains one-third of its weight in oxygen, burns completely and does not leave any deposit or residue.

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[1] "Molasses is the cheapest raw material in common use for the production of alcohol for industrial purposes, the price being governed by supply and demand." *Vide,* report of the Imperial Sugarcane Research Conference, London, 1931.

Alcohol also does not produce violent explosions such as gasoline and other motor spirits proluce. As a result, the motor runs smoothly, thus reducing the wear and tear. The engine is not overheated as in the case of gasoline or other fuels. It keeps the spark plugs clean, thus assuring more efficient ignition. Alcohol, it is also recognised, is a good "anti-knock" fuel.

As alcohol generates less heat in the combustion process, it needs less water for cooling. It is less disagreeable to work with and the danger of poisoning due to inadequate supply of air does not exist when alcohol is used in an engine in a closed place. Medical experts have expressed the opinion that the rapid increase in cases of neurosis or hysteria in big cities is due to the fact that the air is poisoned by carbon monoxide. This could be prevented with the use of alcohol as fuel instead of gasoline.

Even if the cost of production of alcohol is high due to the necessity of using denaturants which are very costly and of little use but whose use is imposed by legislation coupled with taxes which must be paid to the Government, the manufacturer of alcohol can still put his product on the market at low prices. If the manufacturers of alcohol can succeed in getting the Government of India to abolish the use of costly denaturants and substitute less costly ones for them such as petroleum and gasoline for motor alcohol and exempt alcohol from any excise duty as on petrol, the immediate success of the industry would be assured. It must be observed that 95°-96° alcohol mixed with gasoline or ether will prove unsuitable for use as the continuous evaporation produced in the carburetter will lower the temperature to a limit which will give way to the separation of alcohol, then the gasoline or ether, more volatile, evaporates, leaving alone the alcohol which will hinder normal evaporation of the motor. Pure alcohol, however, mixed with gasoline in fixed proportions improves the quality of the former. It is mixable at all temperatures, never reaching a point of separation. The best way therefore of having an outlet for the production of alcohol is to make the distilleries manufacture pure alcohol.

Assistance to Power Alcohol Manufacturing Industry—Compulsory use of Alcohol with Petrol

Power alcohol can be produced in India and mixed with petrol in the proportion of one part of alcohol and three parts of petrol or 20 per cent alcohol and 80 per cent petrol. Several countries have in fact passed legislation making it imperative for petrol companies to use a certain percentage of alcohol with petrol. Below is a statement showing the form in which assistance might be given to the industry and what is done in other countries.

AUSTRALIA.—A mixture of 17 per cent alcohol and 83 per cent petrol is used on a small scale—legislation contemplated.

AUSTRIA.—(1) The law provides that mixing shall be compulsory if the (duty paid) price of petrol exceeds the price of alcohol—not operative.

(2) The petrol *Cartel* takes over the alcohol from the State Alcohol and arranges disposal. During 1933 it is expected that they will take over about 250,000 gallons.

BRAZIL.—Petrol companies are required by law to purchase power alcohol equivalent to 5 per cent of their petrol imports. The law is suspended as most of the alcohol produced is only of 94 per cent strength and the concentrating plant is of insufficient capacity.

CZECHOSLOVAKIA.—The addition of 20-25 per cent of alcohol to motor fuel is compulsory and 98 per cent of the petrol sold is this mixture. The amount of alcohol so used is about 11 million gallons.

FRANCE.—(1) Importers of Petrol are under a legal obligation to take from Government a quantity of alcohol equivalent to 8-10 per cent of their petrol imports.

(2) The State buys alcohol from the refineries up to a certain limit of quantity at £41 per ton (Rs. 1-15-3 per gallon) and sells it to the petrol distributors at a much lower price corresponding roughly to the (internal) price of commercial motor spirit, viz. £17 per ton (13 annas per gallon) the loss being partly made by a special additional import duty of 1s. 3d. per gallon on all imported petrol and kerosene. The amount of alcohol to be allocated for motor fuel for 1933 is estimated at 45 million gallons.

(3) All "heavy" petrol must be mixed with 20-25 per cent of alcohol, this is sold at 2½d. per gallon cheaper than "light" petrol. A mixture of 20 per cent alcohol is permitted without a declaration in fuel grade petrol.

(4) The cost of these subsidies to the State is estimated at 206 million francs or say 3½ crores of rupees.

GERMANY.—The oil importers and indigenous producers are required to purchase from the alcohol monopoly a quantity of power alcohol corresponding to 10 per cent by weight of their imports of petrol and benzol plus 6 per cent of their imports and/or production of kerosene at a control price of £45 per ton. The amount of alcohol taken over is estimated at 42 million gallons. The mixtures permitted range from 10 per cent to 30 per cent alcohol.

GREECE.—(1) It is proposed to standardise a mixture of 78 per cent petrol with 22 per cent alcohol but also to permit the use of unmixed petrol.

(2) To fix annually the quantity of mixture to be made. It is estimated that 1½ million gallons of alcohol would be so used.

HUNGARY.—(1) Petrol over .735 S.G. must be mixed with 20 per cent alcohol (unless used for agricultural purposes) about 90 per cent of the motor fuel used is this 'Motalco'.

(2) The duty on light petrol (below .735 S.G.) is 4*d.* per gallon higher than that on 'Motalco'.

ITALY.—A definite allocation of the total production of industrial alcohol is made to the motor industry—at present 2¼ million gallons which is less than 3 per cent of the total consumption of motor spirit.

This is taken over at a control price (Rs. 1-6-10 per gallon) but does not pay the petrol duty.

LATVIA.—The mixture of 25 per cent alcohol with 75 per cent petrol is compulsory. The alcohol is a State monopoly.

SWEDEN.—There is no legal regulation but power alcohol is free of all duty. The mixture used is 25 : 75. The quantity of alcohol used for motor fuel is about 2 million gallons.

YUGOSLAVIA.—The mixture of 80 per cent petrol with 20 per cent alcohol is compulsory except for aeroplanes.

It can be seen from these statements that whereas in several countries the use of a specified mixture has been made compulsory, in others, the principle has been adopted of requiring the oil companies, by legislation, to purchase annually a quantity of power alcohol corresponding to a certain percentage of their imports and production of petrol and benzol; and in some countries even of their kerosene. The adoption of this method leaves a certain amount of latitude to the petrol distributing companies in distribution, and in practice the mixture is sold at a price somewhat lower than pure "light" petrol in spite of the fact that it actually costs more. A more positive method of promoting the use of alcohol as a motor fuel is its exemption from duty as in Sweden, but the Government of India is hardly in a position to forego any revenue.

Modification in Denaturing Rules in India Essential

Several countries have been experimenting for years with power alcohol in order to make it a commercial success for use in internal combustion engines. The United States of America, South Africa and Philippine Islands have succeeded considerably with mixtures of alcohol and ether, e.g. Natalite—but these countries are fortunate enough to have received the full support of their governments. The greatest drawback in this country, however, to any experiments in this direction materialising lies in the present Excise Rules relative to denaturation. The Government insists upon the use of *Caoutchoucine* as an ingredient for denaturation. This substance which is obtained from the destructive distillation of rubber is not suitable for denaturing alcohol intended for use in internal combustion engines as it leaves a gummy residue which clogs valves and fuel jets. True, Government have of late relaxed to some extent the use of *Caoutchoucine* for denaturation in special cases, e.g. manufacture of high grade soap and have permitted in its place the addition of 5 per cent Wood Naphtha, but the price of this ingredient is prohibitive. It is held by some that the use of *Caoutchoucine* or Wood Naphtha is not imperative as a denaturant so long as *Pyridine*, the other ingredient insisted upon, is used. *Pyridine* in itself renders alcohol unfit for human consumption and if denaturation be permitted with *Pyridine* along—in increased proportion of 1 per cent instead of ½ per cent as at present—the difficulties regarding the denaturation of commercial spirit will be immediately overcome and power alcohol could then be produced to sell considerably below the current price of petrol in the mofussil.

U.P. and Bihar Joint Power Alcohol and Molasses Committee

In January 1938, the Governments of U.P. and Bihar appointed an expert committee to devise ways and means for starting the manufacture of Power Alcohol from molasses and to report on the best method of mixing Power Alcohol with petrol and also to explore the possible use of molasses and their practical application.

The Committee submitted its report to the Governments of U.P. and Bihar in June 1938. The report was published in July 1939. The findings of the Joint Committee on various important questions pertaining to the enquiry regarding power alcohol and their recommendations are given below.

U.P. and Bihar Joint Committee's Findings[1]

The Committee has dealt with the subject of power alcohol tracing its growth in the various countries of the world, and also with reference to the importance it has now assumed so far as India is concerned. It has endeavoured to deal with the properties of power alcohol and has, with the materials available, forecasted what the cost of manufacture would be. The Committee has also suggested that it would be possible for power alcohol being produced at a price, which would enable it to bear, if necessary, an excise duty equal in amount to that of petrol without imposing any additional burden either on the tax-payer or the motor-owner.

It would be seen that if the entire surplus quantity of molasses, estimated at 265,000 tons, be converted into power alcohol, about 15 million gallons of it can be produced, calculating one ton of molasses as equivalent to 57 gallons of power alcohol. The total consumption of petrol being as high as 100,000,000 gallons, the abovementioned quantity of power alcohol can be easily utilised, particularly as there would be little difficulty in the disposal of power alcohol in the interior, where it can be sold at the same price as petrol. Thus the replacement of 15 million gallons of imported petrol by indigenous power alcohol would mean a saving of about Rs. 40 lakhs per year to the country.

The Committee emphasised that the case for the development of the power alcohol industry within the country has assumed particular importance with the separation of Burma from India. It appears to be in the national interest to encourage the manufacture of power alcohol, and thus get rid, to such extent as is possible, of the dependence of the country on imported petrol, the regular supply of which cannot be assured during an outbreak of hostilities, when it would be in greatest demand.

Power alcohol is an ideal fuel having great flexibility, which makes is possible to be used in higher proportions for heavy types of vehicles. If, therefore, for some reasons there is a serious shortage of petrol in the country, or imports are obstructed, or if the price of petroleum which is dependent to some extent on political considerations is enhanced to an uneconomic level, the country would have an alternative supply of fuel, namely power alcohol, to fall back upon.

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[1] The writer (Mr. M. P. Gandhi) had the honour of being a member of this Committee.

The Committee estimated that the quantity of petrol consumed in the United Provinces and Bihar will soon reach a figure of 10 million gallons[1] so that the requirements of power alcohol for the two provinces would be in the neighbourhood of 25 million gallons, for the manufacture of which about 44,000 tons of molasses would be required. But there is no doubt that if a start is made, it will be possible to supply power alcohol to the neighbouring areas as well, and the quantity of molasses so utilised will increase gradually. Although, therefore, the relief given to the molasses situation in the initial stages would not be very substantial there is the certainty that, once the industry is established, it will be possible to extend considerably the use of "industrial alcohol" and methylated spirit. The Committee was thus convinced that the power alcohol industry satisfied all the necessary conditions required for the establishment of a new industry, namely a cheap and abundant supply of raw material in the form of molasses, an adequate supply of labour, and an extensive home market—present as well as potential.

Findings of the Joint Power Alcohol and Molasses Inquiry Committee

The findings[2] of the Committee on various important questions pertaining to the inquiry regarding power alcohol are given below:—

(*a*) The quantity of surplus molasses per annum is estimated at about 265,000 tons for the whole of India.

(*b*) The scheme for the export of molasses from India has virtually been a failure.

(*c*) (i) The use of power alcohol-petrol fuels mixed in proper proportions in place of straight petrol is not likely to give rise to any trouble and would not ordinarily require any change to be made in the adjustment of the engine or carburetter. (ii) The use of a 50 : 50 power alcohol-heavy petrol mixture in motor lorries and buses may be found to give more satisfaction in tropical countries like India than in Europe. (iii) Straight alcohol, even of the usual rectified spirit strength, can be used without much trouble in specially designed stationary engines or for running tractors and other agricultural machinery.

(*d*) There are two recognised processes for the manufacture of power alcohol, namely, the Azeotropic and the Saltdehydration process. Judging from the number of installations all over the world, both the processes seem to be quite satisfactory.

(*e*) The conditions in the United Provinces and Bihar are very favourable for the manufacture and use of power alcohol made from molasses.

(*f*) The power alcohol industry can be established without a subsidy from the Government. But, even if it were slightly more costly, the industry should be encouraged, as it would lead to the development of other industries.

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[1] In 1937, the off-take of petrol was estimated at 5.1/2 million gallons in the United Provinces and 2.1/4 million in Bihar.

[2] *Vide* also the views expressed in this connection emphasising the urgent necessity of establishing this industry, in order to prevent difficulties which would be caused in the event of a blockade of India by sea, etc., in a separate Note attached to this Report, by Mr. M. P. Gandhi, *vide* Report, page 141, Appendix XVIII-E.

(*g*) Power alcohol can be marketed in the United Provinces and Bihar, as also in the other adjoining inland areas at substantially the same, if not lower, price at which petrol is now being sold.

(*h*) The average price of petrol, ex-pump calculated for most of the large towns in the United Provinces during the greater part of 1937 was Rs. 1-9-0 per gallon.

(*i*) Power alcohol can be manufactured at such a cost that an excise duty almost equal to that on indigenous petrol can be levied on it.

(*j*) The manufacture of power alcohol seems to be a subject under the control of the Provincial Governments.

(*k*) (i) The cost of manufacture, by the Azeotropic or the Salt-dehydration process, of power alcohol, starting from rectified spirit and excluding the cost of denaturation, would be about As. 6½ per gallon, when the cost of molasses is As. 6½ per maund delivered at distillery. By adopting a modified process, it may be possible to bring down the cost to about As. 6 per gallon. Again in case molasses are available at As. 4 per maund, these prices would further go down by about As. 1 per gallon respectively. (ii) The price at which power alcohol may be delivered at the petrol mixing depots in these two provinces may not be higher than Rs. 1-4-0 per gallon, after paying As. 6 per maund for molasses, As. 1 for denaturants, and As. 10 as excise duty.

(*l*) The average cost of imported petrol at the railside petrol depot in the United Provinces works out to about Re. 1-5-0 per gallon.

Recommendation of the Joint Committee

The Committee, therefore, made the following recommendations :—

(*a*) The power alcohol industry should be established under the control of the Provincial Government.

(*b*) A Power Alcohol Advisory Board should be established.

(*c*) The duties and functions of the Board would be to advise the Government generally on all matters connected with the industry.

(*d*) Necessary legislation should be enacted at an early date for the compulsory mixture of power alcohol with petrol.

(*e*) Petrol should not be allowed to be retailed until it has been mixed with power alcohol.

(*f*) The present petrol distributing organisations in these two provinces should be required to take up the distribution of the fuel. Failing satisfactory arrangements being made with them, the Government should make alternative arrangement for the same.

(*g*) Power alcohol should be made available at all petrol depots at a uniform price contracted with the Governments, inclusive of any excise duty.

(*h*) Petrol used for admixture with power alcohol should conform to specifications laid down by the Government.

(*i*) The denaturants for power alcohol may be one of the following : (1) "Coal tar Benzole"—3 parts by volume, or (2) Wood Spirit—2.5 parts by volume per 100 volumes of power alcohol.

(j) The Government should explore the possibilities of promoting the use of alcohol-mixed fuels for power purposes in agricultural operations, especially in sugarcane areas.

Industrial Alcohol

The findings of the Committee on various important questions with regard to the uses of industrial alcohol and also of molasses for other industrial and agricultural purposes are given below:—

(1) There is a large field in India for expansion in the use of alcohol for industrial purposes.

(2) The use of "methylated spirit" for purposes of heating and lighting may be considerably increased by suitable propaganda especially when there is the possibility of marketing it at a price competitive with kerosene.

(3) The "Vend-fee" of As. 8 per gallon levied on methylated spirit is very high as compared with the excise duty on kerosene.

(4) The high rate of "Vend-fee" on methylated spirit is a great handicap against its more general use.

(5) The present market in India for vinegar, acetic acid, commercial organic solvents, and such other products wherein alcohol is used as a raw material, is small, but is capable of being developed.

(6) The use of molasses as a fuel is unremunerative.

(7) The use of molasses for making road compositions is still in the early stage of experimentation.

(8) Investigations regarding the utilisation of molasses for making composite cattle-feed have so far not given any discouraging result.

(9) Yeast for cattle-food can be manufactured from molasses at the same time as alcohol, and the economic possibilities in this direction seem to be attractive.

(10) The use of molasses as manure in normal soils has not received much support from the majority of agricultural experts in India.

(11) The use of molasses for reclaiming *usar* soils has aroused considerable interest and is being tried in different parts of India. At many places encouraging results have been obtained and extended trials are being given to this process of reclamation.

Recommendations

(1) "Industrial Alcohol" for use in internal combustion engines should be (i) more heavily denatured than power alcohol; (ii) free from any kind of excise duty, and (iii) sold at almost the cost price.

(2) Research work should be undertaken by the Government on all technical matters connected with the use of industrial alcohol for power generation in stationery engines, tractors and lorries.

(3) Intensive propaganda work should be done to popularise the use of methylated spirit for household purposes, such as for heating and lighting.

(4) Facilities should be given by the Excise Department to encourage experimental investigations for the commercial use of industrial alcohol for solvent and other purposes.

(5) Investigation should be made into the commercial and practical possibilities of combining the manufacture of alcohol with that of yeast for cattle feeding.

(6) The results of the experiments now being carried out under the Imperial Council of Agricultural Research on (i) the feeding of cattle with bagasse oilcake, molasses cakes, and (ii) road making and surfacing compositions, should be closely watched by the Government, as these uses may form in future substantial outlets for molasses.

(7) The Agricultural Departments of the two provinces should give an exhaustive trial to the method of reclaiming *usar* soils by the application of molasses, and study carefully the economic aspects.

Concluding Remarks

The terms of reference to the Committee were :—

(1) To advise on the manufacture of power alcohol out of molasses ;

(2) To report on the best method of manufacture ;

(3) To report on the best method of manufacturing petrol-alcohol mixture ; and

(4) To explore the possibilities ~~of manufacturing~~ of the use of molasses in ~~the~~ other practical applications.

Under the first heading, the Committee has stated that the manufacture of power alcohol out of the molasses is a feasible proposition, being an economic one, and that power alcohol could be manufactured and sold in the United Provinces and Bihar, and in the other interior places, at a price which could be less than the present selling price of petrol, and which could bear, if necessary, the same excise duty as the Government of India may levy on petrol.

The Committee feels that the best method of developing this industry, which is an important one, would be by introducing legislation in the United Provinces and Bihar, and in such other provinces as would like to do so, making it compulsory for all petrol sold in these provinces, to be mixed with power alcohol in a definite proportion, say, 20 per cent by volume of power alcohol.

The petrol alcohol mixture should be prepared under Government supervision, which could be effectively done by the entire production and distribution being regulated by an Advisory Body referred to elsewhere.

As regards the best method of manufacture, there are two well-known processes—Aseotropic and Salt-dehydration—both of which can be tried in India.

The mixture of petrol and alcohol does not appear to present any serious difficulties. The best and the practical method of effecting this appears to be, for alcohol to be transported in bond from the various places of production, to places where there are *bulk* installations by

the distributing agencies for effecting alcohol-petrol mixture, the actual mixing being done in a suitable manner, as may be decided upon to safeguard the interests of the Excise Department.

The Committee was of opinion that the other uses which molasses could be put to, e.g. for the surfacing of roads, for feeding cattle, and for reclaiming *usar* soils, are still in the experimental stage, and the various problems connected with them have not been sufficiently worked out.

The Committee, therefore, felt that from the economic point of view, the most profitable outlet for molasses—an important by-product of sugar industry now running almost to waste—is in the manufacture of alcohol required for power generation and for other industrial purposes. It is also convinced that several other industries such as the manufacture of commercial organic solvents, acetic acid, chemicals requiring alcohol as one of the raw materials or ingredients in their manufacture will develop in the country with the establishment of the power alcohol industry.

There can be no doubt that in modern times the production of motor fuel is a matter of vital importance to every country, and it would be desirable if India developed her resources for the production of a motor fuel which can be pressed into service, if and when necessary for purposes of speeding up the mechanisation of the army, and the development of air-craft. The early establishment of the power alcohol industry on a sound basis will enable India to become an object of strength not only to herself but also to the Empire.

Bihar and U.P. Governments[1] *Resolutions on Utilisation of Molasses*

The Government of U.P. published a resolution in the *U.P. Gazette,* dated the 8th July 1939. The Bihar Government also published an identical Resolution in the *Bihar Gazette.* For ready reference, we are giving the full text of this Resolution :—

" The problem of utilisation of molasses, especially for the manufacture of power alcohol, has been engaging the attention of both the Governments and public for some years. The Governments of Bihar and United Provinces accordingly appointed a Committee in January 1939, to go into the whole question and report as to the best way of dealing with the problem. The Committee consisted of :—

(1) Dr. N. R. Dhar, D.Sc., F.I.C., I.E.S., Professor, Allahabad University.

(2) Mr. G. H. Dickson, Messrs. Begg Sutherland & Co., Cawnpore.

(3) Mr. Ananthasubramanyan, Mysore Sugar Co., Ltd., Bangalore.

(4) Mr. P. S. Maker, Chief Chemist, Majhaulia Sugar Factory, District Champaran.

(5) Lala Padampat Singhania, Cawnpore.

(6) Mr. M. P. Gandhi, Chief Commercial Manager, The Rohtas Industries, Ltd.

[1] *Vide* U. P. *Government Gazette* dated, July 8th, 1939.

(7) Dr. S. S. Bhatnagar, O.B.E., D.Sc., F.Inst.P., Professor of Punjab University.

(8) Dr. N. C. Chatterji, D.Sc., Harcourt Butler Technology Institute, Cawnpore.

"The report of the Committee was received in the midde of June, 1938, and has been further examined by both Governments. The most important points that have to be considered in this connection are whether the manufacture of power alcohol is a sound economic proposition and what arrangements are to be made for the disposal of the power alcohol when manufactured.

Molasses Worth Rs. 13.5 Lakhs Lost Annually

"The total quantity of molasses produced in vacuum pan sugar factories in the United Provinces and Bihar has been estimated at 300,000 tons a year of which, it appears, nearly 200,000 tons are mixed with factory effluent and discharged into neighbouring fields and water courses as waste, thereby polluting the local sources of water supply, giving rise to offensive odours and causing numerous complaints from the local inhabitants. Some 3 years ago an exporting company undertook to purchase molasses at As. 4 per maund, but it appears that in 1936-37 they purchased some 80,000 tons at an average price of just over As. 1 a maund, while the quantity purchased since is much less. The value of the molasses lost at As. 4 a maund comes to 13½ lakhs of rupees annually.

"If power alcohol were to be manufactured from molasses, it is estimated that the output would be 2.2 gallons of alcohol from one maund of molasses or 60 gallons from one ton. Hence Bihar and the United Provinces could, between them, produce 120 lakhs of gallons of power alcohol a year. The Committee have, however, recommended that for the present only as much power alcohol should be manufactured as can be absorbed in Bihar and the United Provinces and the Governments of both Provinces are disposed to accept this view. They also agree that the minimum economic unit for manufacture should be taken to be a plant of a capacity of 2,200 gallons a day, which, it is estimated, will cost about 2½ lakhs of rupees. A number of such plants may be put up at convenient places, the plant being duplicated where a central distillery is found to be more convenient for the purpose of distribution of power alcohol in the case of Bihar.

Cost of Manufacture

"The cost of manufacture, if a plant of this size is installed, has been estimated by the Committee at from 3 to 3½ annas per gallon of alcohol produced, excluding the cost of molasses. Since the report of the Committee was written, it has come to light that no recurring royalty will have to be paid for the use of the patent process to be adopted. Hence the cost of manufacture may be taken to be As. 3. It has been suggested that this cost can be reduced by having one large-scale plant instead of a number of smaller ones, but this need not be considered for the present. Even allowing for the price of molasses at As. 4 per maund, and another As. 1½ the cost of transport

thereof, the cost of the molasses in one gallon of power alcohol comes to As. 2½ and the cost of production of one gallon of alcohol to As. 5½.

"In order to arrive at the actual selling price, it is necessary to add to this figure the amount of the excise duty, if any, and the actual distribution and selling costs. The latter should not exceed 3½ annas a gallon and even if the excise duty is calculated at the same rate as the customs duty on petrol, the total cost comes to Re. 1-3-0 per gallon, which is appreciably lower than the price of petrol in Bihar and United Provinces. It thus appears that it is an economic proposition to manufacture power alcohol, provided it can be used in these Provinces.

Contemplated Legislation

"Practically the only use for power alcohol is as a motor fuel, mixed with petrol. The Governments of Bihar and the United Provinces are satisfied that the admixture of 20 per cent of power alcohol with petrol is unobjectionable from the point of view of the motor industry and are prepared to undertake legislation to make such admixture compulsory in the United Provinces and Bihar unless other suitable arrangements can be made for the same. As the total quantity of petrol consumed in those Provinces is in the neighbourhood of 90 lakhs of gallons a year, it is possible to replace some 18 lakhs of gallons of petrol by power alcohol. In other words, some 30,000 tons of molasses can be utilised in this way.

"The Provincial Governments realise that this will not altogether solve the problem of surplus molasses. But a useful beginning can be made and it may be possible later to arrange to supply power alcohol to other provinces also at a price which is not appreciably higher than that of petrol, excluding the surcharge. For the present, however, the two Governments intend to proceed with the making of suitable arrangements for the manufacture and sale of power alcohol in these Provinces.

"In conclusion, the Governments of Bihar and the United Provinces desire to thank the members of the Committee for their arduous work and their valuable report which will serve as a useful guide for the development of the power alcohol industry."

The representatives of the Bihar and the U.P. Governments met the representatives of the Sugar Syndicate, Ltd. for a discussion and the methods of starting the manufacture of power alcohol, e.g. whether the power alcohol distilleries should be located in definite regions, what should be the price fixed for molasses to be delivered to the power alcohol distilleries, whether sugar factories would like to fix up any quota system regarding supply of molasses, etc. In view of the terms offered by the U.P. Government, the Board of the Indian Sugar Syndicate, Ltd. decided at its meeting held in July 1939, that it would not like to take the responsibility of running the power alcohol industry. The Board of the Indian Sugar Syndicate passed the following resolution in this behalf.

"In view of the discussions that the Syndicate's deputation had with the Government on the subject, the Board agreed that the terms that the Government proposed to impose on the manufacture of power alcohol from molasses did not warrant the Syndicate to take the finan-

cial responsibility involved in the venture and that the matter be left to the individual discretion of member factories."

Madras Power Alcohol Committee

It is worthy of note here that a Committee was appointed by the Government of Madras also for considering the possibility of utilisation of molasses. It submitted its report in 1939 and found that an admixture of alcohol with petrol for use in motor vehicles is a practical proposition and that it is desirable that the Government should take steps to make use of such mixture compulsory, that in time the Madras Presidency may be able to supply all the requirements of absolute alcohol, that a beginning may be made in suitable areas, and further steps may be taken in the light of the experiences gained there and by the Mysore Government at Mandya.

In regard to the cause of the manufacture of power alcohol, the Committee observed that at present the Mandya Sugar Factory is the only concern which is manufacturing absolute alcohol in India. It has a production of 1,500 gallons per day. The cost of production of 90 per cent absolute alcohol has been found to be 5½ annas per gallon at Mandya. With Interest at 6 per cent per annum on the capital, at 10 pies per gallon, which was not included in the calculation and also the cost of dehydration at 1 anna per gallon, the total cost would come to about As. 0-7-4 per gallon of absolute alcohol.

The Committee also reported that alcohol of 95-96 per cent strength unmixed with petrol has been used by the Mandya sugar factory with satisfactory result in the running of tractors, lorries, buses and even cars which are provided with special readjusted engines. Mixtures of 60 parts of such alcohol and 40 parts of petrol have also been used for running buses at Bangalore without any adverse effects on the car engines being observed. The Committee also reported that it feels that even if it is eventually found that power alcohol cannot be marketed at the same price as petrol, the Government of India should, in the national interest, be urged to face loss of revenue and to levy a lower duty on power alcohol than on petrol. The Committee had, therefore, no hesitation in recommending legislation to enforce such mixing. The Chairman of the Committee was Dr. D. N. Strathie, I.C.S., Member of the Board of Revenue and Commissioner of Excise, Madras, and there were nine other members.

During 1940, the report of the Director of Industries, Madras, was published, and it states that some doubt was expressed as to whether power alcohol, even taking the low rate of Rs. 7 per ton of molasses, could compete with petrol at any point in this Province after paying the Central Excise duty. Eventually, the Government decided that the proposed legislation for the compulsory admixture of power alcohol with petrol for use as motor fuel should be dropped, and if the question is to be re-opened at a later date, a committee representative of all the Provinces and the Government of India should be set up to consider the matter further, in the light of all the information and experience that will then be available.

Power Alcohol in Mysore

While the Provincial Governments were thus hesitantly debating on the possibility of the manufacture and use of power alcohol, the Mysore Government was steadily taking one step after another to achieve the purpose.

Ever since the establishment of a distillery at Mandya by the Mysore Sugar Co., Ltd., experiments were conducted with regard to the suitability of 96 per cent alcohol, both by itself and as an admixture with petrol, as motor fuel. Early in 1939, the distillery began the manufacture of absolute alcohol and on the strength of the experience gained with the use of alcohol as motor fuel, the Mysore Power Alcohol Act was passed making it compulsory for the admixture of 15 per cent of alcohol with all petrol sold in the State. This Act came into force on the 1st October 1939, to begin with in the districts of Bangalore and Tumkur, and since that date all petrol sold in Bangalore and Tumkur Districts contains 15 per cent alcohol produced at Mandya.

The annual consumption of petrol in the Mysore State is about 30 lakhs of gallons, and on the basis of a 15 per cent mixture, there is scope for absorbing about 4,50,000 gallons of alcohol. This would mean that the import of petrol into the State can be reduced by this quantity. It is the desire of the Mysore Sugar Company to be able to supply the entire quantity of alcohol required for admixture with petrol for sale throughout the State and it hopes to do so as soon as possible.

To the progressive Mysore State, then, goes the credit of being the pioneer in this field in the whole of India. The example of the Mysore Government coming on top of the exigencies of the war situation was difficult to ignore; and in August 1940 the Power Alcohol Bill which was passed by the Provincial Legislature in October 1939 received the assent of His Excellency the Governor of the United Provinces. This Act made provision for controlling the production, supply and distribution of power alcohol in U.P. and to make its admixture with petrol in certain specific proportions for use as a motor fuel compulsory.

On the 10th August 1940, the Government also published a draft of the rules they proposed to make. The Government proposed to invite tenders for the exclusive privilege of supplying power alcohol to the Government for three years, the tenderer being allowed to manufacture power alcohol on the terms of the required licence which he will have to secure if his tender is accepted. It appears the requirements of the power alcohol have been calculated on the assumption that the prescribed mixture will contain 20 per cent of power alcohol and 80 per cent petrol, the total consumption of which latter is estimated at present at over 6 million gallons in the United Provinces. It also appears that the operation of the Act will in the first instance be confined to the Districts of Agra and Meerut Divisions and some Districts of Rohilkhand Division as it is expected that about 6 lakhs gallons of power alcohol equal to a little less than half of the total requirements would be available in the area.

On the 4th September 1940, a conference of the oil interests was held at Lucknow to discuss the details of the Power Alcohol Act.

Several difficulties were apprehended in the scheme in connection with the securing of the necessary equipment such as tankage, etc. Following a conference held at Nainital on the 4th October under the presidency of Mr. Pannalal, I.C.S., Adviser of the U.P. Governor, for considering the U.P. Power Alcohol Rules, it was understood that at that time there was the possibility of the Meerut Distillery only manufacturing power alcohol. Thus only a few districts were selected in the beginning for the opening of mixing depots.

Power Alcohol Act Amended

On the 10th November 1940, the U.P. Power Alcohol (Amendment) Act, 1940, (Act X of 1940) was promulgated for general information. In the Statement of Objects and Reasons it was stated that U.P. Power Alcohol Act (Act VIII of 1940) required amendment in three respects. Firstly, it was considered desirable to exempt all military requirements from its operation. Secondly, the supply of power alcohol for the whole province was at present not possible and the power to enforce it piecemeal was needed. Thirdly, in the public interest it was felt necessary to make provision in the Act for a contingent breakdown in the supply of the prescribed mixture of power alcohol and petrol. The amending Act makes provision for the above requirement. The following[1] amendments have been made in the Act.

"(4) Nothing in Section 3 or Section 4 shall apply to the sale or use of petrol without admixture with power alcohol for the requirements of His Majesty's naval, military and air forces."

The following section empowering the Collector of a district to take the required steps in case supply fails has also been incorporated in the new Act:

"10-A.—Notwithstanding the provisions of sub-section (1) of Section 3 and sub-section (1) of Section 4 when for any cause there is a failure in the supply of petrol with the prescribed admixture of power alcohol in any district, the Collector may, subject to any rules that may be made in this behalf, authorise the sale and use within his jurisdiction of petrol without such admixture for such period as he may deem fit, and may at any time withdraw or modify such authority or from time to time extend the period of such authority."

U.P. Power Alcohol Act comes into Force

Since the introduction of petrol rationing in August 1941 and particularly with the outbreak of hostilities in the Far East, the problem of providing fuel for industrial and transport purposes has assumed great importance. The war in the Far East has meant a considerable increase in the requirements of the Imperial forces in that war theatre. Also, the oil producing centres in Burma and South Pacific are seriously threatened. It is not surprising, therefore, that there has been a reduction in the supply of petrol. This has resulted in a complete

[1] In Section 1 of the original Act for sub-section (3) the following has been substituted:—

"(3) The Act or such portion or portions thereof shall come into force in such area or areas on such date or dates as the Governor may by notification in the official Gazette, specify."

dislocation of bus traffic. The alternative methods of transport are not quite convenient and quick while the railways are already finding it difficult to meet the needs of the public. It has been proved necessary to suspend booking of goods indefinitely on certain sections of the railways.

It was in anticipation of these needs that the campaign for the production of industrial alcohol on a large scale in this country was started early.

The recommendations of the Power Alcohol Committee of the U.P. and Bihar were given effect to only after a long time and the Power Alcohol Act of the U.P. came into force with effect from April 28, 1941. With the outbreak of war, it is impossible to get the requisite machinery and the operation of the Act was at first confined to the district of Agra. The distillery at Meerut is producing alcohol and selling the whole quantity to the Government of U.P.

Orders for the enforcement of the Power Alcohol Act in the districts of Bareilly, Bijnor, Budaon, Pilibhit and the Chandausi and Amroha tehsils of the Moradabad district have also been issued. The proportion of alcohol to petrol will be 20 parts of the former to 80 parts of the latter. It is understood that the Act will also be extended to Kathgodam and the neighbouring areas. Licences have been issued to the Kesar Sugar Mills and to the Oudh and Hindustan Sugar Mills jointly for manufacturing power alcohol from molasses. The prices at which they should sell alcohol to the Government has been fixed at 6 annas per gallon. The Bihar Government enacted in August 1942, a Power Alcohol Act, similar to the one in the U.P. The Bombay Government published draft rules for enacting a Power Alcohol Act in August 1942. Among the Indian States, Mysore and Travancore are already producing power alcohol. Bhopal also will shortly be commencing production.

But all these efforts are nothing compared to what might have been done if the start had been made much earlier. Today there is little doubt about the desirability or the feasibility of manufacturing power alcohol. But the essential preliminaries have been completed too late. The difficulty of getting the necessary equipment stands in the way of increasing the production. It is urged that such equipment can be made in India. It is of a piece with all our national efforts that no serious attempt has been made so far in this direction.

Use of Bagasse as Fuel Costly

We must now turn to the utilisation of bagasse (or megasse) which is the residue of fibrous matter remaining after the cane is crushed and which is the other main important by-product of the sugar industry. The bulk of bagasse obtained by crushing cane in the factory is burnt as fuel for generating steam, and for boiling the juice in rab or *gur* making. As a rule, almost all the power required in factories is obtained from bagasse and occasionally it is supplemented by coal or firewood. Various sugar factories require only a small amount of outside fuel to supplement the use of bagasse. Mr. E. L. Squires[1]

[1] The International Sugar Journal of August 1929.

observes: "Apparently bagasse is a very high-priced fuel and it might be better to burn the sugar." The high railway rates of freight on coal, and the absence of a demand for bagasse for other purposes are probably responsible for the general practice of its use as fuel for sugar factories.

But the invention of more economic ways of using bagasse has engaged the attention of both the sugar industry and the associated technical and commercial institutions. At its meeting in November 1933, the Sugar Committee considered the question of the utilisation of bagasse for paper and board industry. The Forest Research Institute was also asked to undertake more extended experiments in the manufacture of paper, etc. from sugarcane bagasse. In 1936, the President of the Forest Research Institute put up a note stating that if the factories were equipped with suitable machinery, it should be possible to turn out packing and cheap Badami papers from bagasse pulp mixed with about 25 per cent bamboo pulp. Experiments were also made in the laboratory to produce boards from bagasse. Small samples of boards for insulation and structural purposes, etc. were made by hand and the material, he states, appears to be quite suitable for the production of such boards. He states, however, that the Forest Research Institute is not equipped for making boards on a semi-commercial scale.

The unbleached pulp of the bagasse was also bleached in the laboratory of the Forest Research Institute and it was found that it required 9 per cent standard bleaching power and the yield of bleached pulp was about 41 per cent. The bleach consumption was about 50 per cent higher than that required by such grasses as *sabai*, *ulla*, etc., but it compared favourably with that required on the average by bamboos. The average length of the fibre of the material experimented upon was found to be 2 mm., there being a large number of shorter fibres. In this respect the material compared unfavourably with bamboos or *sarai* grass, etc. Considering the above data, the material does not appear to be unsuitable for the manufacture of products like boards, packing and wrapping papers and even certain classes of writing and printing papers in admixture with longer fibred pulps, e.g. bamboo, rags, etc. The possibility, however, of utilising the material for such products depends, firstly, on the quantities available and, secondly, on the price at which it can be made at the manufacturing site. If the quantities available are only such as are surplus in the most efficient sugar factories, then the supply of the raw materials is likely to be unreliable and also the total quantity available will probably not be large enough to justify putting up a paper or a board factory. According to the Sugar Technologist of the Imperial Council the cost of one ton of bagasse at the sugar factory is likely to be between Rs. 12 and Rs. 14 on the assumption that wood for fuel will cost between Rs. 6 and Rs. 7 per ton. To the above cost of bagasse, the cost of transporting it from the sugar factory to the paper or board factory has to be added. As this cost may be anything from Rs. 14 to Rs. 18, or even more, per ton it appears doubtful whether the utilisation of bagasse for paper or board will be more economic than using grasses or bamboos for the purpose.

If, however, the price of bagasse is low, and adequate quantities are available, there appears to be nothing against its utilisation for

board or paper manufacture. In February 1935, the North Bengal Sugar Mills Co., Ltd., Gopalpur, informed the Forest Research Institute that about 12,000 tons of bagasse could be made available at their factory at about Rs. 7 per ton and that bamboos were also available in the vicinity. In such cases the utilisation of bagasse for paper or board manufacture would appear to be feasible, provided the bagasse is not of poor fibre-content and other manufacturing facilities are available. To sum up, bagasse is a raw material which can be utilised for paper or board manufacture. Each project should, however, be investigated on its own merits.

We give on next page a table showing the quantities and values of packing paper and paste-board, mill-board and card-board of all kinds imported into India during 1934-35 to 1938-39.

A glance at Table 2, next page, will show that there exists a market for wrapping paper and board in India a portion of which can be suitably exploited as bagasse can be utilised for the production of some of those qualities.

Large quantities of board for insulation and structural purposes are being manufactured in Louisiana and other countries. notably by the Celotex Company, in Louisiana. The suitability of bagasse for the above purposes depends to a considerable extent on the quality of the fibre present in it. The experiments conducted at the Forest Research Institute, Dehra Dun, with Indian bagasse have been very encouraging in regard to the suitability of Indian bagasse for paper and board manufacture. The only important defect in Indian bagasse appears to be the shortness of its fibres.

In a Note on the utilisation of bagasse for paper, submitted to the Sugar Committee in March 1938, Mr. R. C. Srivastava, Director, Imperial Institute of Sugar Technology, observed that bagasse at present was being used as fuel in factories. Some bagasse was saved by factories which may be used for raising power during off-season. If bagasse is not to be made available for other purposes, it would be necessary to replace it by other fuel, by wood or coal. It is clear, therefore, that unless a cheap and suitable fuel is found, it will not be possible at present to use bagasse for making card-board and packing papers at prices comparable to prevaling prices of such materials. But if the fuel efficiency of Indian factories improves, some surplus bagasse may be available.

Wood as a substitute for bagasse can be burnt in bagasse furnaces either by itself or in admixture with bagasse. But the price for the same fuel value is likely to be high. The calorific value of dry bagasse may be taken as 8100-8350 B.T.U. whereas that of wood is 4500-5000 B.T.U. On the basis of these fuel values therefore the selling price of bagasse, when wood is a substitute, may be taken at nearly twice the price of wood ex-factory. If the ex-factory price of wood is Rs. 6 to Rs. 7 per ton which is a comparatively low figure for most parts of the U.P. and Bihar, the price of bagasse will come to Rs. 12 to Rs. 14 per ton.

Coal, unless it is much cheaper than wood, is not a very desirable substitute for bagasse, as it is difficult ordinarily to burn it in bagasse

TABLE NO. 1

Imports of Packing Paper and Boards into India

Imports	Quantity in 100 cwts.					Value in 100 Rupees						
	1934-35	1935-36	1936-37	1937-38	1938-39	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39
Packing Paper	313	405	364	510	387	4,535	3,181	3,817	5,301	4,805	8,399	6,683
Total of pasteboard, millboard and cardboard of all Kinds ...	416	496	485	633	541	3,714	2,771	3,838	3,656	5,504	5,514	4,458

TABLE NO. 2

Imports of Packing Paper and Boards into India from 1934-35 *to* 1938-39 *in quantity and value.*

Imports	Quantity in 100 cwts.					Value in 100 Rupees				
	1934-35	1935-36	1936-37	1937-38	1938-39	1934-35	1935-36	1936-37	1937-38	1938-39
Packing Paper	313	405	364	510	387	3,817	5,301	4,805	8,399	6,683
Total of pasteboard, millboard and cardboard of all kinds	416	496	485	633	541	3,838	3,656	5,504	5,514	4,458

boilers, even when they are filled with auxiliary coal furnaces. To get the maximum heat value from coal, separate boilers will have to be installed. This would be an expensive addition, and factories may not be willing to put themselves to this expenditure unless they were assured of their market for bagasse for a long period.

The calorific value of bagasse is about two-thirds of that of coal and therefore the price of bagasse when coal is used as a substitute may be estimated to be about equal to the value of the coal at the factory in consideration of the changes in equipment that may be necessary. The average price of coal at the collieries in Bengal at present is about Rs. 3 per ton. The transport charges from the colliery to the factory will have to be added. Amongst other items affecting the price of bagasse ex-sugar factory are the costs of baling, storage, handling charges and the transport of bagasse. The baling of bagasse for transport is a very important item and for this separate equipment and staff will be necessary at each purchasing centre. (The Saraya Sugar Factory of Sardarnagar is baling its bagasse and keeping it properly packed up.) After allowing for these charges as also for the transport of bagasse, it has been computed that the cost of dry bagasse at the Celotex Company at Louisiana is about Rs. 9 per ton. It may be possible to get bagasse at this rate in the case of a board factory situated in Bihar and Bengal nearer to the collieries, if coal is available at low price. It is true that "the improved canes now grown in Northern India have a relatively high fibre-content," as is observed by the Imperial Council of Agricultural Research. In fact, they are amongst the most fibrous canes in the world. Reports from several factories in India show, however, that at present all of them are using varying quantities of extra fuel. Fuel consumption and steam economy have not reached a sufficiently high standard of efficiency in the Indian factories to permit of large quantities of bagasse being spread. Therefore, at present bagasse can be made available for paper and board manufacture only by replacing it by wood or coal. Wood being a costly fuel as compared with coal, bagasse can only be had at a reasonable price from factories in Bihar which are located nearer the collieries.

The quantity of cane crushed by factories in Bihar and Bengal may be estimated at say 1,826.300 tons and the dry bagasse production at about 250,000 tons per year. The minimum economic capacity of a fibre-board factory is 20 to 25 tons dry bagasse per day or 7,000 to 7,500 tons per year. Therefore, even if the factories in Bihar and Bengal substitute only 10 per cent of their bagasse by coal, there would appear to be scope for running a board factory, but due investigation should be made for determining the consumption of insulation and pressed boards in India, and the cost of production of such boards. The number of sugar factories in Bengal being very few, there is little possibility of establishing a board factory in Bengal. Bihar appears to be a more suitable place for the location of such a factory, in tracts where sugar factories are sufficiently near to the collieries. If a board factory could be established, alongside a sugar factory, that would be an ideal situation from the point of view of the raw material. One such factory was established in 1939-40 at Meerut.

In a Note on this subject Mr. M. P. Bhargava, Officer-in-Charge of the Paper Pulp Section, Forest Research Institute, at Dehra Dun, observed in 1937 that in view of the fact that there was an adequate and permanent demand for boards and packing papers which was likely to grow considerably in the future, there appeared to be no ground for the fear that the demand for bagasse for manufacturing these products might not be a permanent one, particularly as no other raw material for the industry was likely to be obtained at a cheaper price. The sugar factories, therefore, needed to have no hesitation on the score of demand to incur the expenditure necessary for effecting a change in their boiler equipment. If a few sugar factories changed their entire boiler equipment with a view to supply bagasse to a board factory, it would be more economical as the supply would be more uniform, and baling, handling and transport charges would be minimum. The markets for boards and packing papers manufactured in Bihar would lie not only in Bihar and Bengal but throughout the country particularly in Bombay and Sind which import about half the total products.

A technical programme of experimental work in connection with the utilisation of bagasse was then drawn up by the Sugar Committee of the Imperial Council of Agricultural Research Institute. Mr. M. P. Bhargava continued his experiments on the production of insulation boards, straw boards and wrapping papers from bagasse and submitted a final report to the Imperial Council of Agricultural Research in 1941. It is understood that insulation boards, possessing thermal conductivity, sound absorption and strength characteristics comparable with those of imported insulation boards, have been successfully prepared in the laboratories of the Forest Research Institute. Satisfactory qualities of straw-boards and wrapping papers have also been prepared from bagasse at the Forest Research Institute and the results of the experiments must be pronounced distinctly heartening. It is true, the demand for insulation and pressed boards in this country is not very large at present, but it has been increasing. It appears, therefore, that adequate supplies of surplus bagasse would be available for the manufacture of these boards, though we cannot be certain that the rates will be quite economic.

Another development of great importance to this problem is the discovery that cane bagasse is a suitable raw material for plastics; and plastics, as well known, is a substance suitable for moulding into any form and is therefore useful for making a wide variety of articles of daily use and for building automobiles and for electric installations.

It remains to assess the importance of the utilisation of by-products to the question of costs of production. It has been seen that of the two main products of the sugar industry, viz. molasses and bagasse, neither can account for a considerable reduction in the cost of producing white sugar. And when it is remembered that the Tariff Board assumed a price of Rs. 1-8-0 per maund of molasses and that today the sugar mills are actually out of pocket in disposing of it, any industry which will pay a price for molasses must be deemed to bring appreciable relief to the industry. But it is well to bear in mind that the Power Alcohol Committee of the U.P. and Bihar assumed in their calculation of the cost of producing power alcohol, a price of only

As. 4 per maund of molasses. Likewise in the case of bagasse, the by-product is not wholly wasted. Though the use of bagasse as fuel is uneconomic, the advantage of its utilisation as raw material for other industries is, so far as the sugar mill is concerned, no more than the difference between its actual value as fuel and the price which the new industries would be prepared to pay for the raw material. Obviously, the pecuniary value of bagasse as fuel varies in direct proportion to the distance of the sugar mill from the collieries. A mill, which is far away from the collieries, will have to pay a higher price for coal; and to such a mill the value of bagasse as a substitute for fuel is to that extent higher. It may be said, therefore, that the manufacturers of packing paper and the like would seek to obtain the supplies of bagasse from mills situated near the collieries. It would therefore, be well not to exaggerate the net advantage of the utilisation of by-products to the cost of production of sugar. But from the national point of view, the question is indubitably of great importance. We have stressed the view at every point that the benefits of protection to industry have to be carefully gleaned and garnered by the nation. It is no small advantage to have an alternative source of power or to provide for packing material which a developing economy would require in greater quantities in the future.

CHAPTER X

ECONOMIES IN MANUFACTURE OF GUR AND SUGAR BY VARIOUS PROCESSES

WE have seen in the previous chapters that the ultimate justification of protection to the sugar industry is in the establishment, not alone of the industry directly aimed at, but also of a number of ancillary productive activities in the agricultural as well as the industrial spheres. We have seen, too, that if protection must be justified solely by the industry surviving the need for protection through a progressive decrease in the costs of production, then it is far more important that the yield and quality of cane should be improved and that industries should be established for the utilisation of by-products than that the productive processes of the industry itself should be censoriously scrutinised. This view, unwelcome as it is to opponents of protection, will be seen to be quite reasonable even on a cursory examination of the principal elements in the costs of production of sugar in India and abroad.[1] Public opinion, which often finds itself in a dilemma between abandoning a protected industry to its fate and continuing indefinitely to foot a heavy bill of costs on this account has every need to be apprised of the fact that the way out of the dilemma lies in the development of other productive activities to their utmost degree of efficiency and usefulness. This feature is by no means peculiar to sugar. Every industry in India has had to labour under the handicap of inefficiency in connected trades and industries. But it may be said without fear of exaggeration that in the case of the sugar industry this feature is really a salient one.

Nevertheless, the industry cannot be absolved altogether of responsibility for increasing the efficiency of its working. And it is necessary at this stage to clarify the position in this regard. We have had occasion in the earlier chapters to note the progress achieved by the sugar industry in the last decade, particularly the increase in the recovery percentage. But the picture of the utilisation of our cane resources as it is today and as it can be, has to be appraised in its entirety. From this point of view, the most important fact to note today is that the factory industry utilises only about 20 per cent of our total cane crop (as against 1 per cent in 1920 and 6 per cent in 1932) and that by far the larger part of our cane crop goes to the making of *gur* and for other purposes like chewing, etc. which may not strike the modern mind as strictly economic. The table on the next page shows the various uses of cane during the past few years.

It is notorious that in the existing indigenous processes of extraction and conversion into both sugar and *gur* there is a cruel waste of sugar. The Industrial Commission (vide page 80) roughly estimated that of the sugarcane grown in India at least one-third was wasted owing to inefficient and primitive methods of extraction.

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[1] *Vide* B. P. Adarkar's "Indian Fiscal Policy", p. 224.

TABLE NO. 1

Percentage of cane used under different heads during the years 1932-33 *to* 1940-41 *(November-October)*[1]

—	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38 Our est.	1938-39 Our est.	1939-40 Our est.	1940-41 Our est.
Cane used in factories ...	6·5	9·8	12·3	16·0	17·6	17·8	16·2	27·7	19·1
Cane equivalent to *gur* used in refineries ...	3·0	2·0	1·2	1·4	0·5	0·5	0·9	0·9	1·4
Cane used for *gur* manufacture ...	64·7	65·5	66·0	63·8	64·9	62·0	51·4	51·4	57·7
Cane used for other purposes, including *Khandsari*, Chewing, Sets for planting, etc. ...	25·8	22·7	20·5	18·8	16·9	19·7	19·3	20·0	21·8
Total percentage ...	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

The Indian Sugar Committee, 1920, observed in their Report (page 260) that—

> "A thoroughly up-to-date factory can extract at least 96 per cent of the sugar actually present in the cane, and by an efficient control in the boiling house, 90 per cent of the sucrose in the juice can be recovered as manufactured sugar. In other words, about 86.4 per cent of the original sucrose in cane can be obtained as sugar."

In paragraph 336 of their Report, the Indian Sugar Committee remarked, in regard to the low recovery of sugar in India, as follows :—

> "We have assumed that cane in India contains on an average 12 per cent of sugar.[2] If it were dealt with in a thoroughly efficient factory, it would be possible to obtain 9.5 per cent of marketable sugar from it. From cane with the same sugar content, factories in Java recover 9.75 per cent of marketable sugar against an average of 6.85 per cent in Indian factories, the best of which obtain less than 8 per cent. There is thus a difference of almost 3 per cent between the results obtained by factories in Java and India."

Improvement in Recovery Percentage in Factories

A glance at the table below will indicate that the percentage of recovery of sugar in India has been steadily on the increase. From 7.5 in 1923-24 it reached 8.89 in 1931-32, as compared with 10.46 in Java in that year. Since the grant of protection the average recovery has been well maintained and has steadily improved. The maximum recoveries obtained in some of the factories since 1931-32 are also given in the table below from which it will be seen that the maximum

[1] *Vide* reply in the Council of State to Question No. 39, dated 11th November 1941.

[2] The Indian Tariff Board (Sugar Industry) Enquiry Report, 1931 assumed a sucrose content of 11.5 per cent.

obtained in the year 1941-42 was 12.45. This *maximum* compares very well with Java's average recovery. India's average is much lower.

TABLE NO. 2

Average and Maximum Percentage of Recovery of Sugar in Factories in India and Java from 1931-32 to 1942-43[1]

Year	India Average	U. P. Average	Bihar Average	Bombay Average	Java Average	India *Maximum*
1931-32 ...	8 89	8·59	9·06	...	10·92	10
1932-33 ...	8·66	8 55	8·60	10·00	11 56	10
1933-34 ...	8·80	9·08	8·32	10·00	12·84	10
1934-35 ...	8·66	8·56	8·79	10·37	12 55	11·10
1935-36 ...	9·39	9·60	8·93	10·47	13·23	11·34
1936-37 ...	9·50	9·65	9·20	10·68	12 77	11·43
1937-38 ...	9·38	9·18	9·58	10·97	11·87	11 63
1938-39 ...	9 29	9·14	9·00	11·29	11·77	12·25
1939-40 ...	9·45	9·37	9·29	10·97	12·23	12·31
1940-41 ...	9·70	9·87	9·86	9·94	...	11 16
1941-42 ...	9·69	9·87	10·35	9·87	...	12·45
1942-43 ...	10·28	10·16	10·93	10·64	...	13 35

The recovery from Khandsari sugar is, however, remarkably low (being about 5.5 per cent) and if the industry has been able to maintain its production, it is due to the fact that it is possible for it to purchase its cane at a rate far lower than the rate paid by the factories, exemption from any cane cess which has to be paid by the factories, and non-payment of any commission to co-operative societies and railway freight on outstation cane, and saving of Rs. 2-8-0 per cwt. in excise duty.

Manufacture of Gur

As by far the bigger of our cane production goes to the making of *gur*, let us try to examine the position in this regard. *Gur* may perhaps be best defined as cane juice in its natural state concentrated to its solidifying point without undergoing any material process of purification save the addition of a small amount of alkali or other clarifying ingredient, and the removal of the scum. When cleanly made, it is a perfectly wholesome article of diet, and is very much in demand in this country, and is preferred to sugar by a large section of the people particularly in the village areas, and for some purposes, by all. Besides, *gur* has an attractive flavour and delicious taste.

Gur of jaggery could be well defined, in technical language, as cane juice boiled to a temperature of 115° C. containing from 50 to 85 per cent of sucrose, 10 to 20 per cent of inverted sugar, and a smaller percentage of mineral salts, ash and moisture. Most nearly, it may be described as hardboiled massecuite. This is the form in which about 3½ to 4 million tons of *gur* is annually consumed by the people of this country. In colour, purity, hardness, flavour and shape in which it is marketed, *gur* varies greatly from tract to tract but with relatively unimportant exceptions. Most of the *gur* production is consumed directly, only a negligible portion being used for conversion into sugar in refineries. Thus *gur* is not a raw material for refining sugar, but a final product for domestic consumption.

[1] *Vide* Trade Journal, Calcutta, 18th September 1941, and 17th September 1942.

Gur is manufactured in most sugarcane growing villages by the simplest process. Modern 2-roller, 3-roller and 5-roller mills driven by oil engines have replaced the earlier pestle-and-mortar type of mills made of stone or wood. Appreciable improvements have also been made in the furnaces and pans, but in essentials, the process is much the same as it was a hundred years ago, the fresh cane juice being boiled down to a solidifying point in an open pan. A certain amount of clarification takes place during this process and multiple pans are common in some tracts where high class *gur* is made. Ordinarily one or two pans are used for boiling but sometimes as many as 12 are arranged in a boiling series.

Gur Manufacture—A Cottage Industry

Although the quantity of *gur* produced in India is generally 3½ times as big as the quantity of refined sugar at present, the method of production of this enormous quantity, it must be admitted, is very primitive. Its manufacture consists of two main processes, viz. crushing of cane and subsequent boiling of the juice. It is essentially a cottage industry and the manufacture is in small quantities. The extraction of the juice from cane is about 60 per cent in the case of bullock-driven mills and up to 70 per cent in the case of power-driven mills. The best quality of *gur* is produced in Coimbatore, Kolhapur and Meerut. Much superior *gur* remains in good condition for about a year where the climate is a little dry but it deteriorates in humid atmosphere in about 3 months.

The waste of sugar involved in the manufacture of *gur* is attributable, as indicated above, firstly to the crudeness of the mechanism employed for crushing cane and the small scale on which production is carried on by the producers. Where bullocks are used to run the crushing mills, they are of the poorest kind and lack the strength and stamina for this laborious process. A large quantity of juice is thus left in the bagasse, the cane having been crushed once only. Then there are the crude methods of boiling the juice in which inversion takes place from sucrose to glucose.[1] As a result, the recovery of the sucrose content of the cane works out to about 52 per cent as against 86 per cent obtained in a modern sugar factory.[2] The loss of efficiency due to the crude process of manufacture of *gur*, thus works out to about 34 per cent. If we assume an average of 12 per cent sucrose content for this cane, as has been done by the Indian Sugar Committee, the total recovery of sucrose from 34,595,000 tons of cane used for the manufacture of *gur* in 1932-33, would be 41,40,000 tons, out of which only 21,00,000 tons could be extracted by the present crude method, as against a possible extraction of over 35,30,000 tons of white sugar in the modern factory run on efficient lines. The total loss of sucrose thus entailed amounts to 15,00,000 lakhs of tons, which is equivalent to about as large a quantity of manufactured sugar.[3]

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[1] This inversion is not, strictly speaking a loss of sugar, but it is a loss of crystallisable sugar which is of importance when the question of refining from *gur* is considered. *Vide* Tariff Board's Report on the Sugar Industry, 1931, p. 19.

[2] *Vide* Report of the Sugar Committee, 1920, p. 262.

[3] The actual sucrose content of *gur* varies considerably but may be placed at between 65 and 75 per cent as compared with between 99 and 100 per cent for white sugar. (*Vide* Tariff Board's Report, 1931, p. 19.)

But the introduction of power mill in place of the bullock mill, which happily is increasing, has made it possible to extract more sugar per maund of cane, and has reduced considerably the cost of production which, it must be stated, however, varies from province to province. According to the Director of Agriculture, Bengal, the extraction of juice per 100 maunds of cane is 62 per cent from a bullock mill, and 68 per cent from a power mill. (Tariff Board Report, 1931, p. 20.)

On this calculation, the loss of sucrose involved, as estimated in the preceding paragraph, by *gur* manufactured in power mills, would be slightly lower, but nevertheless considerable.[1]

Cost of Manufacture of Gur

It is difficult to state with precision the cost of manufacture of *gur* as it varies from year to year and from district to district, but roughly it may be taken as Re. 1-1-0 per maund for the U.P. and the Punjab (vide Tariff Board Report, 1938, p. 51). Taking As. 4 as the present cost of cane, the Tariff Board stated the cost of production of one maund of *gur* would be Re. 1-3-9.

It is also difficult to arrive at a correct figure of the average price of *gur*, because, it differs considerably according to the quality and varies from district to district and from town to town and from month to month. The average price of *gur* per maund varied from Rs. 5-5-9 to Rs. 2-9-0 during the years 1930-31 to 1937-38. Since 1934-35, the price of *gur* was generally on the decline till 1937-38 due perhaps to the production of larger quantities and to a certain extent to the decline in the price of sugar. The price of *gur*, and sugar rose during 1938-39, but it fell in 1940-41 due to apprehended overproduction.

An idea of the size of the *gur* industry in India can be had from the table given below showing the calculated net annual production of *gur* for direct consumption in India:—

TABLE NO. 3

Calculated Net Production of Gur in India for Direct Consumption from 1930-31 to 1942-43[2]

Year (November-October)	Calculated net Annual Production of Gur for direct consumption in tons
1930-31	22,41,000
1931-32	27,58,000
1932-33	32,40,000
1933-34	34,86,000
1934-35	37,01,000
1935 36	41,01,000
1936-37	42,68,000
1937-38	43,64,000
1938-39	21,31,000
1939-40	24,41,000
1940-41	34,14,000
1941-42	28,29,000
1942-43	35,67,000

[1] The Indian Sugar Committee, on the basis of manufacture of 99 per cent of cane-sugar produced in India from *gur* or *rab*, as against 1 per cent produced direct from cane, in 1921, estimated a total loss of sucrose of 10,69,860 tons per year. This figure represents the theoretical limit of possible improvement. By 1942 there has been a considerable improvement in this position, the manufacture of sugar direct from cane having greatly increased.

[2] Figures for net production are calculated from the figures for total yield of *gur* in the "Final General Memorandum" each year, allowing for the *gur* equivalent to cane used for other purposes (adopting the conversion factor of 10).

It will be seen from this that the total production of *gur* is roughly 3½ million tons and that it is constantly fluctuating, depending on various factors like cane crop, cane prices, sugar prices, etc.

Future of Gur

It is tempting to speculate on the possibilities of expansion of the sugar industry, when our cane crop is increasingly diverted from the manufacture of *gur* to the manufacture of sugar. Doubtless, the avoidance of the waste involved in the former is a legitimate and laudable objective. And those who believe that the masses in India have a secret aspiration to the luxuries of the middle and upper classes would probably be quick to forecast the quick extinction of *gur* manufacture in this country. There are, however, important facts and considerations which argue against this line of thought and which ought not to be overlooked. In the first place, there are large numbers, even among the well-to-do, who prefer *gur* to sugar for certain purposes. The taste of *gur* is distinctly different from that of sugar, and there is bound to be a large demand for *gur* at all times. It is fallacious to regard *gur* as an inferior product which must necessarily be displaced with the increased production and cheapening of white sugar. The practical problems, therefore, in this regard may be said to be one of increasing the efficiency of manufacture rather than of eliminating it from the inventory of our annual national production. If it is reasonable to hold that *gur* does not lend itself to manufacture on a large scale or that, on what are called broadly social grounds, it must remain a cottage industry, then progress lies in educating the rural *gur* manufacturer in economic methods of production. The task then is of a piece with our tasks in regard to other cottage industries. A necessarily slow process of educating the rural cultivator, through the devious ways of co-operative credit, of power-crushing mills, improved boiling pans and furnaces, has to be resorted to. That is a task of responsible ministries who will band their energies to the focal problems of rural reconstruction in India. From the point of view of the economist, what matters is not the form in which sucrose in cane is consumed by the people, but the elimination of waste in the utilisation of cane.

The efforts of the U.P. Government to ensure more economic manufacture of *gur* will be dealt with at a later stage. Other sources of *gur* production may also be noted at this stage.

Village Industry of Palm-gur

Unlike cane-*gur* which exhibits a week tendency towards large-scale production, palm-*gur* is essentially a genuine village industry and by the very nature of the business it must remain such. No factors are necessary as in the case of cane cultivation for planting palms, which are to be planted not every year but only once in 50 years or so. No big costly power crushers are required for extracting the juice which is done with the help of small instruments manufactured by the village smith. Palms are not only useful for *gur* supply, but also for manufacture of tasteful sugar of all grades from the palm juice in the villages with the help of small hand-driven centrifugals which also

can be manufactured within the country by our own mechanics. The technique of sugar making can also be taught to the villagers easily.[1]

Tapping of Palm-juice—Palm Jaggery as good as Cane Jaggery

The method of obtaining juice from the palm is known as " tapping ". Tapping is a delicate and complicated art and men are generally found conversant with this art in the areas in which the palms grow. These men are called tappers, and are mostly engaged in toddy-drawing. The method of tapping the palms is not the same for toddy and *gur* making. There are certain important variations which have to be practically learnt. Besides the knowledge of tapping two more things are essential: (1) to secure a license for free tapping of the palms from the Government, (2) to know the technique of nira drawing and *gur* making. Neither the sweet unfermented juice of any of the four palms is intoxicant nor the *gur* made from palm juice. The following chemical analysis shows that palm-*gur* is akin to cane *gur*:—

TABLE NO. 4

Gur	Cane-sugar	Glucose	Ash	Moisture
1. Sago Palm	76·455	1·642	5·995	1·681
2. Date Palm	79·45	2 281	2·2594	3·05
3. Palmyra	85·263	1·77	1·927	8·467
4. Cocoanut	74·163	2·939	3·815	6·25
5. Sugar Cane	65·209	17·052	2·35	7·38

Lakhs of people are using this without any harmful effects, in Bengal and Madras Presidencies. Hundreds of people in Orissa, Bihar, C.P., Bombay and U.P. have very recently used this *gur* to much advantage.

The utility of this industry as an avenue of employment for the erstwhile toddy-drawers has been recognised. The Governments of Madras, Bihar, Orissa, U.P. and C.P. have provided for the free tapping of palms for *gur*-making in the dried zones. The tappers are being encouraged to take up the industry.

Wherever palm *gur* has been newly introduced the people are relishing it and palm sugar is much in demand everywhere. People are preferring palm *gur* to cane *gur*. Palm *gur* is of a light cream colour, is very pleasant to the sight and to the taste. It has an excellent flavour.

[1] The report of the All-India Village Industries Association for the year 1938 states that *gur* was being made under their auspices in Bengal, Andhra, Travancore, Cochin, Karnatak, Broach and Assam from the palmyra, and in Maharashtra, Bihar and Orissa from the date-palm. In Karnatak a beginning was made during that year in training a few toddy tappers to manufacture sugar in one centre and to manufacture *gur* from the sweet juice of cocoanut trees in another centre. At Wardha, the headquarters of the All-India Village Industries Association, experiments were also carried on for facilities in the manufacture of *gur*. The Association also obtained a licence from the C.P. Government in the year 1938 to use and sell *Nira* or sweet palm juice as a beverage. It is stated that it makes a good wholesome drink and should be popularised in villages.

Quantity of Palm-jaggery in Bengal and Madras

The total quantity of *gur* produced other than that from cane is estimated at about 1,00,000 tons per year in Bengal. The palm juice *gur* manufacturing industry is an industry of great importance in Madras where the production is estimated at about 40,000 tons during a season.[1]

Cocoanut Palm-jaggery

Dr. J. S. Jatel, Ex-cocoanut Enquiry Officer of the Imperial Agricultural Research Council recorded that a tapper can earn Rs. 54-6-0 in six months from 15 cocoanut trees and 40,000 cocoanut palms are tapped for jaggery-making in the Madras Presidency.

Date-Palm Jaggery

The average annual production of *gur* per tree is 12.25 lbs. 500 trees can be grown per acre, so that the yield per acre would be 4 tons.

Prospects of Date Sugar

Date-palm can be grown at a nominal cost. The yield of sugar is an absolute certainty and the trees once grown yield sugar for 30 years on an average. The yield of sugar per unit area in date palm is much higher than in cane.

Nutritive Value of Gur

We cordially welcome the All-India Village Industries Association which was established by the Indian National Congress under the guidance of Mahatma Gandhi in November 1941, particularly on account of the propaganda which that Association has undertaken for the popularisation of *gur*. The Association undertook this task not only on purely economic grounds of promoting a cottage industry but also because it was satisfied about the superior nutritive value of *gur*. Mahatma Gandhi in the course of an editorial in the "Harijan", dated 13th April 1935, observed:—

"Most undoubtedly people will be advised to use *gur* for their milk and tea. They will be told, as they are being told, that it is superstition to think that *gur* taken in milk or tea is injurious to health. One correspondent says that on his wife beginning to take *gur* with her tea instead of sugar she lost her constipation. I am not surprised, because *gur* has a mild laxative effect which sugar certainly has not".

Gur, a Wholesome Article of Diet

Indeed, it cannot be disputed that *gur* is a wholesome article of food. It has been on the daily menu of millions of our countrymen since generations. As the nutritive value of *gur* is being brought to the notice of the people, it is expected that its consumption will show an increase. We might give a warning, however, that the production

[1] *Vide* Tariff Board Report, 1938, pp. 56 and 57.

of *gur*, as it is carried on now is wasteful in many respects, and it will be advantageous in the national interest if suitable improvements were introduced in the manufacuring process of *gur*, for minimising the waste of raw material, increasing the extraction of sucrose, for producing it under more hygienic conditions, etc.

Necessity of Improvement in Village Factories Manufacturing Gur

The importance of the *gur* industry which consumes 3 to 4 times the quantity of cane consumed by factories approximating to about 62 per cent of the total cane-crop, cannot be over-emphasised. Any improvements in and development of the *gur* industry will be of great benefit to millions of cultivators, and should therefore receive careful consideration of the various Provincial Governments.

Many of the village factories are inefficient, leaving behind in the bagasse a considerable amount of sugar—often as much as 20 per cent of the total quantity. The difference in efficiency between the village process and a good factory is visible from the fact that from a given weight of cane, the factory obtains as much sugar (99½ per cent purity) as the village obtains *gur* (80 per cent purity). In both cases, the amount of the product obtained is about 10 per cent of the weight of the cane; *gur* 10 per cent, factory sugar 9.5 per cent and Khandsari sugar 5.5 per cent. It would be very helpful if village factories are set up with efficient mills for extracting the juice, vacuum pans for evaporation, and arrangement for clarification by filtering through charcoal. Thus better quality and bigger yield can be obtained. We are glad to note that experiments for improving the making of *gur* are being made in Bihar, Bengal, Punjab and the U.P. We are also glad to find that the All-India Village Industries Association is taking a keen interest in the matter, since the year 1937.

Palm-jaggery Production also deserves Encouragement

We would recommend adequate encouragement for the manufacture of palm-jaggery along with sugarcane jaggery. Both are important village industries deserving equal attention and encouragement for creating employment and a better diet for the masses. The manufacture of palm jaggery has become important from another point of view also, viz. of diverting the energy of the tappers into a better channel. This aspect has assumed greater importance, particularly since the advent of the programme of Prohibition sponsored by the Congress Ministries in various provinces. Nature's gift of palms can also thus be utilised to the greatest advantage. Chemical analysis of jaggery made from palm has shown that it has almost the same ingredients as are possessed by the jaggery made from sugarcane juice and indeed lakhs of people are using it with beneficient effects in the provinces of Bengal and Madras. No one need have any apprehension that palm jaggery would be intoxicative. It is as useful and harmless as the jaggery made out of sugarcane, and, indeed, is equally delicious. Palm-juice *gur* finds a ready market owing to its flavour.

During the year 1939, since the introduction of the Prohibition in several districts in Bihar, the Government of Bihar are making endeavours to manufacture *gur* from palmyra juice. They expect that

the experiment which is showing signs of progress will succeed in obtaining employment to the old toddy-vendors and be profitable to the owners of the trees also.

Statistics regarding Movement of Gur Scanty

No attempt has as far been made to estimate the quantity of *gur* consumed in the various provinces of India. This is due to the fact that information regarding the movement of *gur* is very scanty. Figures for imports and exports of *gur*, by rail and river from provinces and States are not separately available, these being combined with those for molasses, etc. Large quantities of *gur* are transported by road over long distance, and the error without allowing for this fact is likely to be considerable. Therefore, any estimate of the quantity for consumption of *gur* in the various provinces would be difficult. For these reasons, such figures have not been calculated.

There is no carry over of *gur* as in the case of sugar. Almost all the provinces produce the bulk of *gur* needed for their requirements.

Till very recently there was no elaborate system for the marketing of *gur*. With the efforts of the *Gur* Marketing Bureau it is believed that there could be a considerable expansion in the consumption of *gur* in the various provinces, the figures for Assam and Madras being 9 lbs. and U.P. as much as 72 lbs. The wide disparity in consumption in the respective provinces is not in any way due to the difference in the purchasing capacity of the people. The plain reason is that the problem of distribution has received no attention. The maximum production is of course in the U.P. and the next highest in Bengal and then Punjab, Madras, Bombay (including States) and Bihar.

The following table will show the net production of *gur* in India by Provinces and States during 1938-39 and 1939-40 :—

TABLE NO. 5

Provinces and States	1939-40	1938-39
United Provinces (including States)	9,16,000	7,28,000
Punjab	2,19,000	1,65,000
Bihar and Orissa	82,000	1,24.000
Bengal	3,91.000	3,50,000
Madras	2,67,000	1,87,000
Bombay and Sind (including States)	1,90,000	1,52,000
North-West Frontier Provinces	67,000	50,000
Assam	35,000	31,000
Central Provinces and Berar	38,000	41,000
Delhi	3,000	400
Mysore	36,000	20,000
Hyderabad	54,000	20,000
Baroda	5,000	5,000
Bhopal	3,000	2,000

We may now turn to other methods of manufacturing sugar. In the sugar industry in India, as it is today, both the indigenous method and the modern factory method are practised.

Methods of Manufacture of Sugar

The indigenous method comprises :—

(i) The Open Pan Process,

(ii) The Manufacture of Raw Sugar, i.e. *Gur* and Rab, and

(iii) The refining of raw sugar into white sugar by :—

(*a*) either Bel-khanchi khandsaris, or

(*b*) Bel-centrifugal khandsaris, or

(*c*) Open Pan Factories.

The modern factories are engaged in either—

(*a*) the refining of sugar from *gur* or jaggery in refineries, or

(*b*) the manufacture of sugar from sugarcane, direct.

Indigenous Methods—Raw Sugar, i.e. Gur and Rab

We have already described the manufacture of *gur*. We will now describe rab or massecuite which is different from *gur* only in its being of a thinner consistency. It is obtained by boiling the juice to a slightly lower degree of concentration than *gur*. It is mainly used for the manufacture of crude sugar known as khand. This process of manufacture of rab is known as the Bel Process, and consists of boiling the juice obtained from the cane in bullock or small power mills in a series of open pans. This is prevalent largely in the Rohilkhand Division of the United Provinces. Rab is also prepared from *gur* in the Eastern Districts of the United Provinces.

Rab is manufactured generally within easy reach of the cane supplies.

Refining of Rab into White Sugar[1]

The Bel-khanchi khandsaris use no machinery. The cane-growers crush the cane in animal power crushers (which are generally taken on hire) and sell the juice (not the cane) to the khandsaris who convert the same into rab in direct-fired open pans. The rab is placed in bags, and molasses is squeezed out by applying pressure. The brown sugar thus obtained is then treated with moistened weeds, and after it becomes almost white, it is dried in the sun.

The Bel-centrifugal khandsaris adopt the same method as is adopted by the Bel-khanchi khandsaris except that centrifugal machines which may be hand or power-driven are used for separating sugar from rab. In a modification of this process, the rab-boiler working in villages sells his rab to owners of centrifugal factories, that are generally located in towns.

The process of manufacture of sugar from the rab is accompanied by even more waste than is found in manufacturing sugar from *gur*.

The open pan factories represent a further stage in the industrialisation of small-scale sugar manufacture. Such factories have generally got cane-crushers driven by oil or steam engines or by electric

[1] *Vide* Tariff Board Report, 1938, p. 92.

motors. Rab is boiled in open pans as before and power driven centrifugals are used for separating sugar from rab.

These factories differ from the modern sugar factories not only in size, but also in regard to the simplicity of the machinery and process employed. Most of these are large enough, however, to be classified as factories under the Indian Factories Act.

Statistics of Production of Khandsaris

It is a matter of great regret that the statistics of the sugar produced by the various types of open pan concerns which may collectively (as also conveniently) be called khandsaris, are not available. The Imperial Council of Agricultural Research sanctioned a grant of Rs. 3,000 for taking a census of sugar production in villages and towns in the U.P. by the khandsari process. The Government of the U.P. undertook to carry out a census of production for the year 1933-34[1] and appointed a special staff for carrying on a detailed enquiry in the towns. The Punjab Government also undertook to compile figures of production of sugar by Khandsaris in the Punjab. It is a matter of regret, however, that despite these efforts it has not been possible to obtain any definite and reliable statistics till now and that all the estimates of Khandsari production are conjectural estimates.

A glance at the above table will show, however, that in recent years the khandsari production has been on the decline and that it was at its maximum in the year 1932-33. The Indian Sugar Committee of 1920 (paragraph 278) had estimated the production of khandsari sugar at 2,50,000 tons per annum, while the Tariff Board's estimate for the year 1927-28 amounted to 2,00,000 tons. It will be interesting to observe, however, that 60 per cent of the total khandsari sugar production in India is in the U.P. alone (there is little khandsari production in Bihar).

Future of Khandsari Process of Production

Although one is naturally inclined to feel doubtful about the success of this form of manufacture of sugar which is very wasteful and uneconomic as compared with the modern factory, its importance in the transitional stage of the industry cannot be minimised as it can be undertaken in the interior parts of the country, where owing to lack of communications or the scattered nature of cane growing areas, it would not be worthwhile for modern factories to be established.

The Indian Sugar Committee condemned the khandsari industry, largely on the ground of its inefficiency. Since then, as a result of the imposition of the protective tariff on sugar, the industry has made some progress as estimated above, due *inter alia* to the advantages it has in purchasing cane at a rate, which is considerably lower than the market rate, and the increase in the recovery percentage by improvement in methods of manufacture, and the low overhead charges, etc.

[1] We understand that during the year 1933-34 according to this enquiry, 80,000 tons of sugar were manufactured by Khandsaris in U.P. and 4,000 tons in the Punjab.

The Tariff Board expressed the opinion that the industry must undoubtedly play an important part in providing an outlet for surplus cane. The Report also stated that these khandsari factories are easily and quickly established, and their capital cost of crushing cane is estimated at 6.79 annas per maund, against that of Re. 1 in case of central factories. The industry, as seen above, is of great magnitude, giving employment to thousands of people at a time when their labour is running to waste and holds an important position in the agricultural system of the United Provinces. A set-back to this industry would therefore be a very great hardship to the cultivators, particularly in Rohilkhand where the area under cane is about one-tenth of the total area in India, and where the cane is almost entirely sold for white sugar making by the Bel process. The only way of saving it or of producing its existence, is to increase its efficiency, by carrying on vigorous research, by the adoption of the improved Bel system known as Hadi or Bhopal method, or by the modified Rohilkhand Bel,[1] as was tried by the Sugar Technologist in 1932-33, and which yielded larger quantity of rab, by the provision of technical assistance, and skilled labour, and by a whole-hearted co-operation of the cultivators, zamindars, the khandsari and the Government.

The Imperial Council of Agricultural Research[2] should continue to help this industry which gives employment to a large number of people and which is of great importance to the agricultural economy of the country, by undertaking researches for effecting economy in methods of manufacture, and by eliminating waste, wherever possible, by the assistance of efficient machinery.

Mere sentiment alone, however, will not be of help in saving the industry from sinking, with which it is threatened by efficient factory production on a large scale.[3]

The industry, if it wishes to survive, has an up-hill task before it. Its future will depend considerably on its own efforts. It will have to make earnest endeavours for deriving a better percentage of sucrose, and improving the quality of sugar turned out by it.

Standard Methods of Manufacture

We may now pass on to a consideration of the manufacture of white sugar in India. We may begin with noting the standard methods of cane-sugar manufacture employed in modern factories. These are briefly known as (1) Defecation, (2) Sulphitation, (3) Carbonatation.

DEFECATION PROCESS.—According to this process sufficient time is added to neutralize the raw juice, which is subsequently heated under

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[1] This was tried at the Nagalia Farm, Bilari, belonging to Lala Har Sahai Gupta in 1932-33. The Imperial Council gave a grant of Rs. 4,000 for the purpose. For a description of the Bel, vide "The Open Pan System of White Sugar Manufacture" by R. C. Srivastava, p. 114.

[2] In November 1933, the Imperial Council sanctioned a scheme of Rs. 1,50,000 prepared by the Sugar Technologist for establishment of a Research Station for making improvements in Khandsari method of sugar manufacture and indigenous process of making *gur*.

[3] Even the Tariff Board, 1932, which showed such great interest in the Khandsari industry, could not help observing that the Khandsari system of manufacture, if the scheme of protection is successful, should to a considerable extent give place to a system of central factories. (*Vide* para 81).

pressure, further "boiled" in open pans (defecators) and then allowed to flow into settling tanks, or subsiders, where the separation of the clean and dirty juice occurs. Of late it has been found beneficial to send the juice through heaters before adding the lime-milk.

SULPHITATION PROCESS.—The difference in this process from the above method is that about double the amount of lime is added to the juice, whereupon the latter is treated with sulphurous acid gas.

CARBONATATION PROCESS.—In this process a considerable amount of lime is added following by a treatment with carbonic acid gas.

The defecation process is used for making sugar intended for refining. Since carbonatation and sulphitation are the classical processes in the production of white sugar in factories, we may compare their merits.

Carbonatation vs. *Sulphitation*

The carbonatation factories generally produce 2.6 per cent more than that of sulphitation factories. This superiority of carbonatation is due to the more intensive and thorough elimination of non-sugar ingredients, so that both the purity and the colour of the clarified juice are strikingly better than in sulphitation. The sugar made in a carbonatation factory realizes a slightly better price than in a sulphitation factory, as the sugar turned out is whiter and more sparkling and retains its qualities much longer. At the same time, the carbonatation process is somewhat more expensive, costing perhaps about 5 annas more per maund of sugar produced.

The carbonatation process is not generally as profitable as the sulphitation process, due to the fact that the difference in price of sugar is not very great.

Out of 150 factories over 90 are sulphitation factories.

Characteristic Features in other Countries

Let us first take Java. Java has various natural advantages over other cane-sugar countries. To start with, the Island is situated most favourably in respect of cane cultivation, lying as it does within the tropical belt. It has been blessed with a climate agreeable to the growth of rich cane of higher sugar content and of heavier yield than is found in India. In point of labour also Java has several advantages.

It has a population of 35 millions and has an area of 50,000 square miles. Labour is abundant, cheap and readily available.

There is intensive cultivation of cane combined with the application of a well-devised scheme of economic manuring due largely to the fact that only a small portion of the land can be allotted to sugarcane, as the bulk of the land is required for growing food for the population.[1] In regard to cultivation of cane, the universal practice in Java is to grow exclusively "plant cane"; ratooning as is done in some other

[1] *Vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 52, where he observes "more than 90 per cent of the total cane-grown area in Java is under irrigation, and in the Hawaiian Islands, 50 per cent."

countries, is not done in Java. Owing to the necessity of growing rice for the people, Java is forced to adopt a system of rotation of crops, which also implies that the planting of cane is done on irrigated land. The most important feature, however, is that the cultivation of cane and the manufacture of sugar are done by one and the same administration. As a matter of fact, it can be said that the cultivation of cane as practised in Java may well be regarded as the most scientific and efficient system of cane cultivation in the tropics.

Milling Results in Hawaii superior to Java

In regard to extraction results by the milling installations, however, Java has not yet reached the high level of Hawaii, which ranks the highest amongst other cane countries.

Features in Hawaiian Islands

These islands lie on the northern fringe of the tropical belt, just within the Tropic of Cancer. The sugar industry here is noted for its extraordinary degree of efficiency and systematic thoroughness. The relation of applied science to sugar manufacture is most intimate and complete. Over 50 per cent of the total area under cane is irrigated. In respect of extraction results, Hawaii ranks highest amongst cane countries.

In Hawaii, ratooning is practised and the cane requires about 18 months to mature.[1]

Features in Cuba

The chief reasons for Cuba's pre-eminence as a sugar manufacturing country are the quality and quantity of its soil. The extraordinary fertility of the natural cane lands in Cuba is well-known. Cane, once planted, appears, as it were, to thrive like a weed.

Cuba is similar to Java in some respects. Both are long and narrow lands of roughly the same area (about the size of England). Both of them are within the tropics, north and south of the Equator respectively, and have more or less comparable climatic conditions. It is remarkable, however, that the population of Java is over ten times that of Cuba, although both the islands are of about the same size. On the other hand, the area of cane cultivation in Java is restricted by Government due to the necessity of growing food for the people. Therefore, while land in Cuba is abundant and cheap, and labour comparatively scarce and dear, in Java the land is limited and labour is abundant and cheap. As a result we find that cultivation of cane in Java is intensive and in Cuba extensive. The average yield of cane per acre is less than 20 tons, and of sugar, about 2 tons per acre.[2] Transport of cane in Cuba is not up to date, being largely done by bullock carts.

In India, though the main sugar belt lies in North India, superior qualities are grown in the Deccan and in South India. It is important

[1] *Vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 51.
[2] ibid., p. 55.

that a wide variety of agricultural conditions have to be borne in mind when dealing with the problem of conditions of cultivation of cane and manufacture of sugar. For the purpose of examining the methods of manufacture, it should suffice if attention is confined to agricultural conditions in the U.P. and Bihar.

Nowhere is agricultural conditions impinge on manufacturing conditions more than in the matter of the duration of the crushing season. The following table giving the crushing seasons for the various sugar-producing countries brings out the disadvantages which the Indian industry suffers when compared to others :

TABLE NO. 6

Period of Crushing or Harvesting Seasons for Cane in various Countries

Cuba	January—June
Hawaii	December—September
Java	May—November
Mauritius	August—December
Natal	May—December
Queensland	June—November
Egypt	December—April
India	November—April

Generally speaking, actual crushing period extends from 4 to 6 months, although in districts where exceptional conditions—climatic and otherwise—prevail, e.g. in Hawaii, it extends almost throughout the year. The duration of crushing season depends upon a number of factors, the most important of which is maturity of the cane, and the availability of cane, by more than one crop per year.[1]

The tables below give the average duration of the cane-crushing season in India from 1933-34 to 1942-43 :

TABLE NO. 7

Capacity of Factories and duration of Crushing Season in India[2]

Year	Average cane-crushing capacity of Factory (calculated on the basis of tons of cane crushed per day of actual working in India)	Maximum cane-crushing capacity of factories per day in India
	Tons	Tons
1934-35	517	2,012
1935-36	568	1,807
1936-37	630	1,960
1937-38	660	2,000
1938-39	630	1,850
1939-40	710	1,960
1940-41	690	1,980
1941-42	640	1,800
1942-43	690	1,920

[1] *Vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 22.
[2] *Vide* Indian Trade Journal, Calcutta, 17th September 1942, and previous issues.

TABLE NO. 8

Duration of cane-crushing season (October-May)	1933-34 No. of Days	1934-35 No. of Days	1935-36 No. of Days	1936-37 No. of Days	1937-38 No. of Days	1938-39 No. of Days	1939-40 No. of Days	1940-41 No. of Days	1941-42 No. of Days	1942-43 No. of Days
Mean duration of cane crushing season in all-India	106	104	126	138	112	83	129	113	85	101
Maximum duration of cane crushing season in all-India	208	172	179	203	181	184	203	264	313	278
Mean duration of cane crushing season in U. P. ...	112	107	134	140	124	77	133	100	78	112
Mean duration of cane crushing season in Bihar...	105	109	124	150	99	79	136	100	34	96
Mean duration of cane crushing season in "all other provinces". ...	84	90	112	138	103	97	119	144	117	89

As pointed out by us elsewhere, and by the Tariff Board 1938 (page 62), the duration of the cane-crushing season is dependent on the availability of cane and its economic operating purity. The Tariff Board also reported (*vide* page 66) on the basis of the average for three years. that the duration of the season in the sub-tropical region was 128, for the tropical region, 132, and for the whole of India, 130 days. Taking 26 working days in a month in a crushing season of 5 months, the Tariff Board thought 130 days as a fair average to adopt as an economic period of working in the present conditions.[1]

Age of Crop

The time taken to grow a crop of cane depends largely on climatic conditions and the quality of cane grown which varies from country to country. This point has an important bearing on the subject of yield of sugar per acre, when comparisons are drawn between districts.

JAVA.—In Java, cane takes 11 to 15 months from planting to harvesting, thus practically constituting one year's crop. "Plant Cane" is exclusively grown ; ratooning is not practised. This is due mainly to the system of land tenure in Java, whereby land, although leased for long periods, is actually occupied by the factory during the period of cane growing, i.e. from 14 to 18 months.

CUBA.—In Cuba, though ratooning over long periods is practised, crops are usually harvested after an average growth of 12 to 15 months.

HAWAII.—In Hawaii, two seasons are required for producing a crop of cane. Though what is locally termed "short ratoons" are harvested after 12 months' growth, the bulk of the crop matures in 18 to 24 months. The common practice is to have 3 crops in the ground at the same time :

[1] It is well known that one or two factories in the Bombay Deccan worked as many as 180 days in a season, and the factory in the Mysore State worked for 264 days. The length of the crushing season can be extended by encouraging the growth of the most suitable early and late ripening varieties of cane.

as one crop is being cut, another is being planted or cultivated for ratoons, while a third is growing, to be harvested six months later.[1]

Supply of Cane

In Queensland and Natal the entire crop of cane is grown by independent European Planters, who supply their cane to the neighbouring mills, while in Mauritius a considerable part of the crop, about 45 per cent, is grown by small Indian Planters. The bulk of the cane in Cuba is produced by outside planters and sold to mills.

In Java the whole crop is produced by the mills and in Hawaii about 90 per cent of it.

In India owing to the smallness of the holdings, large contiguous plots of land cannot be put under cane by factories without great difficulty. Small individual cultivators grow cane on their small plots of land and sell their produce to mills as also to the Khandsaries and *gur* manufacturers. More than 70 per cent of the crop is sold to *gur* and other manufacturers, whereas only about 20 per cent of the crop is sold to mills for manufacture of sugar direct therefrom. A tendency is, however, noticeable for factories to purchase their land, in close vicinity, for cultivation under their own management.

Sucrose Content

The crop averages in the different countries indicate practically a uniform percentage of sugar in the cane, i.e. round about 13 per cent. Fibre content is roughly 12 per cent to 13 per cent and the purity of juice is about 87 per cent.

Yield of Cane and Sugar per acre

The yields of cane and sugar per acre are necessary in comparing the yield of sugar in one country with that of another. Some confusion is sometimes caused by mixing up Long and Short tons with metric tons[2] and other factors also are ignored, e.g. whether the figure is based on a one-year or two-year crop, whether based on white or raw sugar, whether based on plant cane or ratoons, whether on irrigated or non-irrigated land, etc.

In Java.—The average extraction of sugar in Java is about 11.9 per cent. It must be borne in mind, however, in comparing these figures, that in Java the crop consists of plant cane exclusively and is a one-year crop.

In Hawaii.—In Hawaiian Islands, the extraction of sugar percentage of white cane is 12 per cent but it must be borne in mind that ratooning is practised and the cane requires about 18 months to mature. For the sake of a fair comparison, the figure of the tonnage of cane harvested per acre should be based upon the same unit of time as well as area, i.e. tons of cane per acre per annum. The tonnage of cane harvested per acre per annum in Java is about 45 (2,000 lbs.) as compared with about 53 (2,000 lbs.) of Hawaii. Both these countries, however, have one

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[1] *Vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 22.
[2] Long ton—2,240 lbs. Short ton—2,000 lbs. Metric ton—2,205 lbs.

factor in common, viz. of intensive cultivation combined with irrigation on an unparallelled scale. In Java more than 90 per cent of the total cane growing area is under irrigation, while in Hawaiian Island, over 50 per cent of the area is under irrigation.

IN MAURITIUS.—In Mauritius the average yield of cane is about 23 to 24 tons per acre on European estates. In Indian plantations, however, the average is only about 14 tons per acre. Consequently the average for the whole is 17.5 tons. This is equivalent to less than 2 tons of sugar per acre. This is due to primitive methods of cultivation of the Indian planters who occupy about half of the total area under cane.[1]

IN INDIA.—In India the average yield of cane is about 15.6 tons per acre as compared with 12.3 tons in 1931-32 (vide page 19, Tariff Board Report of 1938). Higher yields, however, have been recorded e.g. a maximum yield of 100 tons was obtained in the Deccan in 1938. The yield for improved varieties is between 20 to 30 tons per acre. The production of sugar per acre in India works out between 1.25 to 1.50 tons.[2]

IN CUBA.—As regards Cuba, no reliable statistics are available in respect of yields of cane and sugar. But from occasional statements it may be taken that the average yield of cane per acre over the whole island is less than 20 tons and 2 tons of sugar per acre.

IN QUEENSLAND.—In Queensland the average yield of cane per acre is about 16 tons and 2 tons of sugar per acre.

IN PHILIPPINES.—No data is available. From an attempt made in 1924 to compile a representative record of the yield of sugar per acre, it was found that 1.28 tons of sugar was yielded by plant cane, 1.38 by ratoons and the total average was 1.1 tons of sugar.

The following table gives particulars of average yields of cane and of sugar (raw) in terms of short tons per acre in different countries :—

TABLE NO. 9[3]

Broad average of Yields of Cane and of Sugar (Raw) in terms of Short Tons per acre for Different Countries

Countries	Cane Tons per acre	Sugar Tons per acre	Approximate period of growth of cane
Java	Approx. 45	Approx. 5·5	11–15 months
Hawaiian Islands ...	„ 45	„ 5·5	18–24 „
Queensland ...	Less than 20	About 2	Practically 2 years' crop
Cuba ...	„ „ 20	Less than 2	12–15 months
Mauritius ...	„ „ 20	„ „ 2	14–20 „
Philippines ...	„ „ 20	„ „ 2	11–14 „
South Africa ...	„ „ 20	„ „ 2	2 years' crop
India ...	Approx. 12	„ „ 1-1/2	1 year's crop

[1] For a detailed study, *vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 51.

[2] *Vide* Tariff Board's Report, 1938, p. 67. It states this yield of 100 tons of cane should give a yield of sugar of 11 tons per acre.

[3] This table is not, however, up to date (the figures having been compiled in 1927 by Mr. Maxwell) and many improvements have been made since then as observed by us elsewhere in this thesis, in the matter of increase in the yield per acre due to improved canes and the higher yield of sugar due to better recovery. In Java the sugar produced per acre is about 6.72 tons during 1938-39 (*vide* Review of Sugar Industry in India for the year ending 31st October 1940, in the Indian Trade Journal, 7th May 1942).

Labour supply is another point on which it is necessary to note how the different sugar producing countries are placed.

MAURITIUS.—Although the island consists of some 700 square miles and has a population of 3,80,000 people of which 2,70,000 are Indians, Mauritius is not well situated in respect of labour. The labour shortage affects the welfare of the industry.

JAVA.—Java is one of the most densely populated countries in the world, and the result is that labour question is greatly simplified.

INDIA.—In India also there is plenty of labour available and at cheap rates too. The factories alone are estimated to be employing about 1,20,000 labourers during the crushing season, apart from the Khandsaris and *gur* manufacturers. The total labour force dependent upon cane-cultivation may be estimated at about 20 millions, on average of one acre of cane per family of about 4 to 5 members, in addition to others employed for weeding, harvesting and allied operations.

Output of Sugar Factories

The following table gives the average annual output of sugar per mill in different countires :—

TABLE NO. 10

Average Annual Output per Mill in Various Countries in 1927[1]

Countries	Average annual output per mill
Cuba	26,000 tons of sugar
Hawaii	18,000 ,, ,,
Philippines	17,000 ,, ,,
Porto Rico	15,000 ,, ,,
Australia	14,000 ,, ,,
Java	12,500 ,, ,,
South Africa	9,500 ,, ,,
Mauritius	5,500 ,, ,,
India	7,500 ,, ,,

Labour Supply

It must be observed that Cuba stands out prominently amongst the various countries for large outputs and large milling capacities. In Cuba there are very few factories which produce less than 5,000 tons per year, and there are a large number of factories which produce 50,000 tons per year. There are three or four factories which produce more than one lac tons. The factories in India were mostly of a small size till 1931, but since the grant of protection this has been altered and the average production of sugar per season after 1940 may be taken at about 7.500 tons per year.

Size of "Economic Unit" Factories in India

The Tariff Board (1932) recommended (page 64) the establishment of factories with a crushing capacity of 13 lacs maunds of cane

[1] *Vide* Economic Aspects of Cane-sugar Production by Maxwell, p. 104—published in 1927.

per year i.e., about 4,000 tons of sugar as an "economic unit" in the then conditions in view of the vastly scattered and small holdings of cane. The capital cost of such a factory was estimated at about Rs. 13 lacs, or roughly one rupee per maund of cane crushed. It is gratifying, however, to find that the size of the factories in India is increasing with the growth and availability of cane in the vicinity of factories, and consequently the cost of manufacture is also decreasing. The "economic unit" adopted by the Tariff Board of 1937 was 500 tons crushing capacity per day (page 61) as compared with the crushing capacity of 400 tons adopted by the previous Tariff Board. As pointed out, however, this expectation has been more than realised and the size has been increasing still further due to the availability of cane and the desire of the factories to reduce the cost of production. The capacity of a sugar factory is governed by a number of factors which vary from country to country, the main consideration being the amount of cane available, the yield of cane, the duration of the milling season and the quality of the cane.

Crushing Capacities

By crushing or grinding capacity of a factory is meant the amount of cane that goes through the milling plant per unit of time with good extraction and is usually expressed in terms of so many tons of cane per hour or per day. Of course, it would certainly be more rational and desirable to define the capacity as the quantity of cane which can be crushed by the mill with the highest extraction results, for after all, the fundamental object of a milling plant is not the mere crushing through of huge quantities of cane, but extraction of the maximum sugar from the cane. The cane crushing capacity varies considerably in different countries. In Cuba there are over 50 factories which crush more than 75 tons of cane per hour. It appears, however, that the object of Cuban mills is capacity and not extraction. While the Hawaiian industrialists regard the milling plant as a means of extraction of sugar, the Cuban industrialists consider the plant as a means of grinding cane, we find that the highest extraction results are in Hawaiian Islands.

Factories in Java very widely in milling capacity, the majority ranging from 30 to 55 tons of cane per hour.

In India the average cane-crushing capacity may be said to be about 690 tons of cane per day of 22 hours (between 1940 and 1944) and it is gratifying to note that this is on the increase. The *maximum* capacity is 1,900 tons per day.

Over-all Efficiency

The "over-all" efficiency of a factory by which is meant the percentage of sucrose recovered from the total sucrose contained in the cane in the form of commercial sugar varies on account of different conditions. Of primary importance are the richness of the cane, purity of the juice, the fibres in the cane, and method of manufacture. The over-all efficiency combines the extraction of milling efficiency with the recovery of manufacturing efficiency. The following table from Maxwell's Economic Aspects of Cane-sugar Production (page 118) shows the tons of cane required to make a ton of sugar in different countries.

TABLE NO. 11

Tons of Cane Required to make one ton of Sugar

Countries	Tons cane to one ton sugar	No. of factories averaged	Season	Observations
Cuba ...	8·50	70	1924	Raw sugar
Hawaii ...	8·20	Practically all	,,	,, ,,
Java ...	8·80*	,, ,,	,,	Computed on the basis of raw sugar (Standard Muscovado)
Queensland ...	7·80	,, ,,	,,	Raw sugar
Mauritius ...	10·66	20	1919	White ,,
South Africa ...	10·90	12	1925	White and partly raw sugar
India ...	11·50	130	1940	White sugar

The favourable position of Queensland is mainly attributed to the rich canes there. In other countries, also notable improvements have been made during the last few years.

We have seen that in the comparison between the Indian sugar industry with that of other countries, there is hardly a single aspect in which the comparison is in India's favour. Only in the matter of labour supply would India seem to be favourably placed; otherwise in the yield of cane per acre, in the sucrose content of the cane, in the duration of the crushing season, the average milling capacity of factories. India's competitors possess notable advantages. That is why, as we have never wearied of pointing out, the success of protection depends more on what is achieved in the farm than what is attempted in the factory. Nevertheless, when one looks only at the manufacturing process, the efficiency of the milling operation, conditioned no doubt by the quality and state of the cane, is a factor of the utmost importance.

And the Indian industry can claim that the steady increase in the recovery percentage is a point in its favour which needs all the greater emphasis, since protection to sugar often meets with scorn. The Tariff Board (1938) observed (page 74) that from an analysis made by the Sugar Technologist of the increase in recovery (vide Appendix 'B' of the report), they found that the greater part of the improvement was due to the increased efficiency, rather than the better quality of cane. The Tariff Board also observed in the same context (page 74) that the quality of cane had not improved to the extent that might have been expected and had actually declined in Bombay, North Bihar and South Bihar, and that this adverse factor had to a great extent been offset by increased efficiency in milling. The Tariff Board also pointed out (page 72) that the recovery of sugar from cane and the cost of manufacture were largely influenced by the quality of cane over which the factories could exercise no control, unless they were in a position to cultivate cane in their own land or land under their control, an ideal arrangement, which, except

* In 1925 this figure was 8.1.

in Bombay, was exceptional in India. They also pointed out further that in this respect factories in India were at a grave disadvantage in comparison with factories in Java which were in a position to control the cultivation of all the cane they required and could arrange for harvesting at the time cane reached maturity and was in the best condition for crushing.

The following table gives the average and maximum recovery percentage in the various provinces and for India as a whole (and for Java for facility of comparison) from 1931-32 to 1943-44 :

TABLE NO. 12

Average and Maximum Percentage of Recovery of Sugar in Factories in India and Java since 1931-32[1]

Year	India Average	U. P. Average	Bihar Average	Bombay Average	Java Average	India Maximum
1931-32 ...	8·89	8·59	9·06	...	10·46	10
1932-33 ...	8·66	8·55	8·60	10·00	11·15	10
1933-34 ...	8·80	9·08	8·32	10·00	12·64	10
1934-35 ...	8·66	8·56	8·79	10·37	12·35	11·10
1935-36 ...	9·29	9·60	8·93	10·47	13·21	11·34
1936-37 ...	9·50	9·65	9·20	10·68	11·72	11·43
1937-38 ...	9·38	9·18	9·58	10 97	11·40	11·63
1938-39 ...	9·29	9·14	9·00	11·29	...	12·25
1939-40 ...	9·45	9·37	9·29	10·97	...	12·31
1940-41 ...	9·70	9·87	9·86	9·94	...	11·16
1941-42 ...	9·69	9·87	10·35	9·87	...	12·45
1942-43 ...	10·28	10·16	10·93	10·64	...	13·35
1943-44 ...	10·02	9·92	10·53	10·98	...	12·84

It is interesting, however, to note the contention in some quarters that the credit for this progress in the recovery percentage goes to the cultivator, rather than the industrialist; and this view draws some strength from the fact that the best percentage is in Bombay, the province in which the best quality canes are produced. Without seeking to refute this contention, it may be pointed out here that the higher percentage in Java is likewise due to the better quality of cane which the mills there are able to procure, and their ability to crush when cane is in an optimum condition. What matters is whether or not the best results are achieved, given the kind of cane which it is possible at the time to grow. The success of the sugar industry rests as much in the lap of agriculture as of industry. When one considers the achievement from the point of view of justification of protection, one has only to reassure oneself that the rate of progress looked for and expected by the Tariff Board has been maintained. Though Mr. B. P. Adarkar points out that mills have been wasting sugarcane and getting a low percentage of sugar recovery by employing obsolete machinery and old methods, the expectations of the Tariff Board of 1931 in this regard have been more than fulfilled. It was expected that at the end of 15 years this country should achieve a recovery of 9.4 per cent.

The average for all-India in 1940-41 was indeed 9.7 per cent and in 1941-43, 9.69 per cent, and it looks as if there will be a further

[1] *Vide* Trade Journal, Calcutta, 18th September 1941 and 17th September 1942.

improvement in the recovery percentage.[1] Quoting the estimate of the loss in sucrose due to insect pests and disease relating to 10 factories, the Tariff Board observed that the loss per month was estimated at about Rs. 3,56,000 taking sugar at Rs. 6 per maund. For a season of 5 months the loss would be estimated at Rs. 17,80,000. The Tariff Board (1938) estimated an average recovery rate of 9.5 for the whole of India. Fortunately, its expectation has been more than realised in spite of the fact that adequate research has not been undertaken to prevent insect pests and diseases in the cane.

Allowing for the lower sucrose content of the cane in India, the performance of sugar mills in India is equal to the best in Java. For ensuring satisfactory results in recovery of sucrose, the cultivator and the industrialist must both join hands. This is absolutely essential because roughly 78 per cent of the total cost of sugar is represented by raw material and manufacturing charges. The Tariff Board (1938) observed (page 78) that in the " economic unit " they adopted, the cost of the raw material comes to 52.58 per cent and the manufacturing charges 25.49 per cent.

The sucrose recovery in the process of manufacture in India as compared with other sugar producing countries is given on page 71 of the Tariff Board Report of 1938. A reference to that will indicate that while Java recovered 86.57 per cent sucrose in 1933, the sucrose recovery in 1936-37 was 79.35 per cent in the Punjab, 80.24 per cent in the U.P., 79.69 per cent in Bihar, 78.99 per cent in Bengal, 76.17 per cent in Madras and 81.05 per cent in Bombay. On the basis of these figures, the Tariff Board concluded that some mills had an efficiency equal to Java as judged by their recovery figures, but their loss percentage of sucrose was higher as compared with that of Java, which was 1.0 to 1.5 (Tariff Board's Report, page 72).

Charge of obsolete Machinery Leading to Efficiency

The charge levelled against the industry of the employment of obsolete machinery and old methods is perhaps true of the older mills. The charge that Indian mills have been technically inefficient is not generally correct and must be refuted. The Second Tariff Board has itself pointed out that the progress achieved in recovery of sugar has been mainly due to the increase in technical efficiency and that further improvement in the recovery percentage cannot take place without increase in the sucrose content of cane. But for the employment of inefficient and temporary technical staff the increase in the rate of recovery would perhaps have been more pronounced. Even at the present moment most of the mills engage their technical staff only for a particular season and do not employ most of them beyond the season, thus driving them into periods of unemployment of 4 to 5 months per year. It is also true that when the next season begins there is new recruitment of staff. The insecurity of the jobs of the chemists and engineers, and the lack of employment for 5 months in the offseason every year cannot bring forth

[1] It should be realised, however, that if higher recovery is to be achieved, damage by diseases and insect pests should be controlled by research (*vide* telling figures quoted by the Tariff Board (1938) wherein they point out (p. 68) that no great improvement in the recovery rate can be expected unless the loss of about 42 per cent of the sucrose content is prevented by intensive research work.

the best of their work. It is regrettable that the importance of this aspect of the problem is not properly recognised by the industrialists.[1] The Sugar Technologists Association, Cawnpore, has also made several appeals to the industrialists in this respect at their annual meetings. No tangible improvement has, however, been seen so far. The Tariff Board in their Report of 1937 (page 76) also observed that a fair treatment in the matter of employment of technical staff would lead to better efficiency and recommended that if it was not possible to keep the whole staff on a permanent basis, a reasonable retaining fee should be paid to the technical employees whose services are not required after the season. They also observed that " an annual hunt for staff and unseemly haggle for salaries every season reflects little credit on the organised industry." We entirely endorse this view of the Tariff Board. But it is fair to add that such an attitude may have been due to the factory-owners' notion (mistaken, of course) of reducing costs, which is wholly unjustified. Owing to the short working season, however, there is always the tendency to reduce overhead charges, unmindful of the advantages that would flow from the sincere efforts of a contented staff. It will be seen, however, that the manufacturing side leaves comparatively little scope for the kind of economies which matter in bringing the cost of production to the level of effective competition.

The general adoption of the sulphitation process instead of the rival process of carbonatation which produces better quality of sugar of course, at a slightly higher cost, and the appointment of not fully qualified technical staff and their employment for short periods are the counts on which the industry may be exposed to criticism. But in all these matters, the question of costs would form a highly extenuating factor, even if it cannot, as we believe it will not, altogether exonerate the industry. The sulphitation process, we have seen, is really the more economic since the higher quality of sugar secured by the other method does not provide adequate compensation for the higher capital and operating costs involved, particularly in this country, where such sugar fails to fetch an adequately higher price.

India, A Price-Market

As is well known, India is mainly a price-market due to the low earnings of the people who cannot afford to make a higher *initial* outlay on their purchases, although such higher outlay may be compensated by the more lasting qualities or superior quality of the article purchased, e.g. cloth, sugar, glassware. This phenomenon of India being a " price-market " will also explain why various kinds of cheap Japanese manufactures which have the advantage of a low initial price have replaced superior articles made by various countries like U. S. A., U. K., Germany, Czechoslovakia, etc.

Likewise, in regard to the employment of staff, sugar manufacture is so much of a seasonal operation that the industry cannot afford to satisfy at the same time the criterion of expertness and fixity of tenure. But for various considerations, it is imperative that the industry should

[1] The Bihar Government Labour Enquiry Committee of 1937 (of which the writer had the honour to be a member) emphasised this point in their report, and appealed for a more liberal treatment in the interest of the technical staff as also of the industry as a whole.

show a greater regard for the personnel, technical as well as non-technical, and its general welfare.[1] One might, however, reasonably utter a word of warning against the canker of nepotism to which Indian industries as a rule are said to be prone in the matter of employment of their staff. To this reproach may also be added a plea for increasing the size of the manufacturing unit from the present small size where it exists, to a more "economic" one, e.g. of about 600 tons cane crushing capacity, and balancing the plant as soon as it is found feasible to do so.

But, taking the picture as a whole, it is far from disheartening to find that the expectations of the Tariff Board regarding the technical efficiency have been more than fulfilled. Further progress depends on the all-round progress and general development of science and technology in the country to the point at which all the points of comparison of one sugar producing country with another, will be in India's favour. That, however, is a task which devolves on other shoulders besides those of the sugar industrialists.

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[1] In this connection *vide* the observation of Sir George Schuster, ex-Finance Member, Government of India in "India and Democracy", 1941, p. 307: "Above all, employers of labour must realise that an industry is doing no good to a country unless it provides a good life for the masses who are employed in it, and, accordingly, that good working conditions and a reasonable standard of living for the wage-earners must be a first charge on industrial income."

CHAPTER XI

PROBLEMS OF MARKETING

THE need for a strong selling organisation for the Indian Sugar Industry was widely felt at quite an early stage of its career since the grant of substantive protection. And it is no wonder than an industry which achieved such break-neck progress in a period of no more than half-a-decade should find special problems arising from its phenomenal rate of growth. Even apart from this, it is well to remember that the days when the industrialist could confine his attention to production and leave sales and marketing to natural forces have been far left behind. When the world as a whole is becoming in point of economic intelligence and susceptibility to political and other stocks but a small unit, the sensitivity of markets increases hundredfold and the range of fluctuations of prices is too wide for industry to stand up to. Industry has perforce to devise its shelters when inclement weather becomes all too common. And this explains why central selling organisations and various methods of internal control and regulation with or without aid of one or more governments have become such a dreary commonplace of the economic history of our time. The Indian Sugar Industry, however, has in addition to these world factors, special circumstances of its own, which argue loudly for a common selling organisation, even if they have not been powerful enough till now to force its hands in this matter. The all important fact to remember in this connection is that a series of radical changes in the nature and structure of sugar trade were compressed into an almost incredibly short period ; and the adaptation to these altered conditions hardly kept pace with the changes as they worked themselves out. India changed within a few years from a large importer of white sugar to one of the largest producers of it. As the imports were seaborne, the movement of sugar was from the ports to the interior ; while India's new role as producer called for sugar moving from the interior to the ports which are the biggest consuming and distributing centres in the country. So long as the port areas were the battle ground of imported and indigenous sugar, the interests of the latter in these areas required special care and protection, and in the early thirties at any rate, the plea for a common selling organisation was based on this ground. Competition from foreign sugar has never quite ceased ; but the question of the selling organisation has of late had to be viewed from the other angle of evening out the differences of production and consumption among the different provinces and states.

As is well-known, more than 80 per cent of the sugar produced in India, is produced in the U. P. and Bihar, and this production is far in excess of the consumption of these provinces which may be estimated at only about 20 per cent and this situation necessitates scientific marketing of sugar in the various parts of the country in a manner which would avoid over-lapping, which would eliminate unrestrained internal competition, minimize freight charges with a well ordered system of distribution from various production centres and the nearest consuming

markets and check the encroachments of foreign sugar in the vulnerable areas in and around the ports.

Such an organisation could also arrange for marketing of sugar in territories adjacent to India, viz., Tibet, Afghanistan, Nepal, Ceylon, so that a portion of the production may find outlet in such areas and relieve the internal pressure to some extent.

As mentioned earlier, the special requirements of the port areas first pressed this problem to the attention of the sugar industry. But it was not long before it became clear to the sugar mills that the sugar market in India, as a whole and not merely the port areas called for an organisation which could regulate prices, the movement of stocks and the like. There was also the fact that, while production was confined to about five months during the year, consumption was evenly spread over all the twelve months. So long as Indian sugar represented a small part of the total consumption, its sale was quickly effected and there was no problem of storage and standards to face. But when the importer was virtually driven out of the market and merchants were willing to stock indigenous sugar, storage became important; and, obviously storage is not easy when the keeping quality of sugar is at best dubious. The question of standards also cropped up. The market was slowly adapting itself to the changed conditions; but only in the sense that Cawnpore, instead of the ports, became the focal centre of the sugar trade, and merchants slowly abandoned the idea of dealing with Indian sugar in the same way as they had been dealing with foreign sugar. The price differential between the two was more than was warranted by the difference in quality:

It was a very weak structure of the sugar trade that had to face the frequent upsets which started with the outbreak of the Italo-Abyssinian war. The increase in indigenous production, welcome as it was from other points of view, only emphasised the lop-sidedness of the growth of the Indian Sugar Industry. In 1932-33 the output of the Indian mills for the first time exceeded the quantity imported from abroad and in the following year Indian sugar began to compete with foreign sugar in the port areas. The outbreak of the Abyssinian war was the occasion for the rise of speculative buying of sugar as of other commodities. The reaction doubtless caused losses; though it is not so certain how far the subsequent difficulties may be attributed to such losses. But the aftermath of this speculative buying was the starting point of the difficulties of sugar marketing. One direct result of it was that for the first time since the advent of the Indian sugar industry, the available stocks of sugar were distinctly in excess of the possible demand. The increase in Indian production was not offset by a corresponding decrease in imports. Not only the visible supply had increased, but the Indian sugar industry had no control over its production programme, and was certain to have a larger output in the next year.

Conditions were ideal for that landslide in prices which spreads consternation among producers and dealers alike. On top of these, in February 1937 came the increase in excise duty in anticipation of which the mills had moved sugar out of the factories to dump it on an already glutted market. The U. P. and Bihar factories decided at the same time to prolong the crushing season as the price of cane had been reduced. The markets were flattened out by the dead weight of so many adverse

circumstances. By the end of June, 1937, the price of Indian sugar reached the low level of Rs. 6-1-6 per maund for Cawnpore crystal sugar No. 1. Such was the chain of events leading to the formation of a selling syndicate by producers who had little or no tradition of corporate action. The events proved more powerful than the dispositions and inclinations of personalities. The fortunes of the Indian Sugar Syndicate, which was formed, will be recounted and examined at a later stage. The events leading up to it have been sketched with a view to show how the problems of marketing were forced on the attention of the industry.[1] To the extent that the interests of the cultivators were bound up with it, the U. P. and Bihar Governments had to take interest in the marketing of sugar and its price. The Excise Duty was the Government of India's finger in the pie. And once the problem of marketing came up in this formidable form, every aspect of it calls for examination.

The nature of the common organisation is of course, the most important aspect; and we shall begin our consideration of it with an examination of the origin and growth of the most successful of such an organisation abroad, the *Nivas*, in Java.

The Single Selling Organisation in Java

It will be of interest to review here briefly the development of the present Single Selling Organisation of sugar in Java. Before the war, factories in Java sold their sugar as Indian factories did till 1936 before the Sugar Syndicate was formed. As a rule, forward sales were made through brokers. During the early stages of the war of 1914-18 large purchases of Java sugar were made by the British Royal Commission on Sugar Supply and the old system of sales was thus continued. A change however came in 1917 when Great Britain arranged for most of her supplies from other sources and when, by a coincidence, other important buyers also withdrew from the Java market. The manufacturers of Java, instead of selling in advance, as hitherto, were left with large unsold stocks. Prices went down considerably and a complete demoralisation of the market was threatened owing to anxiety of the weak holders to sell. To meet this danger, the sugar manufacturers of Java established the Java Sugar Association as a Single Seller and almost every holder of a factory joined it. This organisation however failed to produce any substantial improvement as the dislocation of shipping owing to war had brought export business almost to a standstill. By 1918 practically the whole of that year's crop as well as a large part of that of 1917 was awaiting sales.

At this juncture a new sales organisation, called the United Java Sugar Producers' Association (V. I. S. P.) was formed in August 1918 covering about 90 per cent. of the industry. As most of the factory owners belonged to Holland and as mail and cable communications were uncertain at that time on account of war, the headquarters of the new Association were transferred from Java to Amsterdam. Although the original object in forming this Association was to dispose of the old stock without undue internal competition as also the unsold stocks of the

[1] For detailed reference to the formation of the Indian Sugar Syndicate, Ltd., attention is invited to Mr. M. P. Gandhi's Sugar Industry Annual for 1937, 1938, 1939 and 1940.

1917 and 1918 crops, the Association proved so very useful that it was continued from year to year till 1932.

Difficulties, however, arose in 1930, when this Sales Organisation experienced trouble in marketing the sugar produced by its members due to the fall in prices. Prices were steadily falling till they ceased to be remunerative. Discontent set in amongst the members, and during the end of 1931 eight members left the organisation thus weakening its position. On account of the decreased sales, the competition against 17 outside mills had also become increasingly difficult. This organisation was therefore on the verge of collapse and in the absence of any organisation to take its place and with the accumulation of large unsold stocks, the entire industry in Java was faced with an unprecedented crisis. Notwithstanding a hint thrown by the Netherlands Government to the effect that a dissolution of the V. I. S. P. under prevailing circumstances would not be countenanced, the dissolution of the V. I. S. P. became by 1932 a practical certainty as the members could arrive at no agreement among themselves.

These advantages furnished an occasion for the Government to investigate to what extent it would be necessary to take active measures. Even before the producers themselves called the Government to come to their aid so as to prevent, by a general ruling, the rise of ruinous competition, the Government itself arrived at the conclusion that in the general interest, it would have to step in to save the situation.

Upon a closer consideration of the problem it was found that the Government's intervention would have to take the shape of a temporary measure only and would have to be limited to the minimum requirements necessary to attain the end in view. It was also found that Government would have to assume full responsibility for the working of the organisation. Four suggestions were made to the Government in regard to the manner of such intervention :—(I) The Covisp Plan, submitted jointly by the Ned. Ind. Handelsbank and the Ned. Ind. Landbous Mij., which involved a complete change in the existing property relations and the current industrial methods, and under which Government intervention would have to be a protracted one and last many years and would also mean definite financial responsibility for Government.

(2) The Segregation Plan, submitted by the President-Director of the Java Bank proposing the pooling of supplies in a Central Sales Organisation combined with a restriction to 50 per cent of the new harvest.

(3) The Minimum Price Regulation Plan, submitted by the Head of the Section of Agriculture, which was closely allied to the previous plan ; and

(4) The 100 per cent Single Seller Plan, submitted by the Chairman and Vice-Chairman of the Boniso, proposing that all sugars be disposed of by one Central Sales Organisation.

Before making a final decision, the Government held Conferences on 21st September 1932 with a great number of producers and representatives of the sugar trade and it was felt that the Government intervention was indispensable. The majority of the producers, as also

the exporters, declared themselves to be in favour of bringing all sugar into one strong hand. A minority of the producers seemed to fear that a 'Single Seller' would prove to be a continuation of the V. I. S. P. and would, on this occasion, exercise coercion.

These expressions of opinion, as also the difficulties which were steadily increasing with the development of political and economic conditions prevailing in British India and in China convinced the Government that a strong organisation was essential to tide over the crisis. After having studied two different projects devising the technical details for establishing a 'Single Seller', the Advisers to Government prepared a memorandum which was submitted on the 16th November to a Working Committee consisting of representatives of producers for their opinion. Representatives of some 40 factories believed that the Government's memorandum contained too much that savoured of the old V. I. S. P. After considerable discussions and after projected ordinance had been considered by the Council of State and by the Minister for Colonies, it was presented for discussion in the People's Council, which body adopted the Associated Sugar Ordinance on 23rd December 1932.

Finding that there were several modifications which totally marred the principle that had been the main consideration of the Government, the project could not be accepted. A few alterations were therefore made in the original draft increasing the Government's influence, etc., after which the Governor-General promulgated the Associated Sugar Ordinance to become effective from 1st January 1933.

Thus on the 31st December 1932 was founded in Batavia the Netherlands Indian Association for the sale of sugar (*Nivas*) with headquarters at Sourabaya. Its constitution was also approved by the Governor-General on the same date. He also appointed this Association to sell the sugar produced in accordance with Article I of the Associated Sugar Ordinance.

With this Act the transfer of new sugar, except such as was prepared in the native manner, became subject, from 1st January 1933 to 1st April 1936, to restrictive regulations, the *Nivas* for the period named, obtaining a sales monopoly for sugar.

The *Nivas* admits as its members any owners or exploiters of one or more factories in Netherlands India that prepare sugar in a manner different from the methods of the native.

Every year the members from among themselves appoint, for the period of one year at least 15 members who, together with the President of the Association (to be appointed by the Governor-General) without his necessarily having to be a member of the Association, and the Java Bank, jointly constitute the Board of Directors. To be a member of the Board of Directors, the candidate requires at least 1-25th of the total number of votes that can be cast at any members' meeting, and this is based on each one's share in the total normal production.

The members of the Board of Directors each year appoint six members who together with the President and the Java Bank jointly form the Diurnal Board with 3 members of the Board of Directors that may be appointed by the Governor-General.

The executive body of the Association has its headquarters at Sourabaya, which represents the Association both juridically and otherwise, in relation to acts, whether of property or management.

The constitution further contains provisions for establishing a sales office in Holland to be located at Amsterdam, as also a Supervisory and Advisory Council in Holland which is to be composed of members of the Association domiciled in Holland. Through such procedure the necessary contact with the European markets remains constant and the Association is able to utilise the large experience of owners of sugar factories domiciled in Holland.

The Directorate and the Manager of the Sales Establishment in Holland are responsible for their management to the Diurnal Board.

The powers of the Government, in addition to those already mentioned, provide that the Governor-General can annul and prohibit decisions and notions of the organs of the Association. He can also order certain actions to be performed by the various organs of the Association. He appoints a Governmental commission consisting of two members, to which he issues instructions.

One of the members of this Commission will exclusively occupy himself with the sale and commercial aspects, while the other member will look after the interests of the Industry as such and its relation to the country as a whole and to the population.

As regards the cessation of the Association, the constitution and the Bye-laws determine that, as long as the Associated Sugar Ordinance remains in force, the Association itself cannot be dissolved. As soon as the ordinance ceases to be effective each member has the right to resign his membership at the end of a certain term which automatically dissolves the Association.

The constitution finally contains an Article providing for the creation of a Sugar Crisis Fund which aims at raising a subvention for such personnel of members of the Association as can reasonably be considered in this connection and have become unemployed since 1st January 1931.

The share of each member in the sugar sold is to be determined by the sugar he must supply, as settled for each member annually, a fraction whose numerator represents the export quantity assigned to him and whose denominator is the total of the export quantities determined for all members conjointly.

In calling for sugar to be delivered to purchasers in the course of any Association year the Directorate, in so far as is possible, will aim at calling upon each member in proportion to his share of delivery. As regards the call it has also been decided that, always observing the proportionate quantities to be delivered the amounts to be called for export and local sales will be divided amongst the members as equitably as possible.

Furthermore the possibility is included of transferring the delivery share or a part thereof. Through this measure a member may be able to obtain a disproportionate share in the call for any Association year, provided he can find another member willing to transfer his delivery share or a part thereof.

As regards the delivery of sugar, it is laid down that the members shall take care to deliver sugar in good time at the usual shipping ports and that each of them will be responsible for the accurate delivery of his own quota. Costs of transport and delivery, including storage and insurance prior to delivery, are to be borne by the member concerned. Special provisions cover delivery at unusual ports. A ruling is also made to the effect that at a members' meeting it may be decided, in case a reduction has been made on the purchase price in favour of any buyer by reason of delivery at a port inconvenient to him, that such reduction is to be charged to the member concerned. This last provision allows the trade in many cases to remain indifferent as regards the port of delivery of the sugars purchased, thus meeting an old grievance on this score.

To guard against levelling the quality of the sugars down to the average, the Board of Management shall make such proposals to the members in Assembly as can secure an improvement of the quality produced.

Payment of sugar sold, barring certain exceptions, will be made by purchasers directly to the member having made delivery.

The Directorate will keep a "General Sugar Account" on which the members will be debited for the prices received by them from buyers (including possible bonuses for over-polarization), increased by any allowances made and deducting whatever may be due or has been paid out for brokerage, and where necessary, further settlements. The members are to be credited with sugar actually delivered, with a reasonable allowance already or still to be determined, in reference to which provision is made in a combination of regulation.

Settlement is made on the basis of crystal. All sugars therefore, will be reduced to crystal value for which certain forms have been adopted, such as, superior head sugar and superior molasses on a basis of 99.4 per cent crystal, canal molasses and sugar No. 16 and higher at 97.15 per cent and Muscovado or so called "new assortment" at 95.45 per cent.

The arrangements regarding pre-sales prior to the 8th November 1932, and of which delivery was to be made on or after 1st January 1933, were as follows:—

Such pre-sales, in so far as they relate to sugars ex-harvest 1933, if in the judgment of the Director of Agriculture, Industry and Commerce they were concluded in good faith, and in the manner customary in the sugar trade, are left entirely for the account of sellers under certain conditions.

The quantity of such sugar will be regarded as having been called from the party concerned on the share to which he will prove to be entitled in the total sales made by the Association from the period covering 1st April 1933, to 31st March 1934; should it become evident that this share has been called against his share in the total sales effected by the Association in the directly subsequent period.

The members so concerned will share proportionately in the disadvantages to which the Association may be subject, as arising from

the sale of sugars to markets that can be reached only at the sacrifices of price, that is to say, such markets as are situated outside the so-called natural markets of Java.

With the coming into existence of the combination of arrangements, stated above, the Java Sugar Industry entered upon a period in which all producers whilst setting aside their special group interests, combined, under the supervision and with the co-operation of the Netherlands Government, by means of a prudent sales policy to avert the crisis then prevailing, with the minimum sacrifices and losses, in the interests of the industry and people as a whole.

Such, indeed, are the history and constitution of the *Nivas,* the common selling organisation of the Sugar Industry of the Netherlands East Indies. But the example and experience of the *Nivas* have had little influence on the Indian Sugar Industry. It would, indeed, be interesting to apply the former to the conditions of the latter and to determine what changes are called for in the *Nivas* to adopt it to the conditions of this country. But the origin and development of the Indian Sugar Syndicate have been shaped more by the uncontrolled flow of events than by the deliberation and choice of the industrialists. The origin of the Syndicate has been referred to at an earlier stage as the anxiety of the sugar mills not to lose the battle against foreign sugar in the weak spots of the Indian market, namely the port areas. Consultations among the industrialists for the purpose of establishing a common selling organisation, therefore, started earlier than the landslide in prices in 1936-37.

The first effort was made in this connection in the year 1934 and the preliminaries and the nucleus of a central sugar marketing board were also contemplated, but due to absence of the requisite support from factories and the initial difficulties in launching such a new and big venture, no headway could be made then. Meantime, individual sales by factories resulted in such suicidal competition that factories began to all sugar at prices which left no profit for them. At a Conference of the Sugar Millowners held in Calcutta in August 1936, and March 1937, this question was brought up for consideration once again and proposals were made to bring into existence a central marketing board. As a result of the crisis which commenced in November 1936 and lasted till June 1937, and panic created in the minds of the manufacturers by the continuous drop in sugar prices, the efforts were redoubled.

Voluntary Sugar Syndicate

As a result, the Indian Sugar Syndicate Limited was established in July 1937 on a voluntary basis with a membership of 92 sugar factories. This Syndicate undertook to effect sales of sugar on behalf of various factories which were enrolled as its members.[1] The Syndicate had about 60 per cent of the unsold stock of sugar in the country within its membership when it commenced operations and it was able to prevent the demoralisation of the market and to bring in a steadying effect on the prices. Of the 92 member factories, 2 were from Bengal, 2 from the Punjab and 4 from Bombay, the rest being from the U. P. and Bihar.

[1] No actual payment was made by the Syndicate. The factories get credit in the books for the amount due to them.

Method of Sale by Issuing Quota and Fixing Prices

The Syndicate had its immediate task cut out for it. It refused to be distracted by other problems connected with a common selling organisation and addressed itself to the task of orderly disposal of overgrown stocks. It pooled together a stock of 52,45,828 maunds. The sale of this stock was made by the Syndicate through a system of quotas which were issued in definite percentages covering definite periods, and the factories sold their sugar themselves at the rates fixed by the Syndicate during each period. The period between July and 30th November was divided into 6 quota periods and by the end of November 1937, more than half the stock of sugar was sold and there was a balance of 23,98,641 maunds left in the hands of the Syndicate, unsold.

After 30th November 1937, the Syndicate had to dispose of the sugar in the best manner and cases where urgent relief was necessary on account of heavy stocks were first tackled and about 8 lakhs of maunds of sugar of members were sold off at a rebate of annas 0-2-0 to 0-4-0 under the then Syndicate's selling rates. This left a balance of about 15,95,000 maunds, part of which was damaged sugar which members wished to reprocess rather than sell. So by a Circular dated 20th November 1937, the Syndicate gave the members option to purchase their sugar at a uniform rate of 0-6-0 under the Syndicate's selling rates. All the members except two exercised this option and the entire quantity was disposed of by the Syndicate by the 31st of December 1937. By its successful operation, the Syndicate was able to save a large sum of money to the industry.

Fixation of Basic Prices

The basic prices of sugar belonging to members were fixed for the stocks pooled, with reference to average prices at which the members' sugars were sold in the month of February 1937, i.e., before the additional excise duty came into force. This appeared to be the nearest approach to correct prices, but these were in some measure found to be faulty. But as the Board had powers to reduce or increase the basic rates, the rates that stood in the way of quick sales were duly reconsidered and suitably reduced. This was inevitable in view of the fact that prices were fixed by a rough and ready method with reference to average prices at which sugars were sold in the month of February and March, 1937.

The selling rates which were fixed at so many annas above the basic rates were gradually raised from one quota period to another so that on the 30th of November 1937, the difference between the basic and selling rates was annas 0-12-0 per maund. Tha basic rate represents the price at which the Syndicate purchases the sugar of members. Therefore, this difference between basic rate and selling rate accrued at a rate earning of the Syndicate, and was distributed *pro rata* at a later date, among the members, according to the quantity of sugar pooled by them with the Syndicate.

The Syndicate Established With U. P. and Bihar Government's Assistance in 1938

With the commencement of the 1937-38 crushing season, the question arose as to whether the Syndicate should continue its operations for the next season. There was a measure of agreement and satisfaction at the excellent work done by the Syndicate, a voluntary organisation established in July 1937, but there was a section of opinion which felt sceptical about the possibility of its working successfully during the next season. It was also felt that the Syndicate could not function successfully if *all* factories in the U. P. and Bihar did not join. As a matter of fact, several factories which had joined the Syndicate in July, 1937, resigned in November, as they were eager to secure the privilege and advantages of effecting forward sales, which had been prohibited by the Syndicate. These defections did not prevent the general recognition that the formation of the Syndicate in July 1937 saved the morale of the industry, prevented a complete breakdown, immediately toned up the market and benefitted the industry as a whole, including those who sat on the fence and watched others taking the risk and the trouble. The price of sugar had been raised about Re. 1 per maund which saved the industry large sums of money it would have lost.

But these facts did not obviate the need for Government help for the continuance of the life of the Syndicate. Although there was a section of members who felt that Government interference with the industry would be detrimental, the majority who were inclined towards the continuance of the Syndicate thought fit to invite Government's intervention, at least for the sake of bringing unity in the ranks of the members. Much as members liked the Syndicate to be established on a voluntary basis, it was felt that there was little chance of that desire being fulfilled and therefore the co-operation of the Government had to be invited. Fortunately, however, for the industry, the Governments of the U. P. and Bihar passed the Sugar Factories Control Act[1] which recognised the Syndicate as the common sales organisation of the sugar industry, for according to the rules under the Act, no factory could obtain the license for crushing unless it was a member of the Syndicate. At the suggestion of the U. P. and Bihar Governments an extraordinary general meeting of the Sugar Syndicate Ltd. was held on 29th June 1938, at which the reconstitution was duly effected.

Government Recognition of Syndicate

With the accordance of Government recognition to the Indian Sugar Syndicate, the common selling organisation of the sugar industry in India may be said to enter a new phase. We have seen that when the Syndicate was first established in July 1937, it was on a voluntary basis with a membership of 92 factories of which 13 were from outside the U. P. and Bihar. Once the crisis of 1936-37 was tided over, it was found impossible to continue the life of the Syndicate. And on this threat to voluntary co-operation coincided with the passing of the Sugar

[1] For text of these Acts, *vide* M. P. Gandhi's Sugar Industry Annual for 1938, 1939 and 1940.

Factories Control Acts of the U. P. and Bihar, the Indian Sugar Syndicate was promptly reconstituted as a body practically exclusive to the U. P. and Bihar and enjoying or suffering the privilege or privations of official recognition. The membership of the Syndicate during the crushing season 1938-39 comprised 108 members of which 71 were from the U. P., 34 from Bihar and 3 from Bengal; and the last mentioned left the Syndicate at the close of the season. The work of the Syndicate during this season may now be briefly noticed.

The sale of this season's stock of sugar, the amount earmarked by the sugar factories at the commencement of the season for the requirements of the manufacture of confectionery, etc. was made by the Syndicate during the year, just as was done in the previous year through a system of quotas which were issued in definite percentages covering definite periods, and the factories sold their sugar at the rates fixed by the Syndicate, or higher if such prices were available during each period.

Fixation of Basic Prices of Sugar by the Syndicate

Adopting the same basis and the same method of calculation as was followed in 1937-38, selling orders were released from 16th December, 1938, onwards. A meeting of the members of the Syndicate was held on 13th November 1938, in order to fix the dates of starting of crushing. Although no effectual decision could be arrived at so as to bind all the factories, yet voluntary agreements were arranged between factories in groups not to start crushing before definite dates which were agreed upon and these were very useful in preventing crushing of immature cane and inter-factory competition in the purchase of cane in free areas.

As the members had started crushing at various dates, it was found on 16th December 1938, that only a few factories had sugar available for sales, and a quantity equal to 50 per cent of the first 10 days' production of each factory was released as the First Selling Order, but very soon release of further quantities for sale was found necessary, and on 31st December 1938, a further quantity to make up 31 lacs of maunds were released. This was distributed amongst members in proportion to their capacity. This quantity was to be sold strictly on Ready Sale Basis and not in anticipation of production. As in the case of many factories, basic prices had not been fixed, interim basic prices were fixed for Standard Grades by adding Rs. 2-4-6 to the last season's price of that grade and this interim price held good, until the fixation of new basic prices. To ensure the new season's sugar being immediately put into the market, it was decided that all despatches should be completed by the 15th of January 1939, on pain of undespatched quantities being considered as cancelled and unsold. Later, this condition was relaxed to this extent, that instead of despatches being actually effected, it was required that despatching instructions must be received within the time prescribed by the contracts. It was made necessary that the conditions of the contract should be strictly enforced.

This method of apportionment of quantities between the members was later changed to a proportion of actual manufacture, and in the Second Selling Order issued on the 21st January 1939, it was decided to release 70 per cent of the new season's manufacture up to 15th

January 1939, inclusive of the quantities already released, and adjustments were made to bring all factories to the same parity. By this time, the prospects of the season's crops were more visible and it was feared that a considerable quantity of sugar would have to be imported for the country's requirements and that this quantity would naturally increase unless prices of Indian sugars were kept at a low level. Accordingly in the 3rd Selling Order issued on the 6th February 1939, it was decided to release the entire manufacture of new season up to 31st January 1939, including the quantities already released. Even this was not found sufficient to bring down prices and finally on 7th March 1939, the 4th Selling Order of the entire unsold balance of the 1938-39 season's production, whether manufactured or programmed to be manufactured, were released for sale. As a necessary corollary, sales were permitted on a forward basis upon the conditions of the terms of the Standard Contract Form being strictly followed with regard to the receipt of despatching instructions. The members were only permitted to bind themselves for deliveries up to 31st of August at the latest, any deliveries made after that date being considered unauthorised.

Throughout the season, stress was laid on the strict enforcement of the Contract in order to promote actual consumption of sugar. The exact position with regard to imports of foreign sugar and of the provincial distribution of Indian sugars was circulated to members from time to time in order to guide them in their sales. Very soon it was clear that an overbought position existed with regard to foreign sugars and the consumption and sale of Indian sugars was being retarded. On the 14th of July 1939, it was found necessary to extend the period for sale of the 4th Selling Order from 31st August 1939, to 15th September 1939, with the condition that all despatches under these scales had to be completed on or before the 30th October and strictly in accordance with the terms of the Standard Contract Form. It was found that owing to an overbought position, merchants who had purchased Indian sugars were, in many cases, unable to give despatching instructions within the time provided in the contract, and in order to assist the trade, it was decided to permit members to extend the time till the end of the month in such cases as they considered fit. This was of some help, but the position again became difficult, and ultimately on the 29th July 1939, it was decided that the time for giving despatching instructions against all existing contracts upto July delivery may be extended to 15th August 1939, and those for August delivery may be extended to 31st August 1939. Fresh sales were suspended upto 15th August 1939, and members were to sell their unsold quantity between 16th August and 7th October 1939, ready or forward, subject to the conditions of the Standard Contract Form that all deliveries are to be completed by 31st October 1939. It was decided that in case of buyer's default, members should not cancel their sales but should only make releases on buyer's account. It was expected that the entire quantity produced in the season would have been cleared off before 31st October. The physical stock of sugar as on 31st October 1939, with member factories of the Syndicate was 60,30,418 maunds, approximating to 22,300 tons.

We give below a chart showing the particulars of selling orders released during the season 1938-39 by the Indian Sugar Syndicate :—

TABLE NO. 1

Particulars of Selling Orders Released during Season 1938-39 by the Indian Sugar Syndicate

Serial Order No.	Date of Release	Basis of Calculation	Quantity released	Selling Rates
			(Maunds)	Rs. a. p.
1.	16th December 1938	50% of first 10 days' production ...		0 1 0 above
1A.	21st December 1938	70% of last year's 1st February to 24th February production; ...	31,37,705	basic rates
		Less quantity adjusted while releasing next Selling Order ...	1,93,360	do.
			29,44,345	
2.	21st January 1939	70% of manufacturing upto 14th January 1939 less Selling Orders 1 & 1A	14,04,108	do.
3.	6th February 1939	Balance of total manufacture upto 31st January 1939	46,51,624	do.
4.	9th March 1939	Balance of season's entire production	42,37,497	do.
			1,32,37,574	

The Syndicate effects its sales since its inception in 1937, by fixation of quotas and prices from time to time, through the members. The Syndicate had always under contemplation a scheme of taking DIRECT sales of sugar in its own hands, using as far as possible the present agency of its members for the sale of their sugar.

As the Syndicate acquires more data and more experience, it should be possible for it to undertake direct sales of sugar which will enable it to save freight charges by an orderly distribution of sugar in the adjacent markets eliminating cross-haulage of traffic in sugar. At present all sales are ready sales which mean delivery within seven days. The Syndicate does not normally permit forward sales at all but in 1938-39 it did so with a view to put larger quantities of sugar in the market and to arrest the increase in prices, brought about as a result of the activity of speculators.

While the ownership of the sugar produced by the factories within the membership of the Syndicate rests in the Syndicate, the factories remain as trustees for the safe custody and storage of the sugar manufactured by them. The Syndicate does not make any payment to the members for the sugar produced or sold by the factories. The factories realise the money direct from the buyers as and when sales are made in accordance with the permission given by the Syndicate. The Syndicate also permits factories to hypothecate their stocks to banks or bankers and take advances on them for their convenience.

To facilitate the conduct of the routine work of the Syndicate there were two Standing Committees appointed by the Board, one, the Basic Price Fixation Committee for new samples, and the other, the Advisory

Committee to assist the Chairman. The procedure adopted for new samples was that their rates were fixed by the Directors and the members concerned were duly informed immediately. But these rates were only tentative, until the rates fixed were confirmed formally at the next Board Meeting.

The close contact between the Syndicate and Governments enabled them to have effective consultations on the question of extensions of plants and establishing of new mills in the U. P. and Bihar. The Syndicate stuck to the view that increase in the present capacity of the factories in the U. P. and Bihar should be prevented. The Board of the Sugar Syndicate also appointed a Technical Committee to deal with the applications submitted by the factories to the Government for extensions and to make recommendations to Government in regard to them. The point of view of the Government of the U. P. appeared to be that factories might be permitted to add machinery to their plant which might help them to increase their efficiency, but a condition should be imposed that they should not increase their crushing by more than 5 per cent of the existing capacity. There was a considerable difference between the point of view of the industry and the Government. The industry was anxious to protect itself against undue and unnecessary expansion. The difficulty is increased owing to the fact that certain factories who are small units claim that they should be permitted to extend in order to make economic units of their mills. This has been conceded by Government in cases where sufficient cane is available for the enhanced capacity. Permission was also given to shift one plant of 1,000 tons hitherto not working from Bihar to the U. P. and a license was given to two plants of 1,000 tons each which were claimed to be under construction when the Act came into force. Extensions to make economic units have also been granted to a number of factories.

Towards the close of the 1938-39 season the Governments of the U. P. and Bihar had joint consultations with the representatives of the Indian Sugar Syndicate for the purpose of determining the conditions for the grant of licenses for extensions to factories.

A sub-committee formed for the purpose fixed the basis of the basic rates in the following way :

1. Factories were first divided into groups each of which included all those factories on one Railway system with a common junction to the nearest market. The most distant factory from the junction was then taken as a datum for freight adjustment.

2. One factory in each group was found whose quality was unchanged since the last season, and this quality was made a datum for quality adjustments.

3. To the basic prices of the quality datum factories as adjusted upto 30th November 1937, a sum of Re. 1-3-0 per maund was added to arrive at the basic prices for 1937-38. The quantity of sugar placed in the pool by factories in July was largely manufactured between March 1937 and end of that season. The cane price during that period had varied form annas 0-4-3 to annas 0-3-0 per maund in the U. P. and from annas 0-4-0 to annas 0-3-0 in Bihar. The average cost of cane, therefore, during the period was at least annas 0-1-6 per maund less

than prices fixed by the U. P. and Bihar Governments for cane in 1937-38, and this difference of annas 0-1-6 per maund in the cost of cane represents an additional cost of at least Re. 1 per maund of sugar in the 1937-38 season; and the balance of annas 0-3-0 per maund is accounted for by a general decrease in basic prices on 18th August 1937, which was made so that the Syndicate could have funds available to meet contingencies. The actual increase in the basic prices of sugar fixed in February 1938 as compared with selling rate last year was only annas 0-7-0 per maund.

4. All the samples of the factories in each group were classified according to Sugar Standards, and a chart was prepared to show differences in price between each grade. It was thus possible to arrive at graded price for each factory's sugar as if freight paid by all factories in the group was the same as that of the freight datum factory.

5. The advantage in Railway freight of each factory in the group over the freight datum factory, in respect of its market, was added to the graded prices fixed to arrive at the basic prices.

And it is worthy of note that a committee appointed in 1939 came to the conclusion that this could hardly be improved upon.

Difference of Opinion Between Government and Industry

The close contact between the Sugar Industry and the Government of the U. P. and Bihar was, however, soon to lead to a serious cleavage of opinion and antagonism. It has been seen already that there were differences of opinion both on the question of productive capacity and on that of the price to be paid for cane. When a new sliding scale of cane and sugar prices was adopted by the Government, the differences came to a head. In June 1940 the Government of India convened an All-India Sugar Conference to consider the urgent problems of the Sugar Industry and suggest the best course of solving them. The constitution and functions of the Syndicate also came in for review on the occasion. While opening the conference, the Hon'ble Commerce Member to the Government of India explained the views of the Central Government on the subject, and expressed his doubts about the utility of an organisation like the Syndicate, especially in the case of a protected industry. That showed how the wind was blowing.

Official Recognition to Syndicate Withdrawn and Restored

In the midst of these circumstances came the announcement of the Provincial Governments of the U. P. and Bihar rescinding the rule under which they had made it obligatory for all factories in the two provinces to remain members of the Syndicate. Such withdrawal of recognition added to the problems of the industry, which was already finding it difficult to keep its head above water. The expectation of a carry-over of 4 lacs tons and of a bumper crop during the next season had already wrought havoc in the market. The withdrawal of Government recognition, coming as it did at a very inopportune moment, made confusion worse confounded. Sugar prices dropped to an uneconomic level and the members tried to clear away their stocks unmindful of the Syndicate's rules and regulations. The Syndicate, however, decided to continue itself on a voluntary basis. But because

of numerous difficulties standing in its way, Government help was sought once again. A deputation of the Syndicate waited on His Excellency the Governor of the U. P. on July 28, 1940, at Allahabad, and a similar deputation also waited on His Excellency the Governor of Bihar on August 2, 1940, at Ranchi. Their efforts met with success and the Governments agreed to restore recognition to the Syndicate subject to certain conditions.

United Provinces and Bihar Government Communique

In the *communique* which they jointly issued, the Governments of the U. P. and Bihar pointed out :

" In the month of June, 1940, the Governments of Bihar and the United Provinces had withdrawn the rule under which it was obligatory for a sugar factory to be a member of the Indian Sugar Syndicate Limited. This was because the Syndicate was following a policy of maintaining a very high price of sugar, which was against the express purpose for which the Syndicate was originally recognised by the two Governments . . . With the inflated price the sugar would not move, but the Syndicate showed no inclination to bring down the price by cutting the profits. The large carry-over and the consequent crippling of the finances of the factories, who had taken large advances from the banks against their stocks, meant considerable curtailment of the next crushing season with its serious consequences on the cane-growers. The Governments of Bihar and the United Provinces had, therefore, no other alternative but to withdraw the recognition of the Syndicate . . .

" While the withdrawal has brought down the prices to a certain extent, it has set loose the forces of disorder . . . As a result of this confusion, a large number of factories in Bihar and the United Provinces are in danger of complete breakdown, bringing out the urgency of stricter Government control in the interests of the industry and the cane-grower. The Board of Directors of the Indian Sugar Syndicate in their last meeting held on July, 26, 1940, realised their helplessness and the mistake of their past policy, and decided to approach the Governments of Bihar and the United Provinces to come to their rescue and, for this purpose, to restore the recognition of the Syndicate and to take over such control of the production and price of sugar as they may consider necessary. A deputation of the Indian Sugar Syndicate accordingly waited on Their Excellencies the Governors of the United Provinces and Bihar. The deputation urged the two Governments to restore the statutory recognition of the Syndicate which has been withdrawn, and thereby strengthen its hands and restore confidence, to stop all forward sales, to set up an emergent board of control to regulate the production and sale of sugar both as regards quantity and prices, and to take such other measures as may be necessary to save the industry.

" The Governments of Bihar and the United Provinces have given their most anxious and careful consideration to the very serious situation that had developed in the Sugar Industry, and after discussion with the representatives of the Syndicate at which the representatives of the Government of India and the Imperial Bank were also present, have come to the following conclusions :

"In order that the market may be stabilised and sugar may move freely, it is necessary that the present prices must be brought down and correlated with the probable prices of the next crushing season. It is by this means that the factories be relieved of their stocks as much as possible so that they may be able to crush cane during the next crushing season up to their full crushing capacity and thereby give the maximum relief to the cane-growers who have already planted their cane. If the present cut-throat competition and speculation be allowed to continue, some of the weaker factories will completely break down, while the others may find it difficult to continue crushing during the next season after paying an economic price for cane. These contingencies must, therefore, be avoided in the interest of the cane-grower.

"Any surplus stock which cannot be sold during 1940-41 at the minimum economic price may be carried over to 1941-42 and the production of that year may be regulated according to demand by regulating the cultivation in time.

"In order that the above measures may be given effect to, it is necessary that a marketing organisation should be set up under the full control of Government in respect of policy regarding price, quota and production, so that it may not lapse into a monopolistic organisation. As the Syndicate is now willing to work in accordance with the above scheme, the Governments of Bihar and the United Provinces have decided to restore the statutory recognition of the Syndicate, subject to the condition that it will forthwith amend its Articles of Association on the following lines :

(1) The Syndicate, which will have its headquarters at Cawnpore, would be a selling organisation only for the purpose of regulating sales within the limits of prices and quotas fixed by Government and will confine its activities exclusively to the marketing of sugar.

(2) The Chairman of the Syndicate will be elected by its Board of Directors, but his election will be subject to Government approval. The Executive Officer of the Syndicate will be nominated by the Governments of the United Provinces and Bihar.

(3) A Sugar Commission would be set up by the two Governments which would be the final authority, subject to Government control, on all matters connected with the production and sale of sugar, as well as other matters regarding cane prices, etc., whch are referred to it by these Governments, provided that the Syndicate will have the right at all times to approach the Governments direct. The Chairman and members of the Commission will be Ex-Officio members of the Board of Directors of the Syndicate.

(4) The basic prices and quotas for individual mills are to be fixed by the Syndicate but will be subject to the approval of the Commission.

(5) All information relating to prices, quotas, etc. will be confidential till it is released for publication by the Commission.

(6) The Syndicate will furnish all the necessary information to the Commission.

"It is hoped that with the restoration of the recognition of the Syndicate and its re-organisation on the above lines, the sugar market will speedily return to its normal working conditions."

The Sugar Syndicate accepted the proposals contained in the *communique* with evident satisfaction, but felt it necessary to append a few provisos: (1) that the mills should not be required to produce in 1940-41 a quantity which might leave a carry-over of more than 4 lacs tons; (2) that the prices fixed by the Sugar Commission shall not be below the cost of production, the estimate of which was specified; and (3) that the Governments may not insist on the Chairman of the Syndicate being subject to approval of the Governments.

The Governments of Bihar and the United Provinces then announced that they have heard with pleasure of the acceptance by the Sugar Syndicate at its meeting held at Cawnpore on 15th August of the proposals made by the Governments in their *communique* of 3rd August for re-organisation of the Syndicate as a condition of recognition.

The *communique* continued that in the furtherance of those proposals the two Governments have decided to appoint a Sugar Commission at once which will consist of Mr. J. E. Podley, C.I.E., M.C., I.C.S., as Chairman, and the Cane Commissioners of the two provinces as members. The Commission, as already announced, will be the final authority, subject to Government control, on all matters regarding cane prices etc., which are referred to it by the Governments of Bihar and the United Provinces. The selection of an Executive Officer for the Syndicate, in accordance with the proposals contained in the *communique*, is under consideration.

"In view of the heavy carry-over of unsold stocks, it is imperative that a large proportion of these stocks should be cleared before the commencement of the next crushing season.

"Owing to the high cost at which these stocks were produced, an adequate clearance is not possible without financial assistance to the industry to bring down the selling price to a price which can be related to the probable selling price of next season's production.

"The Governments of Bihar and the United Provinces have accordingly decided that the consent and help of the Government of India to assist the industry by assuming immediate responsibility for payment to the Government of India of Re. 1 of the excise duty payable on each maund of sugar manufactured during the last season and at present unsold. This will take effect from August 25, 1940.

"The method by which the Governments concerned will recover this subsidy from the industry in future has already been discussed with representatives of the Syndicate and is being considered by the Local Governments concerned. The final decision will be announced as soon as practicable.

"Future prices of sugar will be fixed in accordance with the decision of the Commission and after consultation with the Sugar Control Board, but it is expected that the prices of cane for the next crushing season will be in the neighbourhood of 0-4-9 per maund.

"As has been made clear from time to time, however, in view of the unusually heavy stocks, the quantity of cane, likely to be crushed in the season 1940-41, will be substantially less than in the season 1939-40. Taking all relevant factors into consideration, including the fact of a shorter crushing season next year, it appears probable that next season's sugar price will be in the region of Rs. 9 per maund.

"The difficulties of the industry caused by the existence of unusually heavy stocks, are not likely to be solved until the end of the crushing season 1941-42. In consequence, arrangements must be made for 1940-41 for converting into *Gur*, *Rab* or *Khandsari* sugar a considerably greater proportion of the cane crop than was so converted in previous seasons.

"Further, a scheme for restricting areas under cane in the neighbourhood of sugar factories will have to be formulated for the 1941 sowing season."

The Directors of the Syndicate noted with satisfaction Government's willingness to give temporary assistance to the industry at a critical stage of its existence, and, in response to their wishes, reduced the selling rates then in force by annas 14 per maund with immediate effect. At this meeting, they also decided that from November 1, 1940, price of sugar would be fixed at Rs. 8-12-0 per maund, at which figure it would rule till such time as all the sugar produced during 1939-40 season is sold out. As regards the price of the next season sugar, they announced that it would not be less than Rs. 9-2-0 per maund.

Membership and Sale by Quotas

During the crushing season 1939-40, the Syndicate had 107 factories as its members, of which only 100 operated during the season, 68 in the U. P., and 32 in Bihar. The total manufacture of sugar by members came to about 2,67,00,000 maunds as compared to 1,33,00,000 maunds for 1938-39. The total stock of sugar pooled by members was the same as the total quantity manufactured less the amount earmarked for the requirements of manufacture of confectionery etc. Till April 30, 1940, the sale of sugar was made as in previous years in accordance with the system of quotas covering definite periods. Factories sold their sugar themselves at rates fixed by the Syndicate. Breaches of rules were not wanting, as a number of factories during the season sold at rates below the Syndicate's selling rates, but effective steps were taken from time to time.

The balance of stocks with the member factories at the end of the season 1938-39 totalled about 6,500 tons and members were given the option of repurchasing their share of unsold quantity at the Syndicate's selling price, namely, 6 pies above the basic prices. As it was felt that stocks of Indian sugar in the market were very meagre, the Syndicate decided as early as December 4, 1939, to put as much sugar in the market as possible. Accordingly, the Directors decided to release all sugar manufactured till the 15th January 1940, as the First Selling Order. Basic prices, as a temporary measure, were fixed at Rs. 2-8-0 above the basic prices of the similar quality of sugar produced in the last season,

the rise being due to the abnormal increase in cane prices,[1] and increase in the cost of production due to war.

At an extra-ordinary general meeting of the Syndicate held on November 23, 1939, to fix the basis for computing the prices to be charged to the Syndicate for sugar to be sold to it by the members during the season, the Board of the Syndicate was authorised to fix the basis for the fixation of basic prices. Subsequently on December 4, the Syndicate decided to fix sugar prices on the basis of Nawabganj D 24 for the season, the price for which was fixed at Rs. 12 per maund. The selling prices were to be one anna above the basic prices. The period earmarked for disposing of the quantities issued as the First Selling Order, which came to about 70,60,000 maunds, had to be extended from time to time as this amount could not be easily absorbed in the market. Even as late as August 1940, there were certain factories which were not able to dispose of their share of the First Selling Order. The Second Selling Order was released on May 20, 1940, and was 20 per cent of the balance of manufacture from January 16 to April 12, amounting to 33 lacs maunds. The sales, unfortunately were very slow, stocks sold by the middle of August being only 92 lacs maunds.

The first two Selling Orders comprised 45 per cent of the total manufacture of the factories till April 12. After the price reduction announced on August 25, the tone of the market improved and there was greater demand for sugar. The recognition of the Syndicate had imparted a steady influence in the market. The Syndicate released the Third Selling Order on September 7, which consisted of 15 per cent of the production till April 12. The quota came to 33,39,000 maunds. The conditions for sale effected were similar to those of the first two quotas.

The table on next page shows the details of the quotas released by the Syndicate till 22nd January 1941.

On February 29, 1940, when the budget proposals of the Government of India were announced, it was found that the excise duty on sugar had been increased by Re. 1 per cwt. or 11.9 per maund from 1st March 1940. In the usual course, this should have been followed by an increase in sugar prices. But the Syndicate did not have recourse to such increase. On the other hand, it decided that the industry should bear the loss involved. The Provincial Governments also agreed to amend the sliding scale by reducing cane prices by nine pies per maund and this gave a certain amount of relief to the mills. Side by side, efforts were also made to persuade the Government of India to exempt the stocks produced before March 1, 1940, from the operation of the excise duty. The Syndicate's efforts in that direction met with success and the industry got relief to the extent of Rs. 70,00,000, the share of the U. P. and Bihar mills being Rs. 63,00,000.

On the occasion of the Third Annual General Meeting of the Syndicate held at Lucknow on April 3, 1940, several decisions of a far-reaching nature were taken. By that time, it was evident that while sugar production during the season was much in excess of the

[1] Cane prices till the first week of December 1939, ruled at 0-8-9 per maund, excluding co-operative societies' commission and the cane cess.

TABLE NO. 2

Table Showing the Quotas released by the Syndicate during 1939-40 *and* 1940-41 *(in respect of sugar manufactured during season* 1939-40)

Serial No.	Date of Release	Quantity Released	Conditions
1.	4-12-39	Production from the start of season to 15th January 1940, totalling 70,60,000 maunds.	Ready sales. Selling 0-1-0 above basic rates.
2.	20- 5-40	20% of the balance of production from 16-1-40 to 12-4-40 totalling 33,00,000 maunds.	Do.
3.	7- 9-40	15% of the production upto 12-4-40 totalling 35,39,000 maunds.	Do.
4.	5-10-40	1% of the production upto 12-4-40 totalling 2,36,000 maunds.	Do.
5.	12-10-40	5% of the production upto 12-4-40 totalling 11,83,000 maunds.	Do.
6.	22-10-40	Do. do.	Do.
7.	38-10-40	Do. do.	Ready sales. Selling rate 0-2-0 above current selling rates from 1st Nov. 1940.
8.	7- 1-41	Do. do.	Do.
9.	*22- 1-41	Do. do.	Do.

* Quota released by orders of Sugar Commission, U.P. and Bihar.

normal requirements of the country, and that a bumper crop was lying ahead of it. It was at one stage even considered necessary to stop crushing and thus avoid losses. But as this course involved unbearable losses to the growers the Syndicate gave up the proposal. The Syndicate, therefore, considered it essential so to regulate the production as to minimise the losses to factories. It was decided to fix the basic prices of sugar to be manufactured after April 10, (ultimately the date was changed to April 12) at Rs. 3-6-0 per maund below the original prices; and the Provincial Governments were requested to bring down the prices of cane to be purchased after that date. The sugar to be produced out of this low-priced cane was to be treated separately and was only to be released after all the sugar manufactured before that date had gone into the market. A satisfactory arrangement was reached with the two Governments, and, the Syndicate on its part, gave an assurance to crush as much cane as available.

As the year advanced, conditions in the industry deteriorated. Withdrawal of Government recognition and failure of the contemplated export deal[1] had added to its difficulties. The banks who had given loans to the factories on the security of their sugar were not willing to

[1] Negotiations were afoot for exporting about one lac tons of sugar to the United Kingdom, but ultimately they broke down over the question of a fair price, and over difficulties in shipment.

advance further loans for financing their off-season needs. On the other hand, they even threatened to have recourse to forced selling to realise their dues. In accordance with their wishes, the Syndicate on July 22, 1940, decided to reduce the basic prices by Rs. 2-8-0 per maund. This, it was contemplated, would lead to the movement of sugar and reduce the stocks with the factories.

Further reduction by As. 14 per maund was made on August 25, after the local Government's decision to take immediate responsibility for the payment to the Government of India of Re. 1 per maund excise duty on the unsold stocks of the Syndicate sugar as on August 25, was announced. This reduction was in response to the willingness on the part of the Government of India to defer realisation of excise duty to the extent of Re. 1 per maund. It was contemplated that such a course would enable the Syndicate mills to sell sugar at a cheaper price than the one then prevailing and thereby reduce the stocks in their hands.

In addition to these reductions, the Syndicate also allowed in the middle of the season a rebate on sales for despatch to port areas, where severe competition from Java was felt. The rebate allowed on despatches to Bombay, Karachi, Madras, Cochin and Calicut was fixed at As. 10 per maund on the current selling rates, and at As. 6 per maund on stocks despatched to Calcutta and Chittagong. This came into force from April 24, remaining in force till May 18, 1940.

New Method of effecting Sales of Sugar Adopted

By far the most important decision taken at the Annual General Meeting related to direct selling. It had for a long time been felt that the future of the industry to a great extent depended on the setting up of a suitable organisation for marketing sugar—an organisation which would control the proper distribution and despatch of the commodity to the various parts of the country according to market requirements at different times. Direct sales not only stop the waste involved in cross haulage on account of the defective system of distribution, but are also calculated to minimise the activities of speculators, and, in a season of over-production, serve to reduce the chances of the individual members resorting to malpractices. It was also felt at that time that direct selling would be of immense help to the industry in the crisis through which it was then passing. It was intended that the scheme of direct selling would be brought into operation from April 10, 1940, but its commencement had to be postponed till May 1, 1940, as the necessary arrangements could not be effected by that date. The sales committee was empowered to dispose of the unsold quantity of sugar with Syndicate members by directly calling for offers from selling agents and accepting them on their behalf. As regards the working of the scheme, the existing selling organisations of the members were utilised as far as possible. The acceptance of the offers was communicated to the selling agents, who were responsible for the fulfilment of the contract, payment of all charges in that connection and settlement of claims arising from them. The terms of agency between the selling agents and the factories remained absolutely unchanged excepting that the Syndicate, instead of the factories, accepted both the 'options' and 'firm offers' made by the selling agents. The Syndicate also advised the agents regarding selling rates for all qualities

of sugar produced by the factories concerned. The selling rates included agents' commission or brokerage, but were not subject to any reduction, discount or commission of any description whatsoever. Selling rates announced remained in force until cancelled or substituted by others and alterations could be made at any time without warning. It is gratifying to note that the scheme was worked out efficiently and proved its merit.

Proportionate Sales of Members' Sugar

Throughout the season, the Syndicate laid considerable stress on ensuring that the sales of all factories were made in definite proportion to their production. The First Selling Order, which consisted of all the sugar manufactured till January 15, had brought about considerable disparity in the sales of different factories, those starting earlier having a definite advantage over those who commenced crushing later in the season. It was noticed that while some factories had sold as much as 52 per cent of their total manufactures till April 12, there were others who had not even sold about 10 per cent of their production till April 12, 1940. In order to bring the sales of all the backward factories to the parity of those who had made larger sales, the factories were divided into various geographical groups and in each group the factories which had made highest sales were asked to stop until other factories had come to their level. The factories were divided into 6 groups, namely, South Bihar, North Bihar, Gorakhpur, Basti Gonda, Meerut and Mid-western U.P. and R.K.R. The limit of 33 per cent was fixed in the case of factories in North Bihar, Gorakhpur and Basti Gonda groups and of 45 per cent in the case of factories belonging to South Bihar, Mid-western U.P. and R.K.R. groups. To avoid delay, sales were effected through local offices at Bombay, Cawnpore and Muzaffarnagar under the direction of local committees, which were specially set up for the purpose and were empowered to accept offers regarding sugar of the factories, the sale of which they were required to direct in accordance with instructions issued from the Head Office. In cases of necessity, offers made by selling agents in respect of sugars of factories to which they did not belong, were also accepted.

This scheme worked successfully and the heavy stocks with the backward factories were cleared away by the end of August 1940. Therefore when on September 7, the Third Selling Order was allotted, no provision of this type was made and all factories were given a uniform quota of 15 per cent of their production upto April 12, 1940.

Export of Sugar

Another matter which occupied the attention of the Syndicate and the Indian Sugar Mills Association, a body comprising sugar factories all over the country, during 1940, related to the export of sugar. The heavy surplus stocks of this season and the expected bumper crop of the next, pressed for effective solution. In order to relieve the pressure of heavy carry-over it was decided at the Syndicate's Annual General Meeting to offer 2 lacs tons of sugar to His Majesty's Government at Rs. 5 per maund ex port. The Government of India was also asked to lift the ban imposed by the International Sugar Agreement on exports of Indian sugar by sea. While Government did not

think it proper to remove the export ban[1] they succeeded in persuading His Majesty's Government to agree to the purchase of Indian sugar. The price offered for this sugar was, however, very low, namely, Rs. 4-4-0 per maund ex port. The Syndicate, even then decided to clear away 30 lacs maunds of sugar at this price. It was also expected that the railway would give some concession on this sugar sent to the ports and the loss of the industry would thus be reduced. However, fresh difficulties soon cropped up. The banks with whom sugar was mortgaged did not permit its sale at the reduced price without further margins which the mills were not in a position to provide. Ultimately, the scheme had to be postponed for the time being. For this failure, there was, however, the consolation that the Government of the N. E. I. volunteered to restrict the import of sugar into India to 35,000 tons In the next year, due to shortage of shipping, Java could not export to the Middle East, which therefore became a market for Indian sugar.

The season 1940-41, so far as the Syndicate was concerned, was in the first place taken up with implementing the terms of the above-mentioned agreement. Early in September 1940 the Provincial Governments nominated an executive officer of the Syndicate and Mr. K. G. Ambegaonkar, I.C.S., was nominated to the post.

Early in 1941, the Head Office of the Syndicate was shifted to Cawnpore, which is at present the main sugar market of the industry. Thus remaining in close contact with the market and at the same time in close touch with the Joint Sugar Commission, whose office is also located in Cawnpore, the Syndicate has been able to act more effectively than before.

Government Control over Prices and Selling Quotas

The most important change which has taken place on the marketing side of the sugar industry since the recognition granted to the Syndicate in August 1940, is that control over the sugar prices and the sales quotas have been formally taken over by the Sugar Commission. To this extent the Syndicate's Board has lost the initiative although the Syndicate works in close collaboration with the Government. The minimum selling price of the standard sugar is fixed by the Government and selling prices of all other sugars are practically determined by the Syndicate by the application of a chart of prices, though they are, of course, subject to the formal approval of the Commission. The basic price of the standard sugar produced in 1940-41 which, by the way is Nawabganj D 24, was last year fixed at Rs. 9-2-0 and the price of all other sugars was fixed on this basis. The release of sales quotas is also under the control of the Sugar Commission. Chances of conflict have been greatly minimised by closer collaboration between the Sugar Commission and the Syndicate in all matters.

Standardisation

Before assessing the experiences of the Sugar Syndicate, reference must be made to the technical requirements of an efficient selling

[1] This ban was not lifted. But with the expiry of the International Sugar Agreement in August 1942, India has not been a signatory to a fresh agreement, and with effect from September 1942 she is free to export sugar.

organisation, which, as we noted at the beginning, the Indian Sugar Industry was sadly lacking in. In the course of its working the Syndicate was meeting these needs. We have referred to the fixation of basic prices, the method of issuing selling orders, the evolution of direct sales and the means by which proportionate sales of members' output were secured. It remains now to note the progress achieved in respect of the standardisation of Indian sugar. The Bureau of Sugar Standards which was tackling this problem became from April 1940 an integral part of the Imperial Institute of Sugar Technology. The Bureau continues to :

1. Prepare and supply the Indian Sugar Standards.
2. Publish an annual review dealing with the quality of Indian sugars and giving comparative figures for competitive foreign sugars.
3. Maintain a museum of samples of sugar and sugar products.

The standard sets are available for sale each year from July 1st. The standards come into force from November 1st and remain valid till October 31st of the following year.

Review of Quality of Sugar produced in India during the Season 1939-40

A 'Review of the quality of sugar produced by Central Sugar Factories and Refineries in India during the year 1939-40' was published by the Director, Imperial Institute of Sugar Technology, Cawnpore, on 4th July 1940, in the *Indian Trade Journal.*

The total number of samples analysed for quality during the year was 252 as against 231 last year. As in previous years the samples continued to bear a very large number of different quality designations even for the same class of sugars, a practice which must be discouraged by Indian Sugar Factories for effecting uniformity in the quality of Indian Sugars. Eight factories as against one of last year denoted their quality in terms of I.S.S. numbers. The different grades of sugars produced by Indian factories during the season 1939-40 with comparative figures for the last season are given in the following table :

TABLE 3

Serial number	Particulars	No. of Factories	Percentage	
			1939-40	1938-39
1	Factories making one grade only ...	30	27.27	26.26
2	„ „ two grades „ ...	41	37.27	34.34
3	„ „ three „ „ ..	30	27.27	26 26
4	„ „ four „ „ ...	7	6.37	7.08
5	„ „ five „ „ ...	2	1.82	6.06
	Total	110	100.00	100.00

From the above table it will be observed that, while there has been no reduction in the number of grades of sugars, the percentage of factories producing one, two and three grades has increased during the season of 1939-40. The majority of samples received this year were

also mixtures of varying grain sizes. The big and medium grain sugars lacked brilliance and contained twin, joint and mixed crystals. The figures in the review also show that the quality in respect of first crystal sugars has improved over the previous year but the general grain size has been slightly smaller than the previous year's. A fairly good number of superior Indian sugars compares favourably with the Java Whites.

Evolution of Central Sales Organisation and its Future

We have traced, in somewhat wearisome detail, the fortunes of the Indian Sugar Syndicate and the evolution of its methods of work. It is no comforting thought that at the end of a decade the Indian sugar industry as a whole has no common selling organisation and that the existence of such an institution for the provinces of U.P. and Bihar is to be attributed only to a fortuitous circumstance. But it is perhaps significant that what was first started as a voluntary selling organisation for factories all over India should be changed somewhat abruptly into a compulsory association under Government control and restricted to the provinces of the U.P. and Bihar. Within the limits set by its position, the Indian Sugar Syndicate has, indeed, done much for the sugar industry. It has proved itself equal to tackling every crisis as it arose. It has evolved its own technique of operation and though it was often obliged to look to Government intervention which it secured at a stiff price, it has revealed a substantial body of opinion within the industry which has a firm recognition of the advantages of a common selling organisation and the dangers of being without one. In the years after the war it may well prove that the control which the Governments exercise over the Syndicate will be the means of effecting a satisfactory conciliation of the conflicting interests of the cane growers, the industrialists and the consuming public. If one confines one's attention to the U.P. and Bihar, the history of the Indian Sugar Syndicate has an obvious parallelism to that of the *Nivas*. But it can hardly be pretended that the Syndicate is a common selling organisation for the Indian Sugar Industry as such.

A similar trend for the whole of India can be expected only with the rise of a similar compactness in the sugar industry in India. At the present stage, one can only regard the Sugar Syndicate as a striking proof of the uniqueness of the position of the U.P. and Bihar. That uniqueness gives rise to a special set of problems to which we have now to turn our attention.

The Indian Sugar Syndicate goes in Cold Storage in 1942

As a result of the Sugar Control Act brought into effect by the Government of India from the 14th April 1942 (later amended and passed as the Sugar and Sugar Products Control Order in July 1943—For texts *vide* The Indian Sugar Industry Annual, 1943) the Sugar Syndicate was obliged to curtail its activities. It gave up the practice of releasing sales quotas which had been so far its main function. Its present activities are curtailed to watching the general interests of its members and making representations to the authorities concerned on numerous aspects of control. It hopes to revive itself after the Government control on sugar is removed, after the war is over.

CHAPTER XII

LOCALISATION OF THE INDIAN SUGAR INDUSTRY

Territorial Distribution of Sugar Industry and Sugarcane Production

WE saw in the last chapter how the Sugar Syndicate which started as a voluntary all-India organisation of the sugar mills was transformed in a short time into a compulsory association of the sugar mills of the U. P. and Bihar with more or less complete official control. Such a development is demonstrably due to the uniqueness of the position occupied by the U. P. and Bihar among the various sugar-producing provinces in India. The simple fact that between them the two provinces account for about 80 per cent of the total sugar production in the country suffices not only to bring them together in close co-operation but to mark them off from the rest of the provinces. The result is that sugar mills in the other provinces are none too eager to join the U. P. and Bihar mills who are obliged by virtue of their large export surplus to market their output in other provinces, including the most distant among them. It is obvious that such disparity between the U. P. and Bihar on the one hand and the rest of the provinces on the other must make itself felt in other directions besides that of the marketing of sugar. At present the Indian mills are able to produce a little more than the present total demand of the home market.[1] And it is natural that when the expansion of the Indian Sugar Industry has been so rapid, the benefits of protection should be appropriated so largely and in such a large measure by the two provinces which were in the best position to profit by it. It is a question, however, whether these disparties in sugar protection as among the various provinces are bound to last. That obviously is different from the problems which such disparities give rise to, so long as they continue to exist. It is different, too, though it is allied, from the aspirations of other provinces to increase their sugar production. Inter-provincial jealousies in this regard are of little importance so long as objective conditions are unfavourable to the increase of production in these areas. And no action in the nature of barriers to trade need be apprehended, as such trade barriers depend in the first place on the separateness of the political entities and in the second place on some encouragement being afforded by the objective conditions referred to earlier. Nevertheless, inter-provincial jealousies have often made themselves felt in the Indian Sugar Industry, particularly when conferences of all-India scope were convened to discuss matters connected with the Indian Sugar Industry. One concrete result of these jealousies is that the U. P. and Bihar have not till now been able to secure the consent of other provinces to the principle of prohibiting the establishment of new sugar mills in India till domestic

[1] If the existing sugar mills work to their full capacity and for the full length of the season, they are capable of producing about 15 lacs tons of sugar per year. (*Vide* Indian Sugar Industry Annual 1940-41 and Mr. M. P. Gandhi's speech at the Rotary Club of Bombay on 13th October 1942, published in the Journal of the Indian Merchants' Chamber, Bombay, for November 1942. Also *vide* his speech before the Rotary Club of Ahmedabad on 3rd December 1943, printed in the Sugar Industry Annual of 1943.

consumption increases, or the prospect of export markets become clearly visible. And to the extent that popular ministries have in the past attempted or given thought to the economic development of their respective provinces, they have treated the expansion of sugar production as no different from other channels of productive activity. Doubtless, when the time comes for autonomous provincial ministries to show their mettle to the electorate, plans for increasing production will be formed and pursued, and the position of the sugar industry will be found to offer a few conundrums. It may be supposed, too, that even if the provinces were willing to avoid embarassments for the sugar mills of the U. P. and Bihar, the provincial governments will find it necessary to encourage the manufacture of sugar or at least *gur* as part of the programme of insuring sufficiency of nutritive food for the millions entrusted to their care. That an expansion of demand will enable the other provinces to increase their production without causing any difficulties to the U. P. and Bihar mills is clear. But it is rarely that economic adjustments are so smoothly adjusted. It is necessary, therefore, to enquire into the position of the various provinces as producers of sugarcane and of sugar.

Such enquiries were, no doubt, conducted in the past. The two Tariff Boards which examined the position of the sugar industry compiled the cost of production of cane in the various provinces[1] and though it was obvious that the U. P. and Bihar had definite advantage over others, it is doubtful if the present position was foreseen with any degree of clarity. Inasmuch as it developed within a few years, which are hardly sufficient for any significant development in the other provinces, it is well to examine the position.

We shall begin by noting from the following tables the present acreage under sugarcane, the estimated production of sugarcane, and

TABLE NO. 1

Area under Sugarcane, Yield of Gur or Jaggery and the estimated Production of Sugarcane in India

Year	Area under sugarcane	Gross production expressed as Gur or Jaggery	Calculated total production of sugarcane
	Areas	Tons	Tons
1929-30 ...	26,24,000	28,85,000	3,09,61,000
1930-31 ...	29,05,000	33,59,000	3,57,89,000
1931-32 ...	30,77,000	41,16,000	4,33,16,000
1932-33 ...	34,25,000	48,59,000	5,11,29,000
1933-34 ...	34,22,000	50,55,000	5,24,55,000
1934-35 ...	36,02,000	52,92,000	5,43,46,000
1935-36 ...	41,54,000	61,02,000	6,12,02,000
1936-37 ...	45,82,000	69,32,000	6,73,22,000
1937-38 ...	38,69,000	55,79,000	5,56,37,000
1938 39 ...	31,30,000	35,72,000	3,58,51,000
1939-40 ...	36,40,000	47,48,000	4,76,72,000
1940-41 ...	45,98,000	57,94,000	5,90,90,000
1941-42 ...	35,15,000	43,71,000	4,60,30,000
1942-43 ...	36,00,000	50,76,000	...
1943-44 ...	41,13,000	56,96,000	...

[1] The Imperial Council of Agricultural Research also undertook this investigation in 1934 and published its estimates of costs of cultivation in various provinces in 1938 and 1939.

TABLE NO. 2

Distribution of the average Sugarcane Area and Yield of Gur or Jaggery for 5 years ending 1939-40

Province or State	Average Area (5 years)	Percentage of total area	Average Gur Production (5 years)	Percentage of total Gur Production
U. P. (including Rampur) ...	2089.600	53.10	2940.000	53.36
Punjab ,, ,, ...	462.600	11.76	337.200	6.12
Bihar ,, ,, ...	413.000	10.44	499.000	9.06
Bengal ,, ,, ...	317.000	8.05	532.400	9.64
Madras ,, ,, ...	113.600	2.89	310.800	5 65
Bombay (Exc. States except Baroda)...	120.400	3 06	318.000	5.77
N.W.F.P. ,, ,, ...	65.000	1.65	70.800	1.29
Assam ,, ,, ...	37.600	0.96	38.400	0.70
C.P.& Berar ,, ,, ...	30.200	0.76	47.800	0.86
Orissa ,, ,, ...	32.000	0.81	58.000	1.05
Delhi ,, ,, ...	3.200	0.08	2.000	0.04
Sind ,, ,, ...	5.600	0.14	12.000	0.22
Mysore ,, ,, ...	49.200	1.25	60.200	1.09
Hyderabad ,, ,, ...	42.400	1.07	84.400	1.53
Bhopal ,, ,, ...	5.800	0.15	5.400	0.10
Baroda ,, ,, ...	2.600	0.07	4.800	0.09
Other Areas ,, ,, ...	148.000	3.76	186.000	3.38

the present production of sugar (including Khandsari sugar and sugar refined from *gur*) for several years :

Dearth of Reliable Statistics Deplored

It is a matter of regret that there is great dearth of reliable official statistics in regard to such an important and vital matter. It should be noted clearly that official statistics relating to the sugarcane crop give only the area under cane, and the yield of *gur*, no figures of the tonnage of cane being available. Even in respect of acreage of cane, the figures of such Provinces and States where land revenue system makes it essential to undertake a survey and record of the crop raised annually, may be fairly accurate, but in such parts of India where the Permanent Settlement of land revenue is found, their figures are no better than guesses. Thus, for instance, the statistics in relation to U. P., Bombay, Madras and the Punjab are likely to be more accurate, but this cannot be said of Bihar[1] and Bengal. While this is the position in respect of statistics of acreage, the position in regard to yield is still worse. At present all crop-cutting experiments on which official returns of yield are based and in the weighment of *gur* and not of cane. Even these unsatisfactory experiments have now been given up. With the available statistics, therefore, it is hardly possible to calculate the exact figures of the production of cane each year, as the weight of cane produced per acre varies with the locality as well as with the variety of the cane grown. Similarly, the weight of cane required for manufacturing a unit of *gur* also varies with the variety of cane. Thus neither of the two official figures of acreage and yield of *gur* can, therefore, by themselves be used

[1] *Vide* footnote in the Statement of Objects and Reasons to the Sugar Factories Control Bill, 1937, given in the "Indian Sugar Industry at a Glance", where it is stated that in the absence of an up-to-date survey, it is almost impossible to obtain reliable estimates of cane areas.

for making an accurate calculation of the total yield of cane. The only recourse, therefore, for calculating the production of sugarcane is to use the forecast figures of *gur* as the basis.[1]

The next table shows the production of sugar from cane and Khandsari together in the different Provinces from 1935-36 to 1939-40 :

TABLE NO. 3[2]

Province	1935-36	1936-37	1937-38	1938-39	1939-40
	Tons	Tons	Tons	Tons	Tons
United Provinces	6,45,600	6,92,800	6,28 400	3,94,200	7,60,300
Bihar	2,57,900	3,35,000	2,31,700	1,66,600	3,28 800
Punjab	29,000	26,100	23,100	15,100	24 200
Madras	33,700	33,700	34,600	36,000	47,000
Bombay	35,900	43,200	46,900	57,300	75,500
Bengal	31,200	29,400	26,000	14,900	45,800
Other Provinces	71,000	76,800	82,200	81,400	1,11,600
Total for India ...	11,05,000	12,37,000	10,72,000	7,65,500	13,93,200

It will be seen from the above tables that the U. P., a sub-tropical region, has more than half the total acreage under cane, and more than half of the total production of sugar in India.

The position in 1942-43 and 1943-44 is almost similar to that in 1939-40.

Sugarcane in the United Provinces

The United Provinces of Agra and Oudh lie between 23°52' and 31°18' N. and thus fall entirely outside the tropics. The acreage under cane is more than half of the total acreage under cane in India.

The province has made remarkable progress in extending the cultivation of improved varieties of cane. The United Provinces which possess more than half the acreage under cane in India and about three-fourths of that acreage under improved varieties, holds an important position in the manufacture of sugar. The province is fortunate in that hitherto the attention of the Coimbatore Research Station has been focussed, as is natural, upon producing improved canes suitable for conditions in the main sugar belt of India, i.e., in the United Provinces and Bihar and Orissa. The results of such research have been utilised by the U. P. with great avidity. The United Provinces Government stated before the Tariff Board that while indigenous varieties may be expected to yield 350 maunds of cane per acre, Coimbatore varieties cultivated in the same system yield 600 maunds and cultivated extensively on the Java system, would yield up to 1,000 maunds per acre. The United Provinces are also endeavouring to cultivate special kinds of cane, e.g., Co. 214, which ripens sharply, and cane which ripens late, to enable the factories to extend the crushing season.

The Department of Agriculture of the United Provinces stated in one of its reports that Co. 213 was the most widely grown of the newer

[1] This question was discussed at a meeting of the Sugar Committee of the Imperial Council of Agricultural Research. but no decision was arrived at for remedying the present position, till July 1937.

[2] *Vide* Supplement to the Indian Trade Journal, 7th May 1942, p. 18.

canes. It is high yielding and capable of doing well under normal crop conditions but has shown itself unduly susceptible to monnic disease. Co. 200 and Co. 244, it is observed, have considerable vogue in the west of the province. The former appears to yield better in the west than elsewhere and the latter does well on less highly manured lands.

The total area under improved and ordinary varieties of cane in the United Provinces during 1939-40 was 19,14,000 acres out of which 17,06,000 were under improved varieties and the balance under ordinary varieties. The cost of growing cane, the Tariff Board observed in 1931, was estimated at between 4 and 5 annas a maund. The Tariff Board of 1938 estimated the cost of cultivation at 3 annas and 7 pies per maund.

Bihar and Orissa

The Provinces of Bihar and Orissa lie between 19°3' and 27°31' N. Orissa occupies the most southerly position in the province and is thus entirely within the tropics, whereas Bihar is entirely sub-tropical.

The special features of Bihar are that its climatic conditions are transitional between the tropical and the sub-tropical, that much of its cane is grown without irrigation, and that it was till lately (before the advent of protection) the chief centre for the manufacture of sugar direct from cane in India.

Orissa, however, is essentially a rice-tract and offers hardly any prospect of cane.

The spread of Coimbatore varieties of sugarcane has been phenomenal during the last 5 years. Out of a total of nearly 4,41,000 acres under improved canes in 1939-40, nearly 4,25,600 acres are in Bihar proper. The spread is increasing so rapidly that it is felt that local varieties will completely be ousted before long.

The total acreage under sugarcane in Bihar was about 3,02,000 in 1932-33 and 4,41,000 in 1939-40.

The yield from indigenous canes in Bihar was about 13 tons per acre, while the yield from Coimbatore variety is about 18 to 20 tons.

The Tariff Board (1931) remarked that the cost of cultivation of cane worked out at between 4 and 5 annas a maund; another Tariff Board (1938) estimated the cost at 3 annas 4 pies per maund.

The Punjab lies between 27°39' and 34°2' N. It is well outside the tropics, but comes closely behind Bihar, the U. P. being the first. Although the Punjab grows about 4 lacs of sugarcane, the prospects of manufacture of white sugar are limited to a small proportion of that acreage, due to the short monsoon period and the extremes of temperature which are serious handicaps. The short duration of the crushing season and the danger of frost are the limiting factors. The possibility of establishment of sugar factories, therefore, is confined to the south of the Punjab where conditions are similar to those of the United Provinces.

The yield of cane in the Punjab from indigenous varieties is about 13 tons per acre, while from Coimbatore varieties it is about 15 tons.

The Tariff Board (1931) remarked that the cost of cultivation of cane was estimated at about 5 annas 6 pies per maund. The Tariff

Board (1938) estimated the cost at 5 annas per maund in the areas where factories are situated.

Improvements in Madras

The Madras Presidency lies between 80°4' and 20°60' N. and is entirely within the tropics. Although nowhere in India are the climatic conditions more favourable for the successful cultivation of cane, the area under sugarcane in Madras is both small and scattered. The acreage under cane in 1932-33 was a little over one lac and 1,32,000 in 1939-40. In spite of its tropical situation Madras offers limited prospects for cane, due largely to the widespread preference for rice wherever supplies of irrigation water are assured, and to the very scattered area on which cane is grown, Madras has not benefited from the Coimbatore Research Station, as the experiments conducted there have so far been directed to production of cane suitable for sub-tropical conditions. The average size of a holding in Madras is extremely small and the difficulties in the way of sugar factories obtaining control over a sufficiently large area for cultivation of cane are very great. But these difficulties are slowly being overcome. The yield of cane has improved to 35 tons per acre, and the cost of cultivation of cane has now come down to about 4 to 6 annas per maund, due to fall in prices, chiefly of manures, fall in wages, etc. The area under cane in Madras was 1,32,000 acres in 1939-40.

The cost of production of cane, according to the Tariff Board of 1931, was estimated at from 7 to 12 annas per maund. The 1938 Tariff Board estimated the cost at 5 annas 5 pies per maund.

Improvements in Bombay

The Bombay Presidency proper lies between 13°53' and 24°43' N. and is thus almost entirely within the tropics. The area under cane was 1,05,000 acres in 1932-33 and 1,29,000 in 1939-40.

The Deccan lands and their projected extension afford the brightest prospects for the extension of cane in Bombay. Bombay is also capable of producing a higher yield of cane per acre perhaps than any other part of India. The Tariff Board were informed that in certain fields at the Belapur Estate a yield of 40 tons or more of cane had actually been realised. This represents about 1,080 maunds per acre and compares well with Java production. The actual average for the Belapur estate was about 24.69 tons, i.e. 679 maunds in 1929-30, and indeed on one plot of land in the Deccan the yield was over 100 tons in 1936-37.[1]

The cost of cane was estimated to be about 12 annas per maund by the 1931 Tariff Board. The 1938 Tariff Board estimated it at 5 annas 5 pies per maund.

Improvements in Bengal

The Presidency of Bengal lies between 20°35' and 27°13' N. and is almost entirely sub-tropical. In point of acreage in India, Bengal stands fourth now, although in the early years of the 20th century, it was

[1] *Vide* Tariff Board Report, 1938, pp. 2 and 67.

second. Cane is grown in every district of the province, but the crop is of small importance. The total area under sugarcane in Bengal was 2,33,000 acres in 1932-33 and 3,10,000 acres in 1939-40.

The province appears to afford suitable facilities for the development of cane-manufacturing industry, particularly in view of the decline in the demand and price of Jute, which is the crop of greatest importance to this province.

The cost of cultivation per maund of cane, the Tariff Board (1931) were informed, was about 7 annas. The Bengal Government now believe that the cost has come down to about 3 annas per maund. The 1938 Tariff Board estimated the cost at 3 annas 7 pies per maund.[1]

Provincial Distribution of Factories

Having seen the developments in the cultivation of cane, and the possibilities thereof, let us now turn our attention to the progress of the cane-manufacturing industry, and see its relative position and development in the various provinces. We will compare the production of sugar in the chief provinces during the last few years, the recovery percentage of sugar, the duration of the crushing season, etc., and consider the possibilities of the development of the industry in various provinces :

TABLE NO. 4

Comparative growth of Sugar Industry in the various Provinces since 1931-32

Province	Number of cane factories working										
	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42
U. P. ...	14	33	59	65	67	68	68	69	70	70	70
Bihar ...	12	19	33	34	35	33	33	32	32	32	32
Punjab & Sind	1	1	5	6	4	5	3	3	3	4	5
Madras ...	2	2	4	8	8	11	8	7	10	11	11
Bombay ...	2	1	4	5	6	6	7	7	7	8	8
Bengal ...	...	...	2	5	6	6	6	8	9	9	9
Orissa ...	...	...	...	...	...	...	2	2	2	2	2
Indian States	...	...	4	5	9	8	9	11	11	12	13
Total for INDIA ...	32	57	112	130	137	137	136	139	145	148	150
Burma ...	1	1	1	2	2	3	2	2	3	3	unknown

Burma excluded from 1936-37 onwards from the total for India.
Even in 1943-44, the position is very nearly the same.

The number of factories in the U. P. in 1941-42 (also in 1943-44) is more than double the factories in Bihar and only a little less than half the number of total factories in India. Bihar stands a good second, Madras, Bombay, Bengal and the Punjab are third, fourth, fifth and sixth respectively. More than 125 factories have been established after the grant of protection, and plants of several old factories have been considerably

[1] The 1938 Tariff Board estimated that 3¾ annas per maund may be taken as a reasonable estimate of the cost of cultivation for the whole of India (page 36).

extended. Let us now see the figures of production of sugar in these provinces.

Production of Sugar in the Various Provinces

The production of sugar year by year, since 1932 in the United Provinces and Bihar, and in all-India, can be seen from the following table. The table also gives statistics of the quantity of cane crushed :

TABLE NO. 5

Cane Factory Production of Sugar in U. P., Bihar and All-India (in tons)

Season	U. P.	Bihar	All-India	Total quantity of cane crushed in all factories
1931-32 ...	66,312	75,091	1,56,581	17,83,000
1932-33 ...	1,40,344	1,26,610	2,90,177	33,50,000
1933-34 ...	2,73,774	1,39,957	4,53,965	51,57,000
1934-35 ...	3,15,600	1,84,038	5,78,115	66,72,000
1935-36 ...	5,30,000	2,50,200	9,32,100	98,01,000
1936-37 ...	6,08,600	3,29,300	11,11,400	1,10,87,000
1937-38 ...	5,31,300	2,25,300	9,30,700	99,16,400
1938-39 ...	3,20,300	61,600	6,50,800	70,04,800
1939-40 ...	6,59,500	3,22,100	12,41,700	1,31,31,700
1940-41 ...	5,13,300	2,46,100	10,95,400	1,12,90,000
1941-42 ...	3,82,900	1,17,300	7,78,100	80,26,300
1942-43 ...	6,12,500	2,37,400	10,70,700	1,04,18,500
1943-44 ..	7,27,100	2,12,400	12,16,400	1,21,37,800

The following table gives similar production of the various provinces, along with recovery percentages for 1939-40 and 1940-41 :

TABLE NO. 6

Number of Sugar Factories in various Provinces working in 1940-41. *Estimated Quantity of Cane Crushed, Sugar Produced and Recovery Percentage obtained, etc.*

(Official estimates of the Director, Imperial Institute of Sugar Technology, Cawnpore, published on 18th September 1941)

Province	No. of Mills working	Cane Crushed Tons	Sugar	Recovery Sugar per cent cane (*a*)	
				1940-41	1939-40
United Provinces... ...	70	51,99,800	5,13,300	9.87	9.37
Bihar	32	24,94,300	2,46,100	9.86	9.29
Punjab & Sind	4	2,42,700	21,360	8.93	8.39
Madras	11	4,82,000	44,100	9.15	9.11
Bombay	8	8,52,400	84,600	9.94	10.97
Bengal & Assam ...	9	6,11,300	52,000	8.50	9.23
Orissa	2	34,200	3,000	8.77	8.39
Indian States	12	13,74,200	1,30,300	9.47	10.03
Total (India)	148	1,12,90,900	10,95,400	9.70	9.45
Burma	3	3,99,300	39,300	9.84	10.04

(*a*) The All-India average recovery in 1941-42, 1942-43 and 1943-44 was 9.69, 10.28 and 10.02 respectively.

From the previous tables it would be clear that though the other provinces are backward in point of acreage under cane and cost of production, in point of recovery percentage some of them are quite ahead of the U. P. and Bihar. The differences in the cost of production are there; but these did not prevent the provinces from voicing their dissatisfaction with the rate of progress in the industry, so far as they were concerned, in the year 1933.

All-India Sugar Conference, 1933

The question of the development of the industry in the various provinces was discussed thoroughly at the Sugar Conference held by the Government of India at Simla on the 10th, 11th and 12th July, 1933. The discussion gave rise to a sharp conflict of opinions, and gave an interesting spectacle of provincial jealousies.

Madras Says "No"

The representatives from Madras, Punjab, Bombay, Mysore and Hyderabad felt that their provinces were yet lagging behind in the development of the industry, while the United Provinces and Bihar had forged ahead, having the advantage of an earlier start.[1] They declined, therefore, to accept the Resolution moved by the Hon'ble Khan Bahadur Sayiyid Muhamad Hussain, Minister-in-charge of Education and Development Departments, Bihar and Orissa, which appeared to suggest that there should be no more factories than what existed then. In fact, it was pointed out that Madras consumed sugar to the extent of 1,00,000 tons a year, out of which 55,000 tons was imported by sea in 1932-33. Madras, therefore, need of more factories unless it desired to remain dependent upon Java or Northern India. It was also pointed out that the Tariff Board had emphasised that the strongest aspect of the case for protection of the industry was that based upon the national importance of promoting the cultivation of sugarcane, and that from that point of view there was need of promoting sugar factories in Madras.

It was further stated that hitherto it was thought that canes produced in Coimbatore had been suitable only for the Northern Provinces. But recently in one of the Government farms Co. 213 had been raised and it had been found very suitable with a yield of about 35 to 40 tons and the cost of cultivation of one ton came down to only Rs. 2-8-0. The Minister for the Punjab also supported the Minister for Madras, and observed that while the Punjab had increased its cane cultivation from 3 to 5 lacs acres, they had only two factories. The Director of Industries from Bombay also expressed himself in opposition to the Resolution moved by the Minister from Bihar. He pointed out that conditions in Bombay were somewhat different from those prevailing in the United Provinces and Bihar. In the Bombay Presidency factories were established on the basis that they must grow their own cane; they could not easily buy cane. The acreage in Bombay under cane was 1,00,000, but they were distributed. They had only one factory working up to 1931-32. The Bombay Government were considering how

[1] As pointed out by B. N. Adarkar in "The Indian Tariff Policy", p. 128, "Each Province has its own reason why an expansion of the sugar industry within its borders is imperatively necessary."

best facilities could be given to capitalists to enable them to obtain suitable lands on lease so that they might be able to start factories.

Bombay was fortunate in regard to the yield of cane. The Belapur factory had its own farm which yielded 37 tons per acre, and the percentage of recovery of sugar was II, the highest for the whole of India.

It was also pointed out that the Bombay Government had invested about 10 crores of rupees on irrigation in Deccan, and it was felt that it would be difficult to make those canals financially successful unless the white sugar industry was established in that area. The Government of Bombay were therefore keen on promoting the development of more factories, and they therefore could not agree to the Resolution proposed by the Minister from Bihar.

The Resolution moved by the Minister from Bihar was, however, accepted by a majority of votes (18 to 11), at the Sugar Conference. The Resolution reads as under :—

> "Whereas the recent development of the sugar industry in India has been rapid, although it cannot be said to have been excessive, and whereas, owing to the general fall in prices of agricultural produce there has been a natural tendency towards an increase in the area under sugarcane, the Conference is of opinion—
>
> (1) that when the modern factories now under construction are working at full capacity, it is likely that these and existing factories will produce sufficient white sugar to meet the existing demand for white sugar ;
>
> (2) that in view of the consideration that whilst the potential supply of raw material is very large, the demand for sugar in India is limited, further extensions, should be carefully watched in the interests of the establishment of a sound industry ; and
>
> (3) that if the production of sugarcane expands beyond the actual requirements it would be extremely difficult, and indeed most impossible, for any reasonable level of prices for *gur* to be maintained."

Bengal's Niggardly Development and Apprehensions against Restriction

The Hon'ble Nawab K. G. M. Faroqui, Minister for Bengal, pointed out his apprehension that if the Resolution were passed by the Conference, the United Provinces, and Bihar Governments might approach the Government of India with definite proposals for restricting the starting of new factories elsewhere by legislation. He was, however, assured by the Chairman of the Conference, Sir Fazl-i-Hussain, Member of the Executive Council of the Governor-General-in-charge of the Department of Education, Health and Lands, that the passing of the Resolution would in no way help any of the provinces to come to the Government of India and ask for any particular legislation.

A representative of the Indian Sugar Mills Association took up the brief on behalf of Bengal. He pointed out his firm conviction that in order that India may prosper, it is desirable that each province should, as far as possible, prosper along parallel lines.

It need hardly be said that the expression of such a view struck a responsive chord in the hearts of the representatives of other provinces. But it is a far cry from aspiration to achievement. And though there has, doubtless, been a slow increase in the number of sugar factories in provinces like Madras, the assertion of a major trend, such as above would undermine the pre-eminence of the U. P. and Bihar in the Indian Sugar Industry. In the case of Bengal it may be readily conceded that not only is she most anxious to secure the expansion of her sugar industry, but she has also the advantage that in her case, the cost of producing cane is less than that of Madras and Bombay. A detailed consideration may, therefore, be attempted of Bengal's position in relation to sugar manufacture.

Bengal's Position

Bengal has always grown a certain amount of sugarcane and was once a sugar producing country. In point of area under cultivation of cane Bengal now stands fourth in India, but it is well known that in the early years of the 20th century Bengal took the second place. This decline in the cultivation of the cane crop in this province has been due largely to the spread of the jute crop in which Bengal enjoys a monopoly in the whole world. The question of the development of the sugar industry assumed great importance whenever the decline in the demand for jute, and the consequent need to restrict the acreage under jute suggested the need for an alternative cash crop. If the deterioration in the economic life of the province was to be arrested, some alternative crop had to be found and sugarcane would seem to answer this purpose best.

Quality of Cane Available in Bengal

It is well to note here that cane cultivation had not been ignored by the Department of Agriculture in Bengal. A variety of cane called "Yellow Taanna" was introduced as early as 1931. This is a very hardly and drought-resisting cane. And though its juice and *gur* produced from it leave much to be desired, its other good qualities and heavy yield led to a great expansion of its cultivation throughout the province. Some ten years ago the Department of Agriculture introduced new Coimbatore varieties of cane. These were very hardly canes and were heavy yielders with very rich juice. Of these Co. 213 has proved the best, and is now spreading very rapidly in most parts of the province. It is a matter of satisfaction that experiments are being continually made for finding out a quality of cane even better than Co. 213. The present position is that the area under Coimbatore cane is spreading rapidly, but so far in only a few localities there is sufficient crop to supply large factories.

The total area under cane is over 3 lacs acres. Of this about more than 2 lacs are under improved variety and it is gratifying to find that the recent crop-cutting experiments indicate that the normal yield of *gur* which was 37 maunds per acre has now increased to over 50 maunds per acre, due largely to the introduction of the improved varieties of cane by the Agricultural Department. Taking even the lower figure of 37 maunds of *gur* per acre the total production of cane *gur* comes to

above 1,17,00,000 maunds. In addition to this date-palm juice yields *gur* estimated at about 27,50,000 maunds.

It is in consideration of these circumstances that His Excellency Sir Stanley Jackson, Governor of Bengal, also observed in the course of a speech delivered at the Annual Meeting of the Associated Chambers of Commerce in Calcutta on the 14th December, 1931, as follows:

> "Large areas in four out of five divisions in Bengal are eminently suited for growing sugarcane. It is reasonable to expect that the rapid adoption of the Bengal Agricultural Departments high yielding strains of jute must not only limit the expansion of the area under jute but, even in normal times, may bring about a reduction of that area. The Agricultural Department envisages an eventful reduction from this "cause by as much as 25 per cent of the area normally under jute, or about 5,00,000 acres. If even half of the area thus liberated could be put under sugarcane and if that sugarcane could be locally converted into *gur* for transportation to a refinery, we should not need to import a single ton of the 3,25,000 tons which we are now importing annually into Calcutta alone. We have the market, we have suitable land, we have the cane, the hybrid known as Co. 213 from the Government of India breeding nursery at Coimbatore which has been found admirably suited to Bengal, although I am informed that the Agricultural Department is confident of producing an even better cane in the near future."

The possibilities of the establishment of sugar factories in Bengal were also discussed by the Tariff Board in their report to the Government of India, and the Annual Reports of the Agricultural Department also show that there are several places where the surplus of canes remaining after fully meeting the demands of *Gur* can feed a number of factories. The Government of Bengal felt a natural diffidence about encouraging the establishment of large scale sugar mills, while they believed that conditions would soon be ripe for such a development. In the meantime, the policy of the Government of Bengal was to advocate establishment of small ten-ton factories for the manufacture of sugar from *gur* in order to enable the cultivators to dispose of their cane profitably. The Government of Bengal further observed that this system was suitable for small capitalists and co-operative associations to adopt.

The public mind was exhilarated at the thought of establishing a new industry; and it would be useful to summarise the main points which emerged out of the frequent discussions on the question of the development of the sugar industry in Bengal.

14 *Points in Favour of Bengal*

1. Climatic conditions in Bengal quite favourable for the growth of sugarcane.
2. The grey-silt areas, too, usually consist of fairly rich soil which makes it possible to produce a heavier yielding crop than any other province.

3. Irrigation, too, usually an expensive proposition, is generally not required over the major part of the province, as rainfall, both in incidence and amount, is sufficient for the needs of the crop.
4. It should also be noted that Co. 213 variety of sugarcane is capable of standing water-logging : in fact it has been found to grow in a foot of water, for one or two months during the monsoon without any serious deterioration.
5. The Bengal Government are of opinion that the sugar factories should be more profitable in Bengal than any other province as the cost of production of cane is comparatively low (*vide* "Sugar in Bengal," page . . .)
6. Increase in area near some places makes it possible to establish sugar factories on a large scale.
7. Ryots will also be benefited by the establishment of sugar factories, for while they will undoubtedly still continue to make *gur*, it would almost certainly be not more than the quantity required for themselves and their immediate neighbours, and their excess cane can thus be sold to factories. They will thus free their bullocks at a time when they require them for land preparation for *Kharif* crops and will relieve them from the exacting work of cane-crushing.
8. The establishment of the cane-sugar factories in Bengal will be blessing in another way, viz., effective competition, which the factories in Bengal will be able to offer, with the imported sugar at the port of Calcutta and the neighbouring places, owing to the great reduction in the cost of transport, as compared with factories situated, for instance, in Bihar, selling sugar to Bengal after paying high freight charges.
9. The advantage in freight, which the mills in Bengal will have over the mills in other provinces in supplying the large demand of sugar in Bengal, as also in the provinces of Burma and Assam, will be a compensating factor, which would counteract the disadvantage which Bengal may have as compared to other provinces in regard to higher cost of production (vide Tariff Board's Report) due to the inferior quality of cane, shorter duration of the working season, etc.
10. The *Bhadralog* class will find an excellent avenue for employment in large-scale cane factories.
11. The development of the cane factories will also be instrumental in preventing the wastage of cane in refining sugar from *gur* and this will be a national advantage.
12. The realisation of some price for molasses required for consumption in Bengal will be another compensating factor in favour of mills situated in Bengal.
13. Another incidental advantage of the establishment of sugar factories in Bengal will be a better distribution of the profits arising from the protected industry in the various provinces and the elimination of any feeling about disproportionate burden of protection being felt by consuming provinces for the sake of manufacturing provinces.

14. The efficiency of the Bengali cane-grower is on the whole fairly high (vide Indian Sugar Committee's Report)[1]

It should be easy to detect that in the points listed above, the benefits to be derived from the establishment of the sugar industry are somewhat sedulously mixed up with the advantages which argue for and afford encouragement to its establishment. It need hardly be said, therefore, that of the two, the former, however much it may figure in popular discussion, is of little or no importance in determining the localisation of the industry.

Position of Industry in U. P. and Bihar, as Compared with other Provinces

The one simple fact which arrests attention in this context is that the U. P. and Bihar have an overwhelming advantage over other provinces in the matter of the cost of production of cane as also the ready availability of cane within a short distance from the factories. As already shown elsewhere, about 65 per cent of the total cane requirements of the factories in U. P. and Bihar is obtained from within a radius of 16 miles usually transported by cart. Cane so delivered is commonly known as "gate" cane. The advantages of "gate" cane are several, i.e., it requires less handling, arrives in fresh condition and a uniform supply can be regulated for feeding the factory. The balance of the cane is brought by rail being transported from a distance of as long as 125 miles, the average distance being about 40 miles. In certain areas the cane is also transported by tramways as, indeed, also by waterways, and in one case by an aerial ropeway (in Bihar). The fact that the cost of production of cane in U. P. and Bihar is lower than in other areas seems to offer an advantage to the factories in these two provinces, but the factories are at present subjected to various other handicaps as compared with other provinces. The table on the next page gives a comparative position to the sugar factories in the U. P. and Bihar as far as compared with Indian States and the rest of British India.

A special committee appointed by the Governments of the U. P. and Bihar in 1938 for investigation into the question of working of sugar factories in the U. P. reported that the U. P. and Bihar factories suffered a handicap to the extent of Rs. 2-8-0 per maund of sugar as compared with factories outside. This advantage of cheaper cane cultivation of the U. P. and Bihar has been nullified by the U. P. and Bihar Governments, who have been fixing high minimum prices of cane from year to year, as stated elsewhere (and other Provinces and States have no such minimum prices) by the cess on cane, etc. And these two provinces, therefore, have at the present time hardly any advantage left to them on this score.

We have also pointed out that the price of cane represents more than half the cost of producing sugar, and in view of this, no province can economically engage in the production of sugar, however much it likes to do so, unless it can bring down the cost of production of cane. Provinces other than the U. P. and Bihar at the present time can only

[1] *Vide* Indian Sugar Industry—Its Past, Present and Future, by M. P. Gandhi, 1934. Also *vide* Report of the Industrial Survey Committee of Bengal, 1941.

TABLE NO. 7

Comparative Position of Sugar Factories in Different Parts of India

	U. P. and Bihar	Indian States	Provinces outside U.P. and Bihar in Br. India
1.	High prices of cane fixed by law	Free market	Free market
2.	High wages fixed by law (0-6-0 minimum)	No law	No law
3.	Cess: originally ½ anna and now ¾ anna per maund on cane or As. 11 per maund on sugar	No cess	No cess
4.	Co-operative Society charges: about As. 2 per maund of sugar	No charges	No charges
5.	Short season	...	Very much longer season in the West and the South
6.	Recovery 9./3%	...	10% to 12% in the West and the South
7.	Income-tax, Super-tax and Excess Profits tax	No tax	Income-tax, Super-tax and Excess Profits tax
8.	No concessions	Concessions of land and/or refund of Excise Duty in part or in whole in one form or another	No concessions
9.	No such relief	Import duties on outside sugar and freedom from taxes	No such relief
10.	Not so	In most cases big farms are owned; and very little tax is paid due to the bulk of the income being considered as derived from farms	...
11.	No exemption	No Excise Duty in case of Palmyra sugar	In the South no Excise Duty on Palmyra sugar
12.	Competition with the Khandsari which is free from all the abovementioned charges	No competition	No competition
13.	Freight disadvantage computed at over Re. 1/- in marketing 75¾ of sugar to other distant provinces	Smaller disadvantage	Practically no disadvantage
14.	Storage cost and interest charges as sugar can only be sold by quotas, having to be carried forward for more than 10 months	No costs. Sold immediately	No costs. Sold immediately
15.	Restriction of production by quotas leading to higher manufacturing charges	No disadvantage	No disadvantage
16.	Molasses return from low	Higher	Higher
17.	Municipal tolls on transport of cane—cane carts	No disadvantage	No disadvantage
18.	Implicit obedience to Rules, Regulations and Returns of various sorts, made under Control Act, on paid of heavy penalties	Complete freedom	Complete freedom
19.	No.	No.	High irrigation charges in Bombay

Vide Gandhi & Co.'s Indian Sugar Industry Annual, 1940 and 1941.

produce cane at higher cost, (this is partly compensated by the better quality of cane with higher sucrose) but it should not be forgotten that these distant provinces will have an advantage over U. P. and Bihar in that these provinces have to incur a charge in transporting sugar to distant markets in Bombay, Madras, and to a less extent Bengal. It is necessary to have a precise idea of the freight advantage that is enjoyed by the provinces, which are now to a large extent the markets of the sugar industry in the U. P. and Bihar. It works to about Rs. 1-2-0 per maund of sugar on an average and this may be regarded as the margin between the costs of production in the U. P. and Bihar and the costs in the other provinces. The following table on p. 195 illustrates the position.

In view of the above position, it is easy to see that nothing can deter the other provinces, where the industry is not adequately developed at present, from effecting an expansion of their sugar production, although it would be necessarily at the expense of the sugar industry in the U. P. and Bihar in the present state of the country's sugar consumption, which is smaller than the productive capacity of the factories already established.

An analysis of the cost of cultivation will also show that the differences between the Northern and the Southern provinces are accounted for in a large cost by the irrigation charges. In so far as these irrigation charges[1] are bound up with the larger problem of help to agriculture, one cannot be quite sure that the first step of agrarian reform in the regime of a popular ministry will not include substantial reduction therein, and if it should coincide with the evolution of a better type of cane suited to the tropical areas, there might well be very far-reaching changes in the territorial distribution of sugar production in India, just as there have been over the wider sphere of the world's sugar industry. Such speculation, however, is fruitless to indulge in at the present time.

Principles of Localization and Position of Sugar Industry in Relation thereto

At this stage, let us examine generally how far the " concentration " of the sugar industry in the U. P. and Bihar is scientific, well-planned and how far it satisfies the theory that industries generally, and protected industries particularly, should be suitably located with reference primarily to geographical and economic factors.[2] An examination of the location of the industry in the various provinces at present, as also the sites on which factories have been established will reveal at once that the industry has not been ideally spread over the various provinces looking to the needs of " transport relations," and that there

[1] The Director of Industries, Bombay, speaking at the All-India Sugar Conference in Simla in 1933, stated, "The Government of Bombay have invested between 9 and 10 crores of rupees for irrigation in the Deccan and every Committee and Conference that has sat on the subject has held that unless the white sugar industry is established in the Deccan, it will be very difficult to make these canals financially successful. Therefore, the Government of Bombay have been very anxious to see that new factories are established." (Also see report of the Deccan Canals Financial Inquiry Committee, 1932.)

[2] *Vide* "Theory of Industrial Location" by Mr. Alfred Weber, "Inter-regional and International Trade" by Mr. B. Chlim and "The Structure of Competitive Industry" by Mr. E. D. G. Robinson.

TABLE NO. 8

Railway Freight O.R. on Sugar per maund from certain Stations on the E.I. and B. & N.W. Railways to Various Ports and Towns

From Stations		To Bombay	To Karachi	To Madras	To Vizagapatam Town	To Cocanada	To Howrah	To Rangoon	To Ahmedabad	To Tuticorin	To Akyab
		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Dehri-on-Sone ...	E. I. Rly.	1 0 0	1 1 3	0 14 5	0 14 4	0 14 5	0 8 3	*1 1 3	*1 1 3	0 14 5	*1 5 0
Bihta ...	E. I. Rly.	1 0 0	1 1 3	0 14 5	0 14 5	0 14 5	0 8 3	*1 1 3	*1 1 3	0 14 7	*1 5 0
Guraru ...	E. I. Rly.	1 0 0	1 1 3	1 14 5	0 14 5	0 14 5	0 7 11	*1 0 11	1 1 3	0 14 5	*1 4 8
Rosa ...	E. I. Rly.	1 0 0	1 0 0	1 2 0	...	...	...	...	1 0 0	...	...
Lucknow ...	E. I. Rly.	1 0 0	1 0 0	1 2 0	...	...	...	...	1 0 0	...	...
Motihari ...	B. & N. W. Rly.	1 1 6	1 2 0	1 0 0	1 0 0	1 0 0	0 11 0	*1 4 6	1 2 0	1 2 2	*1 8 3
Basti ...	B. & N. W. Rly.	1 0 3	1 0 6	1 1 0	1 1 0	1 1 0	0 15 0	*1 8 6	1 0 6	1 3 2	*1 12 3
Sardarnagar ...	B. & N. W. Rly.	1 0 0	1 1 0	1 0 6	1 0 6	1 0 6	0 13 8	*1 6 8	1 1 0	1 2 8	*1 10 4

N.B.—Traffic at these rates is subject to the increase of As. 2 per rupee on the total freight charge, which is in force on and from 1st March 1940. So far as the traffic to Rangoon and Akyab is concerned the increase in freight charge is leviable on Railway's proportion only.

* Railway's proportion is the same as Howrah rate.

has been verily a drift in this important matter, sites for location of factories having been haphazardly selected, and even two factories having been located at one site (Pipraich in the Gorakhpur District) in the U. P. The "modern" tendency of the world appears to be against excessive concentration of the industry in any one particular place, and in view of rapid improvements in connection with "transport relations" available in respect of raw materials and manufactured articles, the phenomenon of a more even spread of the industry is becoming common all over the world. That the development of the sugar industry has not been uniform[1] will be seen from the fact that out of the 150 mills operating in the country, as many as 102 have been located in the U. P. and Bihar. Madras having 11, Bombay 10 and Bengal, only 9. Elsewhere, we have given a table showing the growth of factories over all the provinces from 1931-32 till 1941-42.

Factors which Determine Locations

Localisation of the industry depends to a large extent upon the "transport relations" with reference to natural resources, like power, fuel, and consuming markets. In the case of sugar, however, the question of location of the industry is dominated by the factor of easy accessibility to raw material inasmuch as cane should be fresh when it arrives because its sugar content deteriorates rapidly within a few hours of its being cut from the fields. This one single factor has, in our opinion, been largely responsible for the concentration of sugar factories in the U. P. and Bihar at the commencement of the period of protection, due to the ready availability of cane in large quantities, and in concentrated areas in the vicinity of factories, thus enabling the economic operation of factories. Proximity to power is not a factor of any importance (as, indeed, the raw material, which costs about 52 per cent of the total cost of manufactured sugar, is) in the location of the sugar industry, as Bagasse (residue of cane) itself provides the necessary fuel and factories are practically independent of coal.

Curious Concentration of Industry in Sub-Tropical Area

As we have already observed, however, it is somewhat curious that the industry has been concentrated in the sub-tropical areas (comprising Northern and Central India), although the tropical area (comprising Bombay, Hyderabad, Madras, Mysore and other States) is more favourably suited for the growth of sugarcane inasmuch as the conditions there approximate to conditions in the West Indies in Java. But here in India, the case is actually reverse for no less than 91 per cent of the area under sugarcane is grown in the sub-tropical

[1] In his speech at the Bombay Rotary Club on "Problems and Prospects of Sugar" on the 13th October 1942, Mr. M. P. Gandhi pointed out that the sugar industry had not developed uniformly all over India. Few industries did. The iron and steel industry was confined to Bihar and her borderland with Bengal. In Cotton Textiles, Bombay and Ahmedabad had a big share of the total Indian market. In Jute, Bengal had the sole monopoly, and in Mica, Bihar dominated. He pointed out, however, that the position of sugar ought to be different, for every part of India can grow cane and has its own supply of labour, skilled and unskilled. According to him, however, this position was due to the fact that the U. P. and Bihar grew cane more cheaply than other provinces with the result that in the first flash of liberal protection to the sugar industry, the U.P. and Bihar had more than a lion's share of the development of this industry in the country.

region and only 9 per cent in the tropical region, in spite of the higher yield and superior quality of cane there. The reason is the comparatively high cost of cultivation in the tropical region. The rich alluvial soil of the Gangetic Plain is an initial advantage in favour of the main sugar producing belt of the U. P. and Bihar.

Thus, the only combination of factors which will explain this phenomenon of "concentration" of factories in the U. P. and Bihar is (1) ready availability of cane in large quantities in the U. P. and Bihar when protection was granted to the industry. (2) the fact that as many as 26 out of the 32 factories which existed in the pre-protection period were located in the U. P. and Bihar (14 being in the U. P. and 12 in Bihar), (3) cheaper cost of cultivation in these provinces, (4) availability of suitable quality of cane as a result of researches carried on in the Research Station in Coimbatore (Southern India) for evolving a suitable quality of cane for the sub-tropical region and (5) availability of capital and business enterprise in Northern India.

Further Development of Industry should be Outside the U. P. and Bihar

A glance at the distribution of factories will at once indicate that this phenomenon of excessive concentration of the factories in these two provinces, which leads to compulsory transport of 75 per cent of their production to other territories which are thus dependent upon the former for their supplies of an important article on the diet of millions in their areas, should be remedied at the earliest opportunity. As observed elsewhere, however, with the *per capita* consumption of sugar in the country remaining at its present low level, more factories are not required to be set up, as the existing factories, if they work for the full season and up to their full capacity, are capable of producing about 15,00,000 tons of sugar, which is about 25 per cent more than our present annual requirements. But, when there is an increase in the demand as a result of either increased consumption of sugar or possibility of export of sugar, any new factories that may be necessary should be located outside the provinces of the U. P. and Bihar in order that the various provinces may be able to supply to a larger extent their own requirements of sugar, and thus be free from the danger of lack of supplies of sugar from these distant provinces owing to the transport difficulties. This phenomenon of scarcity of sugar in various areas located at a distance from the main sugar producing belt, in spite of there being large quantities of sugar in the godowns of the sugar factories in the U. P. and Bihar, due to transport difficulties caused by the shortage of wagons and locomotives since the outbreak of World War II, was witnessed for the first time in the latter half of 1942, when various provinces had to go on ration in spite of the country having sufficient stocks of sugar. It is a matter of gratification to note in this connection that the Indian Sugar Mills Association, as also the Governments of the U. P. and Bihar have reconciled themselves to the above view which is only fair, natural and justified on the part of the other provinces, viz. that any further development of the industry should be in other territories. Indeed, the Indian Sugar Mills Association has passed resolutions at its various Annual Meetings since 1937 expressing its opinion that in order to achieve a balanced development of the industry and in order to prevent inter-provincial jealousy, future expansion, when necessary, should be outside the U. P. and Bihar. In fact,

in order to regulate the industry properly and rectify the present position, proposals were also made to the Government of India for legislating that no factories should be allowed to be set up without a license, but the Government of India have shown their unwillingness so far to take any action on these lines. In the interest of an orderly development of the industry, we feel that the Government of India should control location of factories except under licences, as is done in the U. P. and Bihar. It should be observed here, however, that it was as early as 1937 that the Government of the U. P. and Bihar passed legislation[1] whereby no new factories could be constructed and no extension of the plant of an existing factory, which is likely to increase its capacity for crushing cane, could be made, unless it had been granted a license by the Government. This step of the Government of the U. P. and Bihar was very timely and commendable as it prevented any further concentration of factories in these two provinces.

Future Trends of Development—more even spread Desirable

We may venture the opinion that the future trends of the sugar industry and its localisation in India will depend to a large extent on the trends of consumption. While the other provinces may now be reconciled to the present disproportionate share of the U. P. and Bihar, they will certainly insist that every increase in the demand ought to be met by their own domestic production with a view to ensure a certain amount of self-sufficiency and freedom from dependence on other provinces for the supply of such an essential article of food. And this will remedy the present uneven distribution and bring about a diffusion of the industry. In fact, looking ahead to the possibility of export of sugar from India, we may unhesitatingly state that factories near the Port towns would be an ideal location. These factories would make a great saving in freight charges while exporting sugar out of India, and, in addition, they would also be able to offer a more effective competition if any attempt was made at any time to dump sugar in India by foreign countries, although this is unlikely in view of India's present production, and high tariff duties which are bound to continue till the 31st March, 1946, under the Sugar Industry (Protection) Act, 1932.[2]

Comparative Increase of Production and Consumption of Sugar

It will be interesting to see at a glance the comparative figures of production and consumption of sugar in the various Provinces. This interesting study, in addition to pointing out the great disparity between figures of production and consumption in various areas, also shows how widely varying the *per capita* consumption of sugar is, in the various provinces.[3]

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[1] *Vide* Clause 9 of the Sugar Factories Control Act, U.P. and Bihar. The entire text is given in the "Indian Sugar Industry", 1941, pp. 12-33.

[2] The present protective duty on sugar is continued from year to year, under the Indian Finance Act, since 1939. The Government have not passed an Act for continuing the duty till the 31st of March 1946.

[3] It was a revelation when, in a speech at the Bombay Rotary Club on the 13th October 1942, Mr. M. P. Gandhi pointed out that Bombay was the sweetest province in India, her *per capita* consumption being about 17 lbs per annum as compared with Bengal, a province popularly believed to be a large consumer of sweets and sugar, which consumed only about 6 lbs. *Vide* Indian Merchants' Chamber, Bombay, Monthly Journal for November 1942.

Bombay's Advance in Production

Bombay is making a steady advance towards self-sufficiency since 1936, and it must be said that in this matter the factories in Bombay have been helped by the high profits which they have been able to make during the last few years due to high prices of sugar ruling in the country owing to fixation of high minimum prices of cane by the Government of the U. P. and Bihar since 1937. A comparison of the balance sheets of the factories in Bombay and Madras with those of the factories in the U. P. and Bihar for the last few years will bear this out. The Bombay factories have their own cane plantations unlike the factories in the U. P. and Bihar which have to buy all the cane from cane cultivators. The high profits provided by the industry in Bombay (and also in Mysore) have resulted in large extensions to the existing plants and establishment of new ones. In 1932, Bombay had only two factories and in 1941 there were 12, including the factories located in Indian States in the Bombay Province. Production of sugar in Bombay has gone up from 19,000 tons in 1931-32 to 81,000 tons in 1943-44 :

TABLE NO. 9

Production, Consumption and Per Capita Consumption of Sugar in various Provinces and States, during the years 1937-38 *and* 1938-39 *(Nov.-Oct.)*

Province	1937-38			1938-39		
	Production	Consumption	*Per capita* Consumption	Production	Consumption	*Per capita* Consumption
	Tons	Tons	Lbs.	Tons	Tons	Lbs.
Bengal ...	26,000	1,90,000	7.9	14,900	1,39,000	5.8
Bombay ...	62,000	2,30,000	16.3	73,400	2,44,000	17.0
Madras ...	35,000	1,00,000	3.9	38,700	88,000	3.4
Bihar ...	2,32,000	58,000	3.3	1,66,600	50,000	2.8(a)
U. P. ...	6,55,000	1,50,000	6.4	4,05,400	1,70,000	7.1
Punjab ...	30,000	2,06,000	14.9	19,800	1,64,000	11.8
C. P. & Berar ...	...	44,000	5.0	...	37,000	4.2
Assam ...	...	18,000	4.0	...	19,000	4.1
Sind and British Baluchistan ...	...	30,000	12.6	...	34,000	14.1
Orissa ...	...	8,000	...	...	8,000	...
N.-W. F. P. ...	...	22,000	10.5	...	13,000	6.2
Delhi ...	...	10,000	30.3	...	16,000	44.8
Rajputana ...	...	43,000	9.9	...	37,000	6.7
Central India ...	...	23,000	4.5	...	24,000	4.6
Nizam's Territory ...	...	21,000	3.0	...	19,000	2.7
Kashmir ...	...	2,000	1.2	...	3,000	1.7
Mysore ...	...	4,000	1.3	...	8,000	2.6
All-India ...	...	11,59,000	7.2	...	10,73,000	6.6

(*a*) Includes Orissa also.

Localisation of Gur Industry

Incidentally it would be interest also to see the position of the localisation of the *gur* industry. The following table gives the net production of *gur* in different Provinces and States of India during the periods from 1st November, 1938, to 31st October, 1940 :

TABLE NO. 10

Net Production of Gur in India (November-October) by Provinces and States

Provinces and States	1938–39	1939–40
	Tons	Tons
United Provinces (including States)	7,28,000	9,16,000
Punjab	1,65,000	2,19,000
Bihar	1,24,000	30,000
Bengal	3,50,000	3,91,000
Madras	1,87,000	2 67,000
Bombay (including States)	1,52,000	1,81,000
North-West Frontier Province	50,000	67,000
Assam	31,000	35,000
Central Provinces & Berar	41,000	38,000
Orissa	52,000	52,000
Sind	9,000	8,000
Delhi	400	800
Mysore	20,000	36 000
Hyderabad	50,000	54,000
Baroda	5,000	5,000
Bhopal	2,000	3,000

The output of *gur* has increased in most of the provinces. In Bihar it fell considerably, due perhaps to the utilisation of a greater proportion of the cane crop for the manufacture of white sugar.

The estimation of consumption of *gur* in the Provinces presents great difficulties. In the first place, figures for imports and exports of *gur* by road for the different provinces, are not available. The error on this account is likely to be considerable. Further, the figures for imports and exports by rail and river are not known separately for *gur*, but only for *gur* and molasses combined. The difference between the initial and the closing " invisible " stocks are again unknown. Lastly, the exports of *gur* to places outside India are not known separately for each Province. It is, therefore possible only to make very rough estimates.

The table No. 11 shows imports and exports of *gur* into and from various Provinces and States, during the same periods.

A glance at tables No. 10 & 11 will show that the production of *gur* is concentrated in the U. P., the next being Bengal, Madras and the Punjab. The U. P. has to export a large bulk of its production to other provinces. Amongst those importing *gur* in large quantities are the Punjab, Bengal, and Bombay.

Shortage of Sugar and Black Markets in 1942

We would also like to point out that this factor of the concentration of the production of sugar and *gur* in the U. P. and Bihar attracted considerable attention in the middle of 1942, as, due to transport difficulties caused by shortage of wagons and restrictions placed on the movement of sugar by the Sugar Control Order of 1942, the distribution of sugar was badly affected leading to enforced rationing of sugar in various distant provinces like Bombay, Madras, Sind, etc. even when

TABLE NO. 11

Imports and Exports of Gur, Rab, Molasses, etc. into and from the various Provinces and States

Provinces and States	Period. November to October			
	1937-38		1938-39	
	Imports	Exports	Imports	Exports
	Tons	Tons	Tons	Tons
United Provinces	2,181	3,62,692	5,000	2,59,000
Punjab	1,48,658	7,363	1,03,000	24,000
Bihar	35,371	96,701	18,000	89,000
Bengal	1,42,519	6,392	1,23,000	6,600
Madras	9,431	30,890	12,600	38,000
Bombay	50,980	19,237	43,400	16,000
Assam	10,089	1,446	10,000	300
C P. and Berar	35,781	186	30,000	168
Sind and British Baluchistan	19,383	119	14,000	94
Orissa	2,083	581	2,334	2,664
N.-W. F. P.	551	32,980	527	20,500

there was enough sugar in the country. This phenomenon of "poverty amidst plenty" and of "black" markets demanding unconscionably high prices of sugar due to shortage in a particular area was witnessed in 1942 and also in 1943. The chief reason[1] of this distress caused to the people who had to form long queues for obtaining a few lbs. of sugar in various cities like Calcutta, Bombay, Madras and other similar places in these provinces, who had also to go on ration in respect of sugar, if not entirely without it for some time, was the lack of an even spread of the industry in the country, due in a large measure to the absence of farsighted planning by the State and the industry.

No Expansion Possible During War Period

No further expansion of the industry appears to us to be possible till the duration of the World War, after which there are bound to be considerable changes in the sugar economy of the world, as also of this country. The destruction of the well organised system of production in Java, as a result of the "scorched earth" policy[2] and the dislocation of the sugar industry in countries like France, Russia, Czechoslovakia—large producers of sugar—may result in the necessity of a large development of cane sugar in this country for catering to various markets flung all over the world. Increased consumption of sugar which is required

[1] *Vide* Mr. M. P. Gandhi's speech before the Rotary Club of Ahmedabad on 3rd December 1943, reproduced in the Indian Sugar Industry Annual, 1943.

[2] An authoritative account of the destruction caused by the "scorched earth" policy relating to the sugar industry in Java by Dr. Honig Hano of the famous sugar experimenting station at Pasoeroean (Java) stated that Java had to surrender the sugar industry which was completely broken up, the warehouses at the ports which contained about 4,00,000 tons of sugar were burnt, harbour installations were demolished and lighters used for transport of sugar from the warehouses to coastal towns were burnt, workshops at the sugar factories were knocked to pieces, etc. *Vide* an article in "Indian Sugar", Cawnpore, issue for September 1942.

according to the International Standards of Nutrition for the people of this country would also point to the necessity of a further expansion of the Indian sugar industry. For this and other reasons we feel that a further development of the sugar industry in India is in the offing in the post-war period, and when this opportunity presents itself we hope that Bombay, Madras and Bengal will make up the leeway and will develop the industry in their areas to a very large extent.

Incidentally this post-war reconstruction[1] will provide an excellent opportunity for the reorganisation of this great industry—the second biggest industry of the country—next only to Cotton Textiles,[2] in the various provinces on proper lines, and we fervently hope that full advantage would be taken of this opportunity for a suitable and well planned territorial distribution[3] of the industry along modern trends of economic thought.

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[1] During the middle of 1944, the Hon. Sir Ardesher Dalal, Member of the Government of India in charge of Planning and Development issued a communique emphasising the necessity of regional development of various industries in the country in order to ensure a more orderly economic development of various provinces.

[2] M. P. Gandhi's "Indian Cotton Industry Annual" for 1941, 1942, 1943.

[3] *Vide* "Industrial Organisation in India", 1935, by Dr. P. S. Lokanathan.

CHAPTER XIII

SUGAR CONTROL IN THE U. P. AND BIHAR

It is only to be expected that with the uniqueness, among Indian industries, of its origin and the peculiarities of its position, the sugar industry should confront the industrialists and the governments alike with a number of knotty problems. We have so far confined our attention to the issues that arise from the grant of a high degree of substantive protection to the sugar industry in India. Though, as we endeavoured to show in the earlier chapters, the grant of such protection is to be attributed to the impact of deeper economic and social forces, the fact remains that in rearing a sugar industry on a large scale, the costs which the nation has had to incur are apparently on an even larger scale. The primary question to be faced, therefore, is whether the experience of the last decade is on the whole calculated to reinforce our faith in this method of stimulating industrial development and how far the concrete results of a decade's working of the sugar industry may be deemed to be an adequate return for the costs of protection. In answering these questions, we brought out the fallacies of the anti-protectionists, their calculations of cost to the consumer, and urged the view that, if the price of Indian sugar were compared with the price of foreign sugar as it would be if no Indian industry had come into existence, then the price paid by the consumer could not be held to be unreasonable. We urged at the same time that the benefits of protection do not depend only on the protected industry any more than they are confined to investors in that industry, that if the cost of production of sugar were to be genuinely reduced, then equal attention must be given to the development of cane cultivation and of industries which can utilise the by-products of the sugar industry. We have also sketched at length the short history of the Sugar Syndicate which is now the common selling organisation of the sugar mills of the U. P. and Bihar. We also showed how the special position of the U. P. and Bihar mills in the sugar industry of India led more or less inevitably to the extension of the intervention of the Provincial Governments from the fixation of cane prices to the complete control of production and of sales. It is true that most of the problems arise primarily from the nature of the attempt at State regulation; but, as we shall see later, they are also problems which the industry would have had to tackle in due course; and this chapter will be devoted to an examination of such problems which may be said to concern the Indian sugar industry inasmuch as they affect by far the largest section of it.

The origin and history of government intervention in the working of the sugar industry have been indicated in the chapter on the "Fixation of Cane-prices". Here, it should suffice to say that the natural solicitude of a popular ministry for the interests of the cane-grower *vis-a-vis* an industry with a very liberal measure of protection led the Government of the U.P. and Bihar by rapid stages to an assumption of the complete control of the working of the sugar factories in their respective territories. The identity of interest has impelled

the Adviser to Governments of these two Provinces to continue the precedent set up by the Congress Ministries of working with the utmost co-operation and on identically similar lines. The chaotic conditions which often arose in the sugar market and the inability of the sugar mills to maintain a common selling organization on a voluntary basis compelled the Governments of the U.P. and Bihar to abandon half-hearted measures and aim at the most thorough-going forms of control. Once it became clear that the Sugar Syndicate could not survive without government recognition, all pretensions of adherence to *laissez faire* were abandoned; and the Sugar Factories Control Act and the Rules made under it vested the most far-reaching powers in the hands of the administration.

We may now proceed to examine the main features of the new regime which was thus instituted for the sugar mills of the U.P. and Bihar.

According to the statement of Objects and Reasons, the Indian Sugarcane Act, 1934 (XV of 1934), was not sufficiently comprehensive for dealing with the problems of the sugar industry, and it was found necessary to replace it by a new measure which will provide for a better organization of cane supplies to sugar factories.

The Bill deals only with factories worked by the vacuum pan process and its provisions relate to:—

(*a*) the licensing of sugar factories,

(*b*) the regulation of the supply of sugarcane to factories,

(*c*) the minimum price for sugarcane,

(*d*) the establishment of Sugar Control Board and Advisory Committees, and

(*e*) a tax on the sale of sugarcane intended for the use of factories.

Section 9(I) of the Act (U.P.) lays down that "no person shall commence the construction of any building intended to be used as a factory or any extension of the plant of an existing factory which is likely to increase its capacity for crushing cane unless he has been granted a licence by the Provincial Government. An application for a licence under this sub-section shall be made to the Provincial Government in the prescribed form."

And Section (II) lays down that "the licence shall be subject to such conditions as the Provincial may, after consulting the Board, impose in respect of all or any of the following matters at the time when the licence is granted:—

(*a*) membership of any organization of the sugar industry the main object of which is to regulate the sale of sugar and which is recognised by the Provincial Government;

(*b*) the price below or above which, the terms on which, and the persons to whom or organisations to which or *through whose agency*, and variety, grade or quantity of sugar produced in the factory may be sold;

(*c*) the manner in which sugar produced in the factory shall be graded, marked, packed or stored for sale;

(d) the quantity of cane *that* shall be crushed during the crushing season, or the quantity of sugar *that* shall be manufactured during the period of the licence;

(*e*) such other matters as may be prescribed, *including conditions of labour.*

The comprehensive nature of the control sought to be established is evident from the conditions set forth above. As regards the regulation of the supply of sugarcane to factories, the Act provides for the purchase of cane—

(*a*) in an area reserved for factory;

(*b*) in an area assigned to a factory;

(*c*) in areas which are neither reserved nor assigned.

The differences were explained in the Statement of Objects and Reasons thus:—

> "In a reserved area if a cane-grower or Cane-growers' Co-operative Society offers to sell cane to the factory for which the area has been reserved, the factory is bound to enter into agreements with such cane-grower or Cane-growers' Co-operative Society to purchase such minimum quantity of cane as may be prescribed in the rules. In other words, a cane-grower or a Cane-Growers' Co-operative Society in a reserved area is given an assurance that his or its cane will be taken by the factory in accordance with the terms and conditions of an agreement, but the factory will not be bound to enter into agreements with such cane-grower or Cane-growers' Co-operative Society for more than the prescribed quantity of sugarcane."

This prescribed quantity is determined by the area under cane cultivation with a proper system of rotation of crops. Latitude is allowed in fixing the boundry reserved. The Act, therefore, makes provision for a survey of reserved areas. It further provides that the factory shall make direct purchases from cane-growers or Cane-growers' Co-operative Societies. Purchasing agents are not allowed to function within a reserved area. In return for the assurance regarding the purchase of cane, the Act prohibits the purchase of cane within the reserved area by or on behalf of other factories. As in some years there may be overproduction of sugarcane within the reserved area, the Provincial Government is given power to direct that the factory shall not purchase cane outside its reserved area unless it first agrees to purchase all the cane available for sale within its reserved area. This provision does not, however, affect agreements entered into by the factory with growers outside the reserved area. The object of creating a reserved area for a factory is to encourage factories to enter into direct relations with growers and to take an interest in the development of cane cultivation within its reserved area.

There are three important differences between a reserved area and an assigned area; firstly, in a reserved area a factory is bound to enter into agreements with all cane-growers or Cane-growers' Co-operative Societies, whereas in an assigned area the only obligation is to enter into agreements for a specified quantity of cane; secondly, in an assigned

area, cane may be purchased through a licensed purchasing agent whereas in a reserved area cane can only be purchased direct from cane-growers or Cane-growers' Co-operative Societies; and, thirdly, in a reserved area only the factory for which the area is reserved may purchase cane whereas in an assigned area any factory or its licensed purchasing agent may purchase cane. In assigned areas and in areas which are neither reserved nor assigned cane may be purchased by—

(*a*) the occupier of a factory or any of his employees specially authorised to purchase cane;

(*b*) a licensed purchasing agent or any of his employees specially authorised to purchase cane; or

(*c*) a Cane-growers' Co-operative Society.

In order to encourage the organisation of Cane-growers' Co-operative Societies, the Act provides that a factory shall not enter into agreements direct with any members of such Society.

As regards the minimum price for sugarcane the Act left a great deal to the discretion of the Government and provided the Sugar Control Board and the Advisory Committee for the consultation of the Government, the former in dealing with the major problems of licensing of factories and price-fixing, and the latter, the minor and local problems of determining reserved and assigned areas. The Act provided for penalties of an effectively deterrent kind. It is to the rules, therefore, that one has to look for the working of this part of the Act.

It is laid down in the Rules that, subject to the control of the Provincial Government, the Sugar Commission shall be the final authority to deal with the Indian Sugar Syndicate in all matters connected with the production and sale of sugar and such other matters as may be referred to it by the Provincial Government. And the Sugar Commissioner may, subject to the control of the Provincial Government, by order, require the occupier or manager of a factory to submit to the Sugar Commissioner or to any other authority specified in such order any information or any return relating to the production, supply and crushing of cane, the manufacture of sugar, and the quantities and grades of sugar manufactured, in stock and issued and the quantities in which and the prices at which such sugar is sold. An Inspector may, within the local limits of his jurisdiction, issue instructions to ensure "the equitable purchase of cane."

In the Rules framed under the Act, the conditions for the grant of a licence are further detailed. No licence for a new factory is to be granted, if it is within 10 miles of another and if the quantity of cane available for it after meeting the cane reserved for another factory is less than 60 per cent of its estimated cane requirement and if the additional production of sugar is likely to affect adversely the interests of the sugar industry.

As regards supplies of cane, the submission by the factory of its normal requirement based on its average daily crushing capacity is an essential preliminary for action to be taken by the Cane Commissioner. This officer may, after a certain stipulated procedure, declare an area to be a reserved area for the purpose of supply of cane to a particular factory and in doing so, he must take into consideration the position

obtaining previously, the distance between the factory and such area and the facility of transport therein. The factory shall then enter into agreements with cane-growers, Cane-growers' Co-operative Societies or purchasing agents for the purchase in the assigned area of such quantity of cane and in such manner as may be fixed by the Cane Commissioner.

Provided that the total quantity of cane for which the factory is required to enter into agreements with cane-growers, Cane-growers' Co-operative Societies or purchasing agents in an assigned area shall be such that this quantity together with the estimated quantity of cane available in the reserved area of the factory shall not exceed 80 per cent of the provisional cane requirement of the factory as determined under Rule 21. Rules are also framed to ensure quick attention to cane-carts, correct weighment, i.e. with a margin error of 2 per cent, and payment without unfair deduction.

It is unnecessary to go further into the details of this unique piece of legislation. What is important is that the Sugar Control Act confronts the sugar mills of the U. P. and Bihar with a *fait accompli* in a number of matters which were formerly subjects of keen controversy. As soon as it was evident that the majority of mills which protection would give rise to were established in these two provinces, the attention of the industry as well as of those who were closely following its fortunes was concentrated on the various possible methods of ensuring an adequate supply of cane on economic terms, the agencies through which the purchases were to be effected and the modes and nature of payment to the cane-growers. There were, of course, in addition to these, questions of restriction of output whether of cane or of sugar and the fixation of price for cane. At quite an early stage, the industry was found to discuss such questions as zoning, licensing, the adoption of a system of licensed contractors for the purchase of cane, the advantages and disadvantages of having intermediaries between the cane-growers and the mills and the desirability of co-operative activity among the cultivators. It may be readily recognised that the industry naturally viewed these questions from its own standpoint while it was ready to appreciate suggestions calculated to improve the well-being of the cultivators. It could not see the justice, not to speak of the wisdom, of the Government fixing a minimum price for cane. It was alive to the need for regulating the output of sugar and for preventing needless additions to the total productive capacity of the industry. But the danger of having to pay a stiff price for State help in this direction was never overlooked. Likewise, a system of licensed agents for the purchase of cane from the growers was generally viewed askance. In fact, in the early thirties, opinion in the Sugar Mills Association was decidedly against zoning. But the advantages of zoning were at the same time sought to be realised by bringing about private arrangements amongst a number of millowners calculated to have the same effect as formal zoning. The Indian Sugar Mills Association, which was established in June 1932, assisted several factories in coming to an amicable settlement on this question. The Association was also instrumental in getting the convention accepted that no factory should place its weighbridge for purchase of cane at another station where a factory is located, and wasteful competition was thus eliminated. Even the Railways co-operated in this matter, and they did not allow any factory to place a weighbridge on Railway land, on outside stations where factories were situated. Natural zones were then established, and there

was no difficulty, except perhaps at the fag end of the season, owing to the paucity of supplies, and even this was not very frequent. It is a question how far this system of private arrangement would have progressed.

But the position in regard to the licensing of contractors was somewhat different. The factories no doubt preferred to deal with the growers direct; but as the ignorant cultivators sometimes defaulted and could not be educated to a live sense of their responsibilities, it was found necessary to employ contractors. Complaints were often heard that even when the factories paid a fair price for cane, the growers got little of it and were, therefore, hard hit. The United Provinces Government suggested at that time that there ought to be a system of licensing contractors which might provide that the licensee should give the actual grower from whom he gets the cane, at least 90 per cent of the price he receives from the factory. The licence of a contractor who failed to comply with this condition, it was suggested, would not be renewed. It was also suggested that the contractor would be responsible for giving out pass books to all growers in which the amount of cane supplied by them and the money paid to them would be duly entered. In answer to this suggestion, Mr. H. C. Prior, Revenue Secretary of the Government of Bihar and Orissa, pointed out at the Simla Conference of 1933 that he felt that the nature of proceeding for the cancellation of a licence of a contractor when he misbehaves, would be very complicated and stated that it seemed to him that it was likely to be somewhat in the nature of Section 100 proceeding with a large number of witnesses appearing on either side. There is no guarantee, he observed, about the integrity and probity of the contractors and the system of licensing would only increase the abuses. The suggestion did not meet with approval; and the sugar mills representatives who met at Gorakhpur at that time passed a resolution calling on the factories to buy cane from the cultivators.

It should be mentioned here that both in regard to zoning and in regard to licensing, opposition was based in the main on (1) administrative difficulties and complications, and (2) the undesirability of state interference in the affairs of private industry. It may be supposed that, when they drafted the Sugar Control Bill, the Governments of the U. P. and Bihar neither had qualms about the latter nor apprehensions about the former. On all these matters which were subjects of controversy, the governments arrived at definite decisions and the Act is based on such decisions. Inasmuch as the control effected by this legislation is of a comprehensive kind, the argument about administrative difficulties loses much of its force. And the system adopted under the Act for ensuring the supply of cane to factories can hardly be said to be exclusively a system of zoning or of licensing. For the essence of the system, so far as purchases are concerned, is that factories enter into agreements with growers or Co-operative Societies or, in the alternative, purchasing agents for the bigger part of their cane requirements. The dangers which were formerly stressed have to a large extent been provided against. The entry of new factories coming in and competing for the identical supplies of cane is rendered impossible by the insistence on licence and by the provision that no licence shall be granted to a new factory within ten miles of an old one. And when the price of cane is fixed by the Government, there can be no danger that the seller or the buyer of cane would

be able to tyrannize over the other. The preservation of zones which are neither reserved nor assigned and the grudging recognition given to purchasing agents may be regarded as buffers against miscalculations or unforeseeable upsets. That such dangers are expected may be seen from Rule 4 of the Rules made under the Bihar Sugar Factories Act :

> If the cane-growers or Cane-growers' Co-operative Societies in the assigned area are not willing to enter into agreements to supply, or fail to supply, the requisite quantity of cane, the occupier or manager of the factory or the purchasing agent may, after giving a fortnight's notice to the Collector having jurisdiction over the area concerned, purchase the balance of the cane required from outside the assigned area unless otherwise directed by the Collector.

An element of unfairness is discernible in the provision which provides conditions for the manager of a factory being left to his own resources in a difficult emergency.

The thoroughness of the measure is obviously both the defence and the chief offending of the Sugar Control Act. Clearly, the merits of the questions which have thus been settled cannot change merely because the U. P. and Bihar Governments have chosen to decide them in a particular way. But it may be readily recognised that the Act solves, necessarily in a rough and ready way, a number of questions which would have worried the industry and which the industry would have been unable to solve solely by its unaided private effort. Inasmuch as fixed price for cane is of longer standing than the other features of the Sugar Control Act, the relief from the vexatious problems of a minor character, not to speak of the major problem of regulation of output may be regarded as something to be thankful for.

But by far the most significant result of the Sugar Control Act is to be seen in the determination of the provincial governments to help the agriculturists by education, by promotion of co-operative effort, by introduction and encouragement of better methods of *khandsari* and *gur* manufacture, etc. Before proceeding to describe the efforts in these directions, it must be noted that the governments utilised the control which the new Act gave them, to introduce the system of deferred payment to cultivators. This, as we have seen in the chapter on price-fixing, is an indispensable corrective to the errors inevitable in the system of price-fixing by Government.

Deferred Payment to Cultivators—1941-42

When fixing the minimum price for sugarcane for 1941-42 season, the U. P. and Bihar Governments made it clear that a deferred payment should be made to cultivators in the event of the price of sugar moving above Rs. 9-6-0 per maund and the average price for the season happened to be above Rs. 9-12-0 per maund. The exact method by which the deferred payment was to be made was clarified later as below :—

(1) If the average selling price of sugar produced in 1941-42 exceeds Rs. 9-12-0 per maund but does not exceed Rs. 10-8-0, an additional price of one pie per maund of cane shall be payable for every anna by which the average selling price exceeds Rs. 9-12-0.

(2) If the average selling price of sugar exceeds Rs. 10-8-0 per maund an additional price of one pie per maund of cane for each increase of 0-1-9 above Rs. 10-8-0 shall be payable.

(3) The average selling price of sugar shall be determined in a matter to be prescribed by the Government in terms of the average selling price of standard sugar i.e. D-24 Nawabganj.

(4) In reckoning the additional price payable, amounts returned by the Indian Sugar Syndicate to members from the reserve shall be reduced to annas and added to the average selling price of the sugar.

(5) Excess payments for cane made by factories to growers above the minimum cane price will be set off against the amount calculated as the additional price due to the growers or the Society.

At the end of the season, a total of 0-7-0 was paid per maund of cane.

Improvement in Khandsari and Gur Manufacture

We may now turn to the efforts made to improve the position of khandsaris and *gur* manufacturers. It should be emphasised that all these efforts are not directly traceable to the Sugar Control Act. As often happens, ideas originate in one or another of the technical bodies like the Imperial Council of Agricultural Research. Grants are obtained from various sources; and the efforts, too, date from an earlier period than the passing of the Sugar Control Act. Nevertheless, in so far as the Act gives the Governments the power and the machinery to deal with these problems and particularly co-operative sales, they may be said to be linked to this piece of legislation.

In regard to the Khandsaris, it is noteworthy in the first place that no minimum price has been fixed by the Governments of the U. P. and Bihar for cane purchased by Khandsari factories and the price paid depends upon the locality. During 1939-40 some Khandsaris in the U. P. purchased cane at 0-6-5 to 0-7-11 per maund, while those in Bihar at 0-6-9 per maund. This compares very favourably with the minimum prices paid by the factories in the U. P. and Bihar varying from 0-8-9 to 0-10-9 per maund. Besides the Khandsaris have not to pay any cess which the factories have to pay at the rate of 0-0-6 and have not to incur other expenses by way of commission to Co-operative Societies and railway freight on out-station cane. The total cost of manufacture of Khandsari sugar may be taken at Re. 1 per maund. The Tariff Board has given interesting figures on the cost of production of sugar by Khandsaris and open pan concerns. The average price of Khandsari sugar is about six to eight annas lower than the prices realised by factory sugar.

The Khandsari industry is at an advantage in the interior areas, far removed from factories where cane is available cheaply and which cannot be disposed of in any other way. Amongst other advantages may be mentioned the following:—

(*a*) Negligible transport and other charges on cane.
(*b*) Saving of 0-0-6 per maund on cane cess.
(*c*) Saving of Rs. 2-8-0 per cwt. in sugar excise duty.
(*d*) Less transport charges on sugar which is consumed in areas in close vicinity.
(*e*) Some preference for Khandsari sugar by orthodox people.

The Khandsari sugar factories can be helped by the Government by improvement of their equipment and introduction of improved types of crushers, juice-boiling bels etc., by improvement of the methods of manufacture in order to improve the quality of the finished product; by better facilities for getting the necessary equipment on hire and by better marketing facilities. The Imperial Council of Agricultural Research had sanctioned a grant of Rs. 1,67,380 for the establishment of a Sugar Research Testing Station for the indigenous system of *gur* and sugar manufacture for a period of 5 tears ending in November 1941. A small grant was also made to the Government of Bihar for investigation into the possibilities of manufacturing Khandsari sugar by single pan method.

Gur Development Scheme in U. P.

As regards *gur*, a *gur* development scheme has been in operation for some time in the United Provinces. Every rupee spent on the scheme has added much to the cane-growers' income. The improved types of mills alone introduced in the last two years are estimated to add Rs. 3 lacs a year to the grower's income. The objects of the scheme of development of *gur* are to avoid wasteful processes of manufacture and increase the quantity as well as quality of sugar by: (*a*) replacement of local Kolhus by improved ones to obtain better extraction; (*b*) introduction of improved types of furnaces to prevent waste of fuel and time to avoid inversion and charring; (*c*) popularisation of cheap and simple methods of juice clarification to improve colour, taste and quality of the product, and (*d*) provision of marketing facilities to capitalise the results of improvements effected.

The scheme was inaugurated in 1937-38 in almost 2,000 villages and has made great progress since then. The *gur* industry is growing in importance daily as it has become the only practicable method of disposing of the cultivator's surplus cane. Kolhus are being installed in areas which never saw one before.

One important development affecting the *gur* industry is the inauguration of the *Gur* Market Information Service by the Department of Industries, U. P. The object of the *Gur* Marketing Information Bureau is to collect and disseminate information regarding the conditions prevailing in all the important *gur* markets where, as in the case of the reserved areas, the cane-grower is assured of a fair price, *gur*-making is definitely discouraged, and this definitely is a point on which the apprehensions of the sugar industry were readily set at rest by the U. P. Government.

The measures cited above are for the normal times. Special efforts are also put forth when the Government is confronted with the problem of surplus cane as a result of a large cane crop, and decline in mill consumption, and the consequent restriction in production. The Governments of the U. P. and Bihar decided to levy a cess on cane in order to give relief to cultivators. At the same time there was a reduction in the minimum price in certain districts in the U. P. and in the whole of Bihar in 1939-40. The Government of the U. P. took steps in time to convert the surplus of cane into *gur* and carried on a widespread campaign to impress upon the districts where there was a real paucity of Kolhus (indigenous cane-crushers). Special efforts were made to

supply these on hire. A sum of Re. 1 lac was sanctioned on account of Takavi for supply of improved types of Kolhus and pans on payment of hiring charges. The big farmers were also advised to instal power crushers and financial help was promised in deserving cases by the Cane Commissioner. The staff of the *Gur* Development Department was also augmented so as to enable co-operation between the cultivators and to ensure fullest use of all available Kolhus. It would be a wise course for the cane-growers in the province of the U. P. to possess *gur* manufacturing equipment for use in abnormal years.

Development of Co-operative Cane Societies in Bihar and United Provinces by means of the Sugar Control Act

The Government realised that it was through the encouragement of co-operative activity that the utmost good could be done to the cultivators. And here the Governments of Bihar and U. P. have the credit of having evolved a comprehensive and well thought out plan of developing the spirit of co-operation among the cane-growers.

Co-operative Activities in Bihar

The Government of Bihar sanctioned a scheme for the organization and operation of Cane-growers' Co-operative Societies in December 1935, from the assistance given by the Government of India from the excise duty on sugar for organizing the cane-growers into Co-operative Societies and to enable them to obtain a fair price for their cane or for other purposes directed to the same end. Two Special Officers, with headquarters at Chapra and Samastipur, 13 Organizers and 13 Supervisors were appointed under the scheme with instructions to form experimental Cane-growers' Co-operative Societies in the areas of a few factories, in consultation with the local officers and the representatives of sugar factories interested in the well-being of the cane-growers. Only 103 Cane-growers' Co-operative Societies operated in the crushing season 1936-37. These Societies supplied 9 lacs maunds cane to the sugar factories. The number of these Societies increased to 215 and the amount of cane supplied by them to 16.28 lacs maunds in 1937-38.

Cane-growers' Co-operative Societies under the Bihar Sugar Factories Control Act, 1937

When the Bihar Sugar Factories Control Act, 1937, came into force, the Government of Bihar announced their decision to form Cane-growers' Co-operative Societies in all the villages in the reserved areas of the sugar factories to enable cane-growers to obtain the full protection vouchsafed to them by the aforesaid Act. As it was impossible for a small staff to form Societies in the reserved areas of all the sugar factories, the local Government sanctioned an additional staff of 3 Special Officers, 22 Organizers and 57 Supervisors to take up the organization of Cane-growers' Co-operative Societies in the areas of all the factories in the province. Four circles under 4 Special Officers, 3 in North Bihar and one in South Bihar, operated in 1938-39. The total co-operative supply of cane by 425 Cane-growers' Co-operative Societies amounted to 13.40 lacs maunds cane in this season. With the appointment of additional officers, it became possible

to organize 671 Cane-growers' Co-operative Societies in 1939. Thus, 1096 Cane-growers' Co-operative Societies operated in the crushing season 1939-40 and supplied 66.75 lacs maunds cane to the sugar factories.

Cane-growers' Co-operative Societies in Bihar upto 1941-42

The policy of cautious expansion of Cane-growers' Co-operative Societies was followed in the year 1940 as well. Although a large number of Cane-growers' Co-operative Societies were formed in this year, most of the Societies were placed on probation for periods varying from 6 months to a year to enable them to qualify them for registration under the Co-operative Societies Act. Only 392 Cane-growers' Co-operative Societies were registered under the aforesaid Act. Altogether 1,488 Cane-growers' Co-operative Societies functioned and supplied 88 lacs maunds cane to the sugar factories, representing approximately 13 per cent of the total cane crushed in Bihar in the crushing season 1940-41.

Most of the Societies placed on probation were registered in the next year under the Co-operative Societies Act. Over 2,000 Cane-growers' Co-operative Societies with 40,000 members functioned in the crushing season 1941-42, in Bihar.

The Cane Department was sought to be unified by placing the Cane-growers' Co-operative Societies under the control of a Cane Commissioner from the 16th November 1939. The Cane Commissioner was appointed the Joint Registrar of Co-operative Societies and vested with the powers of a Registrar of Co-operative Societies, for administering these societies. To ensure the maximum co-ordination between the different sections of the Cane Department, he was further appointed as the Cane Development Officer, Bihar. The main intention in bringing the three sections mentioned above under unified control was to ensure the maximum co-ordination among them. A detailed plan for co-ordinating the work of these sections was laid down at a meeting of the gazetted officers of the department held on the 9th November 1940. Amongst other things, it was decided that the gazetted officers of the department posted in the various circles should meet at least twice every year and more frequently, if need be, to decide on their common programme and that local committees should be formed to carry out this programme into effect. The Assistant Directors of Agriculture were directed to conduct development work mainly through the societies and the Special Officers were instructed to select villages for the formation of the Cane-growers' Co-operative Societies with the concurrence of the Assistant Directors of Agriculture.

The scheme of co-ordination has been extremely successful so far. During the period, demonstrations were carried on cane cultivation, green manuring, compost making and the use of improved implements, of which by now there are 768 sets in Cane-growers' Co-operative Societies. In addition, interesting lectures were delivered at which members were advised not to ratoon their cane and where they were instructed how to recognise the prevalent diseases of cane

and how to prevent their spread by the use of good seed. As a result of these efforts, the cultivation of cane in line is now universal in Cane-growers' Co-operative Societies in North Bihar. Nearly 95 per cent of cane planted by the old members of these societies for supply to the sugar factories in the crushing season 1941-42 is under improved varieties of cane. Altogether 4,526 demonstrations were conducted in the Cane-growers' Co-operative Societies by the staff employed under the scheme for the improvement of sugarcane cultivation in the province.

Along with cane development, the Cane-growers' Co-operative Societies interested themselves in the campaign of Mass Literacy initiated by the Hon'ble Dr. Syed Mahmud, the late Minister of Education and Development, Bihar. The number of Mass Literacy Centres increased from 250 to 350 during the period under review. There was also a corresponding increase in the number of attending adults. More than 100 Societies are receiving copies of the "Roshani," the organ of the Provincial Mass Literacy Committee, Bihar. About 100 societies have equipped themselves with books issued under the "Mahmud Series".

Other Improvements

As the resources of societies are increasing, they are undertaking projects of general welfare in the villages. In the South Bihar Circle 20 surface wells were dug and two tube wells were sunk and two Rahat pumps were bought in the Saran Circle; 1,176 yards of village roads were repaired in the Champaran and South Bihar Circles by co-operative efforts. In the Samastipur Circle eleven village roads were built at a cost of Rs. 4,000, two-thirds of the cost having been contributed by the Government of India from the grant for rural uplift in the Darbhanga District.

Common Good Fund

All the Societies have been advised to establish a Common Good Fund by voluntary contributions from their members. The rate of contribution varies from one anna per cart to 3 pies per maund of the cane supplied by them. The purpose of this fund is to create a capital of at least Rs. 1,000 in each Society to enable it to undertake short-term crop financing. A sum of Rs. 4,000 was collected in this fund during 1939-40. These efforts are being continued so that the fund may be built up as quickly as possible.

Lack of Uniformity in various Areas

Heartening as is the progress recorded above, it must be said that there was no uniformity in the various circles as to how societies should be organized, audited and inspected; the bye-laws of the Primary Societies and Co-operative Development and Cane Marketing Unions varied from Circle to Circle; and the forms and registers used varied from factory to factory. But the work of the standardization was taken up and very considerable progress has been achieved so far. The necessary minimum number of registers were planned, standard forms were drafted, bye-laws for Cane-growers' Co-operative Societies and Co-

operative Development and Cane Marketing Unions were framed and standard rules of financing were issued. Standard forms of audit and inspection notes are being framed and the procedure for systematic inspection and audit of societies has already been laid down. The work of re-organization is continuing.

Training of Members

Along with the re-organization of the department, attention was paid to the training of the members of the Cane-growers' Co-operative Societies. Unless the members are thoroughly trained in the principles of co-operation, they will not be able to manage their societies successfully. The administration of these societies is extremely technical and calls for a specialised knowledge of accounts and business organization in its administration. The Registrar, Co-operative Societies, Bihar, deputed the Principal of the Co-operative Training Institute to train the members of the Cane-growers' Societies by holding peripatetic classes for a year. The training commenced in 1940 and it is hoped that it may bring about an all-round improvement in the working of these societies in this province in the near future.

Cane-growers' Societies in the United Provinces

Having referred to the organization set up by the Government of Bihar for development of the Cane-growers' Co-operative Societies in Bihar, we may refer in brief to the co-operative organization in the United Provinces. The U.P. Co-operative Societies have played an important part in assisting the solution of some of the major problems, e.g. regulation of cane supplies and development of cane. During the first years of the development of the sugar industry after the grant of protection in 1932, there was considerable inefficiency and confusion chiefly in the matter of cane supplies owing to lack of organization. As is observed elsewhere, factories sprang up like mushrooms and were located without much thought or plan, sometimes two factories working at the same station. This led to very conflicting arrangements over cane supplies and resulted in confusion. The cane cultivator who brought cane in bullock carts had to wait for a long time, sometimes more than two days, before his turn came for the weighment of the cane. In the meanwhile the cane dried causing loss in weight to the cultivator and causing loss in sucrose to the factory. Many of the contractors employed by the factories also robbed the growers of the legitimate price of cane also. There was no minimum price of cane before 1934-35. Factories were known to be paying only As. 3½ per maund of cane and this gave a bad name to the industry as a whole.[1]

We have already referred elsewhere to the legislation undertaken by the Government of India for controlling prices of cane as also on other matters relating to the weighment and purchase of cane (Sugarcane Act of 1934 and the Rules made by the U.P. Government under

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[1] *Vide* observations of Pandit Jawaharlal Nehru in his Autobiography, 1936, the chapter on "Paradoxes": "In recent years the fall in agricultural prices of most foodgrains and other articles suddenly led to millions of the peasantry, especially in the U.P. and Bihar, to cultivate sugarcane. A tariff on sugar had resulted in sugar factories cropping up like mushrooms, and sugarcane was in great demand. But the supply was soon far in excess of the demand, and the factory owners cruelly exploited the peasantry, and the price fell."

this Act). The Co-operative Department of the U.P. Government was then a very small one with limited resources of staff and funds. It was in 1935 that a grant of one lac of rupees from the Central Sugar Excise Fund was made "for the improvement of cane cultivation with a view to its co-operative marketing". The U.P. Government organized a scheme for the development of cane in the "gate" areas of such factories as were willing to pay an annual contribution of Rs. 3,000 to the Government to purchase cane through a co-operative society in the area. At the start about 20 factories joined the scheme. The primary intention of the scheme was to improve the quality of the cane both in respect of its yield per acre and its sucrose content. The factories, however, generally did not like the intervention of the Co-operative Societies in the matter of their cane supplies. Nor were they pleased in paying a commission to these societies at the rate of 3 pies per maund of the cane. With the passage of the U. P. and Bihar Sugar Control Act of 1938 after the advent of the Congress Governments in these Provinces, action was taken for reservation of specific areas for each factory, fixation of minimum prices, compulsion on factories for accepting cane from a co-operative society within a reserved area, and prohibition of factories in dealing directly with members of co-operative societies. The very form of agreement to be entered into among the societies by factories was prescribed by rules. A cess on the sale of sugarcane was also imposed, and it gave the Provincial Government a revenue of 30 to 40 lakhs of rupees per annum, which is being utilised for the development of cane, transportation facilities in several areas and other development objects. A separate department with the Cane Commissioner as the head was established to administer the scheme. Co-operative Societies were established freely in the areas of many factories. The object of such cane societies was to develop cane, to arrange for its ordered supply and also for financing these members for these objects. Latterly, they have also included, in their objects, all agricultural improvement and rural reconstruction work. These societies have done a great deal of work in introducing suitable seed of developed varieties and getting cane sown according to improved methods. The societies are thus responsible not only for the improvement of cane,[1] but also have done useful work in combating diseases and pests in cane. It must be observed, however, that factories have not taken kindly to these societies, partly because there are various defects in the societies, which have been organised with "terrific speed" and partly because combination of growers is not very convenient to factory owners.

The cane societies, we feel, need a better organisation and have to work, as far as possible, in collaboration with the factories in order to achieve best results. And if they succeed in doing so, they can play an effective part in the rural reconstruction of the provinces, and can add to the wealth, welfare and well-being of the cane-growers by evolving an improved cane of higher yield, free from diseases, ensuring at the same time full payment of the cane to the cane-growers without any intermediaries.

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[1] *Vide* an article in "Indian Sugar", Cawnpore, of July 1942, on "Co-operative Cane Societies in the United Provinces", by Mr. R. P. Mathur, Assistant Registrar of Co-operative Societies. He estimates that the average increase of sugarcane as a result of Co-operative Societies has been over 33 per cent.

CHAPTER XIV

CENTRAL GOVERNMENT CONTROL OVER SUGAR INDUSTRY IN THE WAR-PERIOD

On the 14th April 1942, the Government of India passed the Sugar Control Order with a view to check the steep rise in prices of sugar and to prevent profiteering by particular mills situated in advantageous areas. Under this Sugar Control Order which was made effective from the 14th April 1942, and which was introduced under the Defence of India Rules, the Sugar Controller for India was empowered to fix ex-factory price of sugar which, for some qualities, was to be the same throughout India, to register dealers and to control distribution of sugar from specific factories to specific markets in view of the need for securing utmost economy in transport. The order was made applicable to all sugar made in factories in India by the *vacuum pan* process.

While no exception can be taken to the introduction of the Sugar Control Order with the avowed object of checking any undue rise in the prices of sugar and of achieving an orderly development of the industry, it must be stated that the control over the affairs of the industry instituted by the Central Government was in complete disregard of the advice offered by the industry, and what is more, such control was introduced without previous consultation with the industry. As a result of the assumption of this control on the industry and the decision of the Government not to avail themselves of the offer of the Indian Sugar Syndicate which was the marketing organisation of the sugar factories located in the U. P. and Bihar from 1937 to 1942, to use its agency for sale and distribution of sugar, the Syndicate had no other alternative but to suspend its principal activities for the duration of the control scheme. This was done with effect from June 1942 and the erstwhile functions of the Indian Sugar Syndicate, as also of other smaller sales organisations in Madras and Bombay in regulating sales of its members' sugar in a manner which would maintain equality in their sales position ensure adequate supply of sugar to the market according to its varying seasonal requirements by releasing the sales quota from time to time, etc., have fallen in disuse as Government evolved their own organisation for the purpose. Doubtless there were several noticeable deficiencies in the working of the Sugar Control Order during the first few months and black markets were in evidence in various parts of the country, but the initial difficulties in administration were slowly got over and a fairly satisfactory position was achieved whereby it was possible to sell sugar at the scheduled rates varying from 0-3-9 to 0-4-0 per pound in various parts of the country. All sugar recovered from factories under Central Government's permits, is now consigned to Provincial Governments, or their nominees, and all intermediate agencies of recognised dealers have ceased to exist. Factories despatch sugar uniformly according to the plan prepared by the Sugar Controller and all factories are treated alike in the matter of disposal of stocks.

With a view to bring under control confectionery and peppermints in the manufacture of which sugar was diverted, the original Sugar Control Order was amplified and the Sugar Controller was given powers to regulate the price and movements of sugar as well as sugar products. Accordingly, the Sugar and Sugar Products Control Order, 1943, was passed in July, 1943. The Act, with all amendments up to 30th, June, 1945 is given in the *Sugar Industry at a Glance, vide* page xxiv.

Gur Control Order passed in 1943

The Sugar Controller fixes ex-factory prices of sugar according to its grades and quality, and also the quantity of sugar to be despatched from each factory during each month to various destinations. Not a bag of sugar can now be removed without his permit. In order to assist in the proper maintenance of the control over sugar and in order to enable the Government of India to get production of sufficient quantity of sugar from sugar factories, the Gur Control Order was also introduced on the 24th July, 1943. Under the Gur Control Order, the Gur Controller (the Sugar Controller is also the Gur Controller) can prohibit or restrict export of sugarcane to any place, direct that cane-growers shall deliver sugarcane to a specified cane factory or factories in accordance with such conditions in regard to quantity, prices and time of delivery as he may specify, prohibit or restrict to such quantities or qualities or both, the manufacture of Gur by all or any class of producers, if in his opinion, unregulated production of Gur in any area is likely to affect adversely the production of sugar in any quantity which, in his opinion, is required for the needs of the community. Immediately after the Order was passed, movement of Gur was controlled and price fixed. The texts of these Acts are given earlier in the portion *The Sugar Industry at a Glance vide* page xxvi.

Rationing of Sugar in India from 1943

In view of the fact that the total production of sugar was not enough to meet the requirements of the country and the defence forces and the neighbouring countries to which sugar had to be exported, rationing of sugar supplies was introduced in all provinces of the country in 1943, and the Sugar Controller allotted quotas for civilian consumption for the various areas in the country and specified how much of such quota was to be made available to the area from local production and how much should be transported from the U. P. and Bihar, the two largest sugar manufacturing areas in the country producing far larger quantities of sugar than were needed for consumption in those areas. The Provincial Government, in turn, introduced rationing for individuals in big cities, and specified quotas for smaller towns and villages.

Annual Quotas fixed for Provinces

These annual quotas for the various Provinces and States were fixed by the Sugar Controller generally on the basis of consumption averages during 1934-35 to 1938-39. The sugar allotted for civilian consumption in 1942-43 was about 25% less than the present consumption requirements of the country which have appreciably increased as com-

pared with the average of the pre-war years. This has been due to various reasons including increase in the population in many towns and cities, which are known to be consuming larger quantities of sugar than the villages, the large influx of refugees in the country, the increase in the allied forces stationed in the country and the changes in the social habits of the people leading to a higher demand of luxury foodstuffs. The production of sugar in 1943-44 season was very much higher than in the 1942-43 season, and therefore allocations to the Provinces were increased. But the production during 1944-45 being expected to be much smaller due to the large reduction in the cane crop of the country, partly as a result of the divergence of cane areas into food crops as a result of the "grow more food" campaign, and partly as a result of the fixation of comparatively low prices of sugarcane as compared with the yield obtained from other cereals like wheat, rice, etc., the quotas for various Provinces were again revised in 1944-45. (*Vide* Table No. 35 in *Sugar Industry at a Glance.*)

For the text of the Sugar and Sugar Products Control Order, 1943 and Gur Control Order, 1943, as amended up-to-date a reference is invited to the pages in the portion entitled *Sugar Industry at a Glance.* The ex-factory prices of sugar fixed of various qualities as on October, 1944 are also given in Table No. 29 on page xiii.

Continuance of Official Control not Welcomed by Industry

Industry, as a rule, resents any official control, particularly when in the case of an industry like sugar, it extends right from the fixation of cane price and the method and manner of its purchase to the sale not only of the finished product, i.e., sugar, but even an important by-product like molasses.* It was also the industry's contention that the manufacturing costs were not computed liberally, when fixing prices of sugar. What is more, such rigid attitude has put a severe limitation on the capacity of the industry to make large sized profits, even during the war-period, as in the case of other industries like cotton textile, cement and coal, and has prevented it from building up adequate reserves during the war-period for reconstruction and replacement of machinery and spare parts which were greatly depreciated and became obsolete. The industry has, therefore, had no opportunity from the war for ameliorating its position. This being so, it is quite understandable that it wishes to be decontrolled at the earliest possible date. It appears to us, however, unlikely that the Government will relax control, on sugar and Gur, at any rate, before a couple of years from the date (15th August, 1945) of cessation of hostilities in the Far East.

We feel, however, that in the interest of an efficient and orderly development of industry in the post-war period, the present form of rigid control should be relaxed, and a suitable scheme should be devised by the industry itself to ensure (1) that there is proper dispersal of the industry all over the country whereby all new factories to meet the expanding needs of sugar are put up at appropriate centres outside the U. P. and Bihar, bearing in mind the necessity of Province-wise development of industry and the desirability of minimising transport of sugar over long distances from producing centres to consuming areas,

* For details regarding the Molasses Control Order, in U. P. and Bihar *vide* page xxviii in the "Sugar Industry at a Glance".

and (2) that there is a Central Marketing Organisation for the entire industry which should study and arrange for adequate supplies of sugar in all markets at all times, and promote the utilisation of sugar for human consumption both in towns and villages by propaganda and by bringing home to the people the nutritive and energising qualities of sugar, and also for other industrial uses, as in the western countries, e.g., in confectionery, road making, etc. (3) that there is a proper correlation between the output and demand and a suitable carry over of sugar to the extent of 2 to 3 lacs tons at the end of every season, to provide against bad crop or other unforeseen circumstances, e.g., outbreak of hostilities, sea-blockade, etc.

Licensing of Factories—Central Control Recommended

There has been some controversy in regard to the appropriateness of Government intervention in the matter of establishment of factories. The Sugar Conference convened at Simla in 1933 comprising of representatives of various Provinces did not view with favour the proposal of a factory acquiring a licence before its establishment. This was due largely to the apprehension that the interests of nationals would suffer as also perhaps of various Provinces. But as a result of the haphazard development of the industry during the last 12 years, the consensus of opinion today is in favour of Government taking powers to issue licences before factories are established or the capacity of existing ones is increased. As a matter of fact, the U. P. and Bihar Sugar Control Acts, passed in 1937 have conferred such powers on these two Provincial Governments and indeed they have exercised it. Only in August 1945, the U. P. Government issued a circular permitting under particular conditions factories having a cane crushing capacity of less than 800 tons to increase the capacity to 800 tons and stating that the Government would not permit the establishment of any further factories in the United Provinces. We definitely favour the system of licensing of sugar factories by the Central Government in the interest of a proper dispersal of the industry all over the country and suggest that the Government of India should take such powers at once for ensuring the object in view, viz., the properly regulated development of industry along planned lines to ensure the establishment of economic units (we recommend units of 800 tons of cane-crushing capacity*) in suitable areas well spread over the various Provinces and Indian States. We also suggest that no new factories should be allowed to be established hereafter until a licence for this purpose is issued by the Government of India.†

* The list of sugar mills given in the appendix shows the cane crushing capacity of factories established in various Provinces and States.

† In this connection, we give below a general resolution, adopted by the National Planning Committee in 1940, with which we are in agreement.

"This Committee is of opinion that no new factory should be allowed to be established, and no existing factory should be allowed to be extended or to change control without previous permission in writing of the Provincial Government. In granting such permission the Provincial Government should take into consideration the factors as the desirability of the location of the Industry in a well-distributed manner over the entire province, prevention of monopolies, discouragement of the establishment of uneconomic units, avoidance of over-production and the general economic interests of the province and the country. The various Provincial Governments should secure for themselves requisite powers for the purpose, if necessary by undertaking suitable legislation."

Dividends of Sugar Factories from 1935 *to* 1944

In an early paragraph we referred to the action of the Government of India in fixation of prices of sugar since 1943 in a manner in which even during the war-period the industry had no opportunity of making satisfactory profits of which they were deprived during some years in the past. At this stage it will be of some interest to see how profitably the industry has worked during the last ten years and particularly during the war-period. A glance at the table on page 222 will show the dividends declared by a few representative sugar companies from 1935 to 1944. It will be seen that the industry has had a chequered career, its fortune swinging from year to year, depending on various factors such as availability of suitable quantity of cane, quality of cane, fixation of minimum cane prices, prices of sugar, imposition of cesses, excise duties, etc. On the whole, however, it must be stated that the industry has had a satisfactory period and has been able to distribute fair dividends on the investment of capital in the industry. It will also be clear from the table that factories outside U. P. and Bihar, e.g., those in Bombay, Mysore, have been able to make larger profits and declare better dividends as their cane cost compared very favourably with the cost of the factories in U. P. and Bihar and they also had the advantage of a better and longer season. We feel that in appreciation of the part played by the industry in supplying the sugar requirements of the country during the war-period without any profiteering, the Government should accord it a liberal treatment as and when necessary during the post-war period, particularly as this industry, unlike other major industries, e.g., Cotton Textile, Coal, Iron and Steel, was unable to lay by adequate reserves for depreciation, replacement of machineries during the war-period, and against lean years of depression, due to bad crop, uneconomic competition, etc.

TABLE No. 1

Capital and Net Block of Sugar Companies, and Dividends since 1935

Name of Sugar Factory	Paid-up Capital with Debentures*	Net Block	Dividends %									
			1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
	Rs.	Rs.										
Balarampur ...	28,00,000	23,94,169	10	10	3¾	2½	Nil	Nil	Nil	Nil	5	5
*Basti ...	18,00,000	18,94,611	15	25	15	15	12	5	10	20	30	20
Belsund ...	20,49,950	14,47,872	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Belapur ...	37,59,800	36,07,486	24	16	14	14	20	20	14	12	18	18
*Bharat ...	6,25,000	4,91,832	Nil	7½	10	5	5	Nil	5	7½	12½	10
Buland ...	24,00,000	22,69,814	...	5	6	11¼	11¼	12½	17½	22½	22½	25
*Carew ...	65,00,000	56,14,075	12½	12½	10	10	Nil	Nil	Nil	Nil	12½	10
Cawnpore ...	25,00,000	27,66,414	25	10	5	5	2½	2½	15	15	25	15
Champarun ...	18,00,000	19,47,896	10	20	5	5	7½	2½	15	15	30	20
Deccan Sugar and Abkari ...	23,60,000	31,02,528	35	20	10	10	10	5	10	...	...	.....
*East India Distilleries & Sugar Factories ...	£314,780	£3,09,055	10	10	5	10	15	12½	10	...	...	.....
Durbhanga ...	26,00,000	18,19,829	...	...	...	...	...	...	12½	10	25	10
*Deoria ...	8,99,452	10,33,906	...	...	...	5	5	Nil	5	7½	...	.....
Ganesh ...	8,00,000	8,25,407	Nil	10	5	5	2½	Nil	12½	...	...	.....
Ganga ...	8,52,841	9,36,912	...	...	...	9	18	12	20	20	...	.....
*Gaya ...	9,84,200	11,27,452	8	8	8	8	8	8	8	...	8	8
*Mahaswastika ...	6,50,000	5,42,176	...	...	...	Nil	Nil	Nil	...	...	...	.....
Modi ...	12,00,000	16,22,542	10	9	10	7	12	12	15	...	...	.....
*Mysore ...	30,79,280	21,79,280	11¼	15	10	15	15	20	20	20	20	20
*Nawabganj ...	19,46,030	19,83,186	10	10	5	11	10	5	12	...	20	15
New Savan Sugar ...	11,00,000	8,00,000	Nil	10	Nil	Nil	Nil	Nil	10	7½	12½	15
*New India ...	14,12,700	12,68,372	...	...	...	Nil	Nil	Nil	Nil	Nil	...	...
Punjab ...	11,93,642	26,17,247	15	20	15	15	6	Nil	10	10	10	10
Purtabpore ...	15,00,000	16,02,376	Nil	7½	Nil	Nil	Nil	Nil	5	Nil	12½	7½
*Ramnugger ...	24,00,000	28,99,038	...	...	...	Nil	Nil	Nil	Nil	...	...	.....
Raza ...	15,00,000	20,28,609	6	10	7½	12½	12½	12½	17½	22½	22½	25
*Ryam ...	10,97,400	7,10,917	15	10	Nil	Nil	Nil	Nil	Nil	5	20	15
*Samastipur ...	17,19,000	11,94,577	Nil	Nil	Nil	Nil	Nil	Nil	Nil	5	10	7½
*Shree Sitaram ...	10,95,462	10,20,378	6¼	Nil	10	10	...	5	7½	12½	15	.....
*Sitalpur ...	13,01,310	12,05,659	Nil	8	Nil	2½	2½	Nil	Nil	5	6¼	6¼
*South Bihar ...	13,25,000	16,79,861	12½	15	15	25	10	9	15	10	...	.....
*Upper Ganges ...	11,99,900	10,38,095	Nil	5	7½	7½	10	Nil	17½	15	15	.....

* Only those marked with asterisks include Debentures.

CHAPTER XV

METHODS OF UTILISATION OF SUGAR AND GUR IN INDIA

IT will be useful to recapitulate and to set out, briefly, a few important data relating to supply of sugar and Gur, and their utilisation and demand in India at the present time, for assessing the possibilities of further development in consumption and production thereof in the years to come.

In India, more than 96 per cent of the total sugar of various kinds is produced from sugarcane, and the balance of 4 per cent from the juice of different kinds of palms.

It is noteworthy that Gur constitutes nearly 77 per cent of the total sugar of various kinds produced in India. It is mainly prepared from sugarcane and the juice of palm trees which respectively contribute approximately 94 per cent and 5 per cent of the total Gur supplies, and the balance consists of Gur prepared from *Khandsari* molasses. The quantity of cane used for purpose of manufacture of Gur varies from year to year. Approximately it works out to about 60 per cent of the total cane production as can be seen from the table below, which indicates the percentage of the crop used for manufacture of sugar in factories, for manufacture of Gur, for non-industrial purposes, etc.

TABLE No. 1

Year. (October to September).	Total cane production (Thousand tons).	Percentages of the crop used for					Quantity of cane used for *gur.* (Thousand tons.)
		Non-industrial purposes.	Sugar.				
			Factories.	*Khand.*	*Gur.*	Miscellaneous.	
1921-25 (1) .	31,935	11 6	1 2	19 6	66.6	1.0	21,258
1926-30 (2) .	33,106	13.1	2.4	15.9	67.6	1.0	22,394
1930-31 .	34,247	14.1	3.9	14.6	66.4	1.0	22,748
1931-32 .	42,185	14.6	4.2	12.4	67.8	1 0	28,678
1932-33 .	49,134	15.1	6.8	11.2	65.9	1.0	32,399
1933-34 .	54,432	15.6	9.4	7 3	66.7	1.0	36,305
1934-35 .	54,206	16.1	12.1	5.5	65.3	1.0	35,387
1935-36 * .	61,316	16 5	16.0	4 0	62.8	0.7	38,460
1936-37 * .	67,200	15.6	17.4	4.6	61.7	0.7	41,493
1937-38 * .	55,970	15.5	17.7	4.8	61.2	0.8	34,269
1938-39 * .	36,527	17.9	19.2	4.6	57.3	1.0	20,924

(1) and (2) averages for the quinquennia 1920-21 to 1924-25 and 1925-26 to 1929-30 respectively.

* The figures include 880,000 tons of cane estimated to be grown in unreported tracts. For figures of later years, *vide* "Sugar Industry at a Glance".

Due to increased cane production, however, the actual quantities of cane which became available for making Gur during the last few years has been practically twice as much as the average for the first quin-

quennium (1920-21 to 1924-25)—omitting the case of 1938-39, which was a year of unusually low production.

It is also of interest to note that the proportion of cane crop used for manufacture of Gur, in different parts of India, varies due to peculiar local conditions. The following table gives the estimated production of different types of Gur during the period 1935-36 to 1938-39. In order to indicate the relative importance of the Gur industry in each area, the proportions of the local cane crop utilised for this purpose in the various tracts have also been included.

TABLE No. 2

Production of cane gur in India. (Average 1935-36 to 1938-39).

(In thousand tons.)

	Percentage of cane crop used for *gur*.	*Gur* produced.				Percentage of total *gur* production.
		Lumps.	Powder.	Semi-liquid.	Total	
United Provinces* ...	55.5	1,483	90	64	1,637	48.2
Punjab*	69.3	267	20	*n*	287	8.5
Bihar	32.8	111	*n*	38	149	4.4
Bengal	87.9	116	*n*	349	465	13.7
Madras	77.3	224	6	6	236	6.9
Bombay*	60.6	163	*n*	15	178	5.2
North-West Frontier Province	80.6	44	11	...	55	1.6
Assam	98.2	35	...	5	40	1.2
Central Provinces ...	86 6	38	...	*n*	38	1.1
Orissa	75.8	21	...	22	43	1.3
Sind	17.7	2	...	...	2	0.1
Mysore	62.3	63	2	1	66	1.9
Hyderabad	86 1	74	1	*n*	75	2.2
Others	72.7	103	*n*	24	127	3.7
India	61.1	2,744	130	524	3,398	100.0

*Including States. *n*=Negligible.

Owing to the concentration of the sugar factories in the United Provinces, Bihar and Bombay, the proportion of the cane crop used for preparing Gur in these provinces is comparatively less. The low figure in the case of Sind is due to the fact that a large part of the crop is used for edible purposes. On the other hand, in Bengal and Assam, where the amount of cane required for seed and various edible purposes is comparatively small, a much higher proportion of the crop is available for Gur, while in the Central Provinces and the North-West Frontier Province there has been practically no demand for cane from factories.

As stated elsewhere, Gur is mainly produced for the home market, which in its turn depends entirely on the local supplies. As such, the cost of production of Gur is chiefly by the trend of local demand, which is discussed in a subsequent paragraph in this chapter. It may, however, be observed that in recent years Gur production has fluctuated round about 35,00,000 tons *per annum*.

The following table shows the estimated total production of different types of cane and palm Gur in India as a whole for the four years (October to September) from 1935-36 to 1938-39.

TABLE No. 3

Total estimated production of gur.

(In thousand tons.)

	Year.				
	1935-36.	1936-37.	1937-38.	1938-39.	Average.
Cane—					
Lumps	3,145	3,416	2,804	1,611	2,744
Powder	145	171	142	63	130
Semi-liquid *	579	579	490	449	524
Total ..	3,869	4,166	3,436	2,123	3,398
Palm—					
Lumps	94	98	88	94†	94
Semi-liquid	68	74	73	81†	74
Liquid	6	6	6	7†	6
Total ...	168	178	167	182†	174
Molassein	50	42	49	49	47
Other kinds	1	1	1	1	1
Total ...	4,088	4,387	3,653	2,355	3,620

*Excluding approximately 10,000 tons of semi-liquid product estimated to be prepared by re-melting lump *gur*.

† Provisional.

For figures of later years, *vide* "Sugar Industry at a Glance".

Taking the average prices of Gur manufactured out of cane, palm and molassein products at Rs. 3-8-0, Rs. 2-8-0 and Rs. 1-4-0 per maund, respectively, for the period 1935-36 to 1938-39, the total value of Gur produced works out at roughly 34 crores of rupees, as compared with nearly 21 crores (at Rs. 8-4-0 per maund) for white factory sugar and 3 crores (at Rs. 7-12-0 per maund) for khand.

The above observations in regard to prices, which relate to the period 1935-36 to 1938-39, made in the Report on the Marketing of Sugar in India and Burma, (1943) have to be radically revised in view of the considerable increase in prices of both Gur and sugar, since 1942.

The value of sugar and Gur produced in 1945 is, of course, much higher, about Rs. 118 crores. (Sugar being Rs. 16-4-0 per maund, and Gur being Rs. 9-6-0 per maund.)

Having considered the position of supply of Gur, we will see briefly the production and supply of sugar. Approximately 85 per cent of the white sugar produced in India is manufactured direct from cane in *vacuum pan* factories. The following table shows the position of the manufacture of sugar in *vacuum pan* factories in India since 1921-22 up to 1939-40 :—

TABLE No. 4

Production of sugar and molasses from sugarcane in vacuum pan factories in India. (Quantities in thousand tons.)

Year.	Total Production of cane.	Percentage of total cane used by vacuum pan factories.	No. of factories worked.	Cane crushed.	Sugar made.	Molasses obtained.	Percentage recovery of cane.	
							Sugar.	Molasses.
1921-22 ...	29,761	1.3	18	395	28	*na*	7.1	*na*
1922-23 ...	34,370	0.9	19	318	24	*na*	7.6	*na*
1923-24 ...	37,533	1.4	23	514	39	*na*	7.5	*na*
1924-25 ...	29,195	1.5	23	434	34	21	7.8	4.84
1925-26 ...	33,426	2.0	23	659	52	28	8.1	4.25
1926-27 ...	36,489	2.0	24	742	63	33	8.5	4.45
1927-28 ...	35,713	2.2	25	786	68	31	8.6	3.95
1928-29 ...	29,809	2.7	23	791	69	32	8.6	4.05
1929-30 ...	30,053	3.3	26	990	90	35	9.1	3.54
1930-31 ...	34,247	3 9	28	1,309	118	48	9.1	3.67
1931-32 ...	42,185	4.2	31	1,763	156	68	8.9	3.86
1932-33 ...	49,134	6.8	56	3,323	286	130	8.7	3.92
1933-34 ..	54,432	9.4	114	5,138	453	188	8.8	3.68
1934-35 ...	54,206	12.1	128	6,569	571	228	8.7	3.50
1935-36 ...	61,316	16.0	134	9,821	916	337	9.3	3.43
1936-37 ...	67,200	17.4	138	11,666	1,109	407	9.5	3.50
1937-38 ...	55,970	17.7	137	9,930	931	350	9.4	3 52
1938-39 ...	36,527	19.2	139	7,017	651	242	9.3	3.46
1939-40* †	*na*	...	145	13,132	1,242	485	9.5	3.69

na = Not available. * Provisional.

† For figures of later years, *vide* "Sugar Industry at a Glance".

The total crushing capacity of the cane factories in India, in an average season of about 120 days, is computed at roughly 13,500,000 tons and in terms of sugar it is equal to nearly 13,00,000 tons, and under favourable conditions it can easily go up to 15,00,000 tons. Thus India's sugar manufacturing capacity is substantially in excess of her present production which is estimated at about 12,00,000 tons annually. As the *vacuum pan* sugar factories consume only about 20 per cent of the country's cane production and as the prices paid by the factories for cane are as a rule more favourable than what the cultivator can ordinarily obtain by converting his crop into Gur, the factories should have, in theory at least, no difficulty in obtaining enough supplies of cane. In practice, however, the position is not so simple and a number of factories have to obtain a considerable part of their requirements of cane from distant places (up to 150 miles) while many others may have to go without adequate supplies, particularly in years of scanty production. The main reason for this is that the majority of the factories grow only a negligible proportion of their requirements in their farms. The concentration of many factories in limited areas is also responsible to a certain extent for the difficulty. This is particularly so in the case of factories operating in the U. P. and Bihar which crush nearly 85 per cent of the total cane handled by the sugar mills in India. The conditions are, however, different in parts of Southern India, where factories are not congested in any particular tract and where majority of the factories, particularly those in the Bombay Province, grow a large portion of their requirements on their own farms.

The position in this respect in the more important sugar factory zones of India is shown by the data in the following table which gives, *inter alia*, the estimated proportion of the total cane obtained from (*a*) factories' own farms (own cane), (*b*) from the cultivators at the factory gates (gate cane) and (c) what is to be obtained from distances by rail or road—commonly known as " rail cane ". The figures in the last column are, however, not quite comparable as the average distances from which cane can be obtained may vary from about 10 miles, as in the case of the Mysore factory, to about 50 miles and more—the average lead for the U. P. and Bihar factories having been about 40 miles in 1937-38.

TABLE No. 5

Approximate percentage of cane obtained from different sources to total crushed.

	Number of vacuum pan factories.	Percentage of local cane crop used.	Percentage of quantity crushed.		
			Own cane.	Gate cane.	Rail cane.
United Provinces *	71	18.7	3	65	32
North Western †	14	15.7	2	60	38
Rohilkhand	15	15.1	1	49	50
North Eastern †	34	52.9	5	70	25
Bihar	33	53.4	2	53	45
North †	28	78.9	3	55	42
South †	5	18.4	*n*	40	60
Bengal	9	4.4	7	48	45
Punjab *	3	4.1	*n*	57	43
Bombay *	9	19.3	85	15	...
Madras	10	8.5	5	67	28

* Including States. *n* = Negligible.
† Refer to tracts as shown in Appendix XVII of the Report on the Marketing of Sugar.

It may be noted that during recent years the quantity of cane available at the factory gate is increasing due to the system of allotment of zones in the U. P. and Bihar, under the Sugar Factories Control Acts, whereby the factories are placed under an obligation to accept all the quantities offered (up to its sanctioned crushing capacity). This is a very welcome feature because 'gate cane' which is generally fresh cane and which is to be brought from distances by rail or road, will not only deteriorate in quality to some extent but is responsible for increased transport expenses which on an average amounts to as much as 15 to 20 per cent of the value.

In a previous paragraph we estimated the total crushing capacity of the cane factories on an average season of about 120 days. The length of the cane crushing season has a very important bearing both on the cost of sugar manufactured and carry-overs—the longer the season the lower the cost. Apart from the duration of the harvest period which depends upon the varieties of cane cultivated and climatic conditions, the actual working season of sugar factories has been influenced by several other factors, i.e., (1) position of stocks, (2) variety of cane supplies, and (3) prices of cane, Gur

and sugar. Consequently, the working period in different parts of the country varies considerably from year to year as will be seen from the figures in the following table for the years 1934-35 to 1939-40.

TABLE No. 6

Average number of working days.

	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	Average 1935-36 to 1938-39.
Punjab	76	93	130	128	71	*n*	105
United Provinces ...	107	134	140	124	77	133	119
Bihar	109	124	150	99	79	136	113
Bengal	94	141	138	92	61	*na*	108
Madras	77	104	105	88	84	*na*	95
Bombay	170	159	150	119	157	*na*	146
Mysore	191	264	264	*na*	191	*na*	240
India	104	126	138	112	83	129	115

na = Not available. *n* = Negligible.
For figures of later years, *vide* "Sugar Industry at a Glance".

Apart from special factors which may influence crushing in any particular year, the length of the working season depends upon the duration of the harvesting period. An idea of the average monthly cane crushings in different parts of the country is given by the figures in the following table, which are based on the quantities of cane crushed, in typical factories, during the four years 1935-36 to 1938-39 :—

TABLE No. 7

Percentages of cane crushed in different months.

Months.	Punjab.	United Provinces		Bihar.	Bengal.	Bombay.	Madras.	Mysore.
		Western	Eastern.					
October ...	...	...	...	...	...	6.8	...	9.6
November ...	13.5	10.7	2.2	2.8	1.6	12.8	1.4	11.7
December ...	26.5	22.1	19.7	19.4	23.5	15.9	3.2	6.2
January ...	28.1	22.7	28.2	22.2	26.2	15.4	17.1	5.5
February ...	18.7	19.5	20.1	21.0	21.6	14.6	22.4	11.2
March ...	13.2	15.9	19.7	20.9	16.8	15.1	24.0	12.0
April ...	...	7.8	9.5	8.2	8.7	12.3	18.8	10.7
May ...	...	1.3	0.6	5.5	1.6	6.8	12.8	9.8
June to September ...	...	...	...	...	...	0 3	0.3	23.3
Total ...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

It may be observed that excepting Mysore and Bombay, the crushing season mainly extends from November to May and that nearly 83 per cent of the total cane handled by the Indian mills is crushed during the four months from December to March.

Recovery

The recovery of sugar on cane for India as a whole has increased from an average of nearly 8.6 per cent for the quinquennium ending 1929-30 to about 10 per cent during recent years. This is attributable to the improvement both in the quality of cane and milling efficiency.

It must be stated, however, that the sugar recovery in India even yet is much lower than in most of the other important sugar producing countries as will be seen from the data given in the following table :—

TABLE No. 8

Percentage recovery of sugar on cane.

	Recovery percentage. (1)		Recovery percentage.
United Provinces ...	9.4	Java	12.1 (2)
Bihar	9.2	Cuba	12.8 (3)
Madras	9.3	Formosa	12.6 (4)
Bombay	10.9	Australia	14.3 (5)
India	9.4	Mauritius	11.7 (4)

(1) Average 1935-36 to 1938-39, (2) Average 1935-36 to 1937-38, (3) 1937-38 (4) Average 1936-37 to 1937-38 and (5) 1936-37.

It may be observed that more than 90 per cent of the cane crushed in India is of medium type grown under sub-tropical conditions and its sugar content, is lower than that of the thick canes generally grown in other parts. As such, there is a limit to the increase in recovery which can be expected from improved cultivation and manuring, though it is hoped that the intensive programme of cane development which is being pursued in the factory areas, particularly those of the United Provinces, will yield results. Some improvement in recovery could perhaps also be secured by improving the milling efficiency. The following table gives relevant data regarding manufacturing efficiency of mills in India as compared with other important cane-sugar countries :—

TABLE No. 9

Tract.	Period.	Milling extraction.	Boiling house extraction.	Over all extraction.
United Provinces—		Per cent *	Per cent *	Per cent *
Western	1936-37/1938-39	90.36	87.47	79.04
Eastern	1936-37/1938-39	91.18	88.90	81.06
Bihar	1937-38/1938-39	91.61	87.75	80.39
Madras	1934-35/1936-37	92.93	83.45	77.56
Bombay	1934-35/1936-37	89.61	88.89	79.66
Java	1933 ...	94.68	91.55	86.23
Queensland	1933 ...	94.48	92.81	87.35
Formosa	1936-37 ...	97.89	93.81	91.69
Cuba	1931 ...	97.55	92.36	89.91

* Percentages refer to weight of cane crushed.

Quality of Sugar

The total production of sugar in India at the present time varies between 10,00,000 tons and 12,00,000 tons annually, and more than 95% of the total sugar produced in *vacuum pan* cane factories in India is estimated to be put on the market in the form of crystals—the balance is covered by the powder sugar which includes mill dust and also

a quantity of sugar prepared by crushing sugar lumps and dull coloured crystals.

The quality of sugar is judged mainly by colour—milk-white with a shining appearance being considered the best. In the case of crystal sugar, the size of the grain is also an important consideration, and as a rule, the bolder the grain, the better the quality.

A general idea of the sugar produced in India direct from cane in *vacuum pan* factories can be had from the following table which gives the estimated proportions of different qualities of sugar in India :—

TABLE No. 10

Estimated proportions of different qualities of sugar produced in India.

(Percentages refer to about 80 per cent of the total production which is handled by the Indian Sugar Syndicate, Ltd.)

	White.	Dull white	Light brown.	Total
Crystals—	(Per cent)	(Per cent)	(Per cent)	(Per cent)
Bold	14.0	7.1	0.3	21.3
Medium	35.8	27.8	1.4	65.0
Small	8.1	5.2	0.4	13.7
Total ...	57.9	40.1	2.0	100.0
Crushed	21.8	66.3	11.9	100.0

Production of Sugar from Gur

The production of sugar from Gur in refineries has gone down considerably during recent years. The average production for the period from 1936-39 amounted to 26,500 tons, forming less than 2½ per cent of the total production of white sugar in India as a whole.

Production of Khandsari Sugar

The production of *khandsari sugar*, however, has been roughly maintained at about 1,00,000 to 1,25,000 tons annually, including a small quantity of about 4,000 tons prepared from palm juice. The production of khand sugar is thus equivalent to roughly 13 per cent of the total production of white sugar in India. Alhough the khand method of production is less economic, its production in fairly large quantities is due to the favourable location of the khand concerns who are able generally to obtain their raw materials at comparatively cheaper rates, and the fact that they have to pay a far lower excise duty as compared with factory sugar, squares up the handicap arising out of low recovery and the high manufacturing cost. Another reason is that there is a special demand for khand sugar from a section of the orthodox people who have a certain sentimental objection against the use of factory sugar. This special demand is estimated at 40,000 tons per year. But it is likely that this will disappear gradually.

The following table gives estimated costs of production of various kinds of sugar per maund :—

TABLE No. 11

Estimated costs of producing 1 maund of various kinds of sugar.

(Figures in brackets indicate percentage recoveries on cane.)

	Factory sugar.		*Khand.*		
			From cane-*rab.*		From *gur.*
	From cane.	From *gur.*	Centrifugal.	*Khanchi.*	
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Cost of cane	2 10 2 (*9.5*)	4 2 8 (*6.0*)	4 8 9 (*5.5*)	5 10 9 (*4.4*)	6 9 3 (*3.8*)
Transportation and assembling charges	0 13 2	0 15 0	0 2 2	0 1 0	0 2 6
Manufacturing costs ...	1 10 0	2 8 0	2 7 3†	3 2 0	3 12 0*
Excise duty	2 3 3	2 3 3	0 5 10	...	...
Total cost ...	7 9 11‡	9 12 11	7 8 0	8 13 9	10 7 9
Less—value obtained for molasses	0 0 5 (*3.5*)	0 6 6 (*3.3*)	0 4 9 (*4.5*)	0 6 9 (*5.0*)	0 7 6 (*4.5*)
Net cost	7 9 6	9 6 5	7 3 3	8 7 0	10 0 3
Relative values on the basis of quality — taking factory sugar as standard ...	...	7 9 6	6 15 0	7 9 6	8 2 0

* Includes cost of making *gur* at 12 annas per maund.

† Includes cost of making *rab* at 13 annas per maund.

‡ Includes an allowance of 5 annas 4 pies for cane cess levied in the United Provinces and Bihar.

We may now turn to the question of the consumption of different kinds of sugars, i.e., Gur and sugar. It may be noted that hitherto practically no information was available regarding the use of different kinds of sugar and the data given in this chapter are primarily based on the results of investigations carried out by the Central Agricultural Marketing Department and the Report on the Marketing of Sugar in India and Burma, published in 1943.

Tables No. 12 and 13 on pages 232 and 233 give the estimated utilisation of Gur (cane and palm) for various periods in India, and the estimated utilisation of sugar, including *khand*, in India.

The total quantity of different kinds of sugar consumed in India for various periods during the years 1935-36 to 1938-39 average about 4,818,000 tons, Gur constituting about 36,15,000 tons. Thus Gur including various unrefined sugars, forms nearly 75% of the total sugar consumed in India. The corresponding figures for factory sugar and *khand* are 21.5 per cent and 2.8 per cent respectively, the total consumption of factory sugar being 24.3 per cent.

TABLE No. 12

Estimated utilisation of gur (cane and palm) for various purposes in India.

(Quantities are in thousand tons and figures in brackets indicate percentages on available supplies).

Trade block.*	Net available supplies 1935-36/ 1938-39.	Stock feeding.	For industrial purposes.			Total for purposes other than human consumption.	For human consumption.						Estimated population based on 1936–39 ‖ (in lakhs)	Consumption in lb. per head.
			Re-fining.	*Bura* and *batasha*	Others.		Drinks.			Domestic uses other than drinks.	Confectionery, etc.	Total.		
							Tea and coffee.	Milk.	*Sharbat* and other cold drinks.					
United Provinces ...	1,383	41.5 (3.0)	75.0 (5.4)	14.0 (1.0)	6.7 (0.5)	137.2 (9.9)	7 5 (0.5)	45.0 (3.3)	72.0 (5.2)	933.2 (67.5)	188.1 (13.6)	1,245.8 (90.1)	517	53.9
Punjab † ...	452	63.3 (14.0)	4.0 (0.9)	3.0 (0.6)	10.6 (2.4)	80.9 (17.9)	4.9 (1.1)	67.0 (14.8)	51.6 (11.4)	199.7 (44.2)	47.9 (10.6)	371.1 (82.1)	356	23.3
Bihar ...	136	2.0 (1.5)	7.0 (5.2)	...	2.7 (2 0)	11.7 (8.7)	0.7 (0.5)	9.0 (6.6)	3.2 (2.4)	90.4 (66 5)	21.0 (15.5)	124.3 (91.3)	348	7.9
Bengal ‡ ...	612	51.4 (8.4)	1.0 (0.2)	...	12.2 (2 0)	64.6 (10.6)	2.8 (0.5)	11 2 (1.8)	3.5 (0.6)	453.4 (74.0)	76 5 (12.5)	547.4 (89.4)	536	22.8
Madras ‡ ...	306	1.8 (0.6)	17.0 (5.6)	...	12 2 (4.0)	31.0 (10.2)	10.9 (3.6)	1.0 (0.3)	2.0 (0.7)	245.8 (80 2)	15.3 (5.0)	275.0 (89.8)	511	12.1
Bombay ‡ ...	216	10.8 (5.0)	...	...	4.3 (2.0)	15.1 (7.0)	2 8 (1.3)	4.0 (1 8)	3.6 (1.7)	173.2 (80.2)	17.3 (8.0)	200.9 (93.0)	313	14.4
N.-W. F. Province ...	18	0.2 (0.1)	...	...	0.9 (0.4)	1.1 (0.5)	1 3 (7.3)	2.0 (11.1)	4 3 (23.9)	7.5 (41.7)	1.8 (10.0)	16.9 (99.5)	51	7.5
Mysore ...	60	1.2 (2.0)	...	*n*	0.6 (1.0)	1 8 (3.0)	7.6 (12.7)	0 5 (0.8)	1.5 (2 5)	39 6 (66.0)	9.0 (15.0)	58 2 (97.0)	70	18.7
Hyderabad ...	86	0.9 (1.0)	...	*n*	0.9 (1.0)	1 8 (2.0)	0.6 (0.7)	1.0 (1.2)	1.6 (1.8)	76.7 (89 3)	4.3 (5.0)	84.2 (98.0)	159	11.8
Others ...	346	9.7 (2.8)	...	1.0 (0.3)	5.6 (1.6)	16.3 (4.7)	3.4 (1.0)	6.1 (1.8)	8.1 (2.3)	284.8 (82.3)	27.3 (7.9)	329 7 (95.3)	759	9.7
Total ...	3,615	182.8 (5.1)	104.0 (2.9)	18.0 (0.5)	56.7§ (1.5)	361.5 (10.0)	42.5 (1.2)	146.8 (4.1)	151.4 (4 2)	2,504.3 (69 2)	408.5 (11.3)	3,253 5 (90 0)	3,629	20.1

n = Negligible.

* As adopted for the Rail and River-borne Trade of India.

† Including Kashmir and Delhi.

‡ Including port towns.

§ Includes roughly 30,000 tons for distilling, 12,000 tons for curing tobacco and the balance of 14,700 tons for miscellaneous purposes.

‖ Calculated at a constant unitary rate of increase based upon the difference between the 1921 and 1931 census figures.

TABLE No. 13

Estimated utilisation of sugar including khand in India.

(Quantities are in thousand tons and figures in brackets indicate percentages on available supplies.)

Trade block.*	Net available supplies 1935-36/1938-39.	For processing into,				For human consumption.									
						Drinks.			For domestic uses other than drinks.	For confectionery, etc.	In the form of candy and *batasha*.	Miscellaneous products including *murabbas*.	Total.	Estimated population 1936-39† (in lakhs)	Consumption in lb. per head.
		Bura.	*Candy*.	*Batasha*.	Total.	In tea and coffee.	In milk.	For *sharbat* and other cold drinks.							
United Provinces ...	192	53.8 (28.0)	2.9 (1.5)	7.7 (4.0)	64.4 (33.5)	7.6 (3.9)	20.0 (10.5)	23.3 (12.1)	64.0 (33.3)	67.2 (35.0)	6.7 (3.5)	3.2 (1.7)	192	517	8.3
Punjab ‡	203	20.3 (10.0)	10.2 (5.0)	6.1 (3.0)	36.6 (18.0)	21.6 (10.6)	31.0 (15.3)	57.6 (28.3)	47.5 (23.4)	30.4 (15.0)	6.0 (3.0)	8.9 (4.4)	203	356	12.8
Bihar	56	0.3 (0.6)	2.2 (3.9)	2.2 (3.9)	4.7 (8.4)	5.8 (10.4)	7.0 (12.5)	5.0 (8.9)	11.2 (20.0)	23.0 (41.0)	3.9 (7.0)	0.1 (0.2)	56	348	3.7
Bengal ¶	150	4.5 (3.0)	18.0 (12.0)	15.0 (10.0)	37.5 (25.0)	27.0 (18.0)	11.6 (7.8)	13.7 (9.1)	22.0 (14.7)	67.5 (45.0)	7.5 (4.9)	0.7 (0.5)	150	536	6.3
Madras ¶	100	4.7 (4.7)	5.0 (5.0)	*n*	9.7 (9.7)	52.8 (52.8)	5.0 (5.0)	11.4 (11.4)	17.2 (17.2)	10.0 (10.0)	3.5 (3.5)	0.1 (0.1)	100	511	4.4
Bombay ¶	227	13.3** (5.9)	22.7 (10.0)	*n*	36.0 (15.9)	80.2 (35.3)	12.4 (5.5)	25.3 (11.1)	36.0 (15.9)	56.8 (25.0)	14.0 (6.2)	2.3 (1.0)	227	313	16.3
N.-W. Frontier Province	20	*n*	3.2 (15.0)	*n*	3.0 (15.0)	2.1 (10.5)	1.0 (5.0)	5.1 (25.5)	7.8 (39.0)	3.0 (15.0)	1.0 (5.0)	*n*	20	51	8.8
Mysore	9	0.5 (5.5)	0.5 (5.5)	*n*	1.0 (11.0)	5.4 (60.0)	0.3 (3.3)	0.6 (6.7)	0.9 (10.0)	1.3 (14.5)	0.5 (5.5)	*n*	9	70	2.9
Hyderabad	27	0.5 (1.9)	0.3 (1.1)	*n*	0.8 (3.0)	3.3 (12.2)	1.2 (4.4)	4.5 (16.7)	8.5 (31.5)	9.2 (34.1)	0.3 (1.1)	*n*	27	159	3.8
Others	187	13.5§ (7.2)	6.7 (3.3)	1.9 (1.0)	22.1 (11.8)	21.6 (11.5)	14.1 (7.5)	24.7 (13.2)	48.6 (26.0)	69.7 (37.3)	6.6 (3.6)	1.7 (0.9)	187	759	5.5
Total ...	1,171	111.4 (9.5)	71.5 (6.1)	32.9 (2.8)	215.8 (18.4)	227.4 (19.4)	103.6 (8.8)	171.2 (14.6)	263.7 ‖ (22.5)	338.1 (28.9)	50.0 (4.3)	17.0 (1.5)	1,171	3,620	7.2

* As adopted for the Rail and River-borne Trade of India. *n* = Negligible. ** Including approximately 6,000 tons of *leesa* (icing sugar).
† Calculated at a constant unitary rate of increase based upon the difference between the 1921 and 1931 census figures. ‡ Including Kashmir and Delhi.
§ Including approximately 2,000 tons of *leesa* (icing sugar).
‖ Includes sugar used for preparing *bura*, candy, and *batasha* as these products are either utilised in the same way as sugar or as sweets.
¶ Including port towns.

Quality Characteristics—Gur Considered more Nutritive

The quality characteristics of different kinds of refined and unrefined sugars are quite distinct although they are all used for sweetening purposes. While the white sugars are generally colourless and odourless, the different types of Gur have a marked flavour and a colour which may range from light to dark brown. Further, the sugar content of Gur is comparatively low and generally averages from 70 to 80 per cent of sucrose and 8 to 14 per cent of invert sugar as against nearly 99 per cent of sucrose and a fraction of 1 per cent of inverts in factory sugar. The moisture content of white sugar is very low and seldom exceeds $\frac{1}{2}$ per cent as compared with about 5 per cent in the solid Gur and 8 to 12 per cent in semi-liquid types. Gur also contains, in small proportions, a number of organic and inorganic salts, which should have a certain nutritive value, but so far their effect on the human system has not been fully studied. This product is, however, considered to have a greater warming effect than sugar. It is also a mild laxative and if taken in large quantities, particularly during summers, it may act as a purgative. Gur is commonly believed to be more nutritive than white sugar, and that explains its popularity and large consumption.

The different kinds of Gur prepared from the juice of various palms are also said to possess special qualities of their own and cane Gur or white sugar are not suitable for certain medicinal purposes for which palm products are used.

In the case of white sugars also, the *khand* prepared by treating *rab* with *siwar* (a water weed) is considered to be more cooling in its effects than factory sugar or *bura*.

No scientific data are, however, available to show how far the various widespread popular beliefs in regard to Gur, are based on facts. The importance of research regarding the nutritive and dietetic values of the various types of Gur, which account for more than three-fourths of the sugar consumed in India, need to be emphasised.

It may also be noted that though the total sugar contents of various unrefined sugars included under Gur are lower than factory sugars, the quantity of Gur required to sweeten a particular preparation is generally 20 to 30 per cent less than that of sugar. No definite scientific data regarding the relative sweetness of different kinds of refined and unrefined sugars are, however, available at present and the statement made above is mainly based upon the information collected during the survey from the various types of consumers using both Gur and sugar. This view seems to be borne out also by the general practice of using brown sugar in coffee, all over the country.

The following Table shows the methods of utilisation of Gur and sugar for different purposes :—

TABLE No. 14

Utilisation of gur and sugar.

(Figures in brackets indicate percentages to total *gur* or sugar used.)

	Gur. (Thousand tons).	Sugar. (Thousand tons).
For stock-feeding	183 (5.1)	...
For industrial purposes	179 (4.9)	*n*
For human consumption :		
Drinks—		
Tea and coffee	43 (1.2)	227 (19.4)
Milk	147 (4.1)	104 (8.8)
Sharbat, etc.	151 (4.2)	171 (14.6)
Total for drinks ...	341 (9.5)	502 (42.8)
Domestic uses	2,504 (69.2)	264 (22.5)
Confectionery	408 (11.3)	338 (28.9)
Candy and *batasha*	...	50 (4.3)
Miscellaneous products including *murabbas* ...	(*n*)	17 (1.5)
Total for human consumption ...	3,253 (90.0)	1,171 (100.0)
Grand Total ...	3,615 (100.0)	1,171 (100.0)

n = Negligible.

As will be observed, practically the entire quantity of white sugar and nearly 90 per cent of Gur are used for human consumption.

It may be noted that though both Gur and sugar are utilised more or less for similar purposes, the proportions of the two products used for different objects differ widely. For example, while nearly 20 per cent of the available sugar is consumed in tea and coffee, the quantity of Gur so used forms only about 1 per cent of its total supply. The fact is that the consumption of different kinds of sugar, as already stated, is governed mostly by their relative price positions, though for certain special preparations a particular type of sugar may be preferred more than any other.

Broadly, the Gur, including the various unrefined products which generally cost one-third to one-half of the price of factory sugar or *khand*, is mostly consumed by the poorer classes, while the white sugar is largely used by the well-to-do, particularly in the urban areas. There are, however, certain tracts, e.g., Baluchistan, where due to the existence of some prejudice against the use of Gur, even the poorer classes prefer to consume sugar to whatever extent they can afford.

It is interesting to note that the total quantity of different kinds of sugar estimated to be used for human consumption in India during the period 1935-36 to 1938-39 averaged about 4,456,000 tons including approximately 3,253,000 tons of Gur, 1,171,000 tons of white sugar and 31,000 tons of *minja dana*. These cover about 90 per cent of the available supplies of Gur and practically the entire quantity of sugar and *minja dana* utilised in India.

The following Table shows the utilisation of Gur and sugar for various drinks :—

TABLE No. 15

Utilisation of gur and sugar for various drinks.

Area.	Gur.				Sugar.			
	Percentage of *gur* used for drinks to total *gur* utilised for human consumption.	Percentage consumption on			Percentage of sugar used for drinks to total sugar.	Percentage consumption on		
		Tea and coffee.	Milk	*Sharbat* and other drinks.		Tea and coffee.	Milk.	*Sharbat* and other drinks.
United Provinces	9.0	6	36	58	26.5	15	39	46
Punjab ...	27.3	4	54	42	54.2	20	28	52
Bihar ..	9.5	5	70	25	31.8	33	39	28
Bengal ...	2.9	16	64	20	34.9	52	22	26
Madras ..	4.6	78	7	15	69.2	76	7	17
Bombay ...	4.8	27	38	35	51.9	68	11	21
North-West Frontier Province	42.3	17	26	57	41.0	26	12	62
Mysore ...	16.0	79	5	16	70.0	85	5	10
Hyderabad	3.7	19	31	50	33.3	37	13	50
Others ...	5.1	19	35	46	32.2	36	23	41
Total India	9.5	13	43	44	42.8	45	21	34

A glance at the above Table will show the utilisation of sugar and Gur for different purposes, namely, tea and coffee, milk, other drinks, the varying habits of the people in different provinces and the varying *per capita* consumption of both Gur and sugar. It has been computed that a large proportion of sugar is utilised in tea and coffee, while Gur is chiefly consumed, excepting in the case of Madras and Mysore, with milk or for preparing *sharbats*, etc.

Increase in Consumption of Sugar along with Tea and Coffee

The increase in the consumption of tea from 27.2 million lbs. in 1933-34 to 101 million lbs. in 1939-40 has also been responsible for an increase in the consumption of sugar. Comparatively more tea is consumed in Bombay, Bengal, Madras and the Punjab than in most of the other tracts, while the largest consumption of coffee occurs in parts of Madras, Travancore and Mysore. The quantities of Gur and sugar estimated to be utilised for flavouring these two drinks are roughly 1,95,000 tons of sugar and 27,000 tons of Gur for tea, and 32,500 tons of sugar and 16,100 tons of Gur for coffee. The quantity of Gur and sugar consumed per lb. of tea, from which generally 150 to 200 cups of liquid drink are made, varies in different tracts from 4 to 8 lbs. Taking into account the conditions in the various parts, the total sugar consumption for sweetening tea works out to 2,22,000 tons, i.e., about 5½ lbs. per lb. of tea. The quantity of Gur or sugar required to flavour the drink from 1 lb. of coffee varies from 2 to 5 lbs. in different tracts—a rough average for Northern and Southern India being 3½ lbs. and 2½ lbs. respectively.

Taking into account the quantities of coffee consumed in different tracts and the demand for Gur and sugar, the total sugar required for

the purpose works out to about 48,600 tons including 32,500 tons of sugar and 6,100 tons of palm Gur and nearly 10,000 tons of the cane product.

The consumption of Gur and sugar utilised for domestic purposes also varies considerably from tract to tract, depending chiefly upon the financial position of the people and their habits regarding consumption of various types of sweet preparations. A glance at the following Table will indicate the utilisation of Gur and sugar for domestic purposes :—

TABLE No. 16

Utilisation of gur and sugar for domestic purposes.

Tract.	Gur.			Sugar.		
	Quantity used. (Thousand tons).	Percentage of total quantity consumed.	Consumption per head. (In lb.)	Quantity used. (Thousand tons).	Percentage of total quantity consumed.	Consumption per head. (In lb.)
United Provinces	933.2	67.5	40.4	64.0	33.3	2.8
Punjab ...	199.7	44.2	12.6	47.5	23.4	3.0
Bihar ...	90.4	66.5	5.8	11.2	20.0	0.7
Bengal ...	453.4	74.0	18.9	22.0	14.7	0.9
Madras ...	245.8	80.2	10.8	17.2	17.2	0.8
Bombay ...	173.2	80.2	12.4	36.0	15.9	2.6
North-West Frontier Province	7.5	41.7	3.3	7.8	39.0	3.4
Mysore ...	39.6	66.0	12.7	0.9	10.0	0.3
Hyderabad ...	76.7	89.3	10.8	8.5	31.5	1.2
Others ...	284.8	82.3	8.4	48.6	26.0	1.4
Total India ...	2,504.3	69.2	15.5	263.7	22.5	1.6

* A sweet preparation made by boiling rice in milk.
† Crushed wheat or maize boiled in water and flavoured with ghee and sugar.

It will be observed that the consumption of Gur for domestic uses excluding drinks varies from about 3 lbs. per head in Mysore to 40 lbs. in the United Provinces. The *per capita* utilisation in the case of sugar is comparatively low and ranges from nearly ½ lb. in Mysore to 3 lbs. in the Punjab and 3.4 lbs. in the North-West Frontier Province.

Gur Consumption in Various Provinces

In the United Provinces, where the *per capita* consumption of Gur is practically thrice as high as in any other tract, a large quantity of Gur is eaten as such. In the producing villages it forms the common sweet particularly for children and quite often the only breakfast for the cultivator, particularly in the winter season. Though Gur is eaten as such in most of the other tracts, the practice is nowhere so common as in the United Provinces and in certain parts of the Punjab, in Gujerat, and in Bombay. It may be added that white sugar—crystal or crushed—is not eaten as such but a considerable quantity of this product is consumed in the form of candy and *batashas*.

The following Table gives a comparative idea of the utilisation of Gur and Sugar for various purposes :—

TABLE No. 17

Utilisation of gur and sugar in lb. per head.

	Gur.				Sugar.			
	Drinks.	Domestic uses.	Confectionery and other products.	Total.	Drinks.	Domestic uses.	Confectionery and other products.	Total.
United Provinces ...	5.4	40.4	8.1	53.9	2.2	2.8	3.3	8.3
Punjab ...	7.8	12.6	2.9	23.3	6.9	3.0	2.9	12.8
Bihar ...	0.8	5.8	1.3	7.9	1.1	0.7	1 9	3.7
Bengal ...	0.7	18.9	3.2	22.8	2.2	0.9	3.2	6.3
Madras ...	0.7	10.8	0.6	12.1	3.0	0.8	0 6	4.4
Bombay ...	0.7	12.4	1.3	14.4	8.4	2.6	5.2	16.3
North-West Frontier Province ...	3.4	3.3	0 8	7.5	3 6	3.4	1.8	8.8
Mysore ...	3.1	12.7	2.9	18.7	2.0	0.3	0 6	2.9
Hyderabad ...	0 5	10.8	0.5	11 8	1 3	1 2	1.3	3.8
Others ...	0.5	8.4	0 8	9.7	1 8	1 4	2.3	5.5
India ...	2.1	15.5	2.5	20.1	3.1	1.6	2 5	7.2
Percentage to total *gur* sugar consumed ...	10.5	77.1	12.4	100.0	43.1	22.2	34.7	100.0

More than 87 per cent of the total Gur including the quantities consumed for drinks, is utilised at home. In the case of sugar, a large quantity of which is used for preparation of sweets and drinks for the market, the corresponding proportion may be between 35 and 40 per cent.

As has already been observed, due to varying financial conditions of the people and their habit regarding the use of different kinds of sugar, the quantities of Gur and white sugar utilised in different tracts for various purposes vary considerably. Taking both Gur and sugar together, the highest *per capita* utilisation of 62.2 lbs. occurs in the United Provinces, as compared with 36 lbs. in the Punjab, 30 lbs. in Bombay, 29 lbs. in Bengal, and only 11 lbs. in Bihar.

Wide differences are also noticed in the *per capita* utilisation of Gur and Sugar in the rural and urban areas of the different tracts as will be observed from the figures in the following Table which shows the consumption of these two products in certain provinces and their important urban centres :—

TABLE No. 18

Per capita consumption of gur and sugar in certain rural and urban areas.

	Gur.		Sugar.	
	Urban areas. (lb.)	Total for the province. (lb.)	Urban areas. (lb.)	Total for the province. (lb.)
United Provinces	13.2 (1)	53.9	58.1 (2)	8.3
Punjab	18.0 (3)	23.3	50 4 (4)	12.8
Bengal	15 4 (5)	22.8	85.5 (5)	6.3
Madras	8.9 (6)	12.1	51.2 (6)	4.4
Bombay	12 4 (7)	14.4	81.4 (7)	16.3
Sind	6.0 (8)	7.2	82.1 (8)	17.8

(1) 22 markets. (2) 29 markets. (3) 6 markets. (4) Delhi.
(5) Calcutta. (6) Madras. (7) Bombay. (8) Karachi.

It will be noted from the figures in the above Table that a much larger quantity of Gur is used in the rural areas than in towns. Just the opposite and in a greater degree is the case with sugar. Further the total consumption of Gur and sugar per head in towns is generally 2 to 4 times higher than in rural areas. It may be assumed that these differences are mainly due to the relatively higher income and the consequent higher standard of living of the town-dwellers.

The following figures show the consumption of sugar per head in some of the more important countries of the world.

TABLE No. 19

	lb.		lb.
United Kingdom	106	France	52
United States of America ...	97	Netherland	64
Australia	116	Germany	52
Union of South Africa	47	Italy	17
Java	11 *	Japan	33
India	27 †	Brazil	34

* Excluding unrefined sugars. Consumption of unrefined sugars in other countries. (excepting India) is comparatively negligible.

† Including 20 lb. of *gur*.

It may be noted that though the *per capita* utilisation of sugar in India as a whole makes a rather poor comparison with the figures for most of the other countries, *the consumption in large Indian towns, particularly ports, is more or less of the same order as in some of the most advanced industrial countries like the United Kingdom and the United States of America.*

Periodicity of Consumption of Sugar and Gur in India

From the above statistical data relating to consumption of sugar and Gur for various purposes, it is possible to draw certain conclusions of value in regard to the possibility of increasing the consumption of sugar and Gur in India. Firstly it is noteworthy that Gur is consumed in larger quantities during the winter season than in the summer months. It is liked most for eating such when fresh, and as already observed, its production is also chiefly concentrated during the winter months from November to March. Roughly 65 to 75 per cent of the total quantity of Gur consumed in different parts of Northern India including the U. P., Punjab, Bengal, Bihar, Rajputana, etc., is estimated to be used during the six months from October to March. Unlike Gur, however, the demand for sugar is more or less fairly evenly distributed throughout the year. Larger quantities are, however, consumed on the occasion of festivals such as the Diwali and Id, and during marriage seasons.

The annual consumption of the different kinds of sugar in India, during the period 1935-36 to 1938-39, averaged about 4,818,000 tons including nearly 3,647,000 tons of Gur and 1,171,000 tons of sugar. The consumption has increased considerably during recent years, particularly in the case of Gur. This is shown by the figures in the following Table which gives among other things, five-year running averages of the estimated net available supplies of Gur and sugar for

the period from 1920-21 to 1938-39. For comparison, the corresponding price data have also been included. Further, with a view to studying fluctuations in consumption in individual years, the position in respect of the recent seven years has been shown separately in the Table. It may be added that in calculating the net available supplies of sugar for the recent years due allowance has been made for stocks and carry-overs, particularly in respect of the major ports and mills. These factors have, however, not been taken into account in the case of Gur as the carry-overs of this product from year to year are comparatively negligible. Nor was it considered necessary to do so in the case of running averages.

TABLE No. 20

Trend of annual consumption and prices of gur and sugar.

Period.	Estimated net available supplies in thousand tons.		Weighted average wholesale prices per standard maund.	
	Cane gur. †	Sugar.	*Cane gur* ‡	Sugar. ‡
			Rs. a.	Rs. a.
1921-25*	1,956	792	9 4	16 12
1922-26*	2,030	866	8 10	14 15
1923-27*	2,159	911	8 2	14 0
1924-28*	2,196	975	8 0	12 9
1925-29*	2,086	1,053	8 0	11 5
1926-30*	2,106	1,081	7 11	10 11
1927-31*	2,131	1,080	7 0	10 1
1928-32*	2,204	1,080	6 7	9 13
1929-33*	2,365	1,080	5 12	9 10
1930-34*	2,700	1,045	5 2	9 10
1931-35*	3,019	1,026	4 10	9 9
1932-36*	3,352	1,060	4 5	9 9
1933-37*	3,626	1,126	4 2	8 13
1934-38*	3,685	1,139	4 6	8 11
1935-39*	3,405	1,147	4 14	9 2
1932-33	3,143	1,020	3 12	9 8
1933-34	3,521	1,011	4 14	9 7
1934-35	3,433	1,051	4 14	9 7
1935-36	3,869	1,253	3 12	8 8
1936-37	4,166	1,293	3 6	7 2
1937-38	3,436	1,085	4 15	8 14
1938-39	2,123	1,052	7 6	11 10

* Quinquennial average based on statistics for crop years (October—September). For example, 1921-25 refers to the period from 1920-21 to 1924-25.

† As the imports and exports in the case of *gur* are negligible they have not been taken into account.

‡ Based on Appendix XLIII of the Report on Marketing of Sugar.

The consumption of both Gur and sugar show considerable and almost a steady increase during the period under review. The increase in the consumption of both these products has been much more than proportionate, compared with the increase in population. This is chiefly attributable to the relatively low prices at which these products have been available upto 1940. As will be observed the demand for Gur and sugar is fairly elastic and there is a close relation between the supplies of these products and their respective price positions. When

the prices rise the consumption is curtailed and *vice versa*. In the case of Gur whose prices depend more or less entirely on home production it would, however, perhaps be more correct to say that demand is fairly steady and when supplies are short of demand the prices rise and the consumption is curtailed. The position is reversed in years of plentiful supplies.

The slight depression in sugar consumption noticeable between 1930-31 and 1934-35 was perhaps due mainly to the world-wide slump in commodity prices and the consequent loss in the purchasing power of the Indian agricultural producers. The consumption, however, appreciably increased in 1935-36 due to both the general recovery in the commodity markets and the fall in the prices of Indian sugar as a result of increased home production. This tendency continued in a marked degree in 1936-37 when the consumption of sugar in India reached a record high figure when the prices touched the lowest level. In the two following years, 1937-38 and 1938-39, the sugar production in India was appreciably reduced, mainly due to the low prices during the former year and a poor crop in the latter. The fall in production was followed by a sharp rise in the prices and in consequence the consumption fell to a low figure of 1,085,000 tons in 1938-39 as compared with 1,293,000 tons in 1936-37. It may, however, be noted that in 1938-39 due to heavy imports there were ample supplies in the market and the year closed with a substantial carry-over.

The consumption of Gur during the period under review has increased by nearly 85 per cent as against an increase of about 17 per cent in population and 45 per cent in the case of sugar consumption. The fall in the prices of Gur was relatively greater than in the case of sugar; hence the greater increase in consumption. It may be pointed out that the prices of both Gur and sugar were relatively very high in the early years of the period chiefly on account of the general inflation in the commodity markets which followed the War of 1914-18.

As in the case of sugar, the peak in Gur consumption was reached in 1936-37 and the quantities used in the following two years particularly 1938-39 were substantially less mainly due to short production and consequent high prices.

Considering the present low *per capita* consumption in the country, particularly of white sugar, and the wide differences in the quantities used per head in the urban and rural areas; there would appear to be ample scope for increasing consumption. The actual increase would, however, depend largely upon the extent to which the cost of production or the sale prices of Gur and sugar could be reduced and new ways of promoting consumption of sugar in the country could be devised. Any improvement in the purchasing power of Indian consumers—who are largely agriculturists—is also sure to promote increased consumption. This has been discussed in detail in the next Chapter.

It may be noted here that in recent years there has been a tendency among the working classes in urban areas to substitute sugar for Gur particularly in tea but as the quantities of Gur used for this purpose are comparatively small, it is not likely to affect the position materially in the near future.

As far as white sugar is concerned the position regarding *Khand* only seems to require some comment. It is generally known that certain orthodox members of the community have sentimental objections to the use of factory sugar believing that bone-charçoal is used in its manufacture. As, however, the knowledge regarding the methods of cane sugar manufacture is becoming more common, the belief is gradually disappearing and with it the special demand for *Khand.* In the near future the demand for *Khand* would probably be guided purely by economic and dietetic factors. These should, however, tend to favour the factory product which can be produced at nearly two-thirds the cost of *Khand* and having regard to the close relation between consumption and prices, the lower the prices of white factory sugar the greater is likely to be its consumption.

A close study of the existing conditions in regard to the consumption of Gur and sugar in different parts will also show that apart from the question of a general reduction in sugar prices or the increased purchasing power of the consumer, the demand for the different kinds of sugar can also be substantially increased by improving the quality and variety of the products prepared and through effective propaganda regarding their dietetic values and by their more economical distribution. The important points in this connection are as follows:—

(*a*) At present Gur is generally made without properly clarifying the juice and in bulky, inconvenient and unattractive shapes and sizes. Further, during handling, storage, transport and retailing due regard is not paid to sanitary conditions and it is not uncommon to see lumps of Gur without any covering material lying exposed to the attention of flies, pariah-dogs, etc. The product in such a condition, far from being attractive, becomes rather repulsive to the consumer. Gur made in attractive forms and properly packed in convenient sizes from well clarified juice can, therefore, be expected to command an increased sale, particularly in the urban areas. The possibilities of putting on the market spiced and flavoured Gur, commonly made by the cultivators in many tracts for their own consumption, might also be explored. It may be noted in this connection that the experience of some of the large producers and the Gur Development Staff in the United Provinces has been that the Gur made after properly clarifying the juice and distributed in neat and handy containers (e.g., paper envelopes) more than repays for the extra expenditure incurred on it.

(*b*) The consumption of Gur can also be encouraged by using it in the preparation of a variety of cheap fruit products such as *chutnis* and *murabbas* for eating with *chapatis*, rice, etc., and as sweets. Such products are not marketed at present while similar preparations from white sugar are sold at fancy prices and are generally out of the reach of the ordinary Indian consumer. In many areas fruits, e.g., mangoes and guavas, are available at very cheap prices during their season. In such tracts, the Gur fruit products can probably be made and sold at a price not higher than that of Gur alone. This would also provide a good outlet for fruits and make them available for consumption throughout the year. The value of such products in the dietary of the people is obvious.

(*c*) The consumption of date palm Gur which is chiefly produced in Bengal and is much relished for its flavour and aroma is mostly con-

fined to the producing months from November to March as the product does not keep well in summer. The producers are, therefore, not able to get the full benefit of the consumers' preference for the article. Provision of cheap storage facilities and the use of suitable preservatives (e.g., sodium benzotte) which would not impair the flavour of the product might be tried with a view to making it available for consumption throughout the year.

(*d*) Palm Gur improves the flavour of coffee. Its production after properly clarifying the juice in handy and attractive form, say cubes, would promote its use for sweetening this beverage.

(*e*) A good outlet for refined sugars might be found in the increased consumption of fruit sugar products like syrups, *murabbas*, squashes, ice-creams, etc. At present these products are generally highly priced and are used for medicinal purposes only. In the case of syrups, essences are mostly used in their preparation instead of fruit juices. In the absence of guaranteed quality the demand suffers. By proper organisation most of these products could be placed on the market at probably less than half the present cost. With relatively low prices, the consumption of these products and with them that of sugar would considerably increase.

(*f*) The use of saccharine, which is commonly used for sweetening various drinks particularly aerated waters requires to be discouraged. This chemical has no food value and in most of the advanced countries its use in various edibles and drinks has to be declared on the label of the products concerned. No such provisions are, however, in existence in this country * at present and the various products sweetened with saccharine are generally sold as products of sugar.

The annual imports of saccharine during the period 1934-35 to 1938-39 varied from 18,000 to 82,000 lbs. and averaged about 40,000 lbs. Taking the sweetening capacity of this chemical as 500 times that of sugar, the sugar required to replace it represent somewhere about 10,000 tons. There is, however, reported to be some smuggling in this article and the quantities actually used may be much more. Besides increasing the consumption of sugar, checking the use of saccharine would immensely improve the quality of drinks put on the market. It may be added that the use of sugar instead of saccharine would not affect the consumers' price to any appreciable extent.

(*g*) Well organised propaganda directed towards educating the consumers regarding the dietetic values of the different kinds of sugar and their products is likely to help in promoting consumption. Proper measures should also be taken to dispel superstitions regarding the harmful nature of Gur or sugar such as are current in certain tracts, e.g., parts of Sind and Baluchistan.

(*h*) In certain areas different kinds of sugar, particularly unrefined are available only at abnormally high prices due either to the high transportation costs or high trade margins. The result has been that the taste for sugar has not fully developed in such tracts, e.g., Dar-

* Excepting in certain towns of Bombay and Sind where the use of saccharine is either prohibited or is required to be specially declared.

jeeling area in Bengal. Arrangements should, therefore, be made to make the sugar products available at economical prices in such tracts by making special arrangements for distribution. The process could perhaps be expedited by making sugar available at relatively low prices in the first instance.

Above all, it has been found that there is a great world deficiency of energising foods like potatoes, sugar and cereals and inasmuch as sugar contains 100 per cent carbohydrate and is one of the cheapest, most universally used and palatable sweetening agent of proved high calorific value, unique for quick conversion into energy, its value as a prime and vital food is greatly enhanced. Besides sugar satisfies a craving that is well nigh universal among mankind. As consumed, it is chemically pure and practically sterile of bacteria. It is an important preserver of other foods. It supplies a large percentage of the total caloric intake of a large number of people, and its production should be encouraged for meeting the shortage of carbohydrates and energising foods all over the world, as was revealed at the Hot-springs Conference in 1941.

Having referred to the present production and utilisation of sugar and Gur in India, we will now turn our attention in the next chapter to the scope of optimum production and consumption of sugar and Gur in India in the years to come.

CHAPTER XVI

SCOPE OF OPTIMUM PRODUCTION AND CONSUMPTION OF SUGAR IN INDIA

THROUGHOUT this work, up to this stage, the position and problems of the sugar industry have been considered from a special standpoint. It has been assumed that no indigenous industry is sound or economic, unless the cost to the consumer can be demonstrated to be no more than what it would have been in conditions of free imports. Due emphasis was, however, laid on the fact that, once an industry is established and is able to market its output, the question of the price at which imports would have been obtainable in the absence of such an indigenous industry and in conditions of free imports is too hypothetical to be of practical value. It has been contended, therefore, that in judging whether a protected industry has been economic or not, less reliance should be placed on the prevalent prices of the imported product than on other available methods of judging whether the price paid for an essential commodity like sugar is or is not, from the broad social point of view, a just price. These methods have been specified; and it has been shown that, judged by these tests, protection to sugar must be considered to have justified itself. That these tests do not satisfy the free trader or other opponents of protection cannot be gainsaid; and it can only be observed in this regard that it is unfair and unscientific to a protected industry to compare the prices of its product with the prices of its foreign competitors, without regard to the fact that the latter would have been at much higher levels but for the establishment of the protected industry. A more valid criterion of judgment can be had only from a comprehensive view of the resources and possibilities, immediate and remote, of the national economy as a whole. For, only in such a view does it become possible to recognise that the cost of production of a particular industry is not a function only of the efficiency of the capital and labour engaged in that industry, but that it must necessarily reflect the efficiency of production of the raw material and of the extent to which the general social and environmental factors are helpful or otherwise to the increase of productive efficiency.

General Toning up of Entire Economic Organisation Necessary for Progress

The case of the sugar industry is almost unique among India's protected industries as it serves to bring out the differences, in the ultimate conclusions, between the two standpoints. By far the most important of the conclusions arrived at in this thesis is that for industrial development in India, in the sense of a progressive reduction of the cost of manufactured products, we have to look, not alone to industry, but to a general toning up of the whole of our national

economic life and the entire economic organisation. This is brought about by the fact that during the last fourteen years since the grant of protection, the sugar industry in India has achieved more than what the Tariff Board expected of it and that for further progress in the reduction of the cost of production of sugar, we have to look to agriculture, far more than industry. Efficiency of industrial production is not attained by pillorying protected industries any more than by pampering them. And if a backward, though civilised, country is to attain industrial efficiency, it has to advance all along on the line instead of goading industry at some points. The importance of the sugar industry lies in bringing out this aspect of our national economy more clearly than any other.

Need for Synoptic Outlook on Economic Problems

The logic of this thesis has been fully borne out by the logic of events. In the first place, the sugar industry is the first instance of a protected industry in which the Tariff Board virtually repudiated one of the fundamental conditions of the Fiscal Commission and refused to consider the date at which protection can be withdrawn. Secondly, the experience of the sugar industry has led to a general demand for the revision of the policy of discriminating protection and a liberalising of the terms on which protection is to be granted. Thirdly, thanks to the outbreak of the war and the change in men's attitude to economic problems, the need for a synoptic outlook on economic problems has been recognised and expressed in the most challenging terms in "The Bombay Plan *" and in the acceptance of planned economic development as the official policy of the Government in this country. The acceptance of planning alike by the Government and by the public as the established policy for the country means in effect that the reasoning adopted in this thesis, which formerly might have appeared to some as a kind of special pleading for one protected industry, is now seen to constitute the only rational approach to all our economic problems. No longer will the question be one of either reducing somehow the price of Indian sugar to that of Java and Cuba or of scrapping the Indian industry and leaving a large part of the country's natural resources to run to waste. While economic planning will not be indifferent to disparity in costs of production between India and Java, the standpoint is different from the old orthodox one in that it will ensure a reduction in the cost of production by securing the utmost improvement in all the factors that determine such cost of production. In concrete terms, planning will secure improvement in all the three spheres, industry, agriculture and the general instrumental factors.

In view of the fact that planning has been unanimously accepted as the policy for the future, the old standpoint becomes altogether

* A 15 years' plan for the Economic Development of India, put forward by eight distinguished industrialists and businessmen in 1944, is known as the Bombay Plan. This is a comprehensive plan, which has arrested the attention of the thinking public and the Government of India.

invalid, so far as the future of the sugar industry is concerned. The lines of development have no longer to be considered as within the rigid and cramping framework of a policy of discriminating protection. Optimum production and consumption of sugar need no longer be considered as the resultant of the prices in a comparatively free and unregulated economic life. Optimum production will be determined on the one hand by the resources available and on the other by the requirements as fixed by other than the old economic considerations. It is not, of course, to be supposed that optimum production and consumption can be fixed at the sweet will of the planning authorities. Economic forces will, no doubt, be operative, but not in the form of free prices which they take in an economy of *laissez faire* and free trade. The forces that will operate will be economic in the broader and truer sense that they spring from the necessity of distributing scarce means among alternative ends. Nevertheless, these forces are so substantially different from the forces that operate in a free economy, that the question of optimum production and consumption has to be considered now from the standpoint of a planned rather than a free economic system.

The starting point of economic planning, unscientific and impractical as it may seem, is an estimate of needs rather than means. The planning authority proceeds from an estimate of the total production of each commodity needed to ensure the standard of life it has in mind, though with the full consciousness that this estimate may have to be considerably altered in consideration, of the actual resources at its disposal. In the case of India, the various plans published by non-official agencies have not, strangely enough, endeavoured to fix targets for the production of sugar. The Bombay Plan, which enjoys the greatest prestige and support, while it mentions a minimum for *per capita* consumption of cotton cloth and for housing accommodation, does not make any special reference to sugar. Sugar being an article of food, it is naturally included in food requirements which are estimated in terms of calories required to sustain the health and efficiency of the average individual. How this estimate of calories is to be distributed among the various articles of food is a question which may seem to offer a bewildering scope for variety of opinion and of choice. But, for all practical purposes, this scope may be deemed to be considerably narrowed by the fact that the primacy of sugar is ensured as much by the universal love of its taste as by its indispensability for the growth of the adolescent and the health of the grown-ups. The exact amount of white sugar which each individual needs may vary according to the consumption of other foods which can provide carbohydrates for the physical system. But to fix the minimum *per capita* consumption of sugar for the purposes of economic planning, it is permissible to look to the consumption of other countries of the world and arrive at a figure which will meet with general approval. The following Table gives the *per capita* consumption of sugar for a number of foreign countries :—

TABLE No. 1

***Per capita** consumption of Sugar in various countries*

United Kingdom ...	106	lbs.	per head	Cuba ...	88	lbs.	per head
U. S. A. ...	97	„	„	Java ...	11	„	„
Brazil ...	34	„	„	Japan ...	33	„	„
France ...	52	„	„	Union of South Africa	47	„	„
Australia ...	116	„	„	Netherland ...	64	„	„
Germany ...	52	„	„	India ...	27 (including 20 lbs. *Gur*)		

It will be seen that the figure ranges from 116 lbs. in the case of Australia to 11 lbs. in the case of Java and works out to an average of about 80 lbs. for the advanced countries.

We may now turn to consider the *per capita* consumption of sugar in India. With our total supplies in the vicinity of about one million tons of sugar for a population of 400 million, the *per capita* consumption of sugar may seem an incredibly low figure. It is necessary in our case, however, to take into account the large and more important factor of the consumption of Gur, estimated at about 3 million tons. The total production and consumption of sugar and Gur in India is given in the Table below for a period of more than one decade, together with the *per capita* consumption in each year.

TABLE No. 2

*Total, and **per capita** consumption of Sugar and Gur in India**

Year (November–October)	Consumption of Sugar in tons	Official Estimate	Consumption of Gur in tons	*Per Capita Consumption lbs.* Sugar	Gur	Total of Sugar and Gur
				lbs. per head	lbs. per head	lbs. per head
1931-32	982,000	„	2,758,000	6.2	17.2	23.4
1932-33	1,006,000	„	3,240,000	6.3	20.2	26.5
1933-34	996,000	„	3,486,000	6.1	21.5	27 6
1934-35	1,059,000	„	3,701,000	6.5	22.6	29.1
1935-36	1,074,000	„	4,101,000	6.5	24.8	31.3
1936-37	1,167,000	„	4,268,000	7.3	26.7	34.0
1937-38	1,159,000	„	3,364,000	7.2	20.9	28.1
1938-39	1,073,000	„	2,131,000	6.6	13.1	19.7
1939-40	1,019,000	„	2,441,000	6.4	18.0	24.4
1940-41	1,100,000	(Our Est.)	3,410,000	6.7	20.6	27.3
1941-42	1,050,000	„	2,829,000	6.0	18.5	24.5
1942-43†	966,000	„	3,567,000	5.9	20.1	26.0
1943-44†	1,086,300	„	3,989,500	6.5	23.8	30.3

* Total value of sugar, including gur, produced in the year 1943-44 may be estimated at about Rs. 118.33 crores.

Price calculated at the rate of Rs. 15-4-0 per maund of sugar and Rs. 9-6-0 per maund of gur as the standard of average for the whole season.

		Maund 82.2/7 lbs. Tons	Sugar 15¼ Rs. Price	Gur 9.1/6
1943-44	Sugar	10,86,300	49,09,65,375	
	Gur	39,89,500	69,23,44,479	
	Total Value Rs.		1,18,33,09,854	Rs. 118.33 Crores. (Includes the excise duty)

† Our estimates.

It will be seen that if our *per capita* consumption * is about 26 lbs. (6 lbs. of sugar and 20 lbs. of Gur), as against the average of 80 lbs.

for the advanced countries listed in the foregoing Table and if this average may be taken as the index of what is necessary in the case of India, our production of sugar requires almost to be trebled, at an early date. About the desirability of a triple increase in the production of sugar there can be no question. Even at about 80 lbs., the figure will be substantially less than the consumption of such countries as Britain, U. S. A., Denmark, Australia and New Zealand. *As the world's biggest producer of sugar (including Gur), India may not unreasonably look forward to a level of consumption which, if it is not among the highest in the world, will, at any rate, not be lower than the average.*

The question which now arises for our serious consideration is: what is the minimum target which we should place before us for the immediate future, and for the distant future? In fixing such a target we should assure ourselves on the one hand that the agricultural economy of the country is not upset to any degree and on the other hand that the maximum quantity of this energising food, sugar, is made available to the people with a view to meet their demand for improving their standard of living and nutrition which, now, is at a low ebb, to the level of International Standards of Nutrition.

Prima facie, a triple increase in the production of sugar would require a similar increase in the acreage of the sugarcane. If so, would it be economic and would it be possible to devote three times the present acreage to the production of sugar, to increase the fixed capital of the sugar industry to a like extent, and secure the increase in sugar production? Have we got sufficient cultivable land to devote to sugarcane without prejudice to equally important or perhaps even more important other food crops like wheat and rice, of which there is a shortage in the country. Are there no other avenues for utilisation of our savings and capital?

Obvious and pressing as these questions may seem, they do not reflect the true nature of the problem we have on hand. A triple increase in sugar production does *not* call for a similar increase in the area under sugarcane. Economies in the utilization of the resources that are now devoted to the production of sugar will by themselves be able to solve by far the greater part of the problem on hand. It stands to reason that in attaining the target that we have provisionally set before ourselves, we should distinguish between such economies and the new developments that may be required. The position at present is that only four million acres of land (less than two per cent of the area under cultivation in India) are devoted to the production of 60 million tons of sugarcane of which about 1|5th or 12 million tons are utilised in modern factories for manufacture of white sugar, about 36 million tons (roughly 60 per cent) are utilized for the production of Gur, and the balance is used for *Khandsari* sugar manufacture, sets and chewing purposes. It is no exaggeration to say that there is a waste of resources at every point, in the yield of sugarcane per acre, in extraction of sugar from sugarcane (1) in the *Khandsaris,* (2) in the making of Gur, and even, though to a far smaller extent, (3) in the modern *vacuum pan* factories. The scope for economies which the present conditions suggest, needs therefore to be examined, step by step.

Considerable Increase in Yield per Acre Possible

Taking first the land under sugarcane, it is well known that the average yield of cane in India per acre at the present time is about 15 tons and that this yield has increased to its present figure from a bare 9 tons in 1913-14. This is due to the fact that during the last 30 years, 80 per cent of the cultivated area of the sugar has been put progressively under the improved varieties of cane bred at the Imperial Sugarcane Station, Coimbatore. Within the last 30 years, the yield per acre has increased by about 61 per cent due particularly to the improvements in cultivation and the new varieties. Again it is heartening to state that this improvement both in yield and quality of cane shows promise of further increase. The present yield of 15 tons of cane represents of course only a fraction of the yields in other tropical countries like Java and Cuba where yields as high as 50 or 60 tons of cane per acre are common. It is doubtful if the yield of cane in India will ever be as high as, for instance, in Java or Cuba, due to the disadvantage of climate, cane in this country being grown mainly in sub-tropical areas. What is more, the benefits of large-scale production of cane are denied to the Indian growers, but it is pleasing to find that yields as high as in Java or Cuba have been achieved in some sugar factory estates, and in the experimental farms in Bombay, Deccan, Madras and other parts of tropical India. There is the arresting fact that already an increase in the yield per acre has been secured from 10 to 15 tons within the last 2 decades. There are still potentialities of further increase. It has been proved by the work of the Indian Research Stations * that quite astounding results can be achieved. The Ravalgaon Sugar Factory in Nasik District in Bombay has been able to raise 50.5 tons and 41.4 tons of cane per acre with CO.360 and POJ 2878. In 1941 it raised 52.9 tons. Yields of 80 tons and 100 tons per acre have also been raised in a competition organised by the Maharashtra Chamber of Commerce in 1934.† Mysore has obtained yields of 36.86 tons, 51.88 tons and 50.40 tons with H.M. 320, H.M. 606 and H.M. 607 varieties of cane. Sugarcane research has just reached the stage of adolescence ; and it is not undue optimism to suggest that the best results are yet to come.

The increase in sugarcane output which we can secure with the present area of 4 million acres on the sugarcane has been estimated by an experienced Agricultural Officer Dr. W. Burns in his Report on "The Technological Possibilities of Agricultural Development in India", published in 1944. After a very careful survey of the position of cane cultivation in each Province he has set out the increase in the yield which it should not be difficult to obtain by scientific cultivation. The following Table indicates the possible yield in tons of sugarcane in various Provinces, according to this expert authority :—

* *Vide* M. P. Gandhi's *Sugar Industry Annuals,* 1939, 1940, 1941, 1942, 1943 and 1944.

† *Vide* Walchand Diamond Jubilee Commemoration Volume published in 1942, p. 149, wherein it is observed "when the Maharashtra Chamber of Commerce organised a competition in 1934 for 'Prize Plots' with record yield of cane, the Walchandnagar Farm at Kalamb on the Nira Canal area in the Poona District came out the best with a yield of 104 tons of cane per acre, the highest figure yet attained in India".

TABLE No. 3

Possible Yield in Tons of Sugarcane

North-West Frontier	30 to 35
The Punjab	40 to 45
United Provinces	27 to 35
Bihar	25 to 35
Bengal	35 to 40
Madras	45 to 55
Bombay	45 to 55 for plant cane
Mysore	70 to 80 for Adsali.

From the above, and as soon as the remaining 20 per cent of the cane-crop which is not under improved varieties at present is also put under improved varieties, it will be possible to expect, if not all too suddenly, at least in course of a few years, an increase in the present average yield of 15 tons to 40 tons an acre, and consequently an increase in the total output of cane to over 160 million tons of cane from the same acreage.* As far, therefore, as the provision of the raw material for the manufacture of sugar is concerned, we can safely assert that there will be no difficulty in producing the requisite quantity of cane for trebling, in course of a few years, the production of sugar and Gur, without increasing the area under cane. It is true that all this large increase will take time but if the process starts right now as a result of careful research work, there will be no difficulty whatever in doubling, at any rate, the production of sugarcane during, say, the next 6 or 7 years, and of trebling it within the subsequent decade. We are allowing ten years for the evolution of a triple yield due to the assumption that increases in the yield from 30 to 40 tons would be more difficult than the first increase from 15 to 30 tons. Relying on the past progress, and the future possibilities as envisaged by expert authorities and our own achievements, we can safely conclude that we can produce double the quantity of sugarcane within the next 6 or 7 years and treble it within the next 10 years from the same acreage. Indeed, if our recommendation for the utilisation of palms and Date trees, which India has in abundance (as discussed in Appendix No. III) is explored and implemented for manufacturing of Gur and sugar, it may even be possible to release some land from cane for purposes of growing food crops also.

The next source of economy lies in the improvement of Gur making, on the ground of its being a more wasteful method of sugar manufacture. The Indian Gur makers recover only 52.4 per cent of the sugar content of cane as against the recovery percentage of 82.6 per cent in the case of modern factories. True it will not be possible to save at once all this 34 per cent of sugar contents in 3|5th of the total output of cane, thus making a substantial addition to the total Gur production, but we can hope that with the universalization of the establishment of more efficient methods of extracting the juice, e.g., by introducing power in place of bullocks for crushing the cane,

* It is assumed that in trying to achieve the above goal, necessary help will be accorded by the State, e.g., in preventing fragmentation of holdings, in securing suitable manure, rotation of crops, irrigation facilities, control and prevention of diseases and pests, etc.

improved methods of boiling the juice, etc., an improvement of 15 per cent can easily be made and the addition of 15 per cent will mean no small addition in improving the present supply position of Gur.

Likewise in the case of *Khandsari* sugar the annual production of which varies between one lakh and two lakh tons, the present recovery of sugar from cane is only 5.5 per cent as against the 9.5 or 10 per cent in a modern *vacuum pan* sugar factory. Although we have grave doubts about the success of this form of manufacture, which is very wasteful and uneconomic, the importance of such improvement as can be made in the transitional stage of the industry cannot be minimised.

The position in the case of modern *vacuum pan* factories is such that any large increase in recoveries and in costs may not be expected for a long time, unless the twin problem of improvement of quality of cane and of provision of an uninterrupted supply of early ripening and late ripening varieties of cane is solved suitably, with a view to ensure that maximum sucrose is extracted from the cane throughout the entire season.

The establishment of modern sugar mills sufficient for the utilisation of the increased output (or a bulk thereof) of cane for the manufacture of white sugar will, no doubt, also form a formidable problem in regard to organisation, location, capital and savings, but it is necessary in this context to note that since 1920, the utilisation of cane in factories has grown up from 1 per cent to 6 per cent in 1932, and a little over 20 per cent in 1944, and this process can be easily continued uninterrupted to further extent with the provision of more mills, and without disturbing unduly the present ratio between the manufacture of white sugar and Gur. The *production* of Gur as compared with the production of sugar in the country has also fluctuated *very greatly*. In 1931-32, for instance, while India produced 478,000 tons of sugar, the Gur production was 27½ lakhs tons, over 6 times the production of sugar. The total consumption of sugar was, however, much higher, the balance of the requirements being imported from abroad. During the last 15 years, however, it must be stated that the consumption of Gur has been roughly equivalent to 3 or 3½ times the consumption of sugar, the indigenous production of white sugar being supplemented to the required extent by imported sugar till very recent times. Since 1940, there have been practically no imports of sugar from abroad, and during the last 5 years, the production of Gur has varied between 2½ to 3 times the total production of sugar, (including *Khandsari* sugar) the variation being due to various factors like prices of cane, of sugar, of Gur, control over transport of cane, Gur, etc. We do not contemplate that during the next few years this ratio between the consumption of sugar and the consumption of Gur in this country will be radically altered for reasons explained in an earlier chapter, but we do feel that with the improvement in the standard of living of people, a preference for white sugar which is cleaner in appearance, which is easily dissolved and which lends itself more easily for use in sweetening cups of tea, coffee, other drinks, and sharbats, the consumption of sugar will certainly increase. Besides the growth in the population of India at the rate of 1 per cent per annum will also mean a continually increasing demand for sugar.

We also feel that sugar which is now considered a luxury product will enter into the consumption of a larger number of people than at present due to improvement in economic conditions and the migration of people in towns, increase in the tea drinking habit, and this will certainly lead to an increased use and consumption of sugar in the country. We would not, therefore, be surprised if during the next 15 or 20 years the ratio between the consumption of sugar and Gur would be altered to some extent in favour of sugar, and while having no desire to prophesy in the matter we feel that it would not be incorrect to assume that while the consumption of sugar might be raised to about two and a half times the present consumption of about a million tons, the consumption of Gur may increase to about 5 million tons, i.e., may be about double, instead of 2½ times or three times the present consumption of sugar, within the next 15 or 20 years.

More Mills Necessary

In this view of the matter, we would be required to plan for an early establishment of a few more mills in the country. To the extent that Provincial plans for industrial development must include plans for expansion of sugar industry and the improvement of sugarcane cultivation as well, a very large part of the problem on hand will be solved by Provincial Plans. It is well, therefore, to note at this stage that the expansion of the sugar production thus necessary to ensure a comfortable standard of living for all is only in accord with Provincial or Regional planning.

And from the point of view of development, it is noteworthy that the expansion of factory production is called for in the Provinces (other than U. P. and Bihar) which are yet to have their proper share in the indigenous production of sugar. The following Table brings out the salient features of the present position in regard to the proportion of cane crushed in factories to the total cane crop in various Provinces.

TABLE No. 4

*Percentage of Cane crushed in factories to the total Cane crop in various Provinces**

Season	U. P.*	Bihar*	Bombay	Bengal	Madras	India
1934-35	13.6	30.9	8.0	2.7	5.0	12.3
1935-36	17.1	40.4	11.7	4.8	5.4	16.0
1936-37	17.1	49.3	13.0	5.2	6.0	17.6
1937-38 (Our Est) ...	18.6	62.3	14.0	...	...	17.8
1938-39	14.5	44.5	...	...	...	19.5
1939-40	25.5	48.4	...	...	...	27.7
1940-41	13.9	29.3	...	...	...	19.1
1941-42	14.6	...	...	...	...	21.2
1942-43	21.9	...	...	...	...	25.0
1943-44	22.3	...	...	...	...	25 0.

* Figures based on Cane Development Department (U. P.) statement showing disposal of cane crop in the U. P. during 1934 to 1942 and on letters from Cane Commissioner, Bihar to Chairman, Sugar Commission, U. P. and Bihar.

These figures will show in a correct perspective the importance of the cane-crushing factories in agricultural economy particularly in Bihar and U. P. So far this fact has not been fully appreciated owing to these statistics not being brought to the notice of all concerned prominently. We have worked out these figures with the help of the Sugar Commission and Directors of Agriculture in the U. P. and Bihar. This will show that the factories are of preponderating importance in the U. P. and Bihar. It must further be noted that in some districts where there is a congestion of factories, 60 per cent to 70 per cent, or even 80 per cent of the cane crop is crushed by the factories, both in the U. P. and Bihar.

The foregoing Table also shows clearly that the scope for economy in the utilisation of the present acreage under cane and for the existing cane crop is far greater in other provinces than in the U. P. and Bihar. Obviously, and *prima facie*, mill consumption of cane is the most economic method of utilising the cane, and governments of the other provinces are not likely to give up the idea merely out of consideration for the mills in the U. P. and Bihar. Avoidance of the wastage of sugarcane involved in Gur manufacture will no doubt be attempted by increasing the number of mills.

For our present purpose, what is important is that the drive for spreading improved varieties and for economies in Gur manufacture will have to be more vigorous in the "backward provinces", e.g., Bombay, Madras, Bengal, where the total consumption is far greater than their production. The whole programme of work for increasing the production of sugar will have to be on a regional basis though this does not necessarily militate against understandings of a tentative kind among the various provinces.

Table No. 2 in the *Sugar Industry at Glance* shows the number of factories established in the various Provinces, and the Appendix at the end of the volume gives details regarding their capacity, etc.

Estimate of Capital needed for Expansion

Considering that the total investment for machinery imported since 1931-32 for this industry is estimated at about Rs. 12 crores and assuming that the machinery in the 32 factories which existed in the pre-war period was of the order of about 2 crores, we find that the total investment in machinery for the establishment of the 150 mills in the country is about Rs. 14 crores. And the total capacity of the industry is for a crushing of about 150 lakhs tons of cane sufficient for the production of 15 lakhs tons of sugar every year. The maximum factory production of sugar has been 12 lakhs and 41 thousand tons in the year 1939-40. If, therefore, we wish to increase our sugar production from its present potential of 15 lakhs tons to 25 lakhs tons it will be necessary to spend on machinery roughly about Rs. 9 crores, and on the assumption that the price of machinery will be about 50 per cent over the prices of the machinery in the pre-war period, the cost will be about Rs. 13 crores. The capital cost of a factory of about 800 tons capacity, which, today, is the average, was in the pre-war period about 16 lakhs of rupees, Rs. 12 lakhs being the price and erection charges of machinery and Rs. 4 lakhs being the

cost of land and buildings. As stated before, for the establishment of a further capacity of about 10 lakhs tons of sugar, the amount of external capital required to be spent will be only Rs. 13 crores. Roughly this will mean the establishment of about 70 to 80 factories of an average cane-crushing capacity of 800 tons. Leaving the two Provinces of Bihar and U. P. aside, the other Provinces, namely, Bombay, Madras, Bengal, the Punjab, and suitable Indian States will have to establish these factories and there can be no doubt that with a liberal credit policy and financial system of the future, this capital will be found without much difficulty, particularly *as the expansion visualised is gradual, and spread over a period of years.*

Export Possibilities of Sugar

Up to this stage, we have assumed that the increase in production capacity is required for meeting only our internal needs of sugar in which we have estimated a large increase depending on an improvement in the economic conditions of the people as a result of the State implementing the salient features of some of the well considered economic plans, both official and non-official, and have also allowed some preference being shown to sugar over Gur, and have also included utilisation of sugar for other industrial purposes like manufacture of confectioneries, biscuits, etc. At the same time we cannot leave out of account possibilities of development of export trade, and particularly because of the severe damage to the sugar industry in Java and the great reduction in the production of sugar in various parts of the world from a total quantity of 30 crores tons in the pre-war period to only about 19 crores tons in 1944-45, India will have a good scope and opportunity for capturing a part of the world's demand particularly in countries adjacent to India, e.g., Afghanistan, Persia, Middle East, Ceylon, Burma, Nepal. While, therefore, we cannot plan for any large sized increase in our capacity depending upon export markets only due to the apprehension that the Java industry may be rehabilitated before long, it is reasonable to hope that we will be able to develop and retain some of the adjacent markets. In view of this possibility it will not be imprudent to plan for some increased production for catering for such outside demand, say, about 2 lakhs tons, and thus provide for additional employment and utilisation of the country's natural resources.

Nutritional Survey Undertaken in 1945

We are happy to note that Dr. V. K. R. V. Rao, Director of Statistics in the Food Department, who was appointed by the Government of India to collate data from Central and Provincial sources for formulating proposals for food planning, was directed in August, 1945, to undertake a country-wide investigation of nutritional conditions, resources and possibilities. We fervently hope that he will conduct an assiduous enquiry and appropriately assess the importance of sugar as a vital energising food,* rich in carbohydrates, and make recommen-

* It would be interesting to note that about 16 per cent of the total food energy requirements of the people of the United States during pre-war years was supplied directly by cane and beet sugar. In addition sucrose (cane and beet sugar) is an essential ingredient or an integral component part of many major processed food items. (*Vide* Report of Food Industry War Committee, Washington, of December 1944, a summary of which was published by Lamborn & Co., New York.)

dations for its utilisation in increasing quantities for improving the nutrition of the people of India, which is at a low ebb today, particularly as there is an enormous potentiality of further development of this industry, with the present set-up and equipment.

Increased Expenditure on Research Recommended

It is also necessary to emphasise at once the need of a well-planned reorganisation of the industry in its various aspects from a broad point of view, in order to ensure that the industry is reconstructed with a far-sightedness that will enable the country before long to produce such quantity of sugar and at such prices as would make it possible to supply the population with sugar and Gur in quantities considered necessary according to International Standards of Nutrition,* and which will be considerably higher than the present *per capita* consumption.

To achieve this, expenditure on sugar research has to be greatly increased as in other celebrated sugar producing countries like Java, Cuba, Philippines, etc. It is useful to remember in this connection that the Tariff Board of 1938 made strong recommendations for a vigorous development of research work, e.g., an increase in the number of testing stations in the various provinces, an improved system of trial in experimental plots, expansion of the famous Coimbatore Research Station, particularly for combating insect pests and diseases like red rot, pyrilla, which do appreciable damage to the sugarcane crop. The Tariff Board also suggested to this end that the grant from excise duty for the purpose of research work should be raised from one anna per cwt. to 3 annas per cwt. and they also made an observation, with which we are in full agreement, that "they were convinced that the only hope of the industry ever being able to combat on equal terms with other countries is a reduction in the cost of raw material."

We would also like to emphasize with all the stress at our command that a sum of not less than Rs. 40 lakhs per annum should be earmarked by the Government of India for expenditure in applied and fundamental research work. We also feel that the industry should be associated actively with the research work being carried on at the various research stations and laboratories. Expenditure on research work should not be considered as fruitless and it should be treated as a profitable investment which will pay itself several times over, and a larger amount should be earmarked by the Government from its present excise revenue of well over Rs. 6½ crores for this purpose, in order to ensure the stabilisation of the industry at an early date. We also suggest that this amount should be placed at the disposal of the Indian Central Sugarcane Committee, established in 1944. (*Vide* pages xxx to xxxii in the *Sugar Industry at a Glance.*)

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* *Vide* the observation made by Sir George Schuster, K.C.S.I., K.C.M.G., M.P., Ex-Finance Member of the Government of India in his book *India and Democracy* (1941), where he states that there is a common agreement that the masses of the Indian people are undernourished, and that an improvement of nutrition must therefore, be the first step in any general plan for increasing the productive power and improved standards of living. He also observes that one of the main causes for the present low production is the physical condition of the people resulting from permanent malnutrition. (Pages 258 to 268).

Referring to the advantages which have flown from the research work undertaken even on the present meagre scale, the Imperial Council of Agricultural Research assessed in 1939 the total increase in the output of the cultivators due to the improvement of sugarcane crop at 2¼ crores of rupees per annum.*

In this connection it will be of interest to observe that, while Hawaii spends on research Rs. 12 per acre, Java Rs. 3, Japan Rs. 3, India spends only 1/3 of a rupee.†

An annual expenditure of Rs. 40 lakhs on research, as suggested, will work out to *only one rupee per acre of cane*, while the cultivator and the industry will receive multiple benefits.

One word more. When it is remembered that in the Steel Industry iron ore costs less than 10 per cent of the value of the finished product, (as compared with about 52 per cent in the case of sugarcane) it will be realised how vast is the difference between sugar and other industries as regards the conditions on which further progress depends.

Cane Cost and Sugar Prices must be Reduced for Attaining Optimum Consumption

As we have observed before, cane represents about 52 per cent of the cost of production of sugar direct from cane, and a higher proportion still in the case of Gur. We entirely endorse the remarks of the Tariff Board of 1931 when they state (*vide* page 27) that the future of the sugar industry depends *mostly* on the cost of producing the primary material, i.e., cane. And for attaining optimum consumption, the price of sugar and Gur will have to be lowered, and this can be done effectively if the cost of cane is reduced, by comprehensive research, to about 0-4-0 per maund of cane, in the post-war period.

Intensive Sugar Research in United States

In this connection, it would be an eye-opener to see the interest taken and expenditure incurred in the United States in establishing a Research Foundation in New York in June, 1943, by companies that produce or refine cane sugar or process sugar beets, as a non-profit corporation. According to the Charter, this research is to relate "to sugar and any or all uses, or possible uses, of sugar in any form whatsoever, and whether as a food or an ingredient of foods and beverages, or in industry or otherwise."

The Sugar Research Foundation is an organisation of growers and processors of cane and beet sugar in the continental United States, Hawaii, Puerto Rico, Cuba and Canada. The purpose is to increase the consumption of sugar through the development of new industrial uses and establishment of the proper place of sugar in the diet. The Foundation will transmit to the consuming public, the scientific and medical

* *Vide* also a Press Note of the Bihar Government issued in July 1939, stating that as a result of the measures taken for improvement of sugarcane cultivation it is computed that the growers realised approximately Rs. 2,45,37,250 during the 1938-39 cane-crushing season. A larger amount still may have been realised by the cane growers in the U.P. *Vide Indian Sugar Industry Annual*, 1939, by Mr. M. P. Gandhi. Also *Annuals* for 1940, 1941, 1942, 1943 and 1944.

† *Vide* Tariff Board Report, 1931, page 94. Also *vide* the Philippines Sugar Industry—A plea for Research for the Healthy Development of the Indian Sugar Industry, by Mr. Chandra Prasad Gupta, with a foreword by Mr. M. P. Gandhi, 1937.

professions, home economists, nutritionists and manufacturers information concerning sugar, its food value, its relative economy and its chemical characteristics in manufacturing process.

To obtain this information, the Foundation has initiated extensive research into carbohydrate chemistry, bio-chemistry and nutrition. In furtherance of the programme, it is supporting authoritative studies at Universities and other research institutions under the direction of leading scientists.

The first and most ambitious of these studies is being conducted in the Sugar Research Foundation Laboratories established in December, 1943, at the Massachusetts Institute of Technology. Here, new industrial uses of sugar and its derivatives are being determined by means of a systematic study of sugar considered solely as an organic compound. The five-year project operates under a grant of 12,500 dollars from the Foundation.

On June 6, 1944, five additional grants-in-aid of research were announced by Dr. Robert C. Hockett, Scientific Director of the Foundation. Dr. Hockett is on a five-year leave-of-absence from the Massachusetts Institute of Technology, where he is associate professor of inorganic chemistry. The grants are as follows:—

(1) 36,000 dollars to Professor Ancel Keys, Laboratory of Physiological Hygiene, University of Minnesota, Minneapolis, for a study of the relation between the vitamins of the B group especially thiamin (B-1), and the utilisation of sugar in the body.

(2) 21,500 dollars to Professor Julian D. Boyd, Department of Pediatrics, University Hospital, State University of Iowa, Iowa City, for a study of the relation between sugar intake and tooth decay, with children as subjects.

(3) 25,000 to Professor F. J. Stare, School of Medicine and Public Health, Harvard University, and Dean A. Leroy Johnson, School of Dental Medicine, Harvard University, for a study of the relation between sugar intake and tooth decay, with animals as subjects.

(4) 24,000 to Professor Melville L. Wolfrom, Department of Chemistry, Ohio State University, Columbia, for a study of the non-fermentable (non-sugar) components of molasses.

The result of this and similar research will be the acquisition of a vast body of knowledge concerning carbohydrates in general and sugar in particular. In the period of readjustment after the war this increased knowledge will be immensely valuable. Research demonstrating "the proper balance between carbohydrates and other food elements in the diet will do much to aid the public in utilizing intelligently low-cost energy foods, such as sugar", according to Joseph F. Abbott, President of the Foundation. "In the current period of world-wide food shortages, which will continue long after the cessation of hostilities, it is obvious that populations will have to be fed diets containing a high proportion of sugars and other carbohydrates, since these types of foods supply the maximum amount of energy per acre of land required for their production and at a minimum cost."

Even more valuable will be the increased knowledge of industrial uses of sugar. "Many of us know that plastics, synthetic rubber, anaesthetics and numerous other products have been made from petroleum,"

says Dr. Hockett. "The era that has produced these wondrous products has been known as the petroleum age. Over three-quarters of the dry weight of the total plant material on the surface of the earth is carbohydrate. The three great carbohydrates are starch, cellulose, and sucrose. We are reading daily that coal and petroleum supplies must eventually dwindle, but carbohydrates such as sugar can be produced perpetually from the soil. The inevitable trend must be toward increasing the utilization of carbohydrates. It is, therefore, very proper that sugar producers have taken their place besides other industries in contributing research toward realization of the coming Carbohydrate Age for agriculture and industry.

In March, 1945, Dr. R. C. Hockett, President of the Foundation also announced at a dinner given by Dr. Karl T. Compton, President of the Massachusetts Institute of Technology, prizes totalling 45,000 dollars to be awarded to scientists for the discovery of new uses of sugar in medicine, and in every art, industry or technology.

The present knowledge about sugar even in the food field is far from complete. As a staple product, universally liked, universally available, and universally used, it has been expected largely to sell itself by its appeal to the appetite. Physiologists and bio-chemists have made many more studies involving the function and behaviour of dextrose in the body than with sucrose. One suspects that because animal experimentation is so immensely complicated these scientists have been tempted to simplify at least their carbohydrate. The result is that we actually know more about the bio-chemistry of a carbohydrate which is consumed as such in relatively minor quantities than we know about the one which provides fifteen per cent of the calories in the American diets.

The Diet Reformers

In the food field also, there has always been small fraternity of diet-reformers who have accused refined sugar of producing many evils including appendicitis, stomach ulcers, high blood pressure, sinus trouble, rheumatism, flatulence and diabetes. As a rule, such nature-food promoters have not received very serious attention from Americans who have been inclined to view them as philosophical relatives of Calvin who reasoned that anything pleasant must necessarily be wicked. Nevertheless, such matters are hardly in the realm of philosophy. Those accusations which are not upheld by experimental evidence, and most of them are not, should be eliminated for once and all.

The discovery of vitamins has raised new problems concerning the relation of sugar to the dietary as a whole. Though sugar contains no vitamins itself, it plays a considerable role in inducing consumption of the protective foods. To appreciate this function, we need only picture what would happen if sugar were eliminated. The use of grapefruit, cooked and canned fruits, breakfast cereals, cereals in baked foods, and dairy products in ice-cream, custards and milkshakes would certainly fall to a very low position. Sugar certainly requires vitamins for its own proper combustion and it may have some influence on the production of vitamins by bacteria in the intestinal tract. Therefore, a re-assay of the total role of sugar in the diet becomes necessary as a part of the general programme to give the people the best possible nutritional

status and at the same time to give them appetizing and palatable food.

The problems to be undertaken by the Sugar Research Foundation are, therefore, numerous and cover a very broad field. They include studies in :

1. Nutrition.
2. Bio-chemistry.
3. Physiology.
4. Medicine.
5. Dentistry.
6. Metallurgy.
7. Microbiology.
8. Organic Chemistry, both fundamental and applied.
9. Beet and Cane by-products.*

Important as sugar is as a food, however, it is equally important in the form of industrial alcohol. The April 1944, issue of *Consumers' Guide*, a publication of the War Food Administration of America, states that " the combined military and direct civilian needs for sugar, as a food, still represent only a part of its total war uses. Sugar flows into the roaring plants of industry. There is hardly a war commodity of which sugar is not a necessary part."

" Normally ", according to the *Consumers' Guide*, " blackstrap molasses, a by-product of sugar, is the chief source of industrial alcohol, and alcohol goes into the making of an endless variety of products." One of these products, synthetic rubber has, as we all know, contributed an enormous share to victory. Others are contributing just as much. Explosives, for example. The bombs and shells and hand grenades which were tearing the guts out of the Axis—to adopt a recent phrase of Prime Minister Churchill's—were almost all made with the help of sugar, *via* industrial alcohol. By means of alcohol, too, we were able to make a variety of plastics, such as those that went into the so-called " green-houses " of fighter planes and into the more familiar celluloid and cello-glass.

All told, sugar has more than 70 known distinct industrial uses. In addition to those already mentioned, sugar is a strategic material in the production of cement, motor fuel, penicillin, paper, soap, fabrics, and welding rods, without which no Liberty Ship would slip down the ways ! !

The war has taught us much about the value of sugar as a vital food and as an aid to industry. It has taught us an even more precious lesson, namely, that we are still vastly ignorant of the potential uses of sugar. It is this lesson that the Sugar Research Foundation of America, has taken to heart and determined to master.

We hope and trust that as a result of more extensive and intensive researches, referred to above, the importance of sugar will be properly assessed in various spheres, and that production of sugar will receive the encouragement it merits in due course.

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* *Vide* an article on Sugar the Unknown, by Dr. Robert C. Hockett, Scientific Director of the Sugar Research Foundation, New York, published in *Indian Sugar*, Cawnpore in July 1945 ; and also Lamborn's various Weekly Reports in 1944 and 1945.

CHAPTER XVII

CONCLUSION

AN inquiry into the position, problems and prospects of the sugar industry in India is in some ways different from a similar inquiry into the problems of our other protected industries. The concluding chapter of this thesis can be devoted to a recapitulation of the main results of this inquiry and to relate them to the standpoint appropriate to the period of planning that lies ahead. We showed in the first chapter that the history of the world's sugar industry reveals the tendency of sugar production to be distributed over the widest areas of the world and that in so far as this was helped by the development of the beet-root which was not in its original state a raw material for sugar, developments in the sugar industry may be deemed to give the world a foretaste of the changes which may overtake world economy when substitutes become more common than they are now. So far as India was concerned, this tendency towards the diffusion of sugar production was strengthened both by reason of India's fitness for growing cane and by the special stresses and strains of the period of the great depression. The view was urged that as the grant of protection to the sugar industry came in the wake of the ponderous historical forces referred to above, a new orientation was inevitable in regard to the claims and the duties alike of the new industry. It would be idle to expect the growth of the sugar industry as the result of a prolonged tug-of-war between the indigenous producer and the foreign importers, a tug of war in which the relative strength is carefully determined by nice and hair-splitting calculations of the fair selling price. Such a prolonged fight with its natural vicissitudes is a familiar story to the students of the policy of discriminating protection. The Cotton Mill Industry and the Iron and Steel Industry both had more than their just share of such tribulation. It is unnecessary here to go in detail into the details of the cause of the departure in the case of the sugar industry. But the link between the sugar industry and agriculture, a link for which there is no exact parallel in the case of other protected industries, must be considered to be the reason which weighed most with the Tariff Board. Most of the local governments stressed the importance of cane cultivation in India, not only from the point of view of the agricultural classes, but also in connection with the Provincial Governments' financial commitments. A very large sum of government money (9 crores) has been sunk in the construction of the Deccan Irrigation Canals. The revenue derived by way of irrigation dues, observes the Tariff Board of 1931, (vide page 41 of their Report) is about Rs. 26 lacs of which sugarcane pays over Rs. 10 lacs. In fact the development of this industry has enabled a large number of cultivators to pay their land revenue and other dues, and this has benefited the provincial revenues considerably.[1]

[1] Also *vide* representation of the Imperial Council to the Government of India, dated 5th February 1930 in Vol. I of the Tariff Board's Report, 1931, p. 18.

Protection Fully Justified—Rapid Development

However that may be, the fact remains that the sugar industry had such a phenomenally liberal measure of protection, that its link with agriculture was not only lost sight of but exaggerated, that the industry expanded beyond the most sanguine expectations of its protagonists, and also gave rise to problems such as other protected industries had never been confronted with. (Vide the following extract from Mr. M. P. Gandhi's speech in the Bombay Rotary Club on "Sugar Problems and Prospects," in October, 1942, wherein he expressed the view that protection to the Indian sugar industry has been fully justified[1]):—

> "Up to 1932, the industry was of a very modest size, but since the grant of protection to it in that year, the magnificent progress made by the industry is a matter of pride to the country. It is interesting to note that the sugar industry is the second largest industry—second only to the Cotton Textiles—and represents an investment of Rs. 32 crores, finds employment for 3,000 University men and one lac unskilled workers. and helps in keeping within the country a sum of not less than 16 crores of rupees per year, and the interests of not less than 20 million cultivators are indissolubly connected with it. Let economists say what they like about the costs of protection or the price to the consumer. An unbiassed study will, however, indicate that protection to the industry has been fully justified, that the consumer has been benefited, and that the country has been assured of supply of sugar in an emergency like the present and at a reasonable price. Indeed the protection has revolutionised this industry, which is a bright example of what the people of this country can do when the necessary help is forthcoming."

In a special article contributed to "Indian Farming" in December, 1941, on "Indian Sugar during the last decade," Mr. M. P. Gandhi also observed:

> "The amount of money paid to cane-growers by the factories alone has increased from about Rs. 1,77,50,000 in 1931-32 to Rs. 18,00,00,000 in 1939-40.[2] The income of the cane cultivators has been augmented considerably by the development of sugarcane crop on account of the comprehensive research undertaken at various places by the Imperial Council of Agricultural Research, and this increase in their income has been assessed at about Rs. 2,50,00,000 per year.
>
> "Transport agencies like railways, motor buses and village carts have also derived large benefits from it. The consumers have benefited due to the availability of sugar at rates cheaper as compared with the pre-protection period, except in the last two years due to the high price of cane and shortage of production of sugar. But this feature cannot be permanent and the consumer may again look forward to an era of cheap sugar."
>
> "Further, this industry has been responsible for the development of the village industry of *gur* manufacture.

[1] *Vide* also Mr. M. P. Gandhi's speech before the Rotary Club of Ahmedabad on 3rd December 1943, printed in Appendix I of the Indian Sugar Industry Annual, 1943.

[2] This amount increased to nearly Rs. 26,00,00,000 in 1944-45.

> "An idea of the importance of the sugar industry can be had when it is remembered that the value of the production of *gur* and sugar works out roughly to about Rs. 75,00,00,000 per year."[1]

The sugar industry, thus, is unique in every way. To overlook this uniqueness is to spoil the perspective in which alone it can be viewed with any clarity and sense of reality and of realism. Nevertheless, those who have taken unkindly to the protectionist policy have regarded the sugar industry in the same light as other protected industries. And the enquiry into its problems has been conducted on the narrow lines of cost to the consumer, cost of production and the like. But if it is remembered that the distinctive characteristic of economic opinion and policy in the post-depression period is the shift from mere protection to regulation under the shelter of high tariff walls, then the inappropriateness of the old approach would be readily recognised. The tests that the old method applies to the soundness of a policy towards an industry are, no doubt, valid. But the Tariff Board, when it recommended protection to the sugar industry, did so realising that the expansion of the industry was an indispensable adjunct to agricultural development, and also expected to see the cultivation of cane sheltered and enabled to expand and prosper.[2] (*Vide* page 39 of the Tariff Board's Report for 1931.)

Another important aspect of cane cultivation is in connection with the supply of cattle fodder. The reaping of cane commencing in November and extending up to the middle of March also serves to afford employment to the agriculturist and his cattle when other employment is scarce.

It will thus be seen that sugarcane occupies a definite place in the crop rotation of this country and the number of people who depend on cane cultivation at present may be safely estimated at 20 million, assuming that one acre of cane occupies on the average the area grown by a family which is taken as comprising of from 4 to 5 members.

Likewise it may be said that after a decade of liberal protection to the sugar industry, we have problems not of mere computation of costs and prices, but of strengthening every link in a whole chain of productive activities from the cultivation of cane to the disposal of molasses, bagasse and press mud. The policy in respect of the sugar industry is not a matter of lowering the import duties, a simple enough operation, when by means of an unrealistically simple logic, one

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[1] The Imperial Council of Agricultural Research valued in 1930 the sugarcane products in India at Rs. 42 crores, the value paid for imports of sugar being Rs. 21 crores. The Tariff Board of 1931 (*vide* p. 30) estimated the value of the total consumption of sugar and *gur* in India in 1930 at Rs. 42 crores. For the year 1943-44, the value is estimated by us at Rs. 118 crores. (*Vide* Table 4 in the *Sugar Industry at a Glance.*)

[2] Indeed, the Tariff Board of 1931 also expected a general increase in agricultural productivity, for it is established that the yield of crops grown after sugarcane is, generally speaking, considerably higher than that after other rotation crops. The Tariff Board was informed that in the U.P. improved types of wheat grown after sugarcane give a yield of 30 maunds as against 20 maunds when the same type is grown after other crops. This improvement is not merely a question of the utilisation of the manurial residue left in the soil after cane cultivation, but is a result of the general stirring up of the soil and deeper cultivation required for cane growing, particularly where intensive methods are followed. It is also useful to remember that cane is an important crop on which the cultivator relies for his requirements of cash and payment of rent, and generally speaking, over a period of years, the return from cane has been consistently greater than from various other alternative crops.

comes to the conclusion that the growth of an industry adds or must add to the national income. It is rather a matter of directing the efforts of private producers as well as public authority towards the improvement of efficiency in production and the realisation of economies in the various productive processes. This standpoint emerged for the first time in the history of discriminating protection in the case of the sugar industry. Formerly the cost of production was regarded as a determinant of the fair selling price and the import duty as deciding the question whether protection should be granted or withheld, or continued or cancelled. The cost of production in the case of Cotton Textiles or Iron and Steel depended predominantly on the efficiency of manufacture. Only in the case of the sugar industry it can be said that agriculturist, too, held the key to the progress of the industry. The history of the sugar industry then must be deemed to have provided a welcome corrective to the most serious of economic misconceptions in India, that economic progress can be achieved by attending to industry or agriculture without regard to the links between the two. This tendency to look at one divorced from the other is responsible for the alignment of economic opinion in favour of or against protection to industry. And the merits of the protectionist policy in the case of any one industry are discussed on the age old lines which have been found to be so inconclusive by the unbiassed.

The problem of economic development as a whole and the problem of industrialisation as a part thereof, both alike tend to be viewed from a narrow standpoint. Prof. H. L. Dey goes so far in overlooking the importance of the economic and broadly social forces which make for industrialisation and economic progress that he regards the cost of protection to the nation in the same light as an individual should look at the distribution of his personal income among the various competing items of expenditure.[1] This erroneous premise naturally drives him to suggest that India's national income being what it is, the first charge on it must be public health and then education and so on, as if the Government of India would have agreed to divert the revenue from sugar imports, which they have now had to forego, to public health, or that the consumers of white sugar could be prevailed on to pay a cess on sugar for the benefit of education, and public health! Social progress never moves along lines chalked out by individual preferences. Nor will the population of India find the problem of industrialisation to be lightened by the improvement in the statistics of public health and literacy.

The function of a policy of protection is therefore understood to be one of increasing the technical efficiency of the manufacturing process. This is, no doubt, in accordance with the theory of protection in its classical form. But protection thus granted or thus viewed can achieve nothing in a country ilke India. Efficiency in industrial production is not an isolated phenomenon. It cannot appear all of a sudden like an oasis in a wide desert of productive inefficiency. So long as protection was granted with the old ideas in the mind of the Tariff Board or of other authorities, it would in a sense be legitimate to criticise the policy with the general stock-in-trade of free trade arguments. But the

[1] *Vide* The Problems of Protection, by H. L. Dey, in "Economic Problems of Modern India" edited by Radhakamal Mukerjee, 1939 (page 358). Also H. L. Dey, "The Indian Tariff Problem", pp. 40, 41.

obvious difference between sugar and other protected industries is wholly forgotten, and the usual argument about protection failing to create employment and the outlay on protection being more urgently required in other spheres is trotted out.

The aim of this thesis is to bring out the fact that just as the grant of protection to sugar was a result not so much of the avowed fiscal policy of the Government as of the stresses and strains of the period, in the same way, the function of this policy lies not merely in the increasing efficiency of manufacture, but in the co-related development of agriculture and industry and the ancillary activities that intervene between them. Likewise, the success of the policy is to be sought in the accomplishment of the requisite progress both in agriculture and industry and not the least in the development of industries for the utilisation of by-products. It is not as well known as it should be that one of the unique features of the protectionist policy in regard to sugar is that the Tariff Board recommended protection for a period of 15 years—the longest period—[1] and at the same time did not attempt to foresee the time when the need for protection would be obviated.

Far from being guilty of lowering the tests of a sound protectionist policy, the Tariff Board has only shown a keener grasp of the special requirements of the country. That the sugar industry has achieved during these years more than was expected of it should suffice to answer the carping criticisms of anti-protectionists.[2]

From the point of view of close governmental watch and vigilance, it is indeed fortunate that the sugar industry has become the major concern of two governments, those of the U. P. and Bihar. It is fortunate, too, that a thorough-going form of control and regulation was attempted by the Congress Governments during the period of their regime from 1937-40. The various minor problems like zoning, licensing and the like are being constantly tackled, while the industry is being sheltered from the violent gusts of over-production. It was left to the U. P. and Bihar Governments among the Governments of the British Indian provinces to initiate the efforts to establish a Power Alcohol Industry. After twelve years of the working of the sugar industry, there is every reason for confidence that protection to sugar will be completely justified not only by the reduction of costs, but also, as we have shown in the last chapter, by maximising the production and consumption of sugar in the country, before long.

[1] Prof. H. L. Dey in "Indian Tariff Problem, and Report of the Tariff Board on the Sugar Industry," 1931, pp. 65-77.

[2] *Vide* Tariff Board Report on the Indian Sugar Industry, 1937, which expresses its satisfaction at the progress in efficiency achieved by the industry within a period of 6 years, and the pessimistic (as also incorrect) observation of Prof. H. L. Dey in 1939, when he observed that in cases where protection was given for long periods, as in the case of sugar, "it would be idle to expect that those who are responsible for the industry concerned would make any great effort to achieve a rapid progress in efficiency." To our mind, no unbiassed and open minded observer could make such a statement regarding the Sugar Industry, unless he had some preconceived notion or theory to support. *Vide* "Problem of Protection", by Prof. H. L. Dey in "Economic Problems of Modern India", p. 358, etc. Also *vide* Review of the Sugar Industry in India, for 1936, 1937, 1938, 1939 and 1940, by Mr. R. C. Srivastava, Director, Institute of Sugar Technology, Cawnpore.

It is not speculative to suggest that it is through the sugar industry that India will learn her first lesson in the rationalisation of her agriculture. For it is only in sugarcane that she is called upon to bring down costs and raise quality to the level of the most economic producers of the world. And it has been aptly observed by the Indian Fiscal Commission that without industrialisation there can be no building of character, of alertness or of the qualities which make for progress. A quarter of a century of protection of the old kind in India still leaves us in the position which so careful an observer as Vera Anstey described in the following words in 1929 :—

> " In the third place, it can be said that, whilst success has been achieved in particular instances in organising both certain long established and some new industries on a large scale, and although here are undoubtedly great potentialities in this direction, so far nothing worthy of the name of an " Industrial Revolution " appears to be taking place. The fact is that India still suffers from certain grave deficiencies with regard to the prerequisites of successful industrial production."[1]

For such a revolution, we have to attend to industry and agriculture at the same time, and for this no industry in this country lends itself better than sugar.

The implication of this is that even if economic policy in India were to continue on the same old lines in the post-war period, the position of the sugar industry is such that it will compel efforts for a correlated improvement of agriculture and industry. Fortunately, this recognition of the importance of allround development has been so keen in recent times, that the country as a whole is now committed to the policy of a planned economic development allround. The effect of this policy on the future of the sugar industry in India will be that the doctrine of graduation in the expansion of sugar production will be virtually abandoned, that the bogey of inadequate consumption or inadequate production will be got rid of, and the country can look forward to an enhanced *per capita* consumption of sugar, such as will help the maintenance of a high standard of health and energy[2] in the country's population.

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[1] " Economic Development of India " by Dr. Vera Anstey, p. 227. Also *vide* pp. 236-283.

[2] *Vide* the following observations of the Indian Famine Inquiry Committee in their Final Report, 1945, pp. 122 and 123, (to hand when the last page was under print).

> " While sugar is a carbohydrate food, containing no protein or vitamins, it supplies calories, *and since there is much undernutrition, calories are needed.*"
>
> " The present *per capita* intake of sugar in all forms in India is much lower than peacetime intake in most western countries and we believe that its production and consumption *can with advantage be considerably increased.*"

APPENDIX NO. I

GLOSSARY AND EXPLANATION OF SOME INDIAN TERMS APPERTAINING TO SUGAR

Gur or Jaggery.—Contains anything from 60 to 85 per cent of sucrose. It may most nearly be described as hard-boiled massecuite. It is prepared by evaporating cane or palm juice in open pans. It is prepared in three forms, lumps, powder, and semi-liquid. *Gur* making constitutes an important cottage industry. It is *unrefined brown sugar.*

About 36,00,000 tons of *gur* are produced from cane annually in India for direct consumption, i.e. about 3 times the quantity of sugar manufactured at present in India in factories. A small quantity of *gur* is also produced from Palmyra, and Date-Palm. There is no carry-over of *gur* to the next season. *Gur* constitutes nearly 76 per cent of the total sugar of various kinds produced in India, factory sugar constituting about 21 per cent.

Khandsari Sugar.—Khandsari sugar, generally known as Khand, is powder sugar of white to light brown colour. Its sucrose contents generally vary from 96 to 98 per cent on weight as compared with 98 to 99 per cent for factory sugar. It is produced in small factories which generally crush with oil engines and employ an open train followed by a centrifugal. *Khandsari* is concentrated in Rohilkhand (U. P.) which is the main centre of this industry. The *annual estimated* production is 125,000 tons, or roughly 2 per cent of all kinds of sugar.

Adsali.—Literally one and a half years'—refers to the sugarcane crop in the Bombay Province which is sown from June to August, and harvested from October to December in the following year.

Desi.—An indigenous variety of cane. This variety occupies today (1943) approximately 17 per cent of the total crop area.

Co.—This prefix when appended to a variety of cane shows that the cane was bred at Coimbatore, e.g. Co. 213, Co. 281, Co. 290.

H.M.—This prefix, when appended to a variety of cane, shows that the cane was bred at *Hebbal* (*Mysore*), e.g. H.M. 320.

P.O.J. 2878, E.K. 28, are some of the exotic varieties of cane of Java now under cultivation in India.

Pundia.—This is the chief variety of cane in the Deccan Canal tracts and Karnatak. It has a soft rind and is preferred for chewing purposes.

Pyrilla.—Steam borers, Top borers, Root borers are insect pests which do great damage to the cane crop by reducing the yield, the percentage of saleable cane, and its milling value.

Rupee.—Rupee—1s. 6*d.* or 29.85 cents.

Lakh or Lac.—One hundred thousand, i.e. 1/10th of a million, i.e. 1,00,000. *Crore.*—10 millions, i.e. 1,00,00,000.

Ton.—One ton is equal to 20 cwts. of 112 lbs. avoirdupois or 27.2 maunds of 82-2/7 lbs. avoirdupois.

APPENDIX NO. II

COMMENTS ON LEVY OF IMPORT DUTY AND EXCISE DUTY ON SUGAR FROM 1932 TO 1946

(1) Too early and frequent impositions of heavy Excise Duty on the Sugar Industry.

(2) A plea for effecting changes, in duty, whenever necessary, in *November* instead of *March*.

(3) No further Tariff Board Enquiry during the war period desirable.

(4) Removal of suspense to industry by Government extending protection straightaway for the remaining years of the period of protection, i.e. till 31st March, 1946.

A protective duty of Rs. 7-4-0 per cwt. was imposed on sugar with effect from 1st April 1932, by the Sugar Industry (Protection) Act, 1932, for a period of 7 years, ending on the 31st March, 1938. A revenue surcharge of Rs. 1-13-0 per cwt. (equivalent to 25 per cent of the protective duty) was also imposed. The total duty was Rs. 9-1-0 per cwt.

On the 1st April, 1934, the Government of India imposed an excise duty of Rs. 1-5-0 per cwt. (roughly equivalent to Rs. 0-15-4 per maund) on factory sugar produced in British India by the Vacuum Pan process (modern system) and Rs. 0-10-0 on sugar produced by the Open Pan process (indigenous or Khandsari system) in spite of unanimous and strong protests from all quarters. No excise duty was imposed on Palmyra sugar (sugar obtained from boiling juice of Palmyra, produced largely in Madras). It must be admitted that the first excise duty imposed in 1934 doubtless pressed heavily on the newly started factories and was a measure taken too early after the grant of protection, but according to the Tariff Board of 1937, it had a steadying influence on the industry in so far as it put a check on the floatation of inefficient concerns.[1]

The protective import duty was increased from Rs. 7-4-0 to Rs. 7-12-0 per cwt. (0-8-0 being additional margin) from 1st April, 1934 to 27th February, 1937, and along with the equivalent excise duty, the total duty was Rs. 9-4-0 per cwt. from 1st April, 1934.

It was a matter of considerable surprise, however, that this excise duty was again increased on 28th Feb., 1937,[2] by 11 annas to Rs. 2 per cwt. (roughly equivalent to Rs. 1-7-6 per maund) and to Re. 1 per cwt. on Khandsari sugar. This increase was effected when the Tariff Board enquiry was in progress, and the Government did not await its report also. This imposition was made by the Government without any notice

[1] *Vide* Tariff Board Report, p. 156.

[2] From 28th February 1937, the protective duty was reduced to Rs. 7-4-0 and along with equivalent excise duty of Rs. 2 per cwt. the total duty was Rs. 9-4-0 per cwt.

being given to the trade or the industry and there was considerable opposition to this policy of the Government, and after very heated debates in the Indian Legislative Assembly and the Council of State in 1937, the Finance Bill incorporating the Government's proposal for the increase of the excise duty on sugar was thrown out. Notwithstanding this, the Finance Bill was later certified by the Governor-General-in-Council and was passed into an Act, in utter disregard of and in direct opposition to the wishes of the Indian Legislative Assembly, with the ostensible object of increasing the revenues from the manufacture of sugar on the ground that the development of the industry was responsible for a reduction in Government revenue from import duty, forgetting or ignoring that this was a foregone conclusion, if protection to the industry was to be successful, the only fault of the industrialists being that they developed the industry far more rapidly than was anticipated or imagined by the Government.

The Tariff Board submitted its report during December, 1937, but its publication was withheld pending examination of its recommendations by the Government of India, and the report was published only on the 30th March, 1939. During the year 1938, the Government of India continued the protection to the industry for a period of one year, by the Sugar Industry Protection (Temporary Extension) Act, 1938, up to 30th March, 1939. On the 30th March, 1939, the Government of India published the report of the Tariff Board, and along with it they also published a Resolution examining the various recommendations of the Tariff Board. They proposed introduction of legislation for fixing the amount of protection to the industry for a period of two years, from April 1st, 1939, to 31st March, 1941, at the rate of Rs. 8-12-0 per cwt. (i.e. at a rate lower by 8 annas than the then existing rate of Rs. 9-4-0 per cwt.). The Government also observed in the course of the Resolution, that a further investigation would be held in 1940 to enable a decision to be made as to the quantum of protection to be granted to the industry for the remaining 5 years from April 1st, 1941. The Government also criticised adversely the recommendations of the Tariff Board in respect of the necessity of lowering the excise duty and in respect of the detailed calculation by which the Board arrived at its estimate of a "fair selling price" of sugar and the "orthodox" line on which the Board proceeded in taking the difference between the estimated "fair selling price" of indigenous sugar and the landed price of imported sugar, as a measure of protection required for the industry. (A full text of the resolution is published in "The Sugar Industry at a Glance" in the 1939 Indian Sugar Industry Annual). It is a matter of surprise that the Government could not find time to consider the Tariff Board's proposals although no less than 15 months had elapsed between the submission of the report by the Tariff Board and the publication of their Resolution on the subject.

We feel firstly that the argument advanced by the Government that the question of excise duty does not fall within the purview of the Tariff Board enquiry, and is outside the scope of their review, is untenable, and we cannot help feeling that such remarks by the Government of India on such a body as the Tariff Board are very undesirable and unwarranted. The effect of the excise duty on the industry is certainly a matter which falls within the scope of the enquiry, and we are tempted to think that such remarks against the Tariff Board should

have originated due to anger at the inconvenience of their recommendations which the Government found very difficult to turn down. The Government took the view that the imposition of excise duty was the best method to remedy over-production, and collect revenue for the state, but completely ignored the effects on the industry which would very nearly have sunk, had it not been for the world recovery of the sugar trade that took place later.

The imposition of this duty of Rs. 2 per cwt., the incidence of which per maund of sugar works out to about 25 per cent was opposed principally by the sugar manufacturers, *inter alia on* the grounds[1] that it was premature in view of the Tariff Board enquiry in progress, that its burden would fall not on the consumer but on the factories and the cane-growers, and that the duty was likely to drive the industry from British India to Indian States which gave various facilities for the development of the industry, like loans of money without interest, provision of free godown accommodation, and exemption from income-tax, import duty on sugar entering the States, etc. It is true that the Indian States were asked by the Government of India to impose an equivalent excise duty, but the effect thereof was counteracted by other facilities given in the various Indian States.

A study of the prices of sugar immediately after the imposition of the duty in 1937 will show that the price of sugar, instead of rising to the full extent of the duty or thereabouts, actually fell and it had to be borne by the manufacturer. The Tariff Board also pointed out that in the U. P. and Bihar the duty fell largely on the cane-grower, and in other provinces on the manufacturer. The Tariff Board also suggested on the analogy of the practice followed in the United Kingdom that "previous investigation by a statutory body of changes in the excise duty is desirable."

While the excise duty may perhaps be justified after the industry has fully developed, there can be little justification for imposing such a heavy burden on an industry *during the currency* of the protection as it is bound to restrict consumption and injure the growth of the industry. In fact, such a step is contradictory to a policy of protection of industries. We would refer the reader to our 1938 and 1939 Annuals for a detailed discussion on the effects of the imposition of such a heavy duty on the industry by the Government of India. We also feel that the Tariff Board were fully justified in discussing the question of the effects of the excise duty on the industry, and apart from other reasons, the Fiscal Commission also observed that one of the ordinary functions of the Tariff Board should be "to consider the effects of excise duty on the Indian industries."

A minor change in the excise duty on Khandsari sugar was made with effect from 28th February, 1939, when the duty was decreased to Rs. 0-8-0 per cwt. by an amendment made in clause 3 (b) of the Indian Finance Act, 1939, but the definition of "factory" was so altered as to make a larger number of Khandsaris liable to pay duty.

A further high increase was made in excise duty with effect from 1st March, 1940, by increasing the duty to Rs. 3 per cwt. (roughly

[1] *Vide* Tariff Board's Report, p. 158.

equivalent to Rs. 2-3-3 per maund), the excise duty on Khandsari sugar being kept at the same level, i.e. 8 annas per cwt. This further increase was effected by an amendment to Clause 3 of the Indian Finance Act, 1940. One cannot help feeling that in their zeal for getting more revenue from the sugar industry, the Government have overlooked the commonly accepted economic principles, and imposed such a heavy duty on a growing industry, the effects of which have been very harmful to the industry. It has led to higher prices and has had the effect of reducing consumption which should have increased with the availability of sugar manufactured within the country at lower prices. The next three tables given below show the changes in the excise duty and import duty from 1932 to 1944 and the revenue received by the Government from the excise duty and import duty from 1931-32 to 1943-44 :—

TABLE NO. 1

Excise Duty and Import Duty on Sugar, Sugar Candy[1] and Molasses in India

On sugar per cwt.	Protective Import Duty per cwt.	Additional Revenue Duty	Total Import Duty per cwt.
	Rs. a. p.		Rs. a. p.
From April 1st 1932 to 31st March 1934	7 4 0	Revenue surcharge @ 25% of Protective Duty Rs. 1-13-0	9 1 0
From 1st April, 1934 to 27th February 1937 (Rs. 1-5-0 Excise Duty on domestic production of factory sugar)	7 12 0 (0-8-0 being additional margin)	Equivalent Excise Duty Rs. 1-5-0	9 1 0
From 28th February 1937 (Rs. 2-0-0 Excise Duty on domestic production of factory sugar)	7 4 0	Equivalent Excise Duty Rs. 2-0-0	9 4 0
From 1st April, 1939 (Rs. 2-0-0 Excise Duty on domestic production of factory sugar)	6 12 0	Equivalent Excise Duty Rs. 2-0-0	8 12 0
From 1st March, 1940 (Rs. 3-0-0 Excise Duty on domestic production of factory sugar)	6 12 0	Equivalent Excise Duty Rs. 3-0-0	9 12 0i
From 1st April, 1942 (Rs. 3-0-0 Excise Duty on domestic production of factory sugar)	8 1 7-1/5	Equivalent Excise Duty Rs. 3-0-0	11 1 7-1/5ii

(i) The import duty of Rs. 9-12-0 per cwt. works out at Rs. 7-2-9 per maund and Rs. 3 Excise Duty per cwt. works out at Rs. 2-3-3 per maund. This import duty has been continued till 31st March 1946.
(ii) Includes surcharge of 20 per cent as from April 1942.

The next table shows the yield of revenue from import duty on sugar in India from 1931-32 up to 1943-44.

[1] From 20th February 1934, a revenue duty of Rs. 10-8-0 per cwt. was imposed on sugar candy in place of Rs. 9-1-0 per cwt. The rate of import duty on molasses is 31¼ per cent *ad valorem* since April, 1932.

TABLE NO. 2

Yield of Revenue from Import Duty on Sugar in India (Burma excluded from 1937-38)

Year (April-March)	Yield of Revenue Rs.	Year (April-March)	Yield of Revenue Rs.
1931-32 ...	7,97,63,000	1937-38 ...	25,33,000
1932-33 ...	6,84,79,000	1938-39 ...	45,22,000
1933-34 ...	4,72,04,000	1939-40 ...	3,96,08,000
1934-35 ...	3,81,35,040	1940-41 ...	18,24,000
1935-36 ...	3,24,16,000	1941-42 ...	1,94,000
1936-37 ...	50,52,000	1942-43 ...	56,000
		1943-44 ...	4,14,000*

* It is difficult to reconcile this figure as imports of sugar were reported to be negligible. It transpires, however, that some sugar imported previously was taken out of bond during the period and duty was paid during this period.

The next table shows the revenue derived from excise duty on sugar from 1934-35 to 1943-44 :—

TABLE NO. 3

Revenue derived from Excise Duty on Sugar from 1934-35 to 1943-44

Year (April-March)	Amount Rs.
1934-35	97,22,000
1935-36	1,58,84,000
1936-37	2,52,49,000
1937-38	3,31,48,000
1938-39	4,23,03,000
1939-40	2,49,06,000
1940-41	3,92,97,000
1941-42	6,68,27,000
1942-43	4,81,84,000
1943-44	6,79,00,000[1]

Alterations in the Level of the Duty on Sugar in the middle of the Season Undesirable

Another point. The Government have made alterations in the level of the excise duty and import duty on sugar with effect from March, i.e., along with the presentation of the proposals for the budget of the Government of India. While this policy may be suitable for other industries, it is definitely unsuitable for the sugar industry, as any change in the duty coming in the middle of the season is bound to cause serious complications and result in harmful consequences. There is a strong reason for deviating from the usual practice in the case of the sugar industry, which is a seasonal industry. As is well known, the manufacture of sugar in India commences about the month of November and continues usually till May or June. Minimum prices of cane are fixed by the Provincial Governments of the U. P. and Bihar and also in certain other parts of the country, e.g. Madras and Mysore, and the quantity of sugar thus affected represents about 80 per cent of the total sugar production of India. These minimum prices are fixed, at the beginning of the crushing season in November, relying on the continuance of the then existing arrangements in respect of Import Tariff and Excise Duty. If any change is made during the middle of

[1] Includes Collections of Sugar (Temporary Excise Duty) Ordinance of November 1943, of As. 13 per maund of sugar. *Vide* Indian Sugar Industry Annual, 1943,

the season either by an increase or decrease in the excise duty, or an increase or decrease in the import duty, one or other of the interests concerned, i.e. the cultivator or the manufacturer, is bound to be adversely affected, and in addition a serious dislocation is also caused in the trade. If, for instance, the import duty on sugar is reduced, say, with effect from 1st March, it would bring about a fall in the price of sugar and the manufacturer stands to lose on his unsold stocks of sugar, for the production of which he has paid cane prices at a higher rate than would have ordinarily been fixed by the Government concerned, in the event of the possibility of lowering the import duty. Similarly, if the import duty is increased in the middle of the season, say, from 1st March, the manufacturer stands to gain on his unsold stocks of sugar, but the cultivator can complain that he has suffered inasmuch as he would have been entitled to a higher rate for his cane, if the import duty was increased and consequently the manufacturer was enabled to get a higher price for his sugar. All things considered, we feel that if any changes in the duty on sugar, whether excise or import, are necessary, they should be made with effect from 1st November, as it would not cause any undue disturbance either to the industrialist or the agriculturist or the trade. Our suggestion for making changes in duty from November instead of April, in the case of sugar, has found support also from the Indian Sugar Mills Association and the Indian Sugar Syndicate, who have both addressed the Government of India on the subject.

In this connection, we also give below the Resolution by the writer (Mr. M. P. Gandhi) when he was a Director of the Indian Sugar Syndicate, which was accepted by the Indian Sugar Syndicate in January, 1940, and forwarded to the Sugar Control Board of the U. P. and Bihar in February, 1940. On the recommendation of the Sugar Control Board the U. P. and Bihar Governments also represented to the Government of India that any changes in the import or excise duty should not be made in the middle of the season in view of their undesirable repercussions :—

> "Whereas the Sugar industry is a seasonal industry, which produces within a period of four or five months the quantity of sugar required for the country's consumption during the period of 12 months, and
>
> "Whereas the United Provinces and Bihar, which produce about 80 per cent of the total sugar manufactured in the country, fix the minimum price of cane to be bought by the factories, and
>
> "Whereas the effects of any changes in the import duty on sugar or in the excise duty on sugar made during the month of March or April, which fall in the middle of the season, are bound to be serious, either on the manufacturers or on the cane cultivators ; The Sugar Control Board recommends to the Government of the United Provinces and Bihar that they should represent to the Government of India the "necessity of making any changes in the import duty on sugar, or in the excise duty on sugar with effect from the month of November, that is, at the beginning of the cane crushing season, and not from the month of March or April, as has been done hitherto, with a view to avoiding undesirable effects either on the producers of the cane or the manufacturers of sugar or the merchants dealing in sugar."

It is a matter of regret to find, however, that no attention had been paid to this matter by the Government of India when the excise duty was increased from its high level of Rs. 2 to Rs. 3 per cwt. in March, 1940. The increase was made effective from 1st March, 1940, i.e. in the middle of the season.

The consequences of this duty were so serious in the U. P. and Bihar that the U. P. and Bihar Government decided to assist the sugar industry of these provinces by assuming immediate responsibility for payment to the Government of India of Re. 1 of the excise duty payable on each maund of sugar manufactured during the 1939-40 season and then lying unsold with the factories, with effect from the 25th August, 1940.[1]

This excise payment (described loosely as rebate) of Re. 1 per maund was recovered by the industry in accordance with a scheme framed in consultation with the Sugar Syndicate by increasing the cane cess in the subsequent season. The Government amended the Sugar Control Act in 1940 and provided for the realisation of the subsidy from the industry by means of advance from the Government of India through the imposition of a special cess of six pies per maund of cane in subsequent seasons.

For this purpose the Provincial Governments of the U. P. and Bihar borrowed from the Central Government at 3 per cent per annum approximately Rs. 150 lacs and passed this sum on to the factories temporarily.[2] This was recovered slowly from factories and the amount was repaid to the Government of India by 1944.

When the announcement was made for the imposition of additional excise duty with effect from 1st March, 1940, the industry represented that all sugar produced on or before the 29th of February should be exempted from the increased duty.[3] Later, the Government accepted this suggestion and made an amendment to their original proposal exempting sugar produced on or before the 29th February from the additional excise duty of Re. 1 per cwt. Even this small relief which created a saving of about Rs. 70 lacs to the industry, was greatly appreciated by the industry.[4]

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[1] *Vide* U.P. and Bihar Government comprehensive communique issued on the 21st August 1940, in "Sugar Industry at a Glance," 1940, p. 75 of the 1940 Annual.

[2] *Vide* speech of the President of the Indian Sugar Mills Association at the Annual Meeting in Cawnpore, on the 14th September 1940.

[3] It will be interesting to observe that in order to avoid sugar produced before 28th February having to pay a higher excise duty in the event of the Government increasing the excise duty along with their budget proposals, the various factories took out their quantities of sugar from the godowns and despatched them to up-country centres. To prevent such possibility and complications, the Government of India had to go to the length of issuing a notification whereby it was laid down that "no sugar shall be issued out of a factory or used within a factory in the manufacture of any commodity other than sugar, after 5 p.m. on the day appointed for the presentation of the annual or supplementary budget of the Central Government to the Chambers of the Indian Legislature. (*Vide* notification of the Government of India Finance Department of the 28th December 1940.)

[4] *Vide* Sugar Industry Annual, 1940, p. 132.

Declaration of Policy of giving Protection for long time necessary

Another point which calls for some comment is the action of the Government of India in not passing an Act for assuring Tariff protection to the industry for the entire period ending 31st March, 1946, as was recommended by the Tariff Board of 1937. In 1938, the Government of India extended protection for one year. In 1939, they extended it for another 2 years up to 1941. In 1941, it was again extended by one year, by the Protective Duties Continuation Act, and again in 1942 it was continued for up to 31st March 1944, by the Protective Duties Continuation Act, 1942, and again up to 31st March 1946.

The industry was thus kept constantly in suspense as to the action the Government of India might take in regard to the tariff on sugar during the future.

As a matter of fact, when the Government decided in 1939, to extend the then existing tariff on sugar for another 2 years up to 31st March, 1941, they observed that a further enquiry would be undertaken to determine the quantum of protection necessary.[1] A further Tariff Board enquiry within 2 years of the last enquiry hardly seemed to be necessary. We definitely held the view that if such an enquiry should be held, it would only distract the attention of the industry. In this connection we give below a copy of the Resolution forwarded by the writer (Mr. M. P. Gandhi) who was one of the Directors of the Indian Sugar Syndicate to the Indian Sugar Syndicate, in January, 1940. The Resolution was accepted by the Indian Sugar Syndicate and forwarded to the Government of the U. P. and Bihar in February, 1940:—

> "As a result of the outbreak of war and the prevalence of abnormal conditions in the Sugar Industry and various other industries in the country, the Sugar Control Board recommends to the Governments of the United Provinces and Bihar to urge upon the Government of India the futility of conducting a further Tariff Board enquiry for determining the measure of protection required for the Sugar Industry, as observed in the statement of objects and reasons appended to the Sugar Industry Protection Bill, 1939. The Sugar Control Board feels that the Tariff Board is not likely to be able to obtain any reliable information either in "regard to (1) the cost of production of cane, or (2) the approximate cost of manufacture, which depends upon various factors, or (3) in regard to the price at which sugar can be imported in India, owing to abnormal conditions due to the war. The Control Board, therefore, feels that the attention of the industry should not be distracted in the direction of preparing a case for the consideration of the Tariff Board, and suggests that the Government of India should take suitable action themselves for giving the industry such adequate measure of protection as is required by it, during the next six years ending 31st March, 1946, and further that they should make an announcement in November, 1940, in regard to the protection to be given to the industry during the entire remaining period, so as to remove the uncertainty in this respect."

[1] *Vide* statement of objects and reasons appended to the Sugar Industry (Protection) Bill, 1939, introduced in the Legislative Assembly. The text of the Sugar Industry (Protection) Act, 1939, is given in the Sugar Industry Annual, 1939, p. 6.

It is a matter for gratification to note that the Government of India announced in October, 1940, that owing to the prevalence of abnormal and unsettled conditions of the industry as a result of the war, it would be difficult for the Tariff Board to obtain proper data, and that in these circumstances they considered that any Tariff Board enquiries would be of very little value, and accordingly decided not to set up a Tariff Board in connection with the sugar industry and also other industries if the present unsettled conditions continued.

As observed before, the Government of India have extended protection to the industry year by year. We feel, however, that even now the Government should pass an Act assuring protection to the industry for the remainder of the period of protection i.e. up to the 31st March, 1946, instead of keeping the industry in suspense in regard to such matter by extending the duties from year to year.[1]

As a result of the general increase in the import duties by 20 per cent with effect from 1st March, 1942, the total import duty on sugar has been increased to Rs. 11-1-7 per cwt. (the excise duty is maintained at the same old level of Rs. 3 per cwt.), and will remain at that level till 31st March 1946.

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[1] This was done in March 1944, by the Protective Duties Continuation Act, 1944, for a period of 2 years, whereby *status quo* is maintained up to 31st March 1946.

APPENDIX NO. III

SUBSTITUTION OF GUR BY SUGAR, AND POSSIBILITIES OF DEVELOPMENT OF PALM GUR INDUSTRY

Necessity of Exploring Possibility of Development of Palm Gur Industry

A study of the Indian Sugar Industry will reveal at once the fact that the production of *gur* is 3-4 times as large as the production of sugar in the country at present. The *per capita* consumption of *gur* is also equally large. An idea of the size of the *gur*-manufacturing industry has been given in the body of the thesis. It will be interesting to note that about 60 per cent of the cane crop of the country is consumed for the manufacture of *gur*, as against about 20 per cent consumed for the manufacture of cane sugar.

As a matter of fact, it must be observed that the continuance of the production and consumption of *gur* in such large quantities, even in the face of all the modern methods of sugar refining, is a remarkable feature of the national economy of the country. With the improvement in the purchasing power of the people, the spread of the tea habit, and the substitution of sugar for *gur* in the sweetmeat trade, and the demand for a clean and white product from sugarcane, it would normally appear that the consumption of *gur* should show a tendency to decrease as time progresses, but actually this has not been the case. The replacement of *gur* by sugar and the extent of such substitution depends greatly on the level of the prices of sugar and *gur*. If sugar becomes cheaper (but it should not be forgotten that it has to bear a heavy excise duty of Rs. 3 per cwt.), most likely it may be preferred to *gur to some extent* and for some uses. But if sugar rises in price, as has been the case during the last 3-4 years, people, particularly in the villages—and 70 per cent of the population of India live in villages—will certainly replace it to some extent by *gur*.

My view is that, as in the past, the consumption of *gur* and sugar will continue to grow slowly with the improvement in the economic condition of the people, but it is improbable that there will be any serious reduction in the consumption of *gur* as a result of increased consumption of sugar, for *gur* is a delicious food liked by millions in the country, and is not easily substituted by sugar. It is not only a sweetening ingredient in food and drink, but it is itself an article of food and is on the dietary of a very large population in all parts of the country.

Indeed, it is also commonly believed that *gur* has superior nutritive value and its production deserves encouragement not only on the economic ground of promoting a cottage industry, but also for its superior character described above. Mahatma Gandhi, in the course of an editorial in the "Harijan" dated 13th April, 1935, observed :—

> "Most undoubtedly people will be advised to use *gur* for their milk and tea. They will be told, as they are being told, that it is superstition to think that *gur* taken in milk or tea is injurious to

health. One correspondent says that on his wife beginning to take *gur* with her tea instead of sugar she lost her constipation. I am not surprised, because *gur* has a mild laxative effect which sugar certainly has not."

Gur is produced not only from cane, but also from Palmyra, Cocoanut, Date Palm[1] Sago and Wild Date. Except Cocoanut, which requires cultivation, the other varieties grow wild and no nursing is necessary for them. There is a great possibility of development of this palm *gur* industry in all the provinces of India.

Possibility of Development of Palm Gur Industry should be Explored

Having discussed the possibility, rather the improbability, of substituting *gur* by sugar, to any large extent, it would be interesting to assess the possibility of the development of the palm *gur* industry in the country. Palm and Date trees are in abundance in various parts of India. It is estimated that there are about 4 crores of Palmyras alone. If these are utilised for manufacture of *gur*, they will not only add to the national wealth but create a revolution in agriculture. If the required numbers of palms are planted, it does not seem to us improbable that within the next 30 or 40 years, a bulk of the 4,00,000 acres of good agricultural land which is under cane at present could be relieved. And if this comes off, it would be possible to release such land for producing cereals and other food crops in the production of which there is a serious deficiency in the country.[2]

We would, therefore, suggest that a proper investigation should be made in regard to the possibility of replacing cane *gur* and sugar, by palm *gur* and sugar, to such an extent as is possible, in the larger economic interests of the country.

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[1] Palm jaggery is as good as cane jaggery. The utility of this commodity as an avenue of employment for the erstwhile toddy drawers has been recognised now. The total quantity of Palmyra jaggery is estimated at about 1,00,000 tons, 40,000 tons being in Madras Presidency alone. Also *vide* Report of the All-India Village Industries Association, 1938 and 1939, and Indian Sugar Industry Annual, 1939, 1940 and 1941.

[2] The severe famine in Bengal in 1943 revealed the deficiency of India in regard to food crops for the requirements of her population. Any land that can be released for growing food crops would therefore be of help in solving this problem to some extent.

APPENDIX NO. IV

IMPORTANT PROBLEMS FACING THE SUGAR INDUSTRY AND AWAITING SOLUTION

1. Regulation both of the cane crop and of sugar production by a careful planning, for the purpose of preventing overproduction of sugar, either by restrictions on establishment of new factories or by extensions to the plants of existing factories, or by assignment of quotas among all factories in the country, either by All-India legislation or a private agreement amongst the factories, with a view to avoiding wide fluctuations in production from year to year, and to ensuring a carry-over of between 2 to 3 lacs tons of sugar every year.

2. Improvement of the quality of cane and the average yield per acre to at least 50 tons per acre and eradication of pests and diseases of cane.

3. Reduction of the cost of production of cane to about Rs. 0-2-6 per maund.

4. Development of improved varieties of cane, particularly in reserved areas for factories in the U. P. and Bihar, and in close vicinity of factories in other parts of India.

5. Provision of demonstration farms for cultivation of different varieties of sugarcane, in close proximity to the factories for experimental purposes, and distribution of hardy and healthy seeds of early ripening and late ripening qualities suited for various areas from the factory farms.

6. Large supplies of fresh and rich cane with high sucrose content from areas adjacent to mills which would yield larger recovery, and acquisition of land in the vicinity of factories for research or production of suitable cane.

7. Provision for irrigation of tube-wells, drainage facilities and better roads, and removal of municipal tolls, etc.

8. Dissemination of knowledge amongst the cultivators regarding manuring, crop rotation, ratooning of the cane crop, electro culture, suitable fertilisation, modern agricultural implements and methods for eradication of diseases in cane crop, and plantation of improved varieties.

9. Extension of the duration of cane crushing season for factories from 4 months as at present to about 7 months in a year, by development of early ripening and late ripening varieties of cane.

10. Chemical, Technological and Agricultural Research on a comprehensive scale for increasing the recovery percentage of sugar, efficiency of plants for extracting maximum sucrose, cultivation of improved varieties of sugarcane, and for studying scientific methods of combating and eliminating of cane pests, by providing larger amount of money for research work annually.

11. Establishment of a Central Research Institute for the U. P. and Bihar for cane development, for testing of seedlings and undertaking breeding work for the U. P. and Bihar, as is being done in Coimbatore for drought resistance, for hybridisation by crossing sugarcane with bamboos and with sorghum, etc.

12. Utilisation of molasses, particularly for manufacture of power alcohol, and of bagasse, and of press-mud, produced in factories.

13. Necessity of good feeder-roads, tramways and aerial ropeways for quicker and cheaper transport of cane and abolition or reduction of Municipal and local tolls in various places on cane carts.

14. Utilisation of the proceeds of the Cane Cess for suitable development of cane in the U. P. and Bihar, through a representative Committee consisting of representatives of the industry and agriculturists.

15. Regulation of production of cane, and of sugar from year to year in order to avoid cycles of overproduction and underproduction, as far as possible, in the interest of the stability of the industry.

16. Scientific marketing of sugar and control of sugar prices in a manner which would avoid wide fluctuations from year to year.

17. Evolution of an efficient and scientific Common Sales Organisation for the entire industry which would undertake direct sales and distribution of sugar in appropriate quantities in the various markets, avoiding criss-crossing of traffic, thus economising in freight charges and avoiding wasteful transport.

18. Proper location of factories at suitable places spread all over the country, and rectification of the defects of haphazard location of factories and of concentration in the U. P. and Bihar, in the subtropical region, by an appropriate dispersal of industries.

19. Co-operation of railways and Steamship Companies in reducing freights and grant of other facilities like sufficient supply of suitable wagons for transport of sugar, cane, molasses, sulphur, lime, gunny bags, etc.

20. Necessity of adoption of a long term policy which would lead to a progressive reduction in the prices of cane and also of sugar with a view to eliminating the necessity of the present high tariff at an early date.

21. Evolving of a suitable method of fixing minimum prices of cane, at a level which would give a fair return to the cultivator, and a fair distribution of the profits, with a view to affording suitable incentive to agriculturists to grow superior quality of cane by giving higher prices therefor.

22. Standardisation of quality of sugar and of improvement, therein, and improvement of quality of *gur* and its keeping qualities.

23. Propaganda for increased consumption of sugar by disseminating information about its nutritive qualities, by opening retail shops in suitable areas for selling sugar, by selling products made from sugar at cheap rates in industrial and agricultural areas, by educating people about other industrial uses of sugar and by developing subsidiary industries like the manufacture of confectionery, syrups, cubes etc.

24. Necessity of vigorous development of cane areas reserved for the various factories in order that factories would receive their complete requirements of cane from such areas within a few years.

25. Improvement in efficiency of Khandsari method of production of sugar.

26. Necessity of development of Cane Co-operative Societies for supply, and development of cane, in a manner which would ensure co-operation of factories with them.

27. Provision of adequate storage facilities to prevent dampness and deterioration of the quality of sugar.[1]

28. Acquisition of other markets like Nepal, Tibet, Afghanistan, Kashmir, Ceylon, Burma, Iran, Iraq and the Middle East for Indian Sugar.

29. Continuance of efforts for export of sugar to U. K. and other countries and acquiring of suitable preference in the U. K. market for Indian sugar.

30. Availability of accurate and detailed information, by improvement of our statistics of the total cane crop, of Khandsari and *gur* manufacture, of percentage of cane crushed in factories, *gur* making etc., to enable scientific planning and future development.

31. Establishment of an *All-India Control* on the industry, with a view to adoption of a national policy, and to achieve suitable regional development of this factory in all provinces by directing further location of factories in areas outside U.P. and Bihar.

32. Solution of problems created by Indian States, e.g. levy of an import duty on Indian Sugar entering their territory with a view to encouraging development of the industry in their area ; prohibition of import of Indian sugar in their territory in order to encourage import of sugar at ports in their territory, e.g. Morvi State in Kathiawar etc., through diplomatic channels and through the agency of the Central Government etc., etc.

33. Establishment of a Sugar Research Foundation, on the lines of American Foundation of June 1943, for carrying on research relating to sugar and any or all uses, of sugar, in any form whatsoever, and whether as a food or an ingredient of foods and beverages, or in industry or otherwise. This research will include studies in Nutrition, Biochemistry, Physiology, Medicine, Dentistry, Metallurgy, Microbiology, Organic Chemistry both fundamental and applied, Beet and Cane by-products, etc.

34. Dissemination of information regarding sugar being one of the cheapest, concentrated, most universally used and palatable sweetening agent of proved high calorific value, easy of transport and unique for quick conversion into energy, containing 100 per cent carbohydrate and its value as a prime and vital food being enhanced due to the shortage of carbohydrate in general all over the world, as revealed in the Hot Springs Conference of 1943, where the shortage of energising foods like potatoes, sugar and cereals, all over the world, was emphasized.

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[1] It is interesting to note that the U.P. and Bihar Sugar Factories Control Rules make it compulsory for any new factory allowed to be established, to build storage accommodation for at least one-third of the estimated annual production of sugar at the factory.

APPENDIX V

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LIST OF SUGAR MILLS IN INDIA AND BURMA

WORKING AND PROJECTED

(1944-45)

THOROUGHLY REVISED AND BROUGHT UP-TO-DATE

APPENDIX

Publishers: **GANDHI & CO.** (*Publishers*),
Jan Mansion, Sir Pherozeshah Mehta Road,
FORT - BOMBAY

Telegrams: "KEEN", BOMBAY. Telephone: { *Office*: 25961; 24047
Res.: 43926

DETAILED LIST OF SUGAR MILLS (VACUUM PAN) IN INDIA (1944-45)

(Including Gur Refineries)

EXPLANATION :—

Asterisk in the last but one column denotes mills which have also got Gur-refining plants.

† *Mills marked thus did not work during this season.*

‡ „ „ „ *are reported to be under construction.*

S' = Sulphitation. "DS" = Double Sulphitation. "C" = Carbonatation. "DC" = Double Carbonatation.

Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
BENGAL						
1. North Bengal Sugar Mills Co., Ltd. M/A. M/S. Soorajmull Nagarmull, 61, Harrison Road, Calcutta. Tele { Grams: Sugar, Calcutta. Phone: B. B. 6101.	Gopalpur. (Tel. Sugar, Gopalpur, Rajshahi.)	Rajshahi.	Gopalpur, B. & A. R.	Saraghat.	1250*	DS
2. Setabganj Sugar Mills, Ltd. M/A. M/S. Soorajmull Nagarmull, 61, Harrison Road, Calcutta. Tele { Grams: Sugar, Calcutta. Phone: B. B. 6101.	Setabganj. (Tel. Sugar, Setabganj, Dinajpur.)	Dinajpur.	Setabganj, Do.	Manihari.	800*	DS
3‡ Shree Radha Krishna Sugar Mills, Ltd. 138, Harrison Road, Calcutta. Tele { Grams: Sugarsweet, Cal. Phone: B. B. 2203.	Beldanga. (Tel. Sugarsweet, Beldanga.)	Murshidabad.	Beldanga, Do.	Lalgola, B. & A. R.	750*	DS
4. The Ramnugger Cane & Sugar Co., Ltd., M/A. M/S. Anderson, Wright & Co., 7, Wellesley Place, Calcutta. Tele { Grams: Amasis, Calcutta. Phone: Calcutta, 4300.	Plassey P. O.	Nadia.	Plassey, Do.	Do.	500/700	DS
5. Carew & Co., Ltd., M/A. M/S. Lyall, Marshall & Co., 4, Fairlie Place, Calcutta.	Darsana.	Do.	Darsana, Do	...	1500	DS
6. The Deshbandhu Sugar Mills, Ltd., M/A. The Industrial Agency, 58. Patuatuly, Dacca. (Tel. Deshbandhu, Dacca.)	Charsindur.	Dacca.	Ghorashal (Flag) Do.	Sultanpurghat.	250	DS
7† Kaligunj Sugar Mills, Ltd., M/D. Seth Pannalal Kothari, Head Office: 168–B, Cotton Street, Calcutta. (Phone: B. B. 2789).	Kaligunj P. O. (Tel. Chinikul, B. & A. Arikhola.)	Dacca.	Arikhola, Do.	Ronaldsay Ghat, Kaliganj.	150	DS
8. Das Sugar Corporation, Ltd., M/A. Dass Brothers, 30, Strand Road, Calcutta. Tele { Grams: Marvellous, Cal. Phone: Calcutta 3385 (3 lines).	P. O. Kishorganj. (Tel. Dayamayee, Kishorganj.)	Mymensingh.	Kishorganj, Do.	...	400	DS
9. Rajluxmi Sugar Mills, M/A. Kartick Bose & Sons, Dr. Bose's Laboratory, Ltd., 45, Amherst Street, Calcutta. Tele { Grams: Lactic, Calcutta. Phone: B. B. 415.	Maitra Bagan, Basirhat.	24 Parganas.	Maitra Bagan Ry. Siding, B. B. L. R.	...	75	S
BIHAR						
1. Sakri Sugar Factory of The Durbhanga Sugar Co., Ltd., Registered Office : Lohat P.O. Dist. Darbhanga. Tele { Grams: Sugar, Lohat. Phone: Darbhanga 53A.	Sakri P. O. (Tel. Sakri Factory, Sakri. Telephone: Darbhanga 53A.)	Darbhanga.	Sakri, O. & T. Rly.	Semaria Ghat.	700	S
2. Lohat Sugar Factory of The Durbhanga Sugar Co., Ltd., Registered Office: Lohat P.O. Dist. Darbhanga. Tele { Grams: Sugar, Lohat. Phone: Darbhanga 53A.	Lohat P. O. (Tel. Lohat Factory, Lohat. Telephone: Darbhanga 53A.)	Do.	Pandaul, Do. (Goods Lohat Siding.)	Do.	1300	S

Name of Factory, with full name and address of Managing Agents or Proprietors	Location	District	Nearest Railway Station	Nearest Steamer Station	Daily cane-crushing capacity(tons)	
3. Ryam Sugar Co., Ltd., M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2331.	Ryam Factory P. O. (Tel. Ryam Factory, Tarsarai.)	Darbhanga.	Tarsarai, O. & T. Rly.	Semaria Ghat.	779	C
4. Samastipur Central Sugar Co., Ltd., M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Samastipur. (Tel. Central, Samastipur.)	Do.	Samastipur, Do.	Do.	795	S
5. New India Sugar Mills, Ltd., M/A. Cotton Agents, Ltd., (1) 52, Queensway, New Delhi. Tele { Grams: Cotagent, New Delhi Phone: New Delhi, 7231. (2) 8, Royal Exchange Place, Calcutta. Tele { Grams: Lucky, Calcutta. Phone: Calcutta, 562.	Hassanpur Rd., P. O. Hassanpur Sugar Mills, (Tel. "Birla", Hassanpur Sugar Mills.)	Do.	Hassanpur Road, Do.	Semaria Ghat.	1300	DS
6. Motipur Sugar Factory, Ltd., M/D. Seth Haji Abdul Rahim Oosman, 2, Rajmohan Street, Calcutta, Tele { Grams: Muslim, Calcutta. Phone: B. B. 2460.	Motipur. (Tel. Sattar, Motipur & Talahgur & Muzaffarpur, Tele. Muzaffarpur 65.)	Muzaffarpur	Motipur, Do.	Paleza Ghat.	1000/1300	DC
7. Champarun Sugar Co., Ltd., Barrah Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Bara-Chakia P. O. (Tel. Cane, Bara-Chakia.)	Champaran.	Chakia, Do.	Paleza Ghat.	932	C
8. Belsund Sugar Co., Ltd., M/A. James Finlay & Co., Ltd., 1, Clive Street, Calcutta. Tele { Grams: Mercator, Calcutta. Phone: Calcutta, 4600.	Righa P. O. (Tel. Mitha, Righa.)	Do.	Righa, Do.	Semaria Ghat	850	DS
9. Shree Hanuman Sugar Mills, Ltd., M/A. Shree Hanuman Investment Co., Ltd., 178, Harrison Road, Calcutta. Tele { Grams: Hopwoda, Calcutta. Phone: B. B. 4502.	Motihari. (Tel. Sugar, Motihari. Telephone No. 36.)	Do.	Motihari, Do.	Do.	780	DS
10. The Sugauli Sugar Works, Ltd., M/D. Mr. Md. Hanif & Mr. Amjadali, 3 & 5 Rajmohan Street, Calcutta.	Sugauli. (Tel. Taj, Sugauli.)	Do.	Sugauli, Do.	Do.	900	DS
11. Motilal Padampat Sugar Mills Co., Ltd., H. O. Kamla Tower, Cawnpore. Tele { Grams: Motipat, Cawnpore. Phone: 2532–34.	Majhaulia. (Tel. Motipat, Majhaulia.)	Do.	Majhaulia, Do.	Do.	1000	DS
12. Champarun Sugar Co., Ltd., Chanpatia Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Chanpatia. (Tel. Chansuco, Chanpatia.)	Do.	Chanpatia, Do.	Do.	870	S
13. S. K. A. Sugar, Ltd., M/A. Dalmia Jain & Co., Ltd., Dalmianagar, Sahabad, Tele { Grams: Dalmiajain, Dalmianagar. Phone: 77, Gaya Special Line.	Pakri Lauriya P. O. (Tel. Dalmia Jain, Lauriya.)	Do.	Do.	Do.	500/600	DS
14. Harinagar Sugar Mills, Ltd., M/A. Narayanlal Bansilal, 207, Kalbadevi Road, Bombay 2. Tele { Grams: Maryada, Bombay. Phone: Bombay 30841.	P. O. Harinagar Sugar Mills. (Tel. Maryada, Ramnagar, Champaran.)	Do.	Harinagar, Do.	Do.	1400/1500	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
15.	The New Swadeshi Sugar Mills, Ltd., (1) M/A. Cotton Agents, Ltd., 8, Royal Exchange Place, Calcutta. Tele { Grams: Lucky, Calcutta. Phone : Calcutta 562. (2) 52, Queensway, New Delhi. Tele { Grams: Cotagent, New Delhi. Phone: New Delhi 7231. (3) M/A. Cotton Agents, Ltd., Imperial Bank Bldg., Bank St., Bombay. Tele { Grams: Lucky, Bombay. Phone: Bombay 27046.	Narkatiaganj. (Tel. Birla, Narkatiagunj.)	Champaran.	Narkatiaganj, O. & T. Rly.	Semaria.	900	DS
16.	Ganga Devi Sugar Mills, Ltd., M/A. Marwari Brothers, Naraipore, Bagaha P.O. (Tele. Ganga, Bagaha.)	Naraipur, P. O.	Do.	Bagaha, Do.	Do.	650	DS
17.	Gaya Sugar Mills, Ltd., Managing Director, Mr. Guru Sharan Lal.	Guraru. P. O. Guraru Mills. (Tel. Sugarmills. Telephone: Gaya 78.)	Gaya	Guraru, E.I.R.	Patna	850	DS
18.	The South Bihar Sugar Mills, Ltd., M/A. N. K. Jain & Company, Ltd., 9, Clive St., Calcutta. Tele { Grams: Inredlead, Calcutta. Phone: Calcutta 5977.	Bihta. (Tel. Sugar, Bihta. Phone: Dinapore 130.)	Patna.	Bihta, Do.	Digha.	1200	DS
19.	Mohini Sugar Mills, Ltd., M/A. M/s. Karamchand Thapar & Bros. Ltd., 5, Royal Exchange Place, Calcutta. Tele { Grams: Spiritual, Calcutta. Phone: Cal. 2333.	Bikramgunj. P. O. Bikramgunj. (Tel. Spiritual, Bikramganj.)	Shahabad.	Bikramganj, A. S. L. Rly.	Sinha 40 Miles Buxar 40 Miles.	700	DS
20.	Rohtas Industries, Ltd., M/A. Dalmia Sabharwal Jain & Co., P. O. Dalmianagar (Shahabad.) Tele { Grams: Dalmiya Jain, Dalmianagar. Phone: Gaya 77.	P. O. Dalmianagar.	Do.	Dehri-on-Sone, E. I. R.	Buxar.	1800	DC DS
21.	Ganga Deshi Sugar Factory, Ltd., M/D. Behari Lal, Buxar, (Tel. Sugar, Buxar.)	Buxar. P. O. Buxar. Gajadharganj.	Shahabad.	Buxar, Do.	Buxar.	100*	
22.	Sitalpore Sugar Works, Ltd. M/D. Ghosh & Dutt, 93, Dharamtolla Street, Calcutta, and Indian Press Buildings, Allahabad. (Local Office: Sahibganj, Chapra).	Sitalpore. (Tel. Kamala, Sitalpore. O. & T.)	Saran.	Sitalpore, O. & T. Rly.	Baghi.	800	DS
23.	Cawnpore Sugar Works, Ltd., Marhowrah Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Marhowrah (Tel. Marsuco, Marhowrah.)	Do.	Marhowrah, Do.	Revelganj	939	DC
24.	Maharajganj Sugar Factory, Prop. M/S. Tulsiram Bhagwandas, 61, Keshab Chandra Sen Street, Calcutta.	Maharajganj.	Do.	Maharajganj, Do.	Do.	400	
25.	The Behar Sugar Works of the Industrial Corporation, Ltd., M/A. Bakubhai Ambalal & Co., P. O. Box 28, Ahmedabad. Tele { Grams: Indus, Ahmedabad. Phone: Ahmedabad 5001. H. O. Bastion Road, Fort, Bombay. Tele { Grams: Indus, Bombay. Phone: Bombay 22497.	Pachrukhi (Tel. Indus, Pachrukhi.)	Do.	Pachrukhi Do.	Palezaghat,	1100	DC

	Name of Factory, with full name and address of Managing Agents or Proprietors	Location	District	Nearest Railway Station	Nearest Steamer Station	Daily cane-crushing capacity (tons)	
26.	New Savan Sugar & Gur Refining Co., Ltd., M/A. Andrew Yule & Co., Ltd., 8, Clive Row, Calcutta. Tele { Grams: Yuletide, Calcutta. Phone: Calcutta 5282.	Siwan. (Tel. Sugar, Siwan.)	Saran.	Savan, O. & T. Rly.	Savan O. A.	800	DS
27.	Indian Sugar Works, R. C. Pandit, Esq., Receiver, P. O. Siwan, Dist. Saran. (Tel. Indian, Siwan.)	Siwan	Do.	Do.	Do. Do.	700	DS
28†	Siwan Deshi Sugar Factory, Prop. Messrs. Noori Mian & Co., Bhatni (Gorakhpur.)	Do.	Do.	Do.	Do. Do.	Gur only.	
29.	Bharat Sugar Mills, Ltd., M/A. Cotton Agents, Ltd., (1) 8, Royal Exchange Place, Calcutta. Tele { Grams: Lucky, Calcutta. Phone: Calcutta 562. (2) 52, Queensway, New Delhi. Tele { Grams: Cotagent, New Delhi. Phone: New Delhi 7231.	Sidhwalia. (Tel. Birla, Sidhwalia.)	Do.	Sidhwalia,	Do. Revelganj and Palezaghat.	650	DS
30.	Sasa Musa Sugar Works, Ltd., M/A. Mousell & Co., Ltd., P. O. Box 2164, Calcutta. (Tel. Diogenes, Calcutta.)	Sasa Musa. (Tel. Factory Sasa Musa.)	Do.	Sasa Musa,	Do. Palezaghat.	600	DS
31.	S. K. G. Sugar, Ltd., M/A. Dalmia Jain & Co., Ltd., P. O. Dalmianagar, Dist. Shahabad. Tele { Grams: Dalmiajain, Dalmianagar. Phone: 77. Gaya Special Line.	Hathua, P. O. Mirganj. Tel. "Dalmiajain", Mirganj, Phone: Hathua 4 & 5.	Do.	Hathua,	Do. Palezaghat.	1400/1500	DS
32.	The Vishnu Sugar Mills, Ltd., M/A. Bilasrai Banarsilal & Co., Agakhan Building, Dalal Street, Fort, Bombay. (Tel. Brijbilas, Bombay.)	Gopalganj. (Tel. Vishnu, Gopalganj.)	Do.	Harkhua,	Do. Revelganj	800	DS

UNITED PROVINCES

1.	Purtabpore Co., Ltd., M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Mairwa. (Tel Sucrose, Mairwa.)	Gorakhpur.	Mairwa,	Do. Revelganj.	720	DC
2.	Noori Sugar Works, Prop. Noori Mian & Co., Bhatni. (Tel. Noori Bhatni.)	Bhatni.	Do.	Bhatni,	Do. Barhaj,	726	DS
3.	Shree Sitaram Sugar Co., Ltd., M/A. Karamchand Thapar & Bros., Ltd., 5, Royal Exchange Place, Culcutta. Tele { Grams: Spiritual, Calcutta. Phone: Calcutta. 2331.	Baitalpur, P. O. Deoria. (Tel. Spiritual, Baitalpur, O. & T.)	Do.	Baitalpur,	Do. Barhaj.	861	DS
4.	Cawnpore Sugar Works, Ltd., Gauri Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Gauribazar, P. O. (Tel. Gaursuco, Gauribazar.)	Do.	Gauribazar, O. & T. Rly.	Barhaj (30 miles)	738	DS
5.	Deoria Sugar Mills, Ltd., M/A. Karamchand Thapar & Bros., Ltd., 5, Royal Exchange Place, Calcutta. Tele { Grams: Spiritual, Calcutta. Phone: Calcutta 2331.	Deoria. (Tel. Spiritual, Deoria.)	Do.	Tahsil Deoria, O. & T. Rly.	Do.	900	DS
6.	Sind National Sugar Mills, Ltd., M/A. The Sindhi & Co., Ltd., Deoria, Dist. Gorakhpur.	Deoria. (Tel. National, Deoria.)	Do.	Do.	Do. Barhaj Bazar.	351	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
7.	Saraya Sugar Factory, Managing Partner, S. Surendra Singh Majithia, Sardarnagar, (Tel. Majithias, Sardarnagar).	Sardarnagar.	Gorakhpur.	Sardarnagar, O. & T. Rly.	Barhaj.	2129	DS
8.	Diamond Sugar Mills, Ltd., M/A. Murarka & Sons, Ltd., 4-E, Dalhousie Square, Stephen House, Calcutta. Tele { Grams: Canesugar, Calcutta. Phone: Calcutta 1003 & 1349.	Pipraich. (Tel. Diamond, Pipraich, O. & T.)	Do.	Pipraich, Do.	Do.	700/800	DS
9.	Pipraich Sugar Mills, Ltd., M/A. Mr. Mohammad Ashfaq, B.A., General Manager, (Telephone: Gorakhpur 25.)	Pipraich. (Tel. Pipraich. Telephone: Gorakhpur 25.)	Do.	Pipraich, Do.	Do.	300	S
10.	The Shankar Sugar Mills, Ltd., M/A. Inderchand Hariram, Captainganj.	Captainganj. (Tel. Shankarji, Captainganj.).	Do.	Captainganj, Do.	Do.	896	DS
11.	The Punjab Sugar Mills, Co., Ltd., Managers, Messrs. Narang Bros. & Co., Ltd., 3. Montgomery Road, Lahore. Tele { Grams: Narang, Lahore.. Phone: Lahore 3717.	Ghughli. (Tel. Factory, Ghughli R. S.)	Do.	Ghughli, Do.	Do.	782	DS
12.	Mahabir Sugar Mills, Ltd., M/A. Dwarkadas Baijnath, Siswa Bazar.	Siswa Bazar. (Tel. Mahabirji, Siswa Bazar.)	Do.	Siswa Bazar, Do.	Do.	620	DS
13.	Ishwari Khetan Sugar Mills, Ltd., M/A. Devidutt Surajmull, Padrauna, Gorakhpur. Tele { Grams: Khetan, Padrauna. Phone: Padrauna 3.	Lakshmiganj (Tel. Khetan, Lakshmiganj.)	Do.	Lakshmiganj, Do.	Do.	500*	S
14.	The Vishnu Pratap Sugar Works, Ltd., M/D. Raja Bahadur Raja Braj Narain Singh, C.B.E., Padrauna Raj. (Tel. Sugar, Rajabazar, Khadda.)	Khadda.	Do.	Khadda, Do.	Do.	761	DS
15.	The Lakshmi Devi Sugar Mills, Ltd., M/A. Messrs. Agarwal & Co., P. O. Chhitauni. (Telephone: Padrauna 3.)	Chhitauni.	Do.	Chhitauni, Do.	Do.	400/600	DS
16	The Ramkola Sugar Mills, Co., Ltd., H. O. Nawashahr (Hazara), *Via* Abbottabad. Tele { Grams: Timber, Nawashahr, Hazara. Phone: Abbottabad 31.	Ramkola, (Tel. Sugar. Ramkola, Tele: Padrauna 18.)	Do.	Ramkola, Do.	Revelganj.	900	DS
17.	Maheshwari Khetan Sugar Mills, Ltd., M/A. Messrs. Devidutt Chaturbhuj, P. O. Ramkola. (Tel. Khetan, Ramkola.)	Ramkola. (Telephone: Padrauna 4.)	Do.	Ramkola, Do.	Barhaj.	777	DS
18.	Padrauna Rajkrishna Sugar Works, Ltd., M/D. Kr. Rudra Pratap Narain Singh, "Jagdis Garh", Padrauna. Tele { Grams: Krishna, Padrauna. Phone: Padrauna 14.	Padrauna. (Telephone No. 6.)	Do.	Padrauna, Do.	Do.	800	S
19.	Jagadish Sugar Mills. Ltd., M/A. Raja Bahadur Brijnarayan Singh & Co., Padrauna. Tele { Grams: Jagadish, Padrauna. Phone: Padrauna 15.	Kathkuiyan, Padrauna P. O.	Do.	Kathkuiyan, Do.	Do.	400	DS
20.	The United Provinces Sugar Co., Ltd., M/A. James Finlay & Co., Ltd., 1, Clive Street, Calcutta. Tele { Grams: Mercator, Calcutta. Phone: Calcutta 4600.	Seorahi P. O. (Tele. Chini. Seorahi)	Do.	Tamkohi Road, Do.	Do.	925	DS
21.	The Madho Kanhaya Mahesh Gauri Sugar Mills, Ltd.	Munderwa. (Tel. Jagdis, Munderwa.)	Basti.	Munderwa, Do.	Do.	600/700	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	Location	District	Nearest Railway Station	Nearest Steamer Station	Daily cane-crushing capacity(tons)	
22.	Ganesh Sugar Mills, Ltd., M/A. Poddar Jaipuria & Co., 51, Vivekananda Road, Calcutta. Tele { Grams: Jaipuria, Calcutta. Phone: Burra Bazar 4100 & 5557.	P. O. Anandnagar, (Tele. Ganesh Pharenda, O. & T.)	Basti.	Pharenda, O. & T. Rly.	Barhaj.	900	DS
23.	Ledi Sugar Factory, Lessees: EL.—Baha' Bhargava & Co., P. O. Nichlaul (Gorakhpur.)	Ledi P.O. Nichlaul, (Tele. "Shyama", Siswa Bazar.)	Do.	Siswa Bazar, Do.	Do.	80	DS
24.	Basti Factory of The Basti Sugar Mills Co., Ltd., M/A. Narang Bros. & Co., Ltd., 3, Montgomery Road, Lahore. Tele { Grams: Narang, Lahore. Phone: Lahore 4614.	Basti. (Tel. Sugar Factory, Basti.)	Do.	Basti, Do.	Ajodhya Ghat.	875/900	DC
25.	Walterganj Factory of The Basti Sugar Mills Co., Ltd., M/A. Narang Bros. & Co., Ltd., 3, Montgomery Road, Lahore. Tele { Grams: Narang, Lahore. Phone: Lahore 4614.	Walterganj, (Tel. Sugar, Walterganj.)	Do.	Walterganj, Do.	Do.	700/800	DS
26.	Barhni Sugar Mills, Proprietors: The Delhi Cloth and General Mills Co., Ltd., Delhi. Tele { Grams: Yarn, Delhi. Phone: Delhi 5243.	Barhni P. O. Ramduttganj. (Tel. Sugar, Barhni, O. & T.)	Do.	Barhni, Do.	Barhni.	800/1000	DS
27.	Shree Anand Sugar Mills, Ltd., M/A. Agarwal Sugar Agents, Ltd., 5, Vivekananda Road, Calcutta. Tele { Grams: Jaipuria, Calcutta. Phone: B. B. 4100 & 5557.	Khalilabad. (Tele. Shreeanand, Khalilabad.)	Do.	Khalilabad, Do.	Do.	650	DS
28.	Shree Sheodayal Sugar Mills, P. O. Sheodayalganj (Gonda). Tel. Mansinghka, Nawabganj (Gonda).	P. O. Sheodayalganj.	Gonda.	Katra, Do.	Do.	100/150	DS
29.	The Seksaria Sugar Mills, Ltd., M/A. Govindram Ramnath & Co., Seksaria Chambers, 139, Medows Street, Fort, Bombay. Tele { Grams: Fairtrade, Bombay. Phone: Bombay 34627.	Babhnan. (Tel. Seksariaco, Babhnan.)	Do.	Babhnan, Do.	Do.	800	DS
30.	Nawabganj Sugar Mills Co., Ltd., M/A. Narang Bros. & Co., Ltd., 3, Montgomery Road, Lahore. Tele { Grams: Narang, Lahore. Phone: Lahore 4614 and 3717.	Nawabganj. (Tel. Sugar Mills, Nawabganj, Gonda.)	Do.	Nawabganj, Do.	Barhaj.	1850	DS
31.	Balrampur Sugar Co., Ltd., Balrampur Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Balrampur. (Tel. Balsuco, Balrampur. Telephone: Balrampur 37.)	Do.	Balrampur, Do.	Do.	768	DS
32.	Balrampur Sugar Co., Ltd., Tulsipur Factory, M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Tulsipur. (Tel. Talsuco, Tulsipur.)	Do.	Tulsipur, Do.	Ajodhya Ghat.	746	S
33.	Seth Ramchand & Sons Sugar Mills, Lucknow.	Aishbagh. (Tel. Malaco, Lucknow. Phone: Lucknow 605.)	Lucknow.	Aishbagh, E. I. R.	Do.	793*	DS
34.	Ratna Sugar Mills Co., Ltd., M/A. Kashiprasad & Co., 107, Streat Field Road, Benares City. (Tel. Ratna, Benares.)	Shahganj, (Tel. Ratna. Shahganj, Jaunpur.)	Jaunpur.	Shahganj, Do.	Balia.	751	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
35.	R. B. Seth Lachhmandass Mohanlal & Sons Sugar Mills, Head Office: Shahalmi Gate, Lahore. Tele { Grams: Laxmansons. Phone :-Lahore 3709.	P. O. Jarwal Rd., (Tel. Laxmansons, Jarwal Road. Telephone : Gonda 16.)	Bahraich.	Jarwal Rd., E.I.R.	Ajodhya Ghat.	860	DS
36.	The Burhwal Sugar Mills Co., Ltd., Managing Directors: Durga Sanker Dayaram, Collectorganj, Cawnpore. Tele { Grams: Ganeshji, Cawnpore. Phone :- Cawnpore 2758.	Burhwal. (Tel. Ganeshji, Burhwal.)	Barabanki.	Burhwal, Do.	Do.	650*	DS
37.	Shree Krishna Deshi Sugar Works, Lessees: J. Gupta & Co., Azmatgarh Palace, Benares. Tele { Grams: Shree, Benares. Phone : Benares 151.	Jhusi. (Tel. Factory, Jhusi. Phone : Allahabad 269.)	Allahabad.	Jhusi, O. & T. Rly.	Do.	400*	DS
38.	§Tribeni Deshi Sugar Works, Lessee: L. Jainarain Prashad Agarwal, Naini. (Tel. Madho, Naini).	Naini.	Do.	Naini, E.I.R. & G.I.P.R.	Buxar.	200*	S
39.	The Lakshmi Sugar & Oil Mills, Ltd., M/D. Rai Bahadur Sheth Bansidhar. Head Office: Hardoi.	Hardoi. (Tel. Lakshmi.)	Hardoi.	Hardoi, E.I.R.	Do.	1565	DS
40.	The Seksaria Biswan Sugar Factory, Ltd., M/A. Govindram Bros., Ltd., Seksaria Chambers, 139, Medows St., Fort, Bombay. (Tel. "Fairtrade," Bombay.)	Biswan. (Tel. Factory, Biswan.)	Sitapur.	Biswan, O. & T. Rly.	Do.	1200	Double Tandem
41.	The Lakshmiji Sugar Mills Co., Ltd., M/D. Seth Kishorilal Saheb, Maholi (Dt. Sitapur).	Maholi. (Tel. Lakshmi, Maholi. Phone: Sitapur 5.)	Do.	Maholi, E.I.R.	Buxar.	1250	DS

§ Only Gur-refining plant is working.

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42.	The Oudh Sugar Mills, Ltd., M/A. Cotton Agents, Ltd., 1. Imperial Bank Bldg., Bank St., Bombay. Tele { Grams: Lucky, Bombay. Phone: Bombay 27046 & 33745 } 4 lines. 2. 8, Royal Exchange Place, Calcutta. Tele { Grams: Lucky, Calcutta. Phone: Calcutta 562. 3. 52, Queensway, New Delhi. Tele { Grams: Cotagent, New Delhi. Phone: New Delhi 7231.	Hargaon. (Tel. Osmills, Hargaon Sugar Mills. Telephone : Sitapur 2.)	Sitapur.	Hargaon, O. & T. Rly.	Ajodhya Ghat.	1925	DS
43.	Aira Sugar Factory, P. O. Aira Estate, Dist. Kheri, U. P.) Prop.: Indra Singh & Sons. Tele { Grams: Indra Singh, Tatanagar. Phone: Tatanagar 18.	Khamaria, (Tel. "Aira", Lakhimpore-Kheri.)	Kheri.	Lakhimpur, O. & T. Rly.	Bahram Ghat.	650	DS
44.	The Hindusthan Sugar Mills, Ltd., M/A. Bachhraj & Co., Ltd., Jehangir Wadia Building, 51, Mahatma Gandhi Road, Fort, Bombay. Tele { Grams: Shree, Bombay. Phone: Bombay 30027.	Golagokarannath. (Tel. Shree, Golagokarannath. Telephone No. 1, Golagokarannath.)	Do.	Golagokaran-nath. O. & T. Rly.	Do.	1950	DS
45.	Rosa Sugar Works & Distillery of Carew & Co., Ltd., M/A. Lyall Marshall & Co., 4, Fairlie Place, Calcutta. (Tel. Ghat, Calcutta.)	Rosa. (Tel. Carew, Rosa.)	Shahjahan-pur.	Rosa Jn., E.I.R.	...	700*	DS
47.	The Kesar Sugar Works, Ltd., M/A. Kilachand Devchand & Co., 45/47, Apollo Street, Bombay. Tele { Grams: Seeds, Bombay. Phone: Bombay 26506.	Baheri. (Tel. Kesar, Baheri. Telephone No. 125, Bareilly Exchange.)	Bareilly.	Baheri, O. & T. Rly.	Barhaj.	1280	DS

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Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
47. H. R. Sugar Factory, Ltd., M/D. Sahu Jagdish Prasad Sahib, Nekpur, Bareilly.	Bareilly. (Tel. Sugar. Bareilly. (Phone : 33.)	Bareilly.	Bareilly Jn., E.I.R. & O. & T. Rly.	Buxar.	902	DS
48. L. H. Sugar Factories and Oil Mills, Ltd., Pilibhit, M/D. Raja Radha Raman, Pilibhit. (Telephone: Pilibhit 32 and 26.)	Pilibhit. (Tel. Crystal, Pilibhit. Phone: Pilibhit 32.)	Pilibhit.	Pilibhit, Do.	Barhaj.	1750 (Double Tandem).	S
49. Upper Ganges Sugar Mills, Ltd., M/A. Cotton Agents, Ltd., (1) 8, Royal Exchange Place, Cal. Tele { Grams: Lucky, Calcutta. Phone: Calcutta 592. (2) 52, Queensway, New Delhi. Tele { Grams: Cotagent, New Delhi. Phone: New Delhi, 7231.	Sheohara. (Tel. Birla, Sheohara.)	Bijnor.	Sheohara, E.I.R.	Buxar.	1300	DS
50. Seth Shiv Prasad Banarsidas Sugar Mills, Superintending Partner: Seth Benarsidas Sahib, Sahibabad, P. O. Ghaziabad, Dist. Meerut. Residential Prop.: Seth Kundanlal Aggarwal, Bijnor. (Telegrams: Jagmag, Ghaziabad.)	Bijnor. (Tel. Aggarwal, Bijnor.)	Do.	Bijnor, Do.	Do.	1100/1200	DS
51.§ The Ganga Sugar Works, M/A. The Ganga Glass Works, Balawali, Bijnor.	Balawali.	Do.	Balawali, Do.	...	100 15/2	(Cane) (Gur)
52. The Dhampur Sugar Mills, Ltd., M/D. Kr. Ram Autar Saheb, Ramniketan Alamgirigunj, Bareilly. (Telephone: Bareilly 159.)	Dhampur. (Tel. Sugarmills, Dhampur).	Do.	Dhampur, Do.	Buxar.	900	DS

§ Factory is not working since 1937, it is not certain whether it will work at all.

53. The Vijai Sugar Corporation Ltd., M/G. Lala Budhram Kuthiala, Doiwala, E. I. R.	Doiwala. (Tel. Vijai, Doiwala. Tel: Dehra Dun 564.)	Dehra Dun.	Doiwala, Do.	Karachi.	400*	DC/DS
54. The Ganga Sugar Corporation, Ltd., College Road, Rawalpindi, Chairman: R.B. L. Isher Dass, M.A., LL.B., M.L.A. Tele { Grams: Gansuco, Rawalpindi. Phone: Rawalpindi 641.	Deoband. (Tel. Sugar, Deoband. Telephone: Deoband 23.)	Saharanpur.	Deoband, N.W.R.	Buxar.	600	DC
55. Rai Bahadur Narain Singh Sugar Mills, Ltd., M/D. S. B. Sardar Ranjit Singh, 2, Curzon Road, New Delhi. (Telephone: Delhi 7617.)	Lhaksar. (Tel. Sugar, Lhaksar, Jn., E. I. Tele: Roorkee 35.)	Do.	Lhaksar, E.I.R.	...	1250	DS
56. The Lord Krishna Sugar Mills, Ltd., Regd. Office: 17, Lawrence Road, Lahore, M/D.: Seth Benarsi Dass Gupta. Tele { Grams: Bindal, Lahore. Phone: Lahore 2865.	Saharanpur. (Tel. Krishna, Saharanpur. Telephone: Saharanpur 3 and 3A.)	Do.	Saharanpur, N.W.R.	Do.	1250	DS
57. Upper Jumna Swadeshi Sugar Mills Co., Ltd., M/A. Hariraj Swarup Rajendralal & Brothers, Muzaffarnagar. Tele { Grams: Swesugmill, Muzaffarnagar. Phone: Muzaffarnagar 32.	Mansurpur. (Tel. Swesugmill, Mansurpur. Telephone: Mansurpur 44.)	Muzaffar-nagar.	Mansurpur, Do.	Karachi.	1000/1200	DS
58. Upper India Sugar Mills, Ltd., M/D. P. Srikrishna Deva Bhargava, M/A. Mitra Mandal, Khatauli. Tele { Grams: Sugar, Khatauli. Phone: Muzaffarnagar 96.	Khatauli. (Telephone: Muzaffarnagar 96.)	Do.	Khatauli Do.		1149/1400	DS
59. Amritsar Sugar Mills Co., Ltd., M/A. Amar Singh & Co., Amritsar (Punjab). Tele { Grams: Refiners, Amritsar. Phone: Amritsar 597.	Rohanakalan. P.O. Rohanamills. (Tel. Refiners, Muzaffarnagar. Phone: Muzaffarnagar 41).	Do.	Rohanakalan, Do.	Buxar.	1200	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	Location	District	Nearest Railway Station	Nearest Steamer Station	Daily cane-crushing capacity (tons)	
60.	Upper Doab Sugar Mills, Ltd., M/A. Hariraj Swarup, Rajendralal Debi Prasad & Brothers, Muzaffarnagar. Tele { Grams: Swesugmill, Muzaffarnagar. Phone: Muzaffarnagar 85.	Shamli. (Tel. Sugarmills, Shamli. Telephone: Shamli 32.)	Muzaffar-nagar.	Shamli, S.S.L.R.	Bombay	1400	DS
61.	Diwan Sugar Mills, Prop. Messrs. Dhanpatmal Diwanchand, Lyallpur (Punjab). (Tel. Dhanpat, Lyallpur.)	Sakhoti-Tanda. (Tel. Diwanmills, Sakhoti-Tanda, N.W.R. Phone: Muzaffarnagar 77.)	Meerut.	Sakhoti-Tanda, N.W.R.	Do.	716*	DS
62.	Daurala Sugar Works, Prop. The Delhi Cloth and General Mills Co., Ltd., Delhi. Tele { Grams: Yarn, Delhi. Phone: Delhi 5243.	Daurala. (Telephone: Meerut, 259.)	Do.	Daurala,	Do. ...	1250	DC
63.	Jaswant Sugar Mills, Ltd., M/A. M/s. Associated Industrial Development Co., Ltd., Dalhousie Square, East, Calcutta. Tele { Grams: Bestluck. Phone: Calcutta 5660.	Meerut City. (Telegrams: Godfearing. Telephone: Meerut 230.)	Do.	Meerut City, Do.	Buxar.	650	DS
64.	Ram Luxman Sugar Mills, Managing Props.: M/s. Dinanath Nanakchand, Chawri Bazar, Delhi. Tele { Grams: Ensey, Delhi. Phone: 5004. and R. S. Chiranjilal & Sons, Saddar Bazar, Delhi. Tele { Grams: Consult, Delhi. Phone: 5011.	Mohiuddinpur. (Telegrams: Sugarmills, Mohiuddinpur, N.W.R. Telephone: Meerut 365.)	Do.	Mohiuddinpur, Do.	Do.	600/800*	DS
65.	The Modi Sugar Mills, Ltd., M/A. Rai Bahadur Multanimal & Sons, Ltd., Modinagar.	Modinagar, Begamabad. (Tel. Modimills, Begamabad. Phone: Meerut 226)	Do.	Begamabad, Do.	Do.	700/1000	DS
66.	Simbhaoli Sugar Mills, Ltd., Chairman: Lt. Sardar Raghbir Singh Sandhanwalia, O.B.E. Tele { Grams: Sandhanwalia, Simbhaoli, E.I.R. Phone: Hapur 77.	Simbhaoli, P. O. Baksar	Do.	Simbhaoli E.I.R.	...	735	DS
67.	The Gokulnagar Sugar Mills Co., Ltd., M/A. Sir Gokulchand Narang & Co., Ltd., 3, Montgomery Road, Lahore. Tele { Grams: Narang, Lahore. Phone: Lahore 4614.	Kichha. (Tel. Sugar Factory, Kichha.)	Naini-Tal.	Kichha, O. & T. Rly.	Burhaj.	800	DS
68.	L. H. Sugar Factories & Oil Mill, Ltd., M/D. Raja Radha Raman Saheb, Pilibhit.	Kashipur. (Tel. Crystal, Kashipur.)	Do.	Kashipur,	Do. Do.	650	DS
69.	The Neoli Sugar Factory, Prop.: The Saraswati Sugar Syndicate, Ltd., M/A. The Neoli Syndicate, Neoli, Dt. Etah. (Telegram: Sucrose, Neoli (Etah).	Manpore Nagaria. P. O. Neoli. (Tel. Sucrose, Neoli, Etah.)	Etah.	Manpore Nagaria,	Do. Do.	873	DS
70.	The Standard Refinery & Distillery, Ltd., M/A. Karam Chand Thapar & Bros., 5, Royal Exchange Place, Calcutta. Tele { Grams: Spiritual. Phone: Calcutta 2331.	Unao.	Unao.	Unao, E.I.R. & O. & T. Rly.	Buxar.	Gur only 75	
71.	Kamlapat Motilal Gutaiya Sugar Mills, Prop.: Messrs. Kamlapat Motilal, P. B. 69, Cawnpore. Tele { Grams: Lalmoti, Cawnpore. Phone: 2573.	Cawnpore. (Phone: Cawnpore 2315.)	Cawnpore.	Rawatpur, B.B.&C.I.R. K. M. G. Sugar Mills Siding, E. I. R.	Do.	Cane 1000 Gur 100	
72.	Experimental Sugar Factory, Imperial Institute of Sugar Technology.	Nawabganj.	Do.	Rawatpur, B.B.&C.I R.	Do.	34*	

	Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
73.	Cawnpore Sugar Works, Ltd., Cawnpore Refinery. M/A. Begg, Sutherland & Co., Ltd., P. O. Box No. 21, Cawnpore. Tele { Grams: Begg, Cawnpore. Phone: Cawnpore 2313.	Cooperganj.	Cawnpore.	Cawnpore, E.I.R.	Buxar.	Gur only 73	
74.	Baijnath Balmakund Sugar Mills, Prop.: Mrs. Bankey Beharilal Singhania, Lalbankey Street, Cawnpore. Tele { Grams: Lalbankey. Phone: Cawnpore. 2489.	Anwarganj.	Do.	Anwarganj, B.B. & C.I.R.	Burhaj.	Gur only 27	
75.	Amroha Sugar Factory, Prop. The Ganesh Flour Mills Co., Ltd., Delhi. Tele { Grams: Ganesh Mill, Delhi. Phone: Delhi 6371.	Amroha. (Tel. Ganeshmill, Amroha.)	Moradabad.	Amroha, E.I.R.	Buxar.	500	DS
76.	The Ajudhia Sugar Mills, Prop.: Lakshmiji Sugar Mills Co., Ltd., 24, Mozang Road, Lahore. Tele { Grams: Seth, Lahore. Phone: Lahore 2467.	P. O. Raja-Ka-Sahaspur. (Tel. Sugarmill, Moradabad. Phone: (1) Moradabad 79. (2) Moradabad 98. (Raja-Ka-Sahaspur Special line.)	Do.	Raja-Ka Sahaspur.	Do. Do.	1305	DS

PUNJAB

1.	The Gujranwala Sugar Mills, Co., Ltd., M/A. Narang Bros., Ltd., 3, Montgomery Road, Lahore. Singh & Co., Ltd., Civil Station, Gujranwala. Tele { Grams: Narang, Lahore. Phone: Lahore 2499.	Rahwali. (Tel. Sugarmill, Rahwali. Telephone 64.)	Gujranwala.	Rahwali, N.W.R.	Karachi.	300/450	DS
2.	†The Amritsar Sugar Mills, Co., Ltd., M/A. M/S. Amarsingh & Co., P. O. Khalsa College, Amritsar. Phone 597.	Gr. Trunk Road, Amritsar. (Tel. Refiners, Amritsar.)	Amritsar.	Amritsar,	Do. Do.	Gur only 42 tons.	
3.	Saraswati Sugar Mills, M/A. The Abdullapur Syndicate Ltd., Abdullapur. M/D. Mr. D. D. Puri. Prop.: The Saraswati Sugar Syndicate, Ltd., 4, McLeod Road, P.O. Box No. 255, Lahore. Tele { Grams: Sucrose, Lahore. Phone: Lahore 3034.	P. O. Abdullapur. (Telegram: Saraswati, Abdullapur. Telephone: Jagadhari 27.)	Ambala.	Jagadhari,	Do. Buxar.	400	DC & DS
4.	†The Pattoki Sugar Works, Pattoki, Prop.: Sahu Ram Swarup Ram Bharose Lal Bankers, Civil Lines, Bareilly, U. P.	Pattoki.	Lahore.	Pattoki,	Do. ...	100	

ORISSA

1.	Aska Sugar Works & Distillery, Prop.: Messrs. Damodar Sahu and Brothers. (Tel. "Massecuite", Aska.)	Aska.	Ganjam.	Berhampur, B.N.R.	...	100/120*	
2.	Jeypore Sugar Co., Ltd., M/D. G. Subba Roa, B.Sc., C.P.E. (Glasgow), Rayagada (Dist. Koraput.) (Tel. Jeysuco, Rayagada.)	Rayagada.	Koraput.	Rayagada,	Do. Vizagapatam.	250	

ASSAM

1.	Padmini Sugar Mills, Managing Prop.: Mr. D. R. Roy, Deopani. P. O. Sarupathar (Sibsagar.)	Deopani, P. O. Sarupathar (Tel. Padmini Sugar Mills, Deopani. P. O. Barpathar, A. B. Rly.)	Sibsagar.	Sarupathar.	...	60	S

Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
MADRAS						
1. The Vizagapatam Sugars & Refinery, Ltd., Anakapalle, M/A. Messrs Kantilal Vasantlal & Co., Ltd., Bombay. (Tel. "Sugars", Anakapalle.)	**Anaka**palle.	Vizaga-patam.	Anakapalle, M. & S.M. Rly.	Vizagapatam	200	DS
2. Etikoppaka Sugar Factory, M/A. The Etikoppaka Co-operative, Agricultural & Industrial Society, Ltd. (Tel. Sugar Factory, Etikoppaka, Narsipatnam Road.)	**Etikoppaka.**	Do.	Narasapatam Road, Do.	Do.	65	DS
3. The Sri Rama Sugar Mills, Ltd., Prop.: Raja of Bobbili, Raja of Venkatagiri and Others, Bobbili. (Tel. Sugar, Bobbili.)	**Bobbili.**	Do.	Bobbili, B.N.R.	...	150	DS
4. The Sri Rama Sugar Mills, Ltd., Seetanagram.	**Seeta**nagram.	Do.	Seetanagram, Do.	...	300	
5. The K. C. P. Ltd., Proprietors of Vuyyuru Sugar Factory. (Tel. "Krushna", Vuyyuru.)	**Vuyyuru.**	Kistna.	Bezwada, M. & S.M. Rly.	...	850/1000	DS
6. The Kirlampudi Sugar Mills Ltd., M/A. K. V. Subbarao and Company, 99-A, Armenian Street, George Town, Madras.	**Kirla**mpudi.	East Godavari.	Samalkot, Do.	...	150	DS
7. The Deccan Sugar and Abkari Co., Ltd., M/A. Parry & Co., Ltd., P. B. No. 12, Madras. Tele { Grams: Parry, Madras. Phone: Madras 2983.	**Samalkot.** (Tel. Deccan, Samalkot.)	Do.	Samalkot, Do.	Cocanada.	Gur CHAR only 40 tons. 250 (Cane).	S
8. The East India Distilleries and Sugar Factories, Ltd., M/A. Parry & Co., Ltd., P. B. No. 12, Madras. Tele { Grams: Parry, Madras. Phone: Madras 2983.	Nellikuppam. (Tel. Distimulo, Nellikuppam.)	South Arcot.	Nellikuppam, S.I.R.	Cuddalore.	1500*	DS
9. The India Sugars and Refineries, Ltd., Chairman, Board of Directors: (1) Mr. Rukn-ul-Mulk S. Abdul Wajid, B.A., Chairman and Managing Director, (2) Rao Saheb A. D. Tandu Mudaliar, Managing Director.	Hospet. (Tel. Sugars, Hospet.)	Bellary.	Hospet, M. & S.M. Rly.	...	500*	DS
10. Coimbatore Co-operative Sugar Manufacturing Society, Ltd., Hony. Secretary: Mr. V. Rangasami Naidu.	Podanur.	Coimbatore.	Podanur, S.I.R.	...	50*	
11. Al. Vr. St. Sugar Mills & Distillery, Prop.: Al. Vr. St. Veerappa Chettiar, Zamindar of Devaram, Devakottah.	Tachanallur. (Tel. Sugarmill, Tachanallur.)	Tinnevelly.	Tinnevelly Jn. Do.	Tuticorin.	Gur only 16 (Palmyra Jaggery.)	
12. T. A. Rm. Lakshmi Sugar Mills, Alvartirunagari. (Tel. Luxmi Sugar, Alvartirunagari.)	Near Laks-manatope.	Tinnevelly.	Alvartirunagari.	Tuticorin.	Gur only 6 (Palmyra Jaggery.)	
13. The Murugappa Sugar Co., Ltd., Mailpatti (N. Arcot.)	Mailpatti.	N. Arcot.	Mailpatti, M.S.M.Ry.	Madras.	Cane 75 Gur 10 (Cane and Palmyra Jaggery.)	
14. The Southern India Sugar Co., Ltd., 179, Lord Napier Road, Erode.	Murugappapuram, Pugalur Sugar Factory P. O.	Trichino-poly.	Pugalur, S.I.Ry.	Madras.	150 to 300	

Name of Factory, with full name and address of Managing Agents or Proprietors	Location	District	Nearest Railway Station	Nearest Steamer Station	Daily cane-crushing capacity (tons)	
BOMBAY						
1. The Saswad Mali Sugar Factory, Ltd., Head Office: Akluj. M/D. H. B. Girme, Esq., Bombay Office: Sir Vithaldas Chambers, 16, Apollo Street, Fort, Bombay. Tele { Grams: Malisugar, Bombay. Phone: Bombay 20134.	Akluj. (Tel. Malisugar, Akluj.)	Sholapur.	Kurduwadi, G.I.P.Ry. Diksal, G.I.P.Ry.	...	450/500	DS
2. The Brihan Maharashtra Sugar Syndicate, Ltd., M/A. C. G. Agashe & Co., Commonwealth Building, 980, Sadashiv, Laxmi Road, Poona 2. Tele { Grams: Shree, Poona and Akluj. Phone: 9—138.	Borgaon.	Do.	Pandharpur, B.L.R.	...	300/350	DS
3. Walchandnagar Sugar Works of Walchandnagar Industries.Ltd., M/A. The Premier Construction Co., Ltd., Construction House, Ballard Estate, Bombay. Tele { Grams: Walsakhar, Bombay. Phone: Bombay 26036, 37, 38, & 39.	P.O. Walchandnagar (Dt. Poona). (Tel. Walsakhar, Baramati and Walsakhar, Diksal.)	Poona.	Baramati, D.B.R. Diksal, G.I.P.R.	Bombay.	1200	DS
4. The Ravalgaon Sugar Farm, Ltd., M/A. Walchand & Co., Ltd., Construction House, Ballard Estate, Bombay. Tele { Grams: Hincon, Bombay. Phone: Bombay, 26036, 37, 38 & 39.	Ravalgaon, Nasik. (Tel. Ravalgaon Farm, Malegaon Camp.)	Nasik.	Manmad, Do.	Do.	600	DS
5. Shree Changdeo Sugar Mills, M/A. Messrs. A. H. Bhiwandiwala & Co., 32, Apollo Street, Fort, Bombay. (Tele. Jaysugar, Bombay.)	P. O. Changdeo Sugar Factory. (Tele. Sugarmills, Puntamba, G. I. P. R.)	Ahmednagar.	Puntamba, Do.	...	350	DS
6. The Belapur Co., Ltd., Managers: W. H. Brady & Co., Ltd., Royal Insurance Building, Churchgate Street, Fort, Bombay. Tele { Grams: Brix, Bombay. Phone: Bombay 25037.	Harigaon. (Tel. Belapur Company, Belapur Road.)	Do.	Belapur, Do.	...	1000	DS
7. The Maharashtra Sugar Mills, Ltd., M/A. M. L. Dahanukar & Co., Ltd., Industrial Assurance Building, 3rd Floor, Opposite Churchgate Station, Fort, Bombay. Tele { Grams: Sugarmills, Bombay. Phone: Bombay 30825.	P. O. Tilaknagar, Belapur Rd. (Tel. Sugarmills, Belapur Rd. Phone: Belapur Rd. P. C. O. Extension.)	Do.	Belapur, Do.	Bombay.	1000/1200	DS
8. The Belvandi Sugar Farm, Ltd., M/A. M. L. Dahanukar & Co., Ltd., Industrial Assurance Building, 3rd Floor, Opposite Churchgate Station, Fort, Bombay. Tele { Grams: Design, Bombay. Phone: Bombay 30825.	P. O. Belvandi Sugar Farm. (Tel. Sugarfarm, Belvandi, G. I. P. R.)	Do.	Belvandi, Do.	Do.	250/300	DS
9. The Godavari Sugar Mills, Ltd., M/A. K. J. Somaiya & Sons, Fazalbhoy Building, Mahatma Gandhi Road, Fort, Bombay. Tele { Grams: Manikaka, Bombay. Phone: Bombay 31921.	Sakarwadi.	Do.	Kanhegaon, Do.	...	750/800.	
10. The Somaiya Sugar Factory, Controlled by Godavari Sugar Mills, Ltd.	Laxmiwadi Via Kopergaon.	Do.	Kopergaon, Do.	...	700/750.	
11. The Ugar Sugar Works, Ltd.	Ugar Khurd.	Belgaum.	Ugar Khurd, M. S. M. R.	Mormugoa Harbour.	500	DS

Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*District*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
N. W. F. PROVINCE						
1. The Frontier Sugar Mills & Distillery, Ltd. Tele { Grams: Sugar Mills, Takht-i-Bhai. Phone: 27.	Takht-i-Bhai.	Mardan.	Takht-i-Bhai.	...	400	DC/S
INDIAN STATES						
(Kashmir)		*State*				
1. Shree Yuvraj Sugar Mills, Ltd., M/A. M/s. Karam Chand Thapar & Bros., (Jammu & Kashmir) Ltd., Ranbirsinghpura.	Ranbirsinghpura, N. W. Rly.	Jammu & Kashmir State.	Ranbirsinghpura, N. W. R.	Karachi.	600	DC
(Punjab)						
2. Jagatjit Sugar Mills Co., Ltd., M/A. Narang Bros. & Co., Ltd., 3, Montgomery Road, Lahore. Tele { Grams: Narang, Lahore. Phone: Lahore 4614.	Phagwara. (Tel. Sugar Factory, Phagwara. Telephone: Phagwara 101.)	Kapurthala State.	Phagwara, Do.	Do.	750	DC
3. The Paramjit Sugar Factory, The Mahalaxmi Sugar Mills Co., Ltd.	Hamira, P. O. Kapurthala.	Kapurthala State.	Hamira, Do.	Do.	1200/1800	
(United Provinces)						
4. Raza Sugar Co., Ltd., M/A. Govan Bros. (Rampur), Ltd., Rampur State. (Telephone: 291).	Rampur. (Tel. Razaco, Rampur Tele.: 332.)	Rampur State.	Rampur, E. I. R.	Buxar.	1100	DS
5. Buland Sugar Co., Ltd., M/A. Govan Bros. (Rampur), Ltd., Rampur State. (Telephone: 291).	Rampur. (Tel. Buland, Rampur State. Tele: 276.)	Rampur State.	Do. Do.	Do.	1100	DC
(Travancore)						
6. The Travancore Sugars & Chemicals, Ltd., Secretaries & Treasurers: Parry & Co., Ltd., P. B. No. 12, Madras. Tele { Grams: Parry, Madras. Phone: Madras 2983.	Thuckalay. (Tel. Sugars, Thuckalay. Telephone: Trivandrum 280.)	Travancore State.	Trivandrum, S. I. R.	Trivandrum.	Gur only 18 (Palmyra Jaggery.)	
(Mysore)						
7. Mysore Sugar Co., Ltd., H.O. Sri Jayachamaraja Wadiyar Road, Bangalore City. Tele { Grams: Mysugar, Bangalore. Phone: 2133.	Mandya. (Tel. Mysugar, Mandya.)	Mysore State.	Mandya, M. S. R.	...	1400	DS
(Bombay)						
8. The Kolhapur Sugar Mills, Ltd., M/A. The United Agencies, Ltd., Shahupuri, Kolhapur. Tele { Grams: Sugar Mills. Phone: 298 (Kolhapur).	Kolhapur. (Tel. Sugar Mills.)	Kolhapur State.	Kolhapur, M. & S. M. Rly.	Bombay.	500	DS
9. The Phaltan Sugar Works, Ltd., M/A. Mafatlal, Apte & Kantilal, Ltd., Sakharwadi, Satara.	Sakharwadi, Phaltan State. (Tel. Sakhar, Phaltan.)	Phaltan State.	Nira, Do.	Bombay.	625/650	
10. Krishna Sugar Mills, Ltd., M/A. M/S. Vinchurkar & Co., Kittur, Via Kudchi. (Tele. Krishna Sugar, Kudchi.)	Kittur.	Miraj Jr. State.	Kudchi, Do.	Bombay.	200	DS
(Central India)						
11. The Jaora Sugar Mills, Prop.: Kalooram Govindram, Jaora, C. I. (Telegram: Sugar, Jaora.)	Jaora.	Jaora State.	Jaora, B. B. & C. I. Rly.	Bombay.	600	DS

	Name of Factory, with full name and address of Managing Agents or Proprietors	*Location*	*State*	*Nearest Railway Station*	*Nearest Steamer Station*	*Daily cane-crushing capacity(tons)*	
12.	Bhopal State Sugar Industries, Ltd., M/A. M/s. A. H. Bhivandiwala & Co., Motilal Mansion, 32, Apollo Street, Fort, Bombay.	Sehore.	Bhopal State.	Sehore, G. I. P. Rly.	...	750	DS
13.	Shri Lakshmi Narayan Sugar Works, Ltd., M/A. Gupta Bros. & Co., Harpalpur (Budelkhand), C. I.	Harpalpur. (Tel. Laxmichini, Harpalpur.)	Alipura State.	Harpalpur, G. I. P. Rly.	...	100	S
14.	The Gwalior Sugar & Co., Ltd., Dabra (Gwalior), M/A. Govan Brothers, Ltd., Scindia House, New Delhi.	Dabra	Gwalior State.	Dabra, G. I. P. Rly.	...	750	DC & DS
15.‡	Maharani Parbati Sugar Mills, Ltd., (Tel. Sugarmills, Sarangpur.)	P. O. & Tel. Office Sarangpur.	Devas State, J. B.	Bercha, Do.	...	100	
16.‡	Dewas Sugar Mills, Dewas.	Dewas.	Dewas Senior.	Nagda Jn.	...	500	DS
17.‡	Ratlam Sugar Mills Co., Ltd., M/A. Sir Gokulchand Narang & Sons.	Ratlam.	Ratlam State.	Ratlam, B. B. & C. I. Rly.	...	500	
18.	§Seth Govindram Sugar Mills, Prop. : Seth Nandlalji Bachulalji.	Mahidpur Road.	Holkar State.	Mahidpur Road, B. B. & C. I. Rly.	Bombay	300	
	(Rajputana)						
19.†	Sri Ganganagar Sugar Mills, Ltd., M/A. Seth Sunder Singh.	Ganganagar	Bikaner State.	...	...	600	DS
20.	The Mewar Sugar Mills, Ltd., M/A. Dhandhania Kedia & Co., Bhupalsagar (Udaipur State).	Bhupalsagar. (Tel. Sugarmill.)	Udaipur State.	Bhupalsagar Me. S. R.	Bombay	300	DS

§ Worked for a few days only.

	(Hyderabad)						
21.	The Nizam Sugar Factory, Ltd., M/A. H.E.H. The Nizam's Industrial Trust Fund, Represented by the Hyderabad Construction Co., Ltd., Abid Rd., Hyderabad. (Telephone: Hyderabad (Deccan).2766.)	Sakarnagar. (Tel. Sugar.)	Hyderabad State.	Sakarnagar Station (Nizam St. Rly.)	...	1300/1500	DS
22.‡	The Salar Jung Sugar Mills, Ltd., Managing Agents: M/S. Agadi & Co., 209, Station Road, Hyderabad (Dn.)	Hyderabad.	Munirabad.	Hyderabad.	Munirabad, M. & S.M.R.	250	DS
	BURMA						
1.†	The Sahmaw Sugar Factory of the Burma Sugar Co., Ltd., (Tel. Colberfeld, Rangoon).	Sahmaw. (Tel. Shortis, Sahmaw.)	District Myitkyina.	Sohmaw, Burma Rly.	...	900	DS
2.†	New Burma Amrit Sugar Mills, Ltd., M/A. Amritlal Ojha & Co. (Burma) Ltd., 619, Merchant Street, Rangoon. (Tel. Ojhaco, Rangoon.)	Hninpale. P. O. Bilin. (Tel. Amrit Sugar Works.)	Thaton (L. Burma.)	Hninpale. Do.	...	400	DS
3.	†The Zeyawadi Sugar Factory, Ltd., M/D. Chandradeva Prakash Sinha, Esq., Zeyawadi (Burma). (Tel. Prakash, Rangoon.)	Zeyawadi. (Tel. Sugar, Zeyawadi.)	Toungoo.	Zeyawadi.	Rangoon.	1000/1200	DS

PROVINCIAL DISTRIBUTION
OF
SUGAR MILLS IN INDIA
(1944)

Province	Cane Factories	Gur Refineries only	TOTAL
Bengal	9	...	9
Bihar	31	1	32
United Provinces	73	3	76
Punjab	3	1	4
Madras	11	3	14
Bombay	11	...	11
Assam	1	...	1
Orissa	2	...	2
N. W. F. P.	1	...	1
Indian States	21	1	22
TOTAL ...	163	9	172

Burma ... ... 3 ... 3

No. of Factories (including Gur Refineries) actually working in the season 1943–44 was about ... 157

No. of Factories (including Gur Refineries) that did not work during the season 1943–44 (Factories under construction included) 15

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