

REPORT
OF THE
Indian Tariff Board
ON THE
GLASS INDUSTRY



GOVERNMENT OF INDIA
PUBLICATION BRANCH
1932

Price Re. 1-8 or 2s. 6d.

REPORT

OF THE

Indian Tariff Board

ON THE

GLASS INDUSTRY

**SERVANTS OF INDIA SOCIETY'S
BRANCH LIBRARY
BOMBAY**



**CALCUTTA : GOVERNMENT OF INDIA
CENTRAL PUBLICATION BRANCH
1932**

Government of India Publications are obtainable from the Government of India Central Publication Branch, 3, Government Place, West, Calcutta, and from the following Agents :—

EUROPE.

**OFFICE OF THE HIGH COMMISSIONER FOR INDIA,
INDIA HOUSE, ALDWYCH, LONDON, W. C. 2.**

And at all Booksellers.

INDIA AND CEYLON : Provincial Book Depôts.

MADRAS:—Superintendent, Government Press, Mount Road, Madras.
BOMBAY:—Superintendent, Government Printing and Stationery, Queen's Road, Bombay.
SIND:—Library attached to the Office of the Commissioner in Sind, Karachi.
BENGAL:—Bengal Secretariat Book Depôt, Writers' Buildings, Room No. 1, Ground Floor, Calcutta.
UNITED PROVINCES OF AGRA AND OUDH:—Superintendent of Government Press, United Provinces of Agra and Oudh, Allahabad.
PUNJAB:—Superintendent, Government Printing, Punjab, Lahore.
BURMA:—Superintendent, Government Printing, Burma, Rangoon.
CENTRAL PROVINCES AND BEHAR:—Superintendent, Government Printing, Central Provinces, Nagpur.
ASSAM:—Superintendent, Assam Secretariat Press, Shillong.
BIHAR AND ORISSA:—Superintendent, Government Printing, Bihar and Orissa, P. O. Gulzarbagh, Patna.
NORTH-WEST FRONTIER PROVINCE:—Manager, Government Printing and Stationery, Peshawar.

Thacker Spink & Co., Ltd., Calcutta and Simla.
 W. Newman & Co., Ltd., Calcutta.
 S. K. Lahiri & Co., Calcutta.
 The Indian School Supply Depôt, 309, Bow Bazar Street, Calcutta.
 Butterworth & Co. (India), Ltd., Calcutta.
 M. C. Sarcar & Sons, 15, College Square, Calcutta.
 Standard Literature Company, Limited, Calcutta.
 Association Press, Calcutta.
 Chukerverty, Chatterjee & Co., Ltd., 13, College Square, Calcutta.
 The Book Company, Calcutta.
 James Murray & Co., 12, Government Place, Calcutta. (For Meteorological Publications only)
 Ray Chaudhury & Co., 68-5, Ashutosh Mukherji Road, Calcutta.
 Scientific Publishing Co., 9, Taltola Lane, Calcutta.
 Chatterjee & Co., 2-1, Bacharam Chatterjee Lane, Calcutta.
 Standard Law Book Society, 8-2, Hastings Street, Calcutta.
 The Hindu Library, 8, Nandalal Mullick Lane, Calcutta.
 Kamala Book Depôt, Ltd., 15, College Square, Calcutta.
 *Bengal Flying Club, Dum Dum Cantt.
 Kall Charan & Co., Municipal Market, Calcutta.
 N. M. Roy Chowdhury & Co., 11, College Sqr., Calcutta.
 B. C. Basak, Esq., Proprietor, Albert Library, Dacca.
 Higginbotham, Madras.
 Echohouse & Sons, Madras.
 G. A. Nateson & Co., Publishers, George Town, Madras.
 P. Varadachary & Co., Madras.
 City Book Co., Madras.
 Law Publishing Co., Mylapore, Madras.
 The Booklover's Resort, Talikad, Trivandrum, South India.
 E. M. Gopalakrishna Kone, Pudukmandapam, Madras.
 Central Book Depôt, Madras.
 Vijapur & Co., Vizagapatam.
 Thacker & Co., Ltd., Bombay.
 D. B. Taraporevala Sons & Co., Bombay.
 Ram Chandra Govind & Sons, Kalbadevi Road, Bombay.
 N. M. Tripathi & Co., Booksellers, Princess Street, Kalbadevi Road, Bombay.
 New and Secondhand Bookshop, Kalbadevi Road, Bombay.
 J. M. Pandia & Co., Bombay.
 A. H. Wheeler & Co., Allahabad, Calcutta and Bombay.
 Bombay Book Depôt, Girgaon, Bombay.
 Bennett, Coleman & Co., Ltd., The Times of India Press, Bombay.
 The Popular Book Depôt, Bombay.
 The Manager, Oriental Book Supplying Agency, 15, Shukrawar, Poona City.
 Rama Krishna Bros., Opposite Vishrambag, Poona City.
 S. P. Bookstall, 21, Buduwar, Poona.
 Mangaldas & Sons, Booksellers and Publishers, Bhaga Talao, Surat.
 The Standard Book and Stationery Co., 23-23, Arbab Road, Peshawar.
 The Students' Own Book Depôt, Dharwar.
 Shri Shuukar Karnataka Pustaka Bhandara, Malameddi, Dharwar.
 The Standard Bookstall, Karachi, Quetta, Delhi, Murree and Rawalpindi.

Frontier Book & Stationery Co., Rawalpindi.
 *Hossenbhoj Karimji & Sons, Karachi.
 The English Bookstall, Karachi.
 Rose & Co., Karachi.
 The Standard Bookstall, Quetta.
 U. P. Malhotra & Co., Quetta.
 J. Ray & Sons, 43, K. & L., Edwardes Road, Rawalpindi, Murree and Lahore.
 The Standard Book Depôt, Lahore, Nainital, Mussoorie, Dalhousie, Ambala Cantonment and Delhi.
 The North India Christian Tract and Book Society, 18, Olive Road, Allahabad.
 Ram Narain Lal, Katra, Allahabad.
 "The Leader," Allahabad.
 The Indian Army Book Depôt, Dayalbagh, Agra.
 The English Book Depôt, Tej Road, Agra.
 Gaya Prasad & Sons, Agra.
 Narain & Co., Meston Road, Cawnpore.
 The Indian Army Book Depôt, Julundur City, Daryaganj, Delhi.
 Manager, Newal Kishore Press, Lucknow.
 The Upper India Publishing House, Ltd., Literature Palace Ammuddaula Park, Lucknow.
 Rai Sahib M. Gulab Singh & Sons, Mufid-Am Press, Lahore and Allahabad.
 Rama Krishna & Sons, Booksellers, Anarkali, Lahore.
 Students Popular Depôt, Anarkall, Lahore.
 The Standard Bookstall, Lahore.
 The Proprietor, Punjab Sanskrit Book Depôt, Saidmitha Street, Lahore.
 The Insurance Publicity Co., Ltd., Lahore.
 The Punjab Religious Book Society, Lahore.
 The Commercial Book Co., Lahore.
 The University Book Agency, Kachari Road, Lahore.
 Manager of the Imperial Book Depôt, 63, Chandmoy Chowk Street, Delhi.
 J. M. Jaina and Bros., Delhi.
 Fono Book Agency, New Delhi and Simla.
 Oxford Book and Stationery Company, Delhi, Lahore, Simla, Meerut and Calcutta.
 Supdt., American Baptist Mission Press, Rangoon.
 Burma Book Club, Ltd., Rangoon.
 S. C. Talukdar, Proprietor, Students & Co., Cooch Behar.
 The Manager, The Indian Book Shop, Benares City.
 Nandkishore & Bros., Chowk, Benares City.
 The Srivilliputtur Co-operative Trading Union, Ltd., Srivilliputtur (S. I. E.).
 Raghunath Prasad & Sons, Patna City.
 The Students' Emporium, Patna.
 K. L. Mathur & Bros., Guzri, Patna City.
 Kamala Book Stores, Bankipore, Patna.
 G. Banerjee & Bros., Ranchi.
 M. C. Kothari, Raipura Road, Baroda.
 B. Parikh & Co., Baroda.
 The Hyderabad Book Depôt, Chaderghat, Hyderabad (Deccan).
 S. Krishnaswami & Co., Teppaknam P. O., Trichinopoly Fort.
 Karnataka Publishing House, Bangalore City.
 Bheema Sons, Fort, Bangalore City.
 Superintendent, Bangalore Press, Lake View, Mysore Road, Bangalore City.

AGENT IN PALESTINE:—Steinmatsky, Jerusalem.

*Agent for publications on aviation only.

Personnel of the Board.

President	Dr. J. Matthai.
Members	{ Mr. Fazal Ibrahim Rahimtoola. Mr. G. T. Boag, C.I.E., I.C.S.
Secretary	Mr. G. S. Bozman, I.C.S. (up to 9th March 1932).
Technical Adviser	Mr. F. W. Hodkin, B.Sc., F.I.C.

TABLE OF CONTENTS.

PARA.	PAGE.
Preliminary	v
CHAPTER I.—THE PRESENT POSITION OF THE GLASS INDUSTRY IN INDIA AND ITS METHODS OF PRO- DUCTION.	
1. The past history of the glass industry in India	1
2. Early experiments on modern lines	2
3. Developments before and during the war	2
4. The present scope of the industry	3
5. Representations received	4
6. The manufacture of glass—	
(1) Raw materials	5
7. (2) Furnaces	6
8. Advantages of gas-fired furnaces	7
9. Pot furnaces	7
10. Pots	8
11. Pot Arch	8
12. Tank furnaces	8
13. (3) Manipulation	9
14. (a) Bangles: the old method of manufacture	9
15. Reshmi bangles	9
16. Fancy bangles	10
17. (b) Lampware	10
18. (c) Bottles and phials—	
(i) by hand	10
19. (ii) by machinery	11
20. (d) Pressed ware	11
21. (e) Glass tubing	12
22. (f) Sheet glass	12
23. (g) Figured and ribbed glass	12
24. (4) Annealing	12
25. (5) Finishing processes	13
26. (6) Packing	13
27. Summary	14
CHAPTER II.—NATURAL ADVANTAGES POSSESSED BY THE INDIAN GLASS INDUSTRY.	
28. The Fiscal Commission's first condition	15
29. Raw materials	16
30. Sand:—Qualities of glassmaking sands	16
31. Deposits of sand in India	17
32. Quantity and price of Indian sand	19
33. Chemical analyses of sands	19
34. Mechanical analyses of sands	23

**CHAPTER II.—NATURAL ADVANTAGES POSSESSED BY THE
INDIAN GLASS INDUSTRY—contd.**

PARA.	PAGE.
35. Purification of Indian sands	25
36. Boric oxide	27
37. Soda ash and Saltcake	27
38. Indian sources of supply	28
39. Dependence on imported materials not a bar to protection	30
40. Proportionate cost of soda ash in glass manufacture	90
41. High cost of soda ash in India	32
42. Claim to protection not invalidated	32
43. Lime	33
44. Limestone deposits in India	34
45. Other materials:—Zinc oxide	34
46. Saltpetre	35
47. Zinc dust	35
48. Colouring materials	35
49. Refractory materials	35
50. Chemical composition of Indian fireclays	36
51. Physical properties of Indian fireclays	59
52. Silica bricks	39
53. 'Mullite' refractories	40
54. Coal:—Calorific value of Indian coal	40
55. Other qualities of Indian coal	43
56. Coal and oil fuel compared	44
57. Labour	44
58. Former defects of labour in Indian glass factories	45
59. Present condition of labour in the glass industry	45
60. Market:—Imports	46
61. Indian manufactures	48
62. Estimate of total market	49
63. Summary	51

**CHAPTER III.—THE CASE FOR PROTECTION AND PRO-
POSALS FOR ASSISTANCE.**

64. Kinds of glassware considered	53
(1) SHEET GLASS, PLAIN AND FIGURED.	
65. Plain sheet glass at present produced only in one factory	59
66. Situation of United Provinces Glass Works not uneconomical	54
67. Works expenditure at Bahjoi in the last three years	56
68. Differences in works expenditure during the last three years explained	56
69. Estimate of future works cost	57
70. Estimate of overhead charges and profit	59
71. Allegation that present price of imported sheet glass is uneconomical	60
72. Cost of manufacturing sheet glass in Belgium in 1926	61
73. Recent cost of manufacture in Belgium	62
74. Allegation of uneconomical prices justified	62

CHAPTER III.—THE CASE FOR PROTECTION AND PRO-
POSALS FOR ASSISTANCE—*contd.*

(1) SHEET GLASS, PLAIN AND FIGURED—*contd.*

PARA.	PAGE.
75. Conditions of the Fiscal Commission satisfied	64
76. Progress of the Indian sheet glass industry satisfactory	64
77. Average fair selling price during the period of protection	65
78. Measure of protection	66
79. Figured and ribbed glass	66
80. Plate glass	67
81. Objections to bounties	67

(2) BLOWNWARE AND PRESSEDWARE.

82. Examination based on the costs of the Calcutta Glass and Silicate Works	68
83. Works expenditure in 1930	69
84. Reduction in works expenditure during the last five years	70
85. Equipment and normal capacity of the works	70
86. Cost of materials	71
87. Cost above material	72
88. Fair selling price of hand-made glassware	73
89. Fair selling price of machine-made glassware	75
90. Conditions of the Fiscal Commission satisfied if manufacture is based on machinery	76
91. Measure of protection	77
92. Cost of manufacturing globes and chimneys higher than bottles	79
93. Measure of protection for bottles applicable to other kinds of blownware and pressedware	80
94. Specific duties unsuitable	81
95. Representations from users of bottles	81
96. Representation from the Government of the Punjab	82
97. Objections to protection for bottles not valid	82
98. Representations from other users of bottles	83

(3) BANGLES, BEADS AND FALSE PEARLS.

99. Statements of costs supplied by bangle manufacturers	84
100. Classes of bangles manufactured	84
101. Future output of typical factory	85
102. Differences in costs of materials	86
103. Costs of compositions for different colours	86
104. Cost of crucibles	88
105. Cost of works labour	88
106. Cost of power and fuel	89
107. Cost of supervision and repairs	89
108. Cost of packing	90
109. Selling expenses	90
110. Overhead charges and profit	90
111. Fair selling price	91
112. Fair selling price per dozen pairs	91
113. Price of imported bangles	91
114. Conditions of the Fiscal Commission satisfied	92

CHAPTER III.—THE CASE FOR PROTECTION AND PRO-
POSALS FOR ASSISTANCE—*concl'd.*

PARA.	PAGE.
(3) BANGLES, BEADS AND FALSE PEARLS— <i>cont'd.</i>	
115. Measure and form of protection	92
116. Economies resulting from the use of recuperative furnaces	94
117. Effect of recuperative furnaces in improving quality and appearance of glass	95
118. Duty on bangles to be applied to false beads and pearls	96
(4) GENERAL RECOMMENDATIONS.	
119. Summary of proposals	97
120. Burden on the consumer	97
121. Period of protection	98

CHAPTER IV.—SUPPLEMENTARY PROPOSALS.

(1) ORGANISATION OF RESEARCH AND TRAINING.	
122. Defects in present methods of working	99
123. Furnaces	99
124. Manipulation and annealing	100
125. Protection ineffective without research and training	101
126. Main lines of investigation	101
127. Training of personnel	102
128. Location at Harcourt Butler Technological Institute	103
129. Outline of scheme for research and training	104
130. Relations with manufacturers of glass	105
131. Grant by Central Government	105
132. Devolution Rules examined	106
133. Need for supplementing protective duties	106
(2) ESTABLISHMENT OF FOREIGN CONCERNS.	
134. Establishment of foreign concerns not inconsistent with the policy of protection	107
135. Conditions to be observed by foreign concerns	107
136. Danger of monopolistic developments	108
137. Action necessary in the case of the glass industry	109

APPENDIX.

Estimate of revenue likely to be yielded by the protective duties on glass	111
--	-----

PRELIMINARY.

The enquiry into the glass industry was referred to the Board in the Government of India, Commerce Department's Resolution No. 458-T. (2), dated 20th October, 1931. The terms of the Resolution are as follows:—

“ The Government of India have received representations from certain glass manufacturers requesting that protection may be extended to the glass industry in India. In pursuance of paragraph 3 of the Resolution of the Government of India, Department of Commerce, No. 3748, dated the 10th July, 1923, they have decided to refer to the Tariff Board for examination these representations along with any others of a similar nature which may be brought to its notice.

2. In making its enquiry, the Tariff Board will be guided by the principles laid down in the Resolution adopted by the Legislative Assembly on February 16th, 1923, and will consider—

- (1) whether the conditions laid down in the Report of the Indian Fiscal Commission are satisfied in the case of the industry, and to what extent, if any, and in respect of what articles, or class or description of articles, protection should be afforded;
- (2) in what form and for what period protection, if any, should be given; and
- (3) how its recommendations, if any, will affect other industries.

3. Firms and persons interested who desire that their views should be considered by the Tariff Board should address their representations to the Secretary to the Board.”

The Board issued a Press Communiqué, dated 20th October, 1931, calling upon all firms and persons interested in the enquiry to make written representations not later than 20th November, 1931. Mr. F. W. Hodkin, B.Sc., F.I.C., who was appointed by the Government of India, Technical Adviser to the Board, for the purpose of this enquiry, arrived on November 13th. On November 21st, the Board issued questionnaires for manufacturers and importers. Replies were received from factories and from manufacturing associations. Representations were also received from a large number of firms interested in the use of glass bottles and containers. We made a tour of inspection of glass factories beginning at the end of November, the programme being as follows:—

Nov. 23rd.—Visited Kandivli Glass Bangle Factory.

Nov. 25th.—Visited Paisa Fund Glass Works, Talegaon.

Nov. 26th.—Visited Ogale Glass Works, Ltd., Ogalewadi.

Dec. 1st.—Left Bombay.

- Dec. 2nd—5th.*—Arrived Agra. Visited Firozabad bangle factories.
- Dec. 6th.*—Visited Upper India Glass Works, Ambala.
- Dec. 7th.*—Visited United Provinces Glass Works, Ltd., Bahjoi.
- Dec. 8th—10th.*—Visited Allahabad Glass Works, Naini.
- Dec. 11th.*—Arrived Calcutta.
- Dec. 14th.*—Visited Bengal Glass Works, Ltd., and Mr. P. M. N. Mehta's Bangle Factory.
- Dec. 15th.*—Visited Calcutta Glass and Silicate Works, Ltd.
- Dec. 22nd.*—Visited Kumardhubi Fireclay and Silica Works (Messrs. Bird and Company, Ltd.).
- Jan. 2nd.*—Visited the Potteries, Jubbulpore (Messrs. Burn and Company, Ltd.).

While at Allahabad we invited Mr. J. L. Sathe, I.C.S., Director of Industries, United Provinces, and Dr. H. D. H. Drane, D.Sc., Principal of the Harcourt Butler Technological Institute, Cawnpore, to meet us, and we had the advantage of a discussion with them on matters affecting the industry. In Calcutta we took oral evidence from the Bengal Glass Works, the Calcutta Glass and Silicate Works and Mr. P. M. N. Mehta on the 17th and 19th December. The Board's office opened in Bombay on January 2nd, 1932, after the Christmas holidays. The following oral evidence was taken in Bombay:—

- Jan 11th.*—United Provinces Glass Works, Bahjoi.
- Jan. 12th.*—Allahabad Glass Works, Naini.
- Jan. 13th.*—Upper India Glass Works, Ambala.
- Jan. 13th.*—Mr. Meyer Nissim, Bombay.
- Jan. 14th.*—Ogale Glass Works, Ogalewadi.
- Jan. 18th.*—Kandivli Glass Bangle Factory.
- Jan. 18th.*—Paisa Fund Glass Works, Talegaon.
- Jan. 19th.*—Glass and Bangles Industrial Association, Firozabad.

We wish to express our appreciation of the courtesy and hospitality which was shewn us by the proprietors, managers and staff at all the factories we visited.

We desire also to acknowledge the services rendered by our Technical Adviser, Mr. F. W. Hodkin, whose co-operation has been of the greatest assistance to us in the elucidation of the technical and practical aspects of the glass industry in India. His accurate and detailed knowledge has greatly facilitated our investigation of the problems connected with this enquiry. In the inspection of factories, in the examination of witnesses and above all in the preparation of the materials on which our Report is based, his co-operation has proved invaluable. His close acquaintance with

the glass industry in other countries and his thorough grasp of the commercial as well as scientific questions involved in it have enabled us to appreciate the position of the Indian industry with greater accuracy and clearness than would have been possible otherwise. While for the actual findings and proposals contained in this Report we hold ourselves entirely responsible, both in the manner in which they are stated and explained and in the marshalling and interpretation of the evidence on which they are based we have benefited greatly by his clear perception and expert criticism and judgment and by the untiring energy which he has devoted to his work.

APPENDIX.

Estimate of revenue likely to be yielded by the protective duties on glass.

In the following calculations it is assumed that:—

- (1) if there were no protection, the normal annual value of imports would be the average of the two years 1929-30 and 1930-31,
- (2) if there were no protection, the normal duties applicable would be 30 per cent. on bangles, beads and false pearls and 15 per cent. on every other kind of glassware,
- (3) the effect of the protective duties would be to reduce the imports by 50 per cent. at the end of the period of protection except in the case of "sheet and plate" and "other glassware" which include unprotected articles,
- (4) the price of imported glassware would remain constant during the period of protection,
- (5) there would be no growth of consumption during the period of protection.

TABLE I.

Normal amount of revenue without protection.

	Normal imports at average of 1929-30 and 1930-31.	Amount of revenue at normal rates.
	Rs. lakhs.	Rs. lakhs.
Bangles, beads and false pearls	90.72	27.22 @ 30 per cent.
Bottles and phials	34.71	5.21 @ 15 per cent.
Funnels, globes and glass parts of lamps	16.66	2.50 @ 15 per cent.
Sheet and plate	27.42	4.11 @ 15 per cent.
Tableware	11.36	1.70 @ 15 per cent.
Other glassware	26.04	3.91 @ 15 per cent.
	—————	—————
TOTAL	206.91	44.65
	—————	—————

TABLE II.

Amount of Revenue from protective duties at the end of the period of protection.

	Value.	Amount of Revenue at protective duties.
	Rs. lakhs.	Rs. lakhs.
Bangles, beads and false pearls @ 50 per cent. of normal	45.36	22.68
Bottles and phials @ 50 per cent. of normal	17.35	8.67
Funnels, globes and glass parts of lamps @ 50 per cent. of normal	8.33	4.16
Sheet and plate—		
(Plate at $\frac{1}{3}$ rd of total)	9.14 plate	2.28 @ 25 per cent.
(Sheet at $\frac{1}{3}$ rd reduced by 50 per cent.)	9.14 sheet	6.40 @ approximately 70 per cent.
Tableware @ 50 per cent. of normal	5.68	2.84
Other glassware @ $\frac{1}{3}$ rd of normal	17.36	3.47 @ average duty of 20 per cent.
TOTAL	112.36	50.50

N.B.—'Scientific Glassware' is excluded from both Tables. It is wholly unprotected and its inclusion would therefore not affect the result of the calculations. No account is taken of glass tiles which are now shown in the Trade Returns under 'Building Materials'. The quantity of imports is however small and will not materially affect the result.