

Dept. of Industries
Bombay Presidency

Annual Report 1922-1923.

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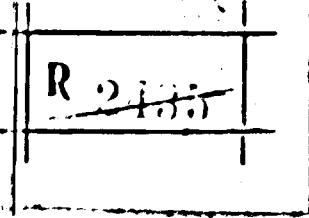
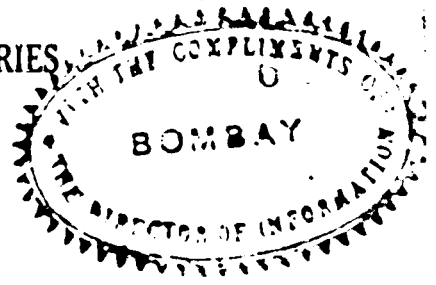
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DEPARTMENT OF INDUSTRIES

BOMBAY PRESIDENCY



ANNUAL REPORT

1922-23

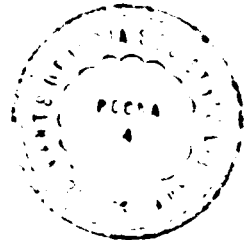
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No. C.—2277.

OFFICE OF THE DIRECTOR OF INDUSTRIES,
Old Customs House,
Bombay, the 7th September 1923.

FROM ·
H. F. KNIGHT, Esq., I.C.S.,
Acting Director of Industries,
Bombay ;

TO
THE SECRETARY TO GOVERNMENT,
General Department,
Bombay.

Annual Report—1922-23.

Sir,

I have the honour to submit the annual report of the Department of Industries for the year 1922-23, 1st August to 31st July.

Mr. R. D. Bell, C.I.E., I.C.S., was in charge of the Department from the beginning of the year to the 18th of May 1923, when he proceeded on six months' leave, since when I have held charge.

STAFF.

2. Mr. G. H. Thiselton-Dyer held the appointment of Deputy Director of Industries till the end of February 1923. The post was abolished from the beginning of March and Mr. Thiselton-Dyer reverted to his appointment of Mechanical Engineer to Government. From the beginning of the year, he had been entirely occupied in giving assistance to the Excise Department in connection with the Government Central Distillery, Nasik, which was being converted from its original design of an acetone factory.

Mr. F. E. Bharucha held the post of Assistant Director of Industries throughout the year. As a measure of retrenchment, his head-quarters were transferred in February from Ahmedabad to Bombay and the Ahmedabad office was closed

Mr. F. C. Davies held the post of Executive Engineer; Central Store and Workshops, Dapuri, Kirkee, with Mr. C. Holliman as Works Manager, until the end of February, when the Dapuri Workshops were transferred

to the Public Works Department and both officers were transferred with it.

Mr. A. E. Hefford held the post of Marine Biologist till the 24th of December on which date the Fisheries section of the Department was entirely closed and Mr. Hefford returned to England to rejoin his permanent appointment with the Ministry of Fisheries and Agriculture, from which his services had been lent.

Mr. E. R. Fern, Superintendent of Pottery, Sir. J. J. School of Art, served as pottery expert throughout the year.

Dr. A. N. Meldrum of the Royal Institute of Science and Mr. A. J. Turner, Principal of the Victoria Jubilee Technical Institute, in addition to their ordinary duties, dealt with chemical problems for this Department. Mr. C. B. Almoula served as Assistant Chemist under Dr. Meldrum and Mr. M. M. Koppikar as Assistant under Mr. Turner till the 22nd of March 1923, when his services were terminated.

3. As Mr. Bell remarked last year, the work of the Director is not solely confined to the charge of the Department of Industries. He is the controlling officer for the administration of the departments of Factories and of Boilers and Smoke Nuisances, for which separate reports are published. In October 1922, the Director was appointed Chairman of the Board of Trustees of the Victoria Jubilee Technical Institute and of the Committee of Direction for Technical Education. He is also a member of the Advisory Committee of the Poona College of Engineering and the Royal Institute of Science, a trustee of the Prince of Wales Museum, member of the Co-operative Conference Committee, and Chairman of the Organising Committee of the British Empire Exhibition. Mr. Bell was a member of the Bombay Legislative Council from 4th December 1922 to 25th January 1923 and from 12th March to 2nd May 1923. I have been appointed a member of the Bombay Excise Committee. The total number of meetings exclusive of those of the Advisory Committee of the Department of Industries and of the Legislative Council attended during the year was 55.

4. *Touring*.—Touring as last year was hampered by the difficulty of leaving Bombay due to the number of miscellaneous duties to be performed. But Mr. Bell besides visits to Calcutta, Poona and Ahmedabad was able to inspect the Departmental weaving schools and demonstrations scattered over the Deccan.

EXPENDITURE.

5. The expenditure incurred by the Department during the financial year 1922-23 and the two preceding years has been as follows :—

				Rs.
1920-21	..	..	..	1,46,000
1921-22	..	..	..	1,73,000
1922-23	..	..	..	2,39,000

(The main causes of increase were in the grant of travelling scholarships, more efficient touring by the weaving and dyeing assistants and the charges involved in starting the semi-commercial scale pottery plant.)

ADVISORY COMMITTEE.

6. In the middle of the year 1922, Mr. A. J. Hood has been appointed in the place of Mr. A. T. Arnal, but he resigned in the beginning of 1923, and Mr. A. Greville Bullocke was appointed in his place. Mr. Mangaldas Girdhardas resigned in April, and his place was taken by Seth Kastoorbhai Lalbhai. The Committee now consists of the following members :—

- (1) Director of Industries, *Ex-officio* Chairman.
- (2) Sir Alfred Chatterton, Kt., C.I.E.
- (3) The Honourable Sir Purshottamdas Thakurdas, Kt., C.I.E., M.B.E.
- (4) Ambalal Sarabhai, Esq.
- (5) G. B. Trivedi, Esq., B.A., M.L.C.
- (6) Seth Kastoorbhai Lalbhai.
- (7) Rao Bahadur R. R. Kale, LL.B., M.L.C.
- (8) Mahomedbhoy Currimbhoy, Esq.
- (9) Jehangir Bomanji Petit, Esq., M.L.C.
- (10) A. Greville Bullocke, Esq., M.L.C.
- (11) N. Birrell, Esq.
- (12) Sir M. de P. Webb, Kt., C.I.E., C.B.E., M.L.A.
- (13) Lalji Naranji, Esq., M.L.C.

Of the twelve non-official members of the Committee, five are members of the Bombay Legislative Council.

At the end of 1922, Government invited the opinion of the Advisory Committee as to the advisability of the Department of Industries being closed down as a measure of retrenchment. In view of the stringency in Provincial finances, the majority of the Committee were of opinion that the Department should be brought to end and its functions distributed among other Departments of Government. Finally, however, in April 1923, Government decided that, after effecting various retrenchments in expenditure, the Department should continue to exist in a skeleton form. The uncertainty as to the future, of course, has somewhat hampered the activities of the Department and is partly responsible for the fact that in the year under report only five meetings of the Advisory Committee were held. Further, owing to financial stringency, and the Department having no funds available with which to inaugurate fresh schemes, there were few questions on which the opinion of the Advisory Committee could be

sought. The chief subjects on which the advice of the Committee was given to Government were :—

- (1) the grant of a concession for the manufacture of paper from grass in the West Khandesh District ;
- (2) repeal of the Apprentices Act ;
- (3) the question of State aid to industries ;
- (4) a scheme proposed by the Government of India for the improvement of indigenous arts and crafts ;
- (5) the marking of cotton bales, maintenance of cotton press records, submission of statistical returns and licensing of gins and presses in connection with the adulteration of cotton, and proposed legislation on the subject ;
- (6) application for loans for industrial purposes from—
 - (a) Mr. L. V. Tikekar of Sholapur and
 - (b) the Gauri Gold and Silver Works Company of Surat ;
- (7) the selection of two state technical scholars ;
- (8) application of The Tata Iron and Steel Company for an annual grant-in-aid to the technical institute at Jamshedpur ;
- (9) a suggested reduction in the import duty of automatic handlooms ;
- (10) a proposed weaving demonstration with automatic handlooms at Dhulia.

In addition, of course, the budget of the Department was referred to the Committee.

The organization of the Bombay exhibit for the British Empire Exhibition, which employed much of the Department's time, was entrusted to an Organising Committee of which four meetings were held.

Government had also referred to the Advisory Committee the suggestion that a provincial stores purchase department should be constituted. At the end of the year, the matter had not been fully discussed by the Committee but Government have issued orders that the Director of Industries shall in future scrutinise all contracts to be made by the Medical and Jail Departments and should draw up in consultation with the Surgeon General and the Inspector General of Prisons a set of rules for this purpose.

POLICY.

7. The industrial depression referred to last year has not yet lightened and there are few signs of any extensive industrial developments in the near future. Public confidence appears to have been shaken and money for new schemes is not forthcoming. Retrenchments have been effected in the Department, the Fisheries section has been abolished, the Deputy Director dispensed with, the experiments in button making stopped, and the Dapuri Workshops handed over to the Public Works Department.

Briefly, the Department has to mark time pending improvement of conditions all round.

COTTAGE INDUSTRIES.

8. *Handloom Weaving*.—The work was as hitherto mainly concentrated on the introduction of the improved fly-shuttle loom and there were working four weaving schools and six weaving demonstrations. Mr. Bell last year detailed the method on which the weaving schools and demonstrations are conducted and it is sufficient here to mention that in the schools, boys, almost entirely of the weaving class, are taught the use of improved mechanism and a school is kept running in a village until a number of fly-shuttle looms have been adopted by the local weavers or until experience shows that no progress is likely to be made. The weaving demonstrations are conducted by a demonstrator who is posted to a village with two fly-shuttle looms on one of which he works and on the other any weaver wishing to learn the new loom can practice. In the year under report, there were weaving schools held at Bhingar (District Ahmednagar), Nasik, and Bagalkot (District Bijapur) while one school was transferred from Faizpur (District East Khandesh) to Parola in the same district. The number of fly-shuttle looms introduced was : Bhingar 105, Nasik 77, Bagalkot 97, Faizpur 90 and Parola 96. These results are quite satisfactory and the school at Bhingar after just over a year's working had made such progress in the introduction of fly-shuttle looms that it can now be moved elsewhere. Here the example of Ahmednagar where a large number of looms had been introduced last year was of great value and indicates how improved methods can spread from one town to another.

At the beginning of the year there were weaving demonstrations at Poona and Parola. The Parola demonstration was then removed to Dholka in Gujarat, but there little progress has been made. The Dholka weavers are in a very impoverished condition and entirely in the hands of their sowkars and the Department had no Gujarati demonstrator available to run the demonstration. It is proposed to transfer this demonstration to Bulsar where the condition of the weavers is not so unsatisfactory and where it is intended to appoint a Gujarati man in charge. The Parola demonstration was removed to Dhulia for demonstrating the double box fly-shuttle loom to the weavers there who had requested a demonstration of improved looms. The double box looms were taken up but the local weavers are anxious for still more advanced practice and proposals have been submitted for holding a demonstration of various automatic handlooms there. In the Southern Division, there were weaving demonstrations held at Guledgud and Nalatvad (District Bijapur), Betgeri (District Dharwar), Bailhongal (District Belgaum) and Karad (District Satara). The two last were removed to Manoli (District Belgaum) and Kolevadi (District Satara) in March 1923 while the Nalatvad and Betgeri demonstrations were

transferred to Bijapur and Shirol (District Dharwar). A special effort was made to exhibit to the silk weavers of Betgeri, the possibility of weaving silk saris on the fly-shuttle looms, because these weavers were doubtful whether refined work could be done on this loom. The demonstration was quite successful.

9. The experiment referred to in last year's report of training agriculturists to take up weaving as a spare time occupation was continued at the village of Hebsur in the Dharwar District. This village had been chosen because the villagers there were already accustomed to weaving 'gudars' or coverings for threshing floors, and in consequence of the school half a dozen agriculturists took up the work of weaving shirtings, saris or similar cloths on fly-shuttle looms during the slack season. As a means of introducing sari and shirting weaving as an agriculturist's spare time occupation, the experiment has not been quite conclusive. It has, however, resulted in a more economical manufacture of 'gudars'. These were formerly woven in narrow strips 8" broad, and 18 of these strips were sewn together to form a 'gudar' of 12' breadth. With the fly-shuttle loom, however, the 'gudars' are now woven 24" wide and with a warp of about 90' long instead of some 13' so that cutting this into six pieces gives enough for a 'gudar' of $14\frac{1}{2}' \times 12'$ composed of six instead of 18 separate strips. With the consequent difference in the cost of sewing, the cost of weaving and stitching one 'gudar' has been reduced from Rs. 2-3-0 to 14 annas. Where the villager can profitably produce 'gudars' on these lines, it is little use expecting him to desert that work for the production of shirtings or saris in his spare time. The school at Hebsur was therefore closed and the experiment is being repeated at Hulkoti where the inhabitants do not habitually use 'gudar' weaving as a spare time occupation.

10. *Weaving Re-organisation.*—Proposals were submitted by Mr. Bell for the re-organisation of the weaving section of the Department. So far, it has been practically impossible to touch Sind or Gujarat and the operations have been confined to the Deccan and the Southern Maratha Country. It was also desired to start a weaving institute where experiments in various looms, etc., could be carried on and demonstrators trained for the Department. Owing to financial stringency, it was impossible to introduce most of the proposals. The pay of the assistant weaving masters was revised—a much needed reform—but the weaving institute and the new schools and demonstrations for Gujarat and Sind have had to be left in abeyance.

11. *Preparatory Processes.*—The sizing and warping machine referred to last year was still under experiment and after various trials, satisfactory tests were undertaken at Amalsad, the main requirement being that for proper working a man trained in power textile machinery was imperatively needed. A jobber was secured from Ahmedabad and under his care the machine worked very well. The Indian Industrial Exhibition held at

Surat in May 1923 gave the Department an opportunity of exhibiting the sizing and warping machine as well as pirn and bobbin winding machines and the fly-shuttle loom. Arrangements were made so that the whole process from the unwinding of cotton from the hanks, sizing, warping and weaving on the fly-shuttle loom was exhibited in continuous working. The demonstration excited very considerable interest among the weavers in Surat and visitors from other parts of Gujarat and there was no question that the machine was of practical value. The difficulties in the way of its introduction are, however, the need of a trained man to look after it and the consequent cost of running and the fact that it produces more sized warp than is required for a single weaver. It should be of value, however, for small power or handloom factories where some 12 or 15 looms are employed. Efforts were made to induce some of the Surat weaving factory proprietors to take over the machine on loan and run it in their own factories, but none of them were willing to do so unless this Department bore the expenses. Therefore owing to lack of funds and having regard to the fact that if the borrower of the machine had to pay the expenses, he would certainly treat the machine more carefully and the experiment would be far more just, no arrangements could be made at Surat. Thereafter the machine was loaned to the proprietors of the Peoples' Pioneer Loom Factory at Ankleshwar, who were prepared to stand all the charges, and it was with this firm at the end of the year.

12. As Mr. Bell had pointed out, the expenditure on weaving instruction in this Presidency is very small compared with that elsewhere, and it is perhaps sometimes forgotten that the handloom industry is one of the most important in India. Probably in Bombay Presidency, there are some 8,00,000 people who depend wholly or largely on handloom weaving as their means of subsistence. There are 300 places in the Presidency where weaving is carried on with handlooms ranging in number from 20 to 5,000. Even in Bombay city itself, handloom weaving continues despite the competition of the Bombay mills. The introduction of the fly-shuttle loom has made a great difference to the economic status of the weavers who have adopted it. It is calculated that a weaver's output has been increased by about 40 per cent. and while, of course, the lack of imports during the war and the general rise in prices has had its effects in improving his lot, yet it is incontrovertible that where the fly-shuttle loom has taken root in this Presidency, there the condition of the weaver is very different to what it was a few years ago. But it is also clear that to continue to compete with the mill industry, there must be continued improvement and experiment on the handloom. Whether an automatic handloom which will be within the reach of the weaver's pocket and also suitable for his cramped workshop can be economically produced is not at present apparent, but there is every reason that endeavours should be made to produce such a loom. Further, and probably, at the moment, of greater importance is the need for experiment in the preparatory processes of

weaving. The ordinary handloom weaver wastes an enormous part of his time in preparing warps on the most primitive methods and of a most uneconomical shortness. Research is urgently needed on the most practicable and cheapest methods of preparing the yarn for the loom. The warping and sizing machine to which reference was made above is not suitable for the ordinary village weaver. It is for this reason among others that a weaving institute is a prime necessity in the Presidency. It cannot, of course, be said that such an institute will solve all, or even any, of the outstanding problems, but the importance of the hand loom weaving industry is such and the need for it to take every method it can, to compete with the power loom industry is so great, that a weaving institute could be justified however unsuccessful it might prove.

13. *Dyeing and Calico Printing*.—The dyeing and calico printing experiments referred to last year have born fruit in that, two firms in Ahmedabad and one in Surat have taken up the manufacture of calico prints on the improved method. The designs furnished by the School of Art were appreciated but unfortunately in some cases these designs being in black and white only, the local dyers produced most unfortunate combinations of colours when they came to print them. But the School of Art was again consulted and there are hopes that an eye for colour may be developed. Some of the calico prints were sent to the British Industries Fair, but few orders were taken mainly, I think, owing to overpricing. The dyeing demonstration was transferred to Faizpur (Khandesh) in April, and was distinctly successful. It was originally intended to keep it there for three months but the local dyers put in a petition for its retention and it was still there at the end of the year. There seems a very distinct opening for this work in the Presidency.

14. During the year it appeared that a possible outlet for Bombay products might be found in the printed cloths used by the natives of East Africa and the Indian Trade Commissioner in East Africa was approached and he sent to Bombay samples of the hand printed cloths imported into East Africa from Manchester and Holland. These are 46" wide and 66" long and are known as 'Khangas'. They are supplied in various styles and the fashions are always changing as each competing importer attempts to obtain an exclusive and attractive model. As many of the importers are Indian firms, there seems no reason why a part at any rate of this trade (worth Rs. 15,00,000 in 1921-22) should not be taken over by Bombay. Attempts were made to interest the Bombay mills which do machine printing but without success, and the Ahmedabad hand printing works were then approached but with no very great result. This appears a direction in which Bombay enterprise might be employed.

15. *Casein*.—The small demonstration factory at Anand is still working under Mr. M. T. Shah. Its operations were suspended during August and September on account of the monsoon causing difficulties in drying

the casein. But a casein dryer designed by Mr. Thiselton-Dyer has been tried and found to be effective with lactic casein and during the present monsoon will be tried on rennet casein. During the year, experiments have been carried on in the making of casein with the employment of vegetable rennets and it has been found that the pulp of the immature fruit of *Withania coagulans* serves the purpose well. The product is satisfactory except for a yellow or brown tinge which it is hoped to eliminate and when a sufficient stock has been accumulated, another attempt to test the London market will be made. Rennet casein is in demand in Europe and America for the manufacture of certain artificial ivories and celluloid substitutes such as 'galalith' and Erinoid. There were difficulties as last year in getting a sufficient supply of separated milk, as the price rose from 11 annas per 60 lbs. to Rs. 1-8-0 per 60 lbs. These fluctuations depend firstly on the rate at which separated milk is exported to Bombay and, secondly, on the price of village casein. The price of the latter has fluctuated very widely. At one time during the year, it was Rs. 20 per 40 lbs. but at the end of the year it varied between Rs. 9 and Rs. 12. Such fluctuations appear unavoidable in view of the system of trading and forward selling employed by dealers in casein.

16. In November, a consignment of about 24 cwts. of lactic casein prepared at the demonstration factory was sent to Messrs. Nicuwhof Surie & Co., London for sale, the object being to test the London market and to discover whether the improved quality of casein prepared at the demonstration factory would on the London market fetch a better price than the ordinary Indian Casein which owing to the somewhat careless methods of manufacture employed, is usually impure, and commands only a poor price. Unfortunately, the Company to whom the consignment was sent went into liquidation, and though the consignment was sold at £ 85 a ton, it has not been possible to get any definitive data as to the relative value of our factory casein. A sample of casein was however sent to a firm of analytical chemists who reported it as much superior to the usual quality of Indian casein and estimated it worth a premium of 10 per cent. ; it was further stated that if a lower fat content could be secured, this casein would approach the French and Dutch. This is a distinctly encouraging report, but until a commercial quantity of our casein has been sold on the London market, it is not possible to say definitely what enhanced value it will command.

DEVELOPMENT OF INDUSTRIES.

17. A certain number of new industrial developments took place during the year to some of which this Department was able to afford assistance.

(a) The Pioneer Rubber and Industrial Works Co., Ltd., Bombay, has started production at its works and it seems probable that its products will be able to compete successfully in many directions with imported

goods, especially as the present tariff affords in most cases a protection of 30 per cent.

(b) The New Oil Mills are now under construction at Vadala near Bombay. It is proposed to manufacture castor oil, linseed oil, and some edible oils on a large scale and the experiment will be watched with interest.

(c) A concession had been granted by Government to the Eastern Development Corporation, Ltd., for the collection of gum-oleo-resin of *Boswellia Serrata* in Khandesh. The terms of the concession have been fixed and further progress is awaited.

(d) A scheme has been brought out for the manufacture of artificial silk in Bombay, but the matter has not yet reached the stage of production.

(e) Government have granted a concession to Messrs. Abdulabhoy and Joomabhoy Laljee, who own a concession for the manufacture of salt in Aden, of an additional plot of 25 acres of land for the manufacture of chemicals from the waste products in their salt works at Sheik Othman. It is proposed to produce such bye-products as magnesium sulphate, potassium sulphate, magnesium chloride, etc., but no report of the actual production having started has yet been received.

Assistance was given by the Department to a raw hide factory in Ahmedabad in regard to the colouring of pickers, to a manufacturer of inks in Poona and to a paint and oil company who were having trouble with the expression of groundnut oil.

The Assistant Director gave assistance in a number of cases detailed in Appendix A.

CHEMICAL RESEARCH.

18. Owing to the absence of new industrial enterprise and the departmental retrenchment, there were no fresh developments in chemical research.

19. *Lactic Casein*.—A sample of lactic casein out of that sent home was examined by Messrs. Solomon and Seba and the following was the resulting analysis :—

Moisture	..	..	..	..	Per cent. 8·7
*Protein (by difference)	..	..	..	..	81·6
Ash	..	..	..	..	3·8
Fat	..	..	..	..	3·2
Acidity (as Lactic Acid)	..	..	..	..	2·7
					<hr/> 100·0
*Protein by direct determination	..	..	..	..	78·6
Silica (Sand)	..	..	..	..	0·5
Solubility in Borax Solutions, etc.	..	..	..	..	Complete,
Adhesive Strength	..	..	..	..	Good.
Colour	..	..	..	..	Good,

20. Mention was made in last year's report of the difference of opinion between the Imperial Institute, London and the local officers of this Department as to the best method of determining the fat in casein. The Imperial Institute had not accepted the method employed in Bombay which with variations is widely used elsewhere and this was subjected to a comprehensive review by the Imperial Institute to prove that the Werner-Schmidt method gave more reliable results than that followed by Dr. Meldrum and Mr. Gangolli. The opinion of the Imperial Institute was not accepted by Dr. Meldrum and Mr. Gangolli, and the technical discussion of the point is still in progress.

21. *Casein Glue*.—The glue testing machine referred to last year was late in arrival and was only erected just before the end of the year, and at present no comparative results of tests are available.

22. *Magnesium Chloride*.—The Pioneer Magnesia Works at Kharaghoda had been producing magnesium chloride during the year but prices have been steadily falling and it was necessary for Government to revise the basis on which royalty was taken and it is now taken on a profit sharing basis. At the moment, the imported magnesium chloride is at such a low price that it is practically impossible for the Pioneer Magnesia Works to produce at a profit and there seems justification for an enquiry into whether this is not a suitable case for the introduction of a measure of protection by tariff.

Reference was made last year to the discoloration of the magnesium chloride produced at Kharaghoda. Experiments were undertaken by Mr. Turner with a view to finding a means of removing this discoloration and these were finally successful and the necessary information was communicated to the Company.

23. *Sind Trona*.—Further investigations were made into the Trona deposits in Sind. Mr. Koppikar, Assistant Chemist, visited Sind in March and made a report on the conditions required for successful working of the Dhands (shallow lakes in which water concentrates during the dry season and the Chaniho (crude carbonate of soda) can be collected just before the rains). From his investigation, it appeared that the liquor in the dhands should not be allowed to evaporate to a specific gravity above 1.28 and that the deeper the liquor in the dhand, the more likely that the proper concentration can be preserved during the period of working. A sample of trona was sent for opinion to the Chairman of the Glass Committee of the Institute of Chemistry and he reported that the trona is suitable for window glass, bottle glass or glass of any ordinary kind, but not for lead glass or other fine type. It is suitable for the type of glass at present manufactured in India but it would be unwise to press the claim of this trona on local glass manufacturers unless a regular supply of a uniform quality is assured. At present it is impossible to say that we have an assured supply of good trona and in any case, the soda ash trade, as

Mr. Bell stated last year, is well organised and has a standardised product and quality. The experiments, however, are being carried out again next year and now that more information is available as to the conditions necessary to secure pure iron, it will be possible to form a juster estimate of the value of the deposits.

POTTERY.

24. Mr. E. R. Fern was in charge of the Pottery section of the School of Art, Bombay, throughout the year. There were nine students under instruction. Mr. Fern is also in charge of the semi-commercial scale pottery factory belonging to this Department. The machinery from home was received late in December and various unforeseen difficulties arose and as a result it was not possible to get the factory working before the end of the year (it started work in August). Over 300 experiments have been made for flooring tiles in various colours, fifty experiments for white vitreous tiles, and thirty experiments for a new earthenware body for crockeryware and glazed wall tiles. Analyses were made on 42 clays and advice given to 13 persons who called at the School of Art. Some extremely successful vases were made and exhibited at the School of Art Exhibition and realized very encouraging prices.

FISHERIES.

25. The steam trawler "William Carrick" was sold before the beginning of the year and the work of the Marine Biologist was restricted to compilation of the report on the work of the steam trawler and his post was finally abolished on the 23rd of December. The report on the work of the steam trawler was published and aroused some interest. It is a valuable scientific contribution to the study of Bombay fisheries even though the financial result of the working of the trawler was not successful. The collection of specimens made by the Marine Biologist was handed over to the Royal Institute of Science. During the year, a cold storage system was introduced at the Crawford Market in Bombay which may be of assistance to any future trawling enterprise in the city.

26. The work of the "William Carrick" is probably responsible for the enterprise of a private firm in Bombay which hired the steam trawler "Madras" from the Royal Indian Marine and worked it from the 1st of January till the 18th of July. Quite good results were obtained for the first five months, but it was finally decided to stop work in July because the Indian crew could not stand the monsoon conditions and the hard work, and it was found that the enterprise was no longer paying its way. The "Madras" was worked by an Indian crew with only two European officers as against four on the "William Carrick."

27. This experiment in conjunction with that of the "William Carrick" appears to establish the fact that successful trawling in Bombay needs a smaller kind of trawler and, to run it efficiently, probably a relief crew

during the monsoon and also cold storage accommodation at the point where the fish is landed whence it can be taken as required to the market. One point of rather depressing interest is that the "Madras" in five months landed nearly three lakh pounds of fish in Bombay but during the same period she threw overboard 108,000 lbs. of skate for which no market could be obtained in Bombay. If trawling is to be successful, it will be necessary to educate the local population to the fact that skate is an admirable edible fish. Not only does the throwing of skate overboard, mean waste of good food, but it also has a very deleterious effect on the fishing grounds in driving other fish away from the place. I am not sure, however, what steps this Department can take to educate the public gustatory taste in the direction of skate.

28. Other work in connection with fisheries was an investigation into certain mussel shells in the hope that they would be suitable for button making, which they were not, and an enquiry about the possibility of pearl oysters in the Thana creek.

29. The sardine oil experiments were continued but we were again unfortunate in that the supply of sardines was most inadequate and the fish could not be caught in any number when in a fat condition suitable for expressing the oil. However, about a ton of guano was produced and the experiment will be continued again next year in charge of the Salt Department.

COMMERCIAL AND INDUSTRIAL INTELLIGENCE.

30. An incomplete but representative list of enquiries during the year is given in Appendix B and shows their general nature.

Receipts of correspondence and official references during the year under report were 5,877 as compared with 7,371 in 1921-22 and 7,049 in 1920-21. Letters issued were 5,775.

MISCELLANEOUS.

31. *Rosha Oil*.—Sometime back, a still for the distillation of rosha grass oil had been designed by the Forest Research Institute, Dehra Dun, and one was constructed and utilised by the Forest Department in the Presidency. The results were good to begin with but the unskilled handling and rough treatment which it received in the out of the way places, where it was necessary to operate it, eventually caused its failure. In consultation with Mr. Turner of the Victoria Jubilee Technical Institute and Dr. J. L. Simonsen of the Forest Research Institute, a new design was got out which was sent to a firm of manufacturers in England who sent out modified proposals on these lines and after further examination, Messrs. Blair, Campbell and McLean constructed a still of improved pattern. This still was received during the year and was erected at the Victoria Jubilee Technical Institute for a trial before being sent up to West Khandesh

where the Forest Department will conduct experiments in extraction of rosha grass oil. The plant was not received in time for erection before the rains and the heavy monsoon prevented a trial being made before the end of the year, but there seems likelihood of the improved plant being a success.

32. *Button Making*.—Retrenchment necessitated closing down the experiments in button making machinery which were being conducted at the Dapuri workshops. The machinery at first was "unbalanced" in that the output from various portions of it was not equal. When, however, it was finally got into running order, there seemed every hope of its successfully turning out excellent buttons, but there was no opportunity to test it on a commercial scale to see whether the buttons could be turned out at a price which would compete with imported articles. The machinery had to be dismantled and it is proposed to loan it to the United Provinces Department of Industries for the carrying out of further experiments.

33. *Match Making*.—An interesting development of the present tariff is the starting of a match factory at Santa Cruz. Machinery was imported from Japan for dipping and packing matches and also the splints are imported from Harbin ready cut, also the veneers for the boxes and in some cases labels also. These articles are imported at a tariff of 15 per cent. The splints are dipped and packed by hand at Santa Cruz and can compete in price with any of the imported matches which pay the full duty of Rs. 1-8-0 per gross. Recently there were some 400 people (largely women and children who were doing the packing) employed and a comparatively very large output of matches was being produced. The other Indian match factories in the Presidency which do not rely on imported splints have not had a good year of it. There had been rumours of evasion of the import duty on matches, which were reported to Government and on my last enquiry the Ahmedabad Match Factory were holding heavy stocks which they were unable to get rid of at a profit. They gave as the reason that the very heavy tariff afforded a very great inducement to evasion by imports through minor ports.

During the year, a note on the prospects of the match industry in the Bombay Presidency was prepared and printed for distribution. The manufacture of matches appears to be a great attraction to a large number of enquirers who often had little idea of the difficulties involved. Some proposed to start the manufacture as a cottage industry, others to use grass splints, etc., etc. It appears, likely however, that if the present tariff continues, firms from Sweden and Japan may consider the possibility of following the lead of the factory now working at Santa Cruz and import the component parts of matches at a low rate to avoid the heavy duty on the completed article.

34. *Gold and Silver Thread Industry*.—Mr. B. J. G. Shastri and J. K. Chapadia, who were awarded scholarships by the Government for the

study of gold and silver thread industry in Europe, have returned and are now engaged in introducing various improved devices into their gold and silver thread factory at Surat. They have applied for a loan of Rs. 15,000 from Government to pay for some of the machinery they desire to order from Europe, and as a sign of Government's encouragement of their enterprise, I had visited their factory and certainly their tour in Europe has enabled them to acquire a number of new ideas which may be brought into effect with advantage to the gold and silver thread industry in Surat. This is one of the most backward industries in its methods, and one which *prima facie* appears as if it could be very much improved by the application of even a little scientific and mechanical knowledge. In any case, the award of the scholarships is of interest as the result may afford an indication as to the best method of employing scholarships in future that is, whether it is best for an industry to have its young men sent home to complete a course of technical study and then come back to try and put their ideas into practice in the industry in which they have received technical training, or whether it is better to send home, as was done in this instance, men who have been working at the industry for some years and have a practical knowledge of the difficulties and limitations of the work as carried on at present in India. If the deputation of Messrs. Shastri and Chapadia to Europe eventually results in any substantial improvement in the gold and silver thread industry in Surat, it will be well worth while making similar experiments in other industries also, but it is as yet too early to judge correctly the results of their tour.

MINES AND MINERALS.

35. As mentioned last year, the subject of mines has been transferred to this Department. There are only three mines in the Presidency: (1) Bauxite,—Taibpur, Kapadvanj (Kaira); (2) Manganese,—Shivrajpur (Panch Mahals); (3) Manganese,—Bamankua (Panch Mahals). Only the two latter are working and raised respectively 23,518 and 16,185 tons of manganese during the year under report. The Taibpur mine did not work at all.

36. *Coal Supplies.*—The system of X-class supplies of coal ceased from November and was replaced by a complicated system of special supplies *pro rata* on a transport capacity basis of collieries and advanced cumulative supplies in rakes and half rakes on the same basis and ordinary consumers had to make the best arrangements they could direct with the suppliers in collieries. The introduction of this system will probably make little difference in Bombay where since 1921 the coal situation has been relieved by the import of foreign coal.

37. *Assistance by the Geological Survey of India.*—The Geological Survey of India afforded considerable assistance to this Department in the year under report.

(1) Kaolin having been observed near Karalgi and Kapoli, Mr. K. A. Knight-Hallowes of the Geological Survey of India was deputed to investigate these deposits in the Khanapur Taluka, Belgaum District, and his report has been published as a bulletin of this Department. At Karalgi, there is estimated to be about 3,750 tons of Kaolin. At Kapoli no kaolin but only kaolinised felspathic muscovite schists and gneisses are found. Although the quality of the Karalgi clay is somewhat inferior to imported China Clay, probably a good market could be obtained for levigated kaolin as a sizing material for cotton cloth; but that at Kapoli, is of no economic value.

(2) Mr. Fern had analysed samples of clay—"kup" from the Khanapur Taluka and has suggested that the deposits there ought to be surveyed. Mr. H. C. Jones, Assistant Superintendent of the Geological Survey, visited the place and reported that though the kaolin appears to be of good quality, it is impossible to get much idea of the quantity, available without putting down a number of borings. Unfortunately, there is laterite present which would make these borings a long and difficult work. But in view of the importance of these deposits, the Geological Survey Department has been asked to make further investigations with a view to determine the quantity available.

(3) The question of a Geological Survey of the Runn of Cutch has been taken in hand with a view to discovering the possibilities of obtaining various products from the brine. Rao Bahadur M. Vinayak Rao of the Geological Survey visited the Runn and in conjunction with the Executive Engineer, Boring Works, drew out a programme for two bores and a line of trial pits to obtain brine. The boring had to be stopped at the beginning of the hot weather but will be resumed next cold season. Eight samples of brine from the Runn were examined at the Royal Institute of Science and the results communicated to Rao Bahadur Vinayak Rao. The importance of this work will not be really apparent until further investigations have been made and these are the province of the Government of India.

STATE AID TO INDUSTRIES.

38. At the instructions of Government, the Advisory Committee considered whether it was desirable for legislation to be undertaken to provide state aid to industries on the lines of the Madras State Aid to Industries Bill. The matter was discussed at some length and four members out of seven were in favour of legislation on the lines of that in Madras. The others considered that in the present financial position, there was not much scope for ad hoc legislation and that any cases which were likely to arise could be disposed of by the existing powers of Government. The opinion of the committee was communicated to Government and the orders on the matter are awaited.

39. *Loan to Industrialists.*—The Advisory Committee had recommended and Government sanctioned the grant of a loan of Rs. 5,000 without interest

to Mr. L. V. Tikekar of Tikekarwadi, Sholapur, to enable him to erect buildings near his weaving factory in which he will establish a weaving school for instructions on improved looms.

The Advisory Committee had also recommended a loan of Rs. 15,000 at 6½ per cent. to the Gauri Gold and Silver Works at Surat for the development of the goldthread industry. Orders of Government on this are awaited.

EXHIBITIONS

40. *British Empire Exhibition*.—This Department was entrusted with the work of making arrangements for the participation of the Bombay Presidency in the British Empire Exhibition to be held at Wembley in 1924, and preparations were taken in hand to secure the participation of private firms and to arrange for exhibits illustrating the importance and activities of Bombay city and the Presidency, but the details of the work done will be more appropriately noticed in the next year's report after the Exhibition has been opened.

41. *British Industries Fair, 1923*.—This Department participated in the annual Fair sending home samples of sandalwood and of silks, gold and silver trimmings, kinkhab carpets and calico prints, but trade both in India and in England was not good in February and March and no orders were obtained.

42. *Red Cross Fete*.—In December 1922, a Red Cross Fete was held in Bombay and this Department organised a weaving exhibit. There were shown 16 different kinds of handlooms, warping and sizing machines, bobbin winding machines, etc. The exhibit emphasised the improved methods which were now possible over the original indigenous pit loom with throw shuttle and it excited considerable interest among the public as well as affording a useful encouragement to the members of the departmental staff.

TECHNICAL EDUCATION

43. The technical education of this Presidency is administered by the Department of Public Instruction. The Department of Industries maintains touch with it through the Director's chairmanship of the Board of the Victoria Jubilee Technical Institute and of the Committee of Direction for Technical Education and his presence on the Committees of the College of Engineering and the Royal Institute of Science.

44. In the year under report, the Victoria Jubilee Technical Institute found itself in straitened financial circumstances, as the heavy drop in the value of securities and the increase in the cost of building had rendered its funds for the completion of the new buildings at Maturga inadequate and the Board of Trustees were themselves unable to complete their programme without assistance. Government made a grant of Rs. 4 lakhs in the financial year 1922-23 and in the financial year 1923-24 have

granted a loan of Rs. 2,80,000 with a promise of consideration whether this should not be converted into a grant. The Millowner's Association also promised to contribute a special grant of over one lakh of rupees and increased their annual subscription from Rs. 2,000 to Rs. 2,500. In view of the extensive assistance required from Government it was felt that the constitution of the Board of Trustees of the Institute needed alteration to bring it into line with present day conditions and the articles of Association were modified to allow further representation to the Millowners' Association and the gradual reduction in the number of Ripon trustees. Before the close of the year, the prospects of the Institute appeared to have been satisfactorily arranged and the work on the new buildings was almost complete and the new term opened in July with the work of the Institute finally transferred from Byculla to Matunga. The Institute is now certainly the best equipped and most advanced of its kind in India, and draws students from all other Provinces. In view, however, of the heavy cost to Provincial revenues, it was felt that it is only just that preference be given in admitting students to those of the Bombay Presidency, and arrangements to this end were introduced.

45. There is nothing of importance to note in regard to the ordinary curriculum of the students of the Institute but a development of possible future consequence has been started in that, arrangements were made for classes in training apprentices belonging to the G. I. P. and the B. B. & C. I. Railways who were undergoing practical training in the Railway Workshops, by giving them classes at the Institute in the theoretical side of their work. These were started in January 1923 and so far have proved successful. Further, after discussion with the Millowners' Association, arrangements were finally made to give theoretical instruction in textiles to apprentices from the mills of the Association. These classes did not begin before the end of the year, but there is every hope that they will prove extremely useful. Such co-operation between practical work and the theoretical side cannot fail to be extremely valuable to both the parties concerned.

46. At the Dapuri Workshops, the training of apprentices was still continued with an average number of some 40 half-timers and apprentices. The scheme there has the advantage over an ordinary technical school in that lads are employed on practical work and not merely on making things for practice where the accuracy of their work does not really matter, and the more advanced boys are sent out under the charge hands to deal with outside repairs. Government have under consideration a scheme for an apprenticeship system in these workshops for boys with a knowledge of English who would take a more advanced course. On the transfer of the Dapuri Workshops to the Public Works Department, the apprentice scheme continued to be worked by that Department.

47. During the year, a report was submitted to Government on the arrangements at present in existence in the local Railway Workshops for

the recruitment and training of artisans and mechanics, foremen, chargemen and other subordinate supervising staff, with a view to seeing whether modifications were needed in the arrangements for the training of the educated middle class, and how far the local Government would be required to give financial assistance in any such scheme. The report at the end of the year was under the consideration of Government.

48. *Technical Scholarships*.—There were three holders of technical scholarships studying abroad during the year. One student after a course of Sugar Technology at the Audubon Sugar School, Louisiana, United States of America, has since been on a tour of the sugar producing areas in the West Indies, Hawaii and Java. Of the other two, one scholar is studying dyeing and bleaching at the Manchester School of Technology and the other studying tanning at the Leather Sellers' College, London. Government have now introduced the system of awarding two state technical scholarships a year irrespective of the numbers already held from previous years, and a recommendation was made by the Advisory Committee for the grant of a scholarship in chemical manufacture (pharmaceutical) and another in textiles (spinning) though awards were not made before the end of the year.

49. *Research Scholarships*.—Three scholarships in technical chemistry at the Indian Institute of Science, Bangalore, awarded in 1921, were renewed last year. The scholars were investigating rape oil, hongey oil and cashew nut oil. Of these three, two scholarships have been renewed for a further period as the authorities of the Indian Institute of Science reported that these and certain fresh investigations into certain reactions in connection with the manufacture of dyestuffs promised to be of considerable technical importance. Two research chemistry scholarships were continued during the year, one for investigation regarding a lactic acid forming yeast and the other for an investigation into casein glue at the Royal Institute of Science, Bombay. A new scholarship was awarded in the year for higher training in Electrical Engineering at the Indian Institute of Science, Bangalore.

CONCLUSION

50. The staff throughout the year worked on the whole with efficiency. The conditions referred to last year by Mr. Bell and the uncertainty regarding the future of the whole Department have made it perhaps rather difficult to carry on with enthusiasm. I would acknowledge the great assistance given by the members of the Advisory Committee who have given valuable time to the consideration of subjects on which their advice was sought.

I have the honour to be,
Sir,
Your most obedient servant,

H. F. KNIGHT,
Acting Director of Industries.

APPENDIX A.

ANNUAL REPORT OF THE ASSISTANT DIRECTOR OF INDUSTRIES.

Sir,

I have the honour to submit my annual report for the work done in the year 1922-23.

Loan of my services.

My services were again loaned to the Excise Department in the month of March 1923 for making valuation of the Dabhoda Distillery. Some of my time was taken up subsequently in calculations and correspondence pertaining to the valuation work in Bombay office.

My services were also loaned to the Registrar of Co-operative Societies to investigate into the prospects and possibilities of the following proposed Co-operative Societies :—

- Co-operative Cotton Society, Parola.
- Co-operative Dyers Society, Surat,
- Kamgar Co-operative Mills, Bombay.

Technical Advice.

I visited the following places to give technical advice :—

- Sorab Dalal Tile Works, Than Road (Kathiawar)—Helped in laying out the factory and advised on power plant and gearing.
- Parola Cotton Co-operative Society, Parola (Khandesh)—Discussed the question of cotton ginning and oil milling with the directors and helped them in the selection of site, laying out the plant, etc., at Parola.
- Bee-Hive Roller Flour Mill, Ahmedabad—Discussed the question of converting the drive from steam to electric, and gave useful hints with sketches.
- Chandra Weaving Works, Ahmedabad—Helped in introducing Calico Printing department for printing sarees, etc.
- Swadeshi Weaving Mills, Surat—Helped in introducing Calico Printing department.
- Jamna Flour Mills, Bombay—Helped to find out the cause of incrustation in engine condenser and suggested remedy.
- Pottery Department of School of Art, Bombay—Visited to see if the old electric motors were still serviceable.
- Gamadia Girls Schools, Bombay—Helped in laying out a laundry for girls.
- Kamgar Co-operative Foundry, Bombay—Investigated into the cause of high fuel consumption and suggested remedies.
- Agricultural Implements Works, Satara—Helped in designing and laying out a foundry and workshops.
- Bharat Tile Works, Uran—Gave general technical advice on the most efficient method of working and management.
- Amalsad Saw and Oil Mills, Amalsad—Gave general technical advice and discussed the question of the utilization of wood tar produced in the gas producer.
- Sanj Vartman Press, Bombay—Helped in installing a large two feeder printing machine.
- Gauri Gold and Silver Works, Surat—Gave general technical advice.
- Taj Engineering Works, Bombay—Investigated into the causes of bad castings produced, and suggested remedies.

Besides the above, I visited a number of small power users in Bombay such as printing presses, flour mills, ice factories, etc., introducing this department, and offering my help and advice if they needed them.

General.

I visited almost all the makers of carved sandalwood boxes in Surat and explained them the necessity of using good locks, hinges and handles for the expensive boxes and distributed free samples of nickel plated locks and hinges amongst them.

I also went round and visited various places in Surat to select and collect fancy goods for the British Industries Fair.

I wrote and published a short note on silk yarn made at Kashmere Silk Factory at Shrinagar, in some vernacular papers of Surat and Bombay and brought the Indian made silk to the notice of silk merchants. Many persons visited me while I was at Surat in October 1922 asking for more particulars of the Kashmere silk and a big merchant was so pleased with the first consignment he received from Kashmere, at my suggestion that he has now been importing the silk in large quantity and supplying to the retailers.

I demonstrated samples of calico prints made in Holland for African markets to the millowners and calico printers at Ahmedabad advising them to take up the business as Ahmedabad could produce certainly better stuff than the Holland samples.

I also demonstrated to the millowners and others, Japan made samples of various fancy piece-goods suitable for Australian markets. One enterprising millowner seemed much interested in it and took down notes with a view to making and sending a sample consignment to Australia.

I was called to Bombay in November 1922 to help in the arrangement of hand weaving demonstration section of the Red Cross Fete.

My office at Ahmedabad was closed at the end of January 1923 and I was attached to the Bombay office from February 1923.

I had also to do the investigation of several Bombay firms of merchants and manufacturers and verify their statement submitted by personal visit and enquiries, on behalf of Indian Stores Department.

Sizing Machine Demonstration.

In the beginning of the official year the trial of the sizing machine at the Dhananjaya Hand Loom Factory of Ahmedabad not having proved successful owing to the lack of experience and practical knowledge on the part of the demonstrator, he was deputed to go to Bangalore to see and gain experience of the actual working methods of the machine at the Mysore Government Weaving Institute. He stayed there for more than a month. On his return, however, the proprietors of the Dhananjaya Factory declined to have the sizing machine tested any more. It was therefore taken to Surat and loaned to Jamshedjee Patel Weaving Factory. The machine worked at this factory for about a fortnight only but did not give satisfaction owing to the Demonstrator having returned from Bangalore without gaining any more experience and training.

The Surat demonstration had to be cut short, as this and other winding and twisting machines had to be taken to Bombay for the Red Cross Fete, where the sizing machine was not put to any actual and continuous test but its working was simply shown and explained to the visitors.

When the machine was being demonstrated at Ahmedabad and Surat the proprietors of the Swadeshi Hand Loom Factory at Amalsad had come to see it and had asked for the loan of the machine for trial in that factory. I therefore visited their factory in January 1923 and having satisfied myself that proper facilities for the actual trial of the sizing machine existed there, it was decided to loan the machine to the Amalsad factory. From my past experience of the working of the machine I had come to the conclusion that only a mill trained man having experience of a power driven sizing machine of a cotton mill could handle and work the machine efficiently, as there were several defects in the machine which could not be removed without the help of a mill trained man. I therefore insisted on having a mill trained sizing jobber in charge of the machine. An experienced man was therefore

recruited from a mill in Ahmedabad and appointed as a Demonstrator and sent to Amalsad. After overhauling the machine thoroughly and introducing some alterations and improvements the machine was put to a thorough working test, a report of which was submitted by me on the 28th April 1923. This report was afterwards given wide publicity by having it published in many vernacular papers.

The machine was afterwards taken to Surat and demonstrated in working conditions at the Industrial Exhibition held there from 20th May to 5th June. The demonstration proved a complete success at the Exhibition as a large number of people came specially to see it owing to the wide publicity that was given to the report of its test at Amalsad, and they spent a long time in the demonstration pavilion seeing and discussing its working.

I wished to have the demonstration extended in Surat as I believed, it had not been sufficiently demonstrated in a place like Surat which is considered the home of handloom industry in Gujarat ; but owing to the shortage of funds nothing could be done. The machine has however been loaned to the Pioneer Loom Factory at Ankleshwar to be tried at their own expenses.

Calico Printing Demonstration.

The demonstration of Calico Printing proved very successful in Ahmedabad. The Chandra Hand Loom Factory actually opened a department in saree printing and has been doing a good business, and I was informed that large orders from Broach and Bombay and other places were received for the printed sarees by the Chandra Factory.

I had suggested in my previous reports that the help and co-operation of Sir J. J. School of Art was necessary in introducing and creating a taste for good artistic designs amongst people. The School of Art was therefore approached who prepared and supplied in black and white some very good original designs for saree borders. These were taken to Ahmedabad and some blocks were engraved according to the new designs, and samples of sarees printed from them, were demonstrated in Ahmedabad and Surat. They were so much appreciated that the Chandra Weaving Factory and other calico printers asked for a loan of the blocks to copy from. The original designs as prepared and supplied by the Art School were in black and white only, and the colour schemes for some of the designs as selected and adopted by the demonstrator and the printers were not quite effective from an artist's point of view. I therefore visited Captain Solomon, the Principal of the School of Art, in company with the demonstrator in October 1922 and again with Mr. Chandulal, the proprietor of the Chandra Weaving Factory of Ahmedabad, in July 1923, and discussed the colouring schemes to be adopted for various designs at great length, and Captain Solomon was kind enough to make very useful suggestions and promised to submit a full report on the subject.

I have, etc.,

(Signed) F. E. BHARUCHA,

Assistant Director of Industries.

APPENDIX B.

COMMERCIAL AND INDUSTRIAL ENQUIRIES 1922-1923.

	Subject of Enquiry.	Number of enquiries.
1.	Acetone. Dealers in —	1
2.	Acid. Acetic „ „	1
3.	„ Citric. Manufacturers of — from lemon juice	1
4.	„ Jars. Makers of — in India	1
5.	„ Sulphuric. Manufacture and importers of —	2
6.	Alcohol, Industrial. Manufacture of —	1
7.	Alkali deposits in Sind. Information re —	1
8.	Alumina. Manufacturers of —	1
9.	Aluminium. Ingot, sheets, Manufacturers of —	1
10.	Apparatus. Scientific, Dealers in —	1
11.	Apprentices. Admission into cotton mills	1
12.	Artimesa Maritima. Purchasers of —	1
13.	Art ware. Dealers in —	1
14.	Atmoid (Kieselguhr). Supply of —	1
15.	Barium Salt. Uses of —	1
16.	Barytes. Sources and Manufacturers of —	2
17.	Battery plates. Manufacturers of — in Bombay	1
18.	Bauxite. Sources of —	1
19.	Benzole. Dealers in —	1
20.	Bleaching powder. Consumers of and demand for —	2
21.	„ „ and caustic soda. State aid for manufacture of — by electrolytic process	1
22.	Bobbin plant. Information re — a proposed —	1
23.	Bone Mill. Estimate for a —	1
24.	Bone Industry. Assistance for —	1
25.	Bone Mills. Information re — in Central India, Rajputana and in the Bombay Presidency	2
26.	Boring Machine. Cost of —	1
27.	Bottle Stoneware. Suppliers of —	1
28.	Bricks — fire. Manufacturers of —	1
29.	Brushes. Sources and supply of bristle for —	1
30.	Building stones. Suppliers of —	1
31.	Buttons. Manufacture of —	1
32.	Button making. Machinery for —	3
33.	„ „ Information re use of cocoanut waste for —	1
34.	Calcined Magnesia. Suppliers of —	1
35.	Calcium citrate. Manufacture of —	1
36.	Calico prints. Supply of —	1
37.	Camphor. Dealers in —	1
38.	Carbuncles. Dealers in —	1
39.	Carpet. Manufacturers of —	1
40.	Casein. Exporters and Importers of —	5
41.	Casein Glue. Importers of —	1
42.	Castings. Iron and Brass. Manufacturers of —	1

	Subject of Enquiry.	Number of enquiries.
43.	Catechu. Manufacture in Bombay of —	1
44.	Caustic soda. Importers of —	1
45.	Cement. Dealers in —	1
46.	Charcoal — animal. Suppliers of —	1
47.	Chemicals. Suppliers of —	1
48.	China Clay. Buyers and importers of —	2
49. Use of — in crayons	2
50.	China ware. Manufacturers of —	1
51.	Cigar-lighters. Dealers in —	1
52.	Cinematograph. Commercial possibilities of — academy of dramatic art —	1
53.	Cinematograph. Manufacture of — films	1
54.	Coal. Indian sources of —	1
55.	Coal Tar. Manufacturers of —	1
56.	Coir fabrics. Dealers in —	1
57.	Coir mats. Manufacturers of —	1
58.	Ccke. Importers of —	1
59.	Common salt. Refining of —	1
60.	Condensed milk. State aid for the manufacture of —	1
61.	Copper Ore. Sources of —	1
62.	Cotton. Statistics of production of raw and manufactured — in Hyderabad State	1
63.	Cotton bedspreads. Manufacturers of	1
64.	.. Belting	1
65.	.. Durries	1
66.	.. Ropes	1
67.	.. Sewing thread. Manufacture and suppliers of —	2
68.	.. Spinning and Weaving Mills — in the Bombay Presidency	1
69.	Crucibles. Manufacturers and dealers of plumbago —	2
70.	Cutlery. Dealers in —	2
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