

ANNUAL REPORT
OF THE
DEPARTMENT OF INDUSTRIES
BOMBAY PRESIDENCY
FOR THE YEAR 1917-18

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No. Mis. 59 of 1918-19.
OFFICE OF THE DIRECTOR OF INDUSTRIES:
OLD CUSTOMS HOUSE,
Bombay, the 22nd January 1919.

From

P. J. MEAD, Esq., C.I.E., I. C. S.,
Director of Industries, Bombay;

To

THE SECRETARY TO GOVERNMENT,
Revenue Department, Bombay.

Sir,

I have the honour to submit the Annual Report of the Department of Industries for the year 1917-18.

2. I took charge of this new Department on 31st October 1917, and the Indigenous Industries Committee, consisting of various representatives of commercial interests with Mr. G. A. Thomas, I. C. S., as Secretary, became defunct shortly after completing their labours by a detailed report on the Industrial Commission when it visited Bombay at the end of 1917. Madras and the United Provinces had long ago shown the way, and the history of those departments is fully set out in the Report of the Industrial Commission. In the Punjab, Bengal and the Central Provinces, separate Directors of Industries were appointed recently, as in the case of Bombay. In this Presidency, the Department of Agriculture has for some years included an Agricultural Engineer who has stimulated agricultural industries generally and well-boring in particular, and the Registrar of Co-operative Societies has, under that Department, assisted the handloom weaving industry both financially and by technical advice and demonstration.

3. War conditions then prevailed and all existing departments of Industries were fully occupied with work under the new Munitions Board organisation. In Bombay alone, the new Director was not directly associated with the Munitions Board organisation, which was then in full swing and, in Bombay especially, fully engaged in important problems of transport and shipping, calling for special knowledge and qualifications. The new department began modestly with one clerk and the usual belted attendant, and I proceeded early on tour to learn what had been done in other parts of India and organise an agency for the discharge of similar duties in this Presidency. A rapid tour through the U. P. and Madras, principally with special reference to sugar manufacture, glass-making, fisheries, and of course departmental organisation, was followed by various visits to different parts of the Presidency, and the general lines on which work should proceed were examined. This report therefore deals with seven months' work including rapid tours of inspection and the gradual collection of an office, temporarily housed in the Secretariat, and such expert staff as could be collected in the peculiar circumstances of the year.

4. A list is attached showing the places visited in the Presidency.

5. It has been pointed out in the Report of the Industrial Commission that a policy of judicious opportunism must be followed in tackling the problem of general industrial development, and the limitations imposed by the special war conditions obtaining, inevitably and peculiarly restricted the department's efforts this year. Technical advisers of any merit do not grow on every bush, and neither they nor the plant required can be imported to order in times of war. Advice and assistance were freely given by existing Institutions and officers of departments, and special mention must be made of the Victoria Jubilee Technical Institute, the College of Engineering, and the Mechanical Engineer to Government and his staff. T¹

Department was fortunate in obtaining the services of Capt. Mackenzie Wallis, R. A. M. C., who was set free by the Army to serve as an Industrial Chemist, for which duties he was peculiarly qualified; the Educational Department placed at our disposal Mr. Fern, the pottery expert at the School of Art, with a view to place all pottery instruction, experiments and demonstration work on a proper footing under this Department, and the weaving establishments under the Registrar were also taken over from 1st April 1918. The necessity for whole-time Engineers and establishments has been recognised and proposals submitted, and preliminary investigations have been commenced and a small, partly half-time, establishment entertained in connection with the fishing industry along our coasts. The inadequacy of existing staff is patent, but a beginning has been made, and as opportunities offer, further establishments which have already been proposed, will be rapidly engaged. With the Director has been associated an advisory committee of businessmen whose assistance will yearly become more valuable as the Department strengthens and is in a position to supply them with more material. Additional members have been co-opted to deal with the shipbuilding problem which has been entrusted to this Department under the War Purposes Board.

6. In the circumstances explained above, only a brief resumé will be expected of the actual work done with a short note on some aspects at least of the chief industries examined.

(a) *Handloom Weaving*.—This department was handed over by the Registrar of Co-operative Societies from the 1st of April 1918 and has continued to be run on the old lines. Certain changes are at present under consideration, but I am not entirely satisfied that the existing organisation, useful as it has undoubtedly been, is the most economic possible. Detailed proposals will be submitted after further discussion, but generally I am inclined to think that schools should be run by Local Bodies with the assistance possibly of grants-in-aid, as is the case in Madras and elsewhere. The present cost for a school is far higher (Rs. 1,500 per annum) than was originally contemplated by Mr. Pomfret (Rs. 600 per annum with a possibility of being self-supporting in a year) in his letter which is printed in G. R. No. 7262 of December 1911. Demonstrations have continued under Mr. Wagh, but here too I consider that a change of method may be beneficial. I found that in the Central Provinces where also the main line of work is the popularisation of a simple form of fly-shuttle loom, they employ demonstrators on Rs. 15 per month only, and give them a bonus of 8 as. on every loom which they introduce in any area. The manufacture of these looms has been taken up, I find, in many weaving centres in the Bombay Presidency, and I think, that with the assistance of a weaving carpenter, it should be possible to encourage such manufacture at new centres. The number of demonstrators can thus be largely increased without any extra expenditure, and they will become selling agents to the manufacturers. It is mainly a business proposition and should gradually be treated more and more as such. On the other hand, I am of the opinion that more should be done by the Department in introducing new patterns, and above all in creating a local demand before teaching new methods. The schools have suffered like other institutions from the prevailing epidemic of influenza, and the weaving industry generally has been hampered by the high price of yarns, the uncertainty of the market, and the difficulty of obtaining dyes. I have noticed in the course of my tour some interesting small power installations in various weaving centres, and I propose to investigate the limits within which such transition is desirable and should be encouraged for the weaving of coarse cloth.

(b) *Pottery*.—Clays sent to the Department for testing :—

Kaolin—Goa 2 samples, Khanapur 2 samples, Central Provinces 2 samples, Panch Mahals 1 sample.

Fire clays—Karachi 2 samples, Surat 4 samples, Jodhpur State 1 sample, Ahmednagar 1 sample.

Clays—Thana District 14 samples, Cutch 1 sample, G. I. P. Railway 11 samples, Surat District 1 sample, Porbandar 1, Burma 1, Kolaba 1, Jalgaon 1, Worli (Bombay) 3, Nadiad 2, Nizam State 1, Than (Kathiawar) 26, Sind 1, Satara 1, Director of Industries, Madras 4, Poona 4, Ahmednagar 1 sample.

Sand—Baroda 3 samples, Mysore 1.

Limestone—Director of Industries, Madras, 2 samples.

Iron Ore—Director of Industries, Bombay, (iron, Goa) 1 sample.

Of the above 96 samples, 49 samples were brought in departmentally and the localities were examined by the Superintendent of Pottery.

The testing of the majority of the samples is complete: where reports were necessary reports have been sent. 30 samples are under treatment in various stages of completion, and 10 samples have yet to be taken in hand.

Besides the testing of clays, drawings for kilns, factory buildings, and staff quarters for the proposed new Pottery Demonstration Factory, were prepared and notes and estimates for the scheme were made and forwarded to the Director of Industries by the Superintendent of Pottery. Practically the whole of the Thana District within one mile on both sides of the Bombay-Agra Road from Kurla to Thana, the country adjoining the road from Thana to Belapur, and from Thana to Uran *via* Panvel, have been minutely examined for clay deposits.

The country within a two miles radius of Than Road Station in the Lakhtar State of Kathiawar was surveyed by the Superintendent of Pottery, and very valuable clay beds, especially fire clays, were exposed.

The manufacture of bricks, and to a small extent roofing tiles, is carried on in different parts of the Presidency. No other branch of the Pottery Industry has yet been attempted in Bombay, notwithstanding the abundance of raw material, but it is hoped that when the Demonstration Factory, for which proposals are being prepared, is established, the commercial possibilities of various new lines of work will be indicated, and a practical training given to pupils who wish to learn the various processes in connection with the manufacture of earthenware.

The brick industry is flourishing but the quality of the article leaves much to be desired, and it has been demonstrated that a far superior brick to the ordinary Kalyan brick can be made from material found in the vicinity of Bombay. The lime and sand brick works at Marwa in Salsette and the Western India Brick Company's Works at Worlee also show that the brick industry is attracting capital and brains at the present juncture.

The roofing tile industry requires encouragement and guiding along right lines of manufacture and management. Some progress has been made in the Belgaum District where capital is being invested and Mangalore workmen employed, but larger commercial ventures are in view in the neighbourhood of Bombay City, and considerable progress may be shortly expected.

(c) *Oilseed Crushing*.—The production of vegetable oils in this Presidency has increased of late years. The difficulty however would appear to be that the right type of machinery is lacking, and that at present installed is not properly worked. Batteries of rotary ghanis are the commonest form of advance on the old bullock press and the American Anderson's Expeller, which however is sold at too high a price and is not suitable for all kinds of seeds, also has its devotees. It is understood that the American oilseed industry is in a similar plight, and everyone is looking for the ideal method of oil extraction. The method which has the most universal application in industrialised countries is undoubtedly the hydraulic press, particularly the large and more powerful types. In this way large quantities of seeds can be pressed at one time. This is a matter of commercial importance, since fresh seeds arriving on the market can be dealt with at once. Again better methods than those at present in use for heating the seeds require to be tested, as the use of steam has several drawbacks. The introduction of more efficient methods of decortication, deshelling and washing of seeds would result in the production of purer articles, and effect a saving in labour. Practically all the problems connected with the oilseed industry in India are mechanical ones and require the co-operation of expert engineers and oil chemists. With regard to the better utilisation of the oils, methods of purification should be adopted, and such oils would then be of value as edible oils.

The whole question of the use of oilseed cake for human and cattle food depends on the use of proper machinery, and this will effect an improvement on the yield of oil from these oil seeds. The proper decortication, cleansing and pressing of cottonseed is another subject worthy of considerable attention. The oil when purified would be of great value as an edible oil, and the resulting cake should have a prominent place as a highly nutritious foodstuff. Finally, a great future awaits the Indian vegetable oil trade with the introduction of hydrogenation resulting in the production of a solidified oil. The saving in transport alone would be enormous, apart from the production of a wholesome and efficient substitute for "ghee".

(d) *Dairying*.—This question is largely one of an agricultural nature, but there is a distinct chemical side which awaits development. Buffalo milk yields a large quantity of fat, and after this has been removed, the separated milk can be used for the preparation of casein, and also milk sugar. Casein is an article of considerable commercial importance, and the Casein Company of New York alone would monopolise all the casein produced in India. The technical applications of casein are almost unlimited, and hence the demand for casein in America and England. Milk sugar (Lactose) is also a valuable product, and it would appear from observations made that buffalo milk is particularly well adapted for yielding a good quantity of this sugar. It enters very largely into all forms of infant's food, and commands a high price, especially when pure.

For these two products alone, apart from the question of butter and cheesemaking, the dairying industry merits encouragement and development.

(e) *Bitterns*.—The proper utilisation of bitterns has stood apart as the prime subject of investigation by this Department. The reason for this is that Kharaghoda offers such a promising field for future industrial development. There are of course considerable obstacles in the way of commercial developments, chief amongst them being fuel, water supply, labour and transport.

To overcome the first we attempt to utilise the natural heat of the sun as far as possible, and to this end special pans are being constructed. This will, we hope, reduce the consumption of both fuel and water. The transport difficulty is to be averted to a certain extent by the introduction of a pipe-line to convey the bitterns by mechanical means to the factory. There will thus be a saving of labour, which is also a problem of no small magnitude in an isolated place like Kharaghoda. To show the possibilities of the bittern industry, I append the following figures showing the quantity of salts at present wasted in India:—

Magnesium Chloride...	193,000 tons.
Magnesium Sulphate...	127,000 tons.
Potassium Chloride ...	20,000 tons.
Bromine ...	1,800 tons.

(f) *Fisheries*.—A general survey of the conditions obtaining along our coasts was made in the hot weather. There is obvious scope for improvement in the present methods of curing fish, and the possibilities of canning on the lines adopted in the Madras Presidency must be tried and demonstrated. As compared with Madras, the supply of sardines except in the very south of the Presidency is too uncertain for any extensive operations. But the catches of mackerel (*scomber microlepidotus*) are considerable and this fish has been successfully canned in Madras. A large trade is done particularly from Karachi in the sounds of the gol fish (*sciæna sina*). We still export these for the manufacture of isinglass, and any visitor to the Crawford Market can see these sounds being collected in the fish market, while next door the manufactured isinglass is offered for sale. The possibility of the manufacture of the commercial article should be examined. A very large revenue is also derived from the traffic in sharks' fins which are exported to China as an article of food. So little is known at present about the possibilities of our fisheries that it is useless to say more for it in advance. Mr. Walke has been devoting part of his time to examining local conditions, chiefly along the Kanara and Ratnagiri coasts, and will shortly, it is hoped, be appointed as a wholtime officer under the Department. The necessity for scientific investigation as well as organisation has not been overlooked, and proposals will be submitted shortly.

(g) *Glass*.—War conditions while generally hampering industries, have temporarily assisted others through restrictions on freights, and glass is one of these. Five glass-making concerns have started in Bombay City during the War, and in spite of difficulties in connection with coal supplies, have met to some extent the local demand for cheap lampware in particular. The factory at Sunth Road closed during the year under report; and its position at a distance, both from markets and fuel supplies, was obviously not in its favour. The glass works at Talegaon continue to work on altruistic lines and supply blowers to many of the new works. Some progress was also made by the Ogale Brothers at Karad. Nearly all the glass works in this Presidency obtain their supplies of sand from Naini near Allahabad. The sand is suitable, but it is quite possible that nearer supplies of equal value will be discovered. Two of the glass works of Bombay are under Japanese managers, and two are attached to established trading concerns in glassware. All use direct-fired Japanese pot furnaces, and their consumption of coal, even allowing for the bad quality of some of the coal supply, is uneconomical in many cases. It is possible that in the future oil may be employed with success, but the supplies at present are too limited and freights too high to bring oil within the limits of practical politics. Probably one of the greatest needs of the glass industry at present is the provision of an expert who can construct furnaces on the regenerative or recuperative principle for the economic melting of glass.

(h) The possibilities of sugar manufacture are shortly to be tested by a local syndicate in the Ahmednagar District, where a suitable block of land on one of the new canals has been acquired with a view to its lease to the syndicate. The high price of Deccan gul makes the price of cane far higher than it is in Behar, and one essential for success is the growth for the factory of its own cane by improved methods. The syndicate's operations are watched with considerable interest and must prove of the greatest value as a lesson in the economical utilisation of water and manure, if for no other reason.

(i) The Department is mainly interested of course in nascent industries. Occasionally a moribund industry must be examined if only to discover whether it should be regarded as a shocking example or can in any way be revitalised. The Match industry in this Presidency is a case in point. Leaving aside derelict machinery, I have inspected one running concern and also made enquiries about their past experiences in pre-war conditions. Wood of course is the main difficulty, and it is exceedingly doubtful whether a really satisfactory wood for splints can be found in sufficiently large quantities and concentrated within a reasonable area to make the manufacture of splints a possible commercial undertaking. The common silk cotton tree (*Bombax Malbaricum*) provided a good enough timber for the boxes. But even if obtainable in specially large quantities for commercial purposes, the wood is useless for splints. The greatest success in the past seems to have been obtained with imported splints from Sweden, which is not encouraging. As a shocking example to point the moral of necessary preliminary enquiries and proper consideration of all the factors underlying commercial production, the Match industry on this side of India has its uses.

(j) To turn to brighter subjects, Brush making has made some progress. Many of the materials such as bristles and fibres have to be imported at present, but it is possible that substitutes may be found for some of these. The class of articles produced has undoubtedly improved.

(k) Button-making has attracted attention in the past and may command more notice in the future. The raw materials are available in the shape of bone and horn, to say nothing of the 'hoka' nut found in the south coast of Kathiawar, and the tali palm seeds available in Kanara which are already used for making coatbuttons, studs, etc. Mother-of-pearl from the Persian Gulf comes into Bombay normally, and could be made up easier here than at Dacca where the industry at present flourishes. The only buttons being made at present on this side are stamped out of aluminium sheets. The Department has taken over temporarily certain button-making machinery and proposes to experiment and examine the possibilities.

(l) In the absence of any available expert, no experiments have been made with tanning on this side of India. The experience gained in the Dharavi Tanne-

working under the Munitions Board, seems to show that under suitable direction considerable progress might be made. Experiments on a large scale have been carried out at Maihar in Central India under the Munitions Board, and their results are certain to be interesting and helpful.

Leather belting is made in Bombay, and its suitability to compete with the imported article is under investigation.

Roller skins, picker-bands, and pickers, have also been manufactured, but are not yet up to the required standard. It has been argued that English pickers are superior, because they have been seasoned for six months or more in sperm oil, but I find on enquiry that the Mills in Bombay do not consider the seasoning sufficient and adopt their own measures even with the English article. It is always an attractive proposition to try and encourage the manufacture of some article in common industrial use, but unless large stocks of a thoroughly adequate article are carried, industrialists naturally decline to run any risks and prefer to import something on which experience teaches them that they can rely.

(m) In connection with the Forests, a few small matters engaged the attention of this Department. The undoubted possibilities of the salai trees in Khandesh, to which Mr. Pearson called our attention sometime back, are to be further investigated. As pointed out in the Industrial Commission's Report, these Indian turpentine differ from the ordinary commercial variety, and it is possible that by special treatment still more valuable products will be obtainable. There is still, I believe, a little more laboratory work to be done before establishing a small plant on a commercial scale for demonstration purposes, and this is being undertaken. Experiments are being made under the Conservator of Forests, Southern Circle, to test various kinds of woods for their suitability for cask-making, and an ingenious device has been designed in Bombay for cutting cask staves. The distillation of rosha oil by steam should by now have been a *fait accompli*, but there have been serious delays in getting the plant made.

(n) Lastly, various small enquiries and indents from the Munitions Board have been attended to so far as possible with the inadequate staff at my command. For this, as already noted, special war conditions have been entirely responsible, and little more has been done than to survey the general field and give assistance wherever possible, and endeavour to ascertain where help and advice can be most profitably employed for the future.

I have the honour to be,

Sir,

Your most obedient servant,

P. J. MEAD,

Director of Industries.

**List referred to in paragraph 4 of the Administration Report
of the Department of Industries.**

Name of the District.	Name of the place visited.
Kolába	... Uran.
Ahmednagar	... Belápur.
Thána	... Thána.
Karáchi	... { Karáchi. Maurypur.
Ratnágiri	... { Jaigadh. Ratnágiri. Vijayadurg. Málvan. Vengurla.
Kánara	... { Kárwár. Ankola. Hattikeri. Belikeri.
Belgaum	... Belgaum.
Kolába	... Khapoli.
Ahmedabad	... Kharághoda.
Poona	... { Poona. Talegaon.
Belgaum	... Belgaum.
Kaira	... A'nand.
Surat	... Surat.
Poona	... { Poona. Phursungi.
Ahmednagar	... Ahmednagar.
Sátára	... { Karád. Kundal Road.
Dhárwár	... Dhárwár.
Belgaum	... Kittur.
Poona	... Poona.
Sholápur	... { Sholápur. Kumthe.
Bijápur	... Bijápur.
Poona	... { Poona. Málávali.
Násik	... { Deoláli. Násik.

P. J. MEAD,
Director of Industries

Annual Reports.

Report of the Department of Industries of
the Bombay Presidency for the official
year 1917-18.

GOVERNMENT OF BOMBAY.

REVENUE DEPARTMENT.

Resolution No. 8717.

Bombay Castle, 26th August 1919.

Letter from the Director of Industries No. Mis.—59 dated 22nd January 1919—Submitting the Annual Report of the Department of Industries of the Bombay Presidency for the official year 1917-18.

Government memorandum* No. 3861 dated 14th April 1919 to the Director of Industries.

Memorandum* from the Director of Industries No. Mis.—59 dated 28th June 1919.

RESOLUTION.—The Governor in Council recognizes the difficulties under which the new department has laboured with an entirely inadequate scientific and technical staff and records his appreciation of the energy and interest which late Director showed in this work. Proposals, however, have been separately submitted for the establishment required, and next year's report will be awaited with interest. The valuable assistance rendered by the Director's Advisory Committee, assistance which will become still more valuable, as the Director points out, when expert establishment is available and important problems can be adequately examined, is gratefully acknowledged.

SHAMRAO D. MANKAR,

Acting Under Secretary to Government.

[P. T. O.]

*Not printed.

To

- *The Commissioner in Sind,
- *The Commissioners of Divisions,
- *The Commissioner of Customs, Salt and Excise,
- *The Collector of Bombay,
- *All Collectors, including the Collectors in Sind, and the Deputy Commissioner, Upper Sind Frontier,
- *The Collector of Customs, Bombay,
- *The Chief Collector of Customs in Sind,
- The Director of Industries,
- *The Director of Agriculture,
- *The Registrar of Co-operative Societies,
- *The Chief Conservator of Forests, Bombay Presidency,
- *The Conservators of Forests, N., C. and S. Circles,
- *The Deputy Conservator of Forests in charge Sind Circle,
- *The Accountant General,
- *The Director of Public Instruction,
- *The Compiler, General Administration Report,
- *The Oriental Translator to Government,
- *The Private Secretary to His Excellency the Governor,
- *The Educational Department,
- *The Public Works Department,
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- *The Millowners' Association, Bombay.
- *The Millowners' Association, Ahmedabad,
- *The Bombay Piecegoods Merchants' Association,
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- *Members of the Advisory Committee,
- †The Government of India,
- †The Under Secretary of State for India.

*With copies of the Report.

†By letter.

No. of 1919.

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