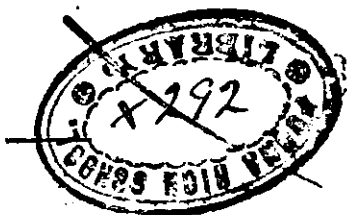


REPORT
OF
THE NINTH
INDIAN INDUSTRIAL
CONFERENCE

HELD AT KARACHI

ON THE

25th December 1913.



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CONTENTS.

	PAGE.
Introduction	i
Summary of proposals and suggestions	xxxii
Resolutions passed by the Conference	1
Proceedings of the Ninth Indian Industrial Conference	7
Speech of Rao Bahadur Dewan Hiranand Khemsing, Hyderabad, Sind, Chairman of the Reception Committee	8
Election of the President	11
Address of the President, the Honorable Mr. Lalubhai Samaldas, C. I. E., Bombay	13
Presentation of the Annual Report by the Honourable Rao Bahadur R. N. Mudholkar, C. I. E., the General Secretary, Indian Industrial Conference.	40
Adoption of the Report	41

THE PAPERS.

<p>(1) Manures tried in the Central Provinces and Berar and experience gained from the use of the same : <i>By D. Clouston Esqr., M.A., B. Sc Deputy Director of Agriculture S. C., Nagpur.</i> ...</p>	42
<p>(2) The Sugar industry in the United Provinces : <i>By the Hon'ble Mr. H. R. C. Hailey, Director of Agriculture U. P.</i></p>	53
<p>(3) Cooperative Central Sugar Factories : <i>By G. N. Sahasrabudhe, Esqr., Sugar Expert, Poona</i> ...</p>	64

- (4) Indian Sugar Tariffs and the Indian Sugar refining industry : *By G. N. Sahasrabudhe Esqr., Sugar Expert, Poona* , 67
- (5) A Short note on American Cotton in Sind : *By G. S. Henderson, Esqr., N.D.A., N.D.D., Deputy Director of Agriculture in Sind, Mirpur Khas* ... 71
- (6) Fruit cultivation and fruit industry : *By L. B. Kulkarni Esq., L. Ag., Ganesh Khind Botanical Gardens, Kirkee* 76
- (7) Indian Paper making materials : *By David Hooper Esqr., F.C.S., F.I.C., F.I.S., The Economic Botanist, Indian Museum, Calcutta* ... 101
- (8) Paper pulp industry in India from Baib Grass: *By Rai Bahadur Munshi Prag Narain Bhargava, Director, Lucknow Paper Mills, Lucknow* ... 111
- (9) The Paper making industry in India : *By Dhruva Sumanas, Esqr., Paper Technologist (London), Ahmedabad* 117
- (10) A Note on prospects of establishing Match Factories in Southern India: *By Rao Saheb M. Ram Rao Garu, Conservator of Forests, Travancore...* 132
- (11) Note on Co-operation among the Mill hands : *By G. K. Devadhar, Esqr., M.A., Member, Servants of India Society, Bombay* 156
- (12) Cooperative Subjects. (Three Notes) : *By G. K. Devadhar Esq., M. A., Bombay* 167
- (13) Economic conditions in India: *By C. Gopal Menon Esqr., F.I.P.S., Madras* 191
- (14) Our Industrial Future : *By A. H. Silver Esqr., Cawnpore Woollen Mills Co., Ltd., Cawnpore* ... 209

CONTENTS.

- (15) Development of Banking in India : *By Sorab R. Davar, Esqr., Principal, College of Commerce, Bombay 214*
- (16) The present downfall of the Swadeshi Banks : *By B. B. Master Esqr., F.C.R.A., Corporate Accountant, Karachi 219*
- (17) The transition in international trade of India : *By Professor Radha Kamal Mookerjee, M.A., Krishnah College, Berhampore 229*
- (18) The place of Indian Art in Indian industries : *By Samarendranath Gupta Esqr., Central Museum Lahore 237*
- (19) Tanning industry, its development in India : *By P. V. Mehl, Esq.; M.A., B.Sc., Leather Specialist, (London), Government of India Scholar, Ahmedabad 245*
- (20) Hides and skins industry in Berar : *By H. R. Pitke, Esqr., Prices Current Inspector, Akola 258*
- (21) Some economic aspects of the Swadeshi movement : *By S. Satyamurti Esqr., B.A., B.L., High Court Pleader, Madras 271*
- (22) Notes on industrial organizations in India *By L. G. Khare, Esqr., Assoc. Editor, Science and Industry, Bombay 284*
- (23) Progressional ruralization of the Punjab : *By Professor Balkrishna, M.A., Gurukul, Hardwar 295*
- (24) Aluminium industry in India ; *By Professor P. G. Shah, M.A., Forman Christian College Lahore 312*

- (4) Indian Sugar Tariffs and the Indian Sugar refining industry : *By G. N. Sahasrabudhe Esqr., Sugar Expert, Poona* , 67
- (5) A Short note on American Cotton in Sind : *By G. S. Henderson. Esqr., N.D.A., N.D.D., Deputy Director of Agriculture in Sind, Mirpur Khas* ... 71
- (6) Fruit cultivation and fruit industry : *By L. B. Kulkarni Esq., L. Ag., Ganesh Khind Botanical Gardens, Kirkee* 76
- (7) Indian Paper making materials : *By David Hooper Esqr., F.C.S., F.I.C., F.J.S., The Economic Botanist, Indian Museum, Calcutta* ... 101
- (8) Paper pulp industry in India from Baib Grass: *By Rai Bahadur Munshi Prag Narain Bhargava, Director, Lucknow Paper Mills, Lucknow* ... 111
- (9) The Paper making industry in India : *By Dhruva Sumanas, Esqr., Paper Technologist (London), Ahmedabad* 117
- (10) A Note on prospects of establishing Match Factories in Southern India: *By Rao Saheb M. Ram Rao Garu, Conservator of Forests, Travancore...* 132
- (11) Note on Co-operation among the Mill hands : *By G. K. Devadhar, Esqr., M.A., Member, Servants of India Society, Bombay* 156
- (12) Cooperative Subjects. (Three Notes) : *By G. K. Devadhar Esq., M. A., Bombay* 167
- (13) Economic conditions in India: *By C. Gopal Menon Esqr., F.I.P.S., Madras* 191
- (14) Our Industrial Future : *By A. H. Silver Esqr., Cawnpore Woollen Mills Co., Ltd., Cawnpore* ... 209

CONTENTS.

(15)	Development of Banking in India : <i>By Sorab R. Davar, Esqr., Principal, College of Commerce, Bombay</i>	214
(16)	The present downfall of the Swadeshi Banks : <i>By B. B. Master Esqr., F.C.R.A., Corporate Accountant, Karachi</i>	219
(17)	The transition in international trade of India : <i>By Professor Radha Kamal Mookerjee, M.A., Krishnah College, Berhampore</i>	229
(18)	The place of Indian Art in Indian industries : <i>By Samarendranath Gupta Esqr., Central Museum Lahore</i>	237
(19)	Tanning industry, its development in India : <i>By P. V. Mehd, Esq., M.A., B. Sc., Leather Specialist, (London), Government of India Scholar, Ahmedabad</i>	245
(20)	Hides and skins industry in Berar : <i>By H. R. Pitke, Esqr., Prices Current Inspector, Akola</i>	258
(21)	Some economic aspects of the Swadeshi movement: <i>By S. Satyamurti Esqr., B.A., B.L., High Court Pleader, Madras</i>	271
(22)	Notes on industrial organizations in India : <i>By L. G. Khare, Esqr., Assoc. Editor, Science and Industry, Bombay</i>	284
(23)	Progressional ruralization of the Punjab : <i>By Professor Balkrishna, M.A., Gurukul, Hardwar</i>	295
(24)	Aluminium industry in India ; <i>By Professor P. G. Shah, M.A., Forman Christian College Lahore</i>	312

CONTENTS.

- (25) Industries suitable for the blind: *By Dr. Nilkanthrao Dayabhai, L.M., and S. Principal, Victoria Memorial School for the blind, Bombay* ... 340
- (26) A Note on Hyderabad industries: *By Rao Bahadur Dewan Bulchand, Hyderabad (Sind)* ... 351
- (27) The lacquer industry of Khanoh: *By Bulchand Karamchand, Esqr., B. A., Hyderabad, Sind* ... 359

SPEECHES ON THE RESOLUTIONS.

- The First Resolution (Indian Banks)* Mr. D. E. Wacha, Rao Bahadur R. N. Mudholkar, Rao Bahadur Hiranand Khemsing, Messrs. P. D. Shamdasani and C. P. Ramaswamy Iyer ... 365
- The Second Resolution (Congress of Commerce)* Mr. Jehangir Bomanji Petit, Hon'ble Sir Fazulbhoy Churrimbhoy, Lala Goverdhandas ... 370
- The Third Resolution (Cooperation among Indian Chambers of Commerce)* Mr. C. Y. Ohintamani, Lala Lajputrai, Mr. C. Gopal Menon ... 376
- The Fourth Resolution (Weights and Measures)* Mr. J. Chowdhary, Mr. Gopaldas Jhamatmal ... 377
- The Fifth Resolution (Apprentices)* The Hon'ble Mr. Gokuldas K. Parekh, The Hon'ble Mr. G. V. S. shagiri Aiyer, Mr. Shri Kishendas ... 378
- The Sixth Omnibus Resolution (From the chair)* ... 380
- The Seventh Resolution (Gift of Dr. Rash Behari Ghosh)* Mr. G. K. Devadhar, Mir Ayubkhan ... "
- The Eighth Resolution (Office bearers)* Hon'ble Dewan Bahadur L. A. Gavindaragava Iyer, Hon'ble Dr. Nil Ratan Sircar ... 382

CONTENTS.

vii

APPENDIX I.

Resolutions passed at the first, second, third, fourth, fifth, sixth, seventh and eighth Indian Industrial Conference	1
--	---

APPENDIX II.

List of delegates to the Ninth Indian Industrial Conference	39
--	----

REPORT ON THE INDUSTRIAL CONFERENCE
WORK AND RECORD OF THE GENERAL
INDUSTRIAL ACTIVITY IN THE COUNTRY
IN THE YEAR ENDING WITH NOVEMBER
1913.

Report on Industrial Conference Work	41
Summary of Accounts	48
Government and industrial development	51
Industrial activity of the people	71

APPENDIX I.

Indian Patents, applications, specifications and designs filed	77
---	----

APPENDIX II.

Joint Stock Companies registered during the year ...	80
--	----

INDEXES.

PRINTED AT MADRAS.

At the AMBIKA PRESS, List of Contents, Introduction pages i to xlii, Papers, pages 155 to 218, Resolutions, Annual Report, Appendices I and II p. 1 to 84.

At the GUARDIAN PRESS, Resolutions of the 9th Conference, Proceedings and papers from p. 1 to 154B.

At the MINERVA PRESS, pages 229 to 382.

At the KANARA PRESS, pages 219 to 228B.

INTRODUCTION.

There are bound to be set-backs, for there can be no continuous progress in banking business as in all matters and the only thing we have to be careful about is to see that even after each set-back we are further on the road and nearer our goal than when we began. In spite of the present gloom the future does not seem to me to be devoid of hope; and it is entirely in our hands as to when and to what extent we are able to realise our expectations.

* * * * *

We must not allow our judgment to run away with our feelings, but must keep our heads cool, and direct our energies to finding out the good in the evil; for I sincerely believe that, in the economy of Providence, there is no single evil without its counterbalancing good. (*Presidential address of the Honourable Mr. Lalubhai Samaldas*).

Let education be regarded as the handmaid of industry, a means to an end rather than an end in itself. I refuse to believe that energy and perseverance are lacking in India, they merely require directing into the right channels, and the earnest attention which you, gentlemen, are now bestowing upon the subject will, I am confident, eventually bear fruit in the shape of a revival of industry in our midst. (*Mr. A. H. Silver*).

There can be no two opinions as to the fact that the material prosperity of a country entirely depends upon its commerce, and the industrial development of its resources. That we are advancing there is not the least doubt as is evident from the feverish jactivity in every department of life. It is for Indian patriots, financiers, and well-to-do people to educate the people at large, and to explain to them the absolute necessity of making a united effort as far as it lies in their power to come forward and to help the growing industries and industrial concerns of the country and to provide the necessary capital for their development.

There is plenty of wealth in India in the deposit vaults of Maharajahs, Rajas and Talukdars and the tiny hoards of the thrifty agriculturists, and unless it is made available for remunerative industrial enterprizes, the economic development of the country will be arrested. It is, therefore, the duty of all enlightened men to show the way to their wealthy neighbours and less advanced brethren how to invest their savings in commerce and industry, which will start India on a career of prosperity and accelerate her economic regeneration. (*Mr. D. K. Ghosh, Member, Bengal Legislative Council*).

The Ninth Session of the Indian Industrial Conference which was held at Karachi in the Pandal of the Indian National Congress on Thursday, the 25th of December 1913, was in the matter of attendance one of the most successful sessions of that organization. This success was in no small measure due to the courtesy of the Reception Committee of the Indian National Congress in agreeing to the Conference holding its sitting one day before the commencement of the Congress Session and to the valuable help rendered by the Reception Committees of the Conference and Messrs. Bulchand Karamchand and Keshavdas of Hyderabad and to Mr. M. B. Sant the Assistant Secretary of the Conference who had proceeded to Karachi in advance to organize the Session. About 2000 invitations were issued to prominent persons all over India, the bulk of the invitations having been sent to gentlemen in Sind, and it was gratifying to find that, long before the appointed hour, people began to pour in and by noon, the pandal was full. The attendance was highly representative and consisted of people of all denominations, castes and creeds. Delegates from various Provinces, representatives of the Karachi Chamber of Commerce, merchants, traders and bankers from Bombay, Sind and other parts in the country, had mustered strong to hear the address of the Hon'ble Mr. Lalubhai Samaldas, who, as an expert in banking was expected to handle the subject of the recent Banking failures and to discuss the *pros* and *cons* of the unprecedented financial crisis which affected almost the whole country, bringing in its train ruin and desolation into hundreds of families of the middle classes. That the Conference was right in electing a sound financier like the Hon'ble Mr. Lalubhai at this juncture is more than justified by his masterly diagnosis of the recent financial catastrophe and his cheering optimism for the future of Indian industries and commerce. The President comes from a family that has for several generations held high offices in the States of Kathiawar and have been held in great respect and esteem. The Hon'ble Mr. Lalubhai, who was a high official

in Kathiawar State, soon perceived that his abilities lay in the direction of commerce and exchanged a commercial career for the restricted field of service and has since that time carried on the work of a merchant in various capacities. The sound position of the Bank of India, of which he is a Director is to no small extent due to his abilities. He is connected with the cement works which have lately been started at Lorbunder. It is no wonder, therefore, that under the able guidance of such a distinguished man, the proceedings of the Karachi Conference were highly successful.

The Proceedings were opened by Rao Bahadur Dewan Hiranand Khemsing of Hyderabad, Sind, who as the Chairman of the local Reception Committee delivered an interesting address in welcoming the delegates to the Industrial Conference. Rao Bahadur Hiranand remarked that while the produce of Northern India is finding its exit through Karachi, which serves also as an inlet for foreign goods, the outlook of the industries of the Province itself is very gloomy, there being not a single textile or sugar mill or a tanning factory in Sind, and expressed his hope that the Session of the Conference may give an impetus to local industries. A factory of handlooms at Shikarpur, lacquer work, Hala pottery and printing of cloth, rice hulling and flour mills; conversion of sugarcane into molasses and curing of hides in a few places were the only industries in Sind according to Mr. Hiranand and most of them were in a gradually languishing state.

The Presidential address which was characterised with great ability and impressiveness was listened to with great attention. The President at the very outset explained that the motive which actuated him to accept the honor was that as a representative of the Indian Merchants' Chamber and Bureau, which has taken up the Hon'ble Sir Fazulbhoj's proposal to hold an All-India Commercial Congress, he will be able to remove certain misunderstanding, and to help in bringing about a complete

understanding between the proposed institution and the existing Indian Industrial Conference, and if possible the amalgamation of the two.

In alluding to the deplorable bank failures, Mr. Lalubhai said that the cases arising out of these failures being then *sub-judice* no detailed discussion of the causes leading to them was permissible. The prime cause in his opinion was either "vast speculation or locking up of an unduly large amount of call and short notice deposit money in long period loans," which could not be available when depositors pressed for repayment. He then gave the history of the Bank of India pointing out how carefully the Bank was organised and a well qualified man selected to manage its affairs, and it was no wonder that in the midst of the tremendous financial crisis, this bank with which he was personally connected has worked successfully from the commencement and maintains an exceedingly strong position. "Expert, efficient and honest management under active control of the Directors" are the essentials of a sound and safe banking business even though accompanied with moderate profits at the beginning. Another requirement of sound banking is that neither the Manager, nor the Directors should have any personal interest in inflating the profits of the company. The establishment of Swadeshi Banks gave an opportunity to educated Indians to learn banking methods and to manage banking concerns, which were always in the hands of Europeans, the highest post to which Indians could aspire being those of shroffs or bill keepers.

The difficulties which face our swadeshi concerns are quite identical with those that had to be faced by the English joint stock Banks in their initial stages, as will be evident from the following extract from Gilbert in his book on Banking :—

"But, after joint stock banks were started as matters of speculation they increased more rapidly than efficient managers could be found. The new Banks naturally enough looked to Scotland. But the Scotch banks had the sagacity to raise the salaries of their principal officers to prevent their

emigration to England. In some cases these Scotch men who were appointed managers of English Banks had never held office in a Bank before, or else it was an office so inferior that all they knew about banking was merely the routine of office."

The first English joint stock Banks had experienced the same difficulty with regard to the efficient control of the Directors over the affairs of a bank. In England also as in India, officers in the army, Barristers, solicitors, medical men, retired tradesmen and country gentlemen were considered as the most eligible directors. These gentlemen, majority of whom were quite unacquainted with banking and some of whom were destitute of business habits, eventually brought about the ruin of the banks through their inefficiency. Another reason for the failure of some of the Swadeshi banks was that they vied with each other in their anxiety to show inflated profits by taking up unsound lines of business, some of which were not pure banking. English Banks were also not free from this mistake and had been warned by Lord Goschen.

After comparing the state of the English Banks in their initial stages with the Indian banking concerns of to-day, the President comes to the conclusion which may be quoted in his own words :—

"What is required is not merely the training of men as Directors and Managers, but educating the general investing public as to their rights and responsibilities. When this is done, banks will be able to stand the strain of slumps in trade and industries, and will by gaining the confidence of the investors attract deposits and slowly increase their profits. These recent failures and disclosures need not make us unduly despondent. Whenever institutions are started in response to a strong sentiment, there will not be wanting some who will use that sentiment for their own aggrandisement. Though they may go on prospering for some time, when a crisis like the present one comes they will be found out and weeded out, but during the process they will have done an amount of mischief, causing loss to many. That is the price we must pay for purchasing experience, which, if properly utilized, will surely lead to the successful growth of healthy institutions."

After dealing in detail with the financial crisis arising from the deplorable and unprecedented Bank failures in the

Punjab, Bombay Presidency and other parts of the country, the President next passed on to other industries, which he divided for the sake of convenience into (1) agriculture and its allied industries and (2) non-agricultural industries, including mining and chemical industries and handicraft. In his opinion, progress in agriculture on the whole has been satisfactory, due to the activities of the Pusa Research Institute and of the agricultural Colleges, Schools and Demonstration farms in almost every Province in British India. He justly paid a tribute of gratitude to Sir Sassoon David of Bombay, who has placed at the disposal of the Bombay Government a munificent sum of eight lakhs of Rupees for the establishment of Vernacular agricultural schools and the general importation of agricultural methods in the Presidency. Central Co-operative Bank of Bombay and other similar bodies are doing a lot of useful work.

In regard to the sugar industry he urged the necessity of starting factories for refining of sugar, wherever practicable. Owing to the low percentage of sugar in the canes grown in India, experiments are being made in the United Provinces to improve the quality of the indigenous cane by the selection of the best type grown in the country, as well as by the introduction of superior exotic varieties. The Sugar Expert, who went to the West Indies as a Government of India Scholar, advocates the establishment of Gur Jaggery making factories before starting refineries, which may be added later on.

Jute mill next claimed his attention. The total production of woven goods is steadily increasing and attempts are being made to improve the quality of these goods. The production of cotton goods (woven) has doubled itself during the last decade and yet the imports of foreign woven goods do not show any signs of decrease. Larger imports of American cotton have enabled the Indian Mills to spin finer counts of yarn and thus to improve the quality of cloth turned out. According to Mr. Lalubhai this industry is much hampered by the invidious excise duty,

and the necessity of depending on foreign countries for the plant and machinery.

The decline of the natural indigo industry in the fierce competition with the artificial indigo cannot be arrested unless the Scientific Research work that is being carried on by the Behar Planters' Association with the help of a Government grant succeeds in finding some way out of the difficulty.

Among other large industries, the President gives a prominent place to the Tata Iron and Steel Company, as the largest and the most important Swadeshi enterprise, which has demonstrated that it was possible to manufacture iron and steel on a profitable basis.

The failure of the Joint Stock concerns, other than banks, was next alluded to. The causes of the failures may be thus summarised in his own words :—

"These are : (1) want of expert preliminary inquiries as to the possibility of the success of that particular industry ; (2) inexpert or inefficient internal management ; (3) want of control by the agents ; (4) want of commercial or economic knowledge as regards that particular industry ; (5) the difficulties in the way of getting the required working capital at a profitable rate of interest."

Another enterprise which does much credit to Messrs. Tata & Sons., is the Tata Hydro-Electric Works, which are now reaching completion. The installations when completed will give a great impetus not only to the Spinning and Weaving Mills of Bombay, but to other concerns in the city and suburbs of Bombay and will also help agriculture in the surrounding Districts.

Cotton seed oil industry and cement-making were next dealt with and the possibilities of expansion and improvements in these concerns was pointed out.

A paper Expert who has recently returned to Ahmedabad after training in foreign countries suggests the establishment of a factory at Ahmedabad for making hand paper from paper

pulp. The President recommends the starting of such a concern if the dealers in that article are satisfied with the proposals and qualifications of the young man.

In connection with the training and prospects of Technical students, Mr. Lalubhai thinks that from the sympathetic and encouraging tone of the Report of Sir Theodore Morrison's Committee, there is reason to hope that the India Office is willing to give every assistance to the Government Scholars and other students in acquiring the necessary training.

In conclusion, the President expresses his satisfaction with the progress made since the inception of the Indian Industrial Conference, and has acknowledged in highly appreciative terms the services rendered by this organization which has successfully done much spadé work, in the following directions :—

"Our demands about granting facilities for technical and commercial education for improvement of agriculture, for an industrial survey and for the establishment of a central Co-operative Bank have been carefully listened to by Government, who have granted them in the way they thought best and practicable. A Committee has been appointed to make inquiries about the desirability of standardisation and uniformity of weights and measures.

The work which remains to be done by the Conference will be of a detailed and technical character. The President made the attitude of the proposed Congress of Commerce towards the Industrial Conference clear by assuring the meeting on behalf of himself and Sir Fazulbhoj Currimbhoj, the originator of the scheme, that they had not, at the time of making the proposal, the remotest idea of strangling the Conference but that he would be the first to welcome the amalgamation of both the institutions, if that be possible, or co-operation between the two in a "spirit of amity and friendliness," in case amalgamation be impracticable.

After the usual presentation of the Annual Report on the work of the Indian Industrial Conference office by the General Secretary, the papers contributed by official and non-official

gentlemen were duly submitted to the Conference. The writers of papers, who were present were allowed permission to read abstracts from them.

The number of papers received this year was even larger than that of last year. While printing these papers in the body of the Report, an attempt is made to group them together according to the subject matter of each.

The first paper which appears in the Report was contributed by Mr. D. Clouston, Deputy Director of Agriculture, C. P., and deals with "manures tried in the C. P. and Berar and experience gained from the use of them." Mr. Clouston mentions in this paper the manures actually used by the cultivators for sugarcane, vegetables, cotton crop, rice, oil seeds, and other crops in these Provinces and the different manures tried by the Agricultural Department in Government Farms and recommended to agriculturists and the results of these trials.

"To sum up, extensive as opposed to intensive cultivation prevails in these provinces and manure is not highly appreciated except by the very few—*e. g.*, the best of the cotton growers and those who grow garden crops. The ordinary village *ryot* is content with poor outturns and does not trouble much about the quality or quantity of his farm-yard manure. He is a man of prejudices too, and will, for religious reasons, not willingly agree to apply bone-meal, saun-hemp, night-soil or *poudrette* except under pressure. He is poor and cannot afford to take risk in purchasing costly manures, which for all he knows, may bring him no profit. Added to this, being a poor observer, he can never tell with any degree of accuracy what profit he derives from manuring his different crops. He has yet to learn economy in manuring, and the best way to teach him is to work from within. We must first convert the more enlightened and by making such arrangement for the provision of cheap supplies of manure as will convince them that intensive cultivation is, so far as it depends on high manuring, a paying proposition. This the department is trying to do through its District Agricultural Associations, practical training classes and its Experimental and Demonstration Farms.

Sugar industry, which is so intimately connected with agriculture and forms part of it, naturally claims our attention and deserves a careful study. There are three papers this year

on this industry, first is contributed by the Hon'ble Mr. Hailey, Director of Agriculture, U. P., who writes on "The Sugar industry in the United Provinces," and two by Mr. G. N. Sahasrabudhe, one on "Indian Sugar Tariff and the Indian sugar refining industry," and the other on "Co-operative Central Sugar Factories."

In the first paper the Hon'ble Mr. Hailey points out that the great bulk of sugar comes into India from Java which sent out as much as 10 million cwt. of sugar in 1911/12, although the area under sugarcane in that small island is actually much less than in India. According to the writer, the area in 1911 under this crop in Java was only 335,591 acres, whereas in the United Provinces alone sugar cane occupied nearly one million and a half acres. Notwithstanding these facts, owing to superior methods and machinery used in Java, she has become a formidable competitor with India in the manufacture of sugar. This is mainly due to the enormous wastage by the Indian method in making *gur* which still is preferred by a large section of the Indian public. This wastage is so much that "the amount of sugar burnt in the megass in the United Provinces as fuel would amply supply all the needs of the Province and obviate the necessity for imports." Another defect in the Indian process of *gur* making is the direct heating of the cane juice over the fire, which destroys much sugar and hence has been abandoned in other countries. Large indigenous factories which formerly made sugar from *rab* have been abandoned owing to the steadily increasing imports of foreign sugar. In spite of fluctuations in the rates of *gur*, rise in the price of labour and cost of cattle, there is yet ample room at least in the U. P. with its large cane crop for the manufacture both of sugar and *gur*.

After describing in detail the processes actually in use in Java for the manufacture of sugar the author refers to the two successful factories of the U. P., viz ; the Rosa Sugar Factory,

Rosa and Raja Lalta Prasad's Factory at Pilibhit. The first which is under European management has already conferred a great boon on the agriculture of the District. The second which is owned by an Indian gentleman and worked entirely by Indian labor has for its object the demonstration to the people of the U. P. that sugar could be manufactured in a modern factory by methods which could not offend the feelings and religious susceptibilities of the most orthodox Hindus and at the same time on thoroughly hygienic principles.

Mr. Sahasrabudhe in his paper introduces the question of the revision of the Indian Sugar Tariff. In his opinion, the arguments advanced in support of the Resolutions on this question which came up before the Imperial Legislative Council on two occasions were "non-convincing and unsatisfactory." Unless radical improvements are made in the processes and methods of sugar-making in India mere increase in the duty on foreign sugar will be of very little avail. With the improvements in these methods alone, we will in the course of a few years be able to compete with foreign sugar *even with our present tariff* except perhaps in sea coast Provinces like Bombay or Madras.

Mr. Sahasrabudhe points out that practically in all other countries except India, bulk of the imported sugar comes in the form of raw sugar (gray crystals) below D. S. and is refined on the spot. "Why should we not" he argues "get raw sugar and refine it here?" To make this possible he suggests the revision of the present Sugar Tariff as the conditions of the sugar market make it absolutely imperative. His conclusions are given below in his own words for the benefit of our readers:—

"What I beg to propose to the Government is that the duty on sugar should be made a *specific* duty instead of *ad valorem* as it is at present and that there should be a distinct difference between the duty on raw sugar (*i. e.* 15 D. S. and below), and white sugar (*i. e.* 16 D. S. and above). After taking into consideration our Indian conditions I should think that a duty of as. 4

per cwt. on raw sugar and as 12 per cwt. on white sugar would serve the purpose. At the usual prices of raw and white sugar this is equivalent to about 3½ per cent on raw sugar and 7 per cent on white sugar. Such an arrangement will not materially increase the retail price of sugar in India (which is the chief argument against the revision of our present Sugar Tariff), and at the same time it will leave a profit of about Rs. 10 per ton of raw sugar melted, to the refiner. A refinery melting say 100 tons of raw sugar per day will cost about Rs. 10,00,000 and will melt about 30,000 tons of raw sugar per year. A profit of Rs. 10 per ton means a gross profit of 30 per cent on the capital outlay. Of course the net profit will be smaller than this but it will be a steady profit and will be sufficient to carry on the industry successfully."

In his paper on "Co-operative Central Sugar Factories," Mr. Sahasrabudhe shows clearly how wasteful and defective the methods of the Indian manufacture of Gul and Sugar are when compared with those followed in countries outside India. For the removal of these defects and to encounter the numerous difficulties experienced in India as in other countries, he advocates co-operation between the cultivators on the one hand and capitalists or business men on the other and the establishment of Central Sugar Factories after the models of similar societies in Java and the West Indies.

He has formulated the following scheme, which deserves careful consideration and practical trial, in all places in India where the conditions are favourable.

"Since the complication in the ownership is thus removed there remains no necessity of issuing any debentures. I think, organization of a factory dealing with say 3000 acres in the United Provinces should be as follows :—

The total capital required will be say Rs. 10,00,000 made up as follows :—

Factory	...	...	...	... Rs. 6,00,000
Advance to cultivators	...	...	...	... Rs. 3,00,000
Working Capital	...	...	...	... Rs. 1,00,000
				Total ... Rs. <u>10,00,000</u>

The capital should be raised by an issue of either all ordinary shares or half ordinary and half Preference shares carrying a dividend of 7 per cent. Money should be advanced to the cultivators at the rate of 9 per cent on the understanding that all the cane grown with that money is to be delivered to the factory at rate which will be acceptable to both the factory owners and the cultivators. The total amount to be advanced to each cultivator should not exceed half of the estimated value of outturn.

At the end of each financial year after paying all the factory expenses, a dividend of 7 per cent on the paid up capital and after allowing for depreciation at 5 per cent on plant and buildings and leaving aside a reserve fund equal to 10 per cent of the gross profits, the surplus profit that may remain should be distributed equally between the ordinary shareholders and cane-cultivators, the share of each cultivator being in proportion to the cane delivered by him in that year."

The arrangement proposed in the above scheme, will in the opinion of this writer, be to the mutual advantage of both the cultivator and the capitalist, and convince the ignorant farmers of the benefits to be derived from the Central Sugar Factory System.

Cotton cultivation, being one of the principal industries of India, attracts every year one or two writers. This year Mr. G. S. Henderson, the Deputy Director of Agriculture in Sind, gives his experiences in cotton cultivation in his "Short note on the American Cotton in Sind."

Sindhi cotton is short stapled, coarse and strong with a particularly good color. To improve this indigenous cotton and to introduce new varieties, the Agricultural Department has been carrying on experiments in their demonstration farms for the last eight years. Indian growths of superior quality such as Broach had to be discarded as unsuitable to the land in Sind. Egyptian cotton was next tried and the trial had, it appears, to be given up and, finally, trial is being given to American cotton, and the results are decidedly encouraging. Mr. Henderson who has visited the chief American cotton growing centres has selected the "Triumph" variety as particularly suited to the climate and soil of Sind. 40 tons of the seed of this cotton was

obtained and distributed in good time in the cotton producing tracts. A syndicate has been formed by some of the Bombay mill owners, to buy, gin, bale and dispose of this American cotton grown in Sind. The syndicate has erected cotton gins at two places.

We now proceed to the paper contributed by Mr. L. B. Kulkarni, L. Ag., who is attached to the Ganeshkhind Botanical Gardens, near Poona, Mr. Kulkarni's contribution partakes more of the nature of a small treatise on "Fruit cultivation and Fruit industry" than a paper for the Industrial Conference. It is packed with information of a most practical kind and ought to be utilized by owners of orchards and others interested in fruit rearing and fruit marketing.

Mr. Kulkarni has shown that the majority of fruits now grown in India were known to the ancients and were in general use both for dietetic purposes and for their medicinal properties. To avoid being deceived by unscrupulous dealers in plants and grafts, who occasionally mix up inferior sorts when complying with requisitions, he points out that it is always better to make one's own grafts and to keep a nursery.

Mr. Kulkarni has in his paper dealt with the following subjects :—

- (1) Selection of proper soil for fruit plants
- (2) Proper site and situation for the fruit garden
- (3) Preliminary operations of the field to make the land suitable for fruit growing
- (4) Distance between plants
- (5) Process of planting fruit trees
- (6) Sub-crops which may be raised before the trees begin to bear fruits

- (7) Method of watering .
- (8) Manures suitable for different fruits
- (9) Importance of pruning and thinning
- (10) Treatment of diseases
- (11) Methods of harvesting
- (12) Grading of fruits according to size, quality, etc.
- (13) Wrapping and packing the fruit for the market.

In addition to the information on the above points, the writer gives some statistics to demonstrate the value of fruit as a commodity for export, describes the measures adopted by foreign countries to develop this industry and exhorts his countrymen to devote their attention to fruit culture which is so much neglected in India.

We have received three contributions this year, on Paper-making. The first paper is contributed by Mr. David Hooper, the Economic Botanist, Indian Museum, Calcutta.

Mr. Hooper shows that out of 70,000 tons of paper which is approximately the annual requirement of India, only 25,000 tons are supplied by the Indian mills; there is thus a large margin for the development paper making industry in India. The author has mentioned several varieties of grasses, leaves, bamboos and other trees yielding materials suitable for the manufacture of paper which deserve careful trials.

Rai Bahadur Munshi Prag Narain Bhargava, who is the Director, Lucknow Paper Mills, writes on "Paper pulp industry in India from Baib grass." In the opinion of the Rai Bahadur the following causes make it impossible for India to compete with foreign countries :—

- (1) In Europe every paper mill is situated at a convenient distance from the supply of raw material, whereas in India there is no pulp Factory and the mills are far away from sources of raw material.
- (2) In Western countries paper is made mostly from pulp and the paper mills have very little to do with the handling of raw material. In India, however, the paper mills have to collect their own grass, pay freight on the full weight of grass, reduce it to pulp after throwing away nearly 60 per cent of refuse before it is utilized for paper making
- (3) In Europe, the pulp mills can supply ready made pulp to paper mills at cheap rates which reduces the cost of paper manufacture, while the conditions are quite unfavourable in India.

The author deduces from these facts the conclusion that unless cheaper raw materials are made available, Indian paper mills cannot possibly compete with foreign concerns. According to his estimate Baib or Bhabar grass which grows in abundance in Bengal, Chhota Nagpur, Nepal Terai and the Oudh forests, is a far more suitable substitute for rags, jute, hemp, straw and other materials hitherto used.

The third paper "is contributed by Mr. Dhruva Sumanas, Paper Technologist of Ahmedabad on "The paper making industry in India." Mr. Sumanas has collected much material of a historic value in connection with his subject. He takes us back to the hoary antiquity and the dawn of humancivilization and points out that it was the East which taught the art of paper-making like so many other crafts to the West. The probable date of the invention of paper making is 105 A. D. by the Chinese, from that country it spread gradually to India and other countries. Before the invention of paper. leaves and

barks of different trees were used for the purpose of committing sacred books to writing. The author gives a historical survey of the industry and brings us to the time when hand-made paper was manufactured at many centres all over India. Ahmedabad, Surat, Junnar, Brandol, Nasik, Bagalkot, Gokak, Daulatabad, Vijayanagar, Serampore, Madras, Bombay, Rangoon, Calcutta, Delhi, Lahore, Lucknow, Agra, Allahabad and numerous other places were formerly noted for hand-made paper. Until 1799 A. D. paper was entirely made by hand all over the world but about the middle of 19th century, paper-making machine was brought to perfection and the process of making wood pulp was discovered by mechanical and chemical methods. The effect of these developments was striking. In 1854 Bombay established its first paper mill. Several other mills came to be started in other parts of India with varying success. Machine-made paper gradually ousted the hand-made product from the market and the doom of the old industry which maintained so many families all over the country is almost sealed. The author minutely describes the methods followed in a paper mill of the modern-type and those pursued by the artisans of old type in making paper by hand labour. In his opinion, if the knowledge of the improvements in the art of paper making industry is diffused among our artisans and men engaged in commerce there are chances yet of the revival of this art.

We now pass on to the paper of Rao Sahab M. Rama Rao Garu, Conservator of Forests, Travancore, who in his "Further Note on Match Factories" gives much valuable information of practical utility and his paper deserves to be read by all who are interested in starting Match Factories.

Mr. G. K. Devadhar, M.A., a member of the Servants of India Society, Bombay, who has done so much to further the cause of co-operation in parts of the Bombay Presidency and who is now recognised almost as an authority on this subject, contributes this year four notes on "Co-operation". In his first note

he puts forth a " plea for co-operation among the mill hands ". Mr. Devadhar alludes to the address of the President of the millowners' association delivered at its last annual meeting and the remarks of the Editor, the Times of India, who in his able article pointed that improvement of the state of the mill employees can be brought out only in two ways ; one was the provision of better housing and the other was the spread of co-operation. In the opinion of Mr. Devadhar, the mill hands are fit objects of co-operation just as their agricultural brethren, and the remedy furnished by co-operation will equally fit in with their wants and requirements. For the purpose of investigation into the actual condition, habits, mode of living, the qualifications and defects of the mill hand community, Mr. Devadhar collected detailed information of 100 mill hands working in four mills situated in two separate localities in Bombay and comes to the conclusion that there is much scope for the spread of co-operation among the mill employes, and his proposals have been approved by several prominent mill owners.

In the " Three Notes on Co-operative Subjects " Mr. Devadhar exhaustively deals with

- (1) co-operation as a measure of famine insurance
- (2) the necessity of state aid in co-operation
- (3) definite proposals regarding the formation of supervising agencies or unions.

Within the limited space at our disposal it is not possible to do justice to these notes, which should be carefully read in full by all who are interested in the spread of the co-operative movement.

" Economic conditions in India " is the theme selected by Mr. C. Gopal Menon, of Madras, for this year's paper. Mr. Menon rightly asserts that " Economics on western lines is the youngest of all sciences in India and offers virgin soil for study

and research." Considerable interest has lately been aroused in the economic side of the western life, as may be seen by any intelligent observer of modern agricultural and industrial activities in the country. The author surveys the vicissitudes through which India has passed during the last two thousand years, from the early references to economic usages discovered in the ancient Buddhistic canonical works, the smritis of Manu and other authorities on ancient Law, the times of Asoka, the great King whose empire in India fully equalled in area that of Britain, with the exclusion of Burma, ancient navigation, foreign commerce and industries of India, to the development of the science of Economics in the western countries. "With the age of medievalism" says the author, "a change from local institutions to national ones took place, every European nation began to work in the direction of increasing national power and national wealth." This new awakening led to the discovery of the new world, the opening of the eastern trade and the modern inventions. The formation of the Joint Stock Companies was the result of the keen struggle for economic supremacy among the European nations. The advent of the East India Company and the steps taken by it to extend its trade and commerce and political influence have been graphically delineated. India was ill-prepared for the coming industrial revolution owing to her economic isolation, self-sufficiency, and ignorance of the outer world. The rigidity of the caste system also contributed to some extent to the decadence of Indian Industries. The author hopes that modern influences have tended to remove a great deal of the objectionable features of the caste guilds as they exist to day, and advocates capitalists to utilize the raw materials for starting various industries needed in the country.

Mr. A. H. Silver of the Cawnpore Woollen Mills Co., Ltd., in his paper on "our industrial finance" tries to diagnose the causes of industrial inactivity in the country. He assigns the first place to the fact that in India a large proportion of the aristocracy and the so-called educated classes regard all manual or physical

labour as menial and degrading, and the natural consequence of this national tendency is that Indian youths prefer educational courses leading to the practice at the bar or clerical appointments. Mr. Silver's remarks on the subject are very trenchant and we make no apology for reproducing them for the benefit of our readers as they deserve to be carefully pondered over and laid to heart by all who have their country's industrial and economic welfare at their heart :—

“ How many of you, gentlemen, can point to youths of your acquaintance who, after receiving the foundations of education, have directed their latent energies to an attempt to master the intricacies of a modern manufacturing industry? We speak glibly of the dignity of labour in the abstract; have we accorded the honour and dignity which are the due of the skilled craftsman? I hold that the man who can fashion crude metal into a useful utensil of beautiful design, the craftsman who from the raw fibre produces the means of clothing his fellowmen in fine raiment, is of more value to the community than the learned clerk who expounds the intricacies of our various Codes, and should be honored accordingly. Let education be regarded as the handmaid of industry, a means to an end rather than an end in itself. His Majesty the King Emperor, as you will have doubtless noticed, makes a special point of honoring the manufacturers of England by his visits and the Government of India are earnestly doing all that lies in their power to guide the undoubted skill of Indian people into profitable industrial channels.”

The author aptly quotes John Stuart Mill who, so far back as in 1848, looked forward to a time when the attention of the people of India would be directed towards things requiring a larger manufacturing population for their production in the country itself. Unless our industries proceed on western lines, it will be beyond our power to produce our own requirements at a price which will enable us to compete successfully with the merchandise of western people. Much can be done in the opinion of Mr. Silver, to revive indigenous industries, if people exercise a little care in making their purchases.

Two papers have been received this year on Banking. Mr. Sorab R. Davar, Principal of the Davar's College of Commerce, writes on “ Development of Banking in India.” Mr. Davar observes that the only medium which can stimulate enterprise

in the departments of business and industries is a well organised Banking Community which would serve as a "main reservoir of all extra wealth forming part of the savings of a nation and distributes the same in the channels where it would be most profitably employed to the advantage of the investor, borrower and the Bank; the only point of importance is that these banking concerns ought in the interest of the public and of the concerns themselves be conducted on proper-lines by men of acknowledged ability and integrity. Unless there exists genuine business morality in the managers and directors of banks, no legislation can be of any avail. Anent the unprecedented Bank failures in India, Mr. Davar's remarks are very encouraging and he sees in them no cause for alarm. Says he :—

We should impress on our countrymen not to be too nervous when they hear of the failure of any concern and make a run on all other concerns where they may have deposited money because by so doing they would be committing financial suicide. This tendency was noticed in India during the past few weeks following up on the failures of one or two of our indigenous Banks, and it is a matter for congratulation that results have not proved as disastrous as one would have expected. The fact that our Indian Banks have stood the test of these frequent runs is in itself a great factor in support of the contention that our men can manage Banking concerns on Western lines as well as they did and do our Oriental Pehdies of Shroffs.

"The Present Dowafall of the Swadeshi Banks, its causes and precautions necessary to avoid a recurrence" is the title of the contribution of Mr. B. B. Master, Corporate Accountant, Karachi. Mr. Master who was asked by Government to give his views on the proposed Banking legislation, has dealt with his subject very ably and his paper deserves more than passing interest and ought to be read carefully. In the opinion of this author, the immediate starting of many Banks leading to unhealthy competition, is one of the many causes of this financial crisis in India, where "the success of one or two concerns led many to follow suit." To make business remunerative headlong anxiety was shown to advance money to traders, who indulged in wild speculations in an irresponsible

manner. Unless people fully understand the causes which led to these failures there is every chance of recurrence of the financial disasters as the result of the same erroneous financial and business methods.

To guard against these evil consequences and to encourage the illiterate classes of people not to resort to the old method of hoarding up of money and to revive national credit in general which is so rudely shaken by recent events, the author thinks that there is urgent need for banking legislation for the control and guidance of Swadeshi Banking enterprises on the follow lines :—

(1) It is not advisable to force the new Act on shroffs or native bankers as they do not advertise for deposits.

(2) The Registrar of Joint stock Companies shall have the power to reject any of the clauses from the memorandum of articles of association which may be objectionable and against the interests of the public.

(3) One-third of the subscribed capital shall be paid up within one year of the registration.

(4) All half yearly reports should clearly specify whether the Reserve Fund is employed in business or in outside securities and if so, the nature of those securities to enable the shareholders to fully understand the position of the Bank. There ought to be restriction that the Reserve Fund should be invested only in Government or authorized securities.

(5) It is not desirable to force the directors and shareholders to carry the net profit of the first few years to the Reserve Fund.

(6) To protect the Indian public from such crises the English and Foreign Banks in India should also be registered under the new Act.

(7) The Directors should be jointly and severally liable for the mismanagement and fraudulent mal-administration of Banks and their liabilities shall be unlimited.

(8) The auditors should be made responsible for *knowingly* or *negligently* certifying a balance sheet.

(9) No one holding the office of Manager or Director of a Bank shall do any private business.

(10) Persons carrying on at present the business of auditing shall apply to Government for permission to work as such and an examination in auditing shall be held once a year.

(11) A Bank may advance money to its Directors on substantial securities and not on the bankshares.

(12) No petition in winding up a Bank shall be heard unless supported by shareholders representing at least one third of the share capital.

The author has cited the decisions of some important English cases on Auditors' and Directors' liabilities, duties and responsibilities which it is not possible to recapitulate here.

We now proceed to the paper of Professor Radhakamal Mookerjee of the Krishnath College, Berhampore, on "The Transition in the internal trade of India." "There is at present" says Mr. Mookerjee, "going on a gradual process of change in the methods of trade organization of India." Not only the middle man who carries on his trade individually with his own small capital, but also the method of his buying and selling are gradually becoming things of the past." The Railways in other countries contribute largely to the expansion of national trade but here in India the case is quite the reverse, the effect of the Railways very often becomes not equal distribution but the depletion of wealth, as being under the guidance and control of European mercantile communities,

they exploit our agriculture and positively discourage indigenous trades and cottage and factory industries. It behoves Government to remove these complaints and to develop irrigation in the land and improve the existing water ways to make them suitable for navigation to facilitate rapid and cheap transport of goods.

Industry is so closely associated with art that it is not possible to separate the one from the other. To prove this interdependence is the object of the paper of Mr. Samarendra Nath Gupta, on "The place of Indian art in Indian industries." The popular notion that art is cultivated merely for its own sake and is seldom associated with any object of our daily home life is highly erroneous. Decoration which is the function of art is not superfluous but highly essential as it is the form of any article of commerce that makes it an object of utility. A bundle of wool is of no use until and unless it is converted into some kind of cloth or fabric with the aid of industrial art. There being no definite standard of either beauty or quality there is for ever room for new designs and new types of commodities, on artistic lines. "A good deal of success of industrial products" says Mr. Gupta, "is ensured by the proper choice and selection of their forms." If the form or finish of an article is attractive there is every likelihood of its consumption even if the quality be poor.

Tanning industry has attracted two writers this year. The first paper on "Tanning industry, its development in India" is contributed by Mr. P. V. Mehd, Leather specialist and Government of India Scholar. Mr. Mehd gives much valuable information highly technical in its character regarding hides and skins, the raw materials used in India for tanning purposes and has pointed out the defects both in the tanning and curing of hides and the vast scope that exists in the country for the expansion of the manufacture of chrome

leather and the starting of tannin extract factories. He refers to the attempts of German chemists to manufacture a synthetic or artificial tannin. Researches on similar lines are being conducted in England also and he fears that in a few years every one will be using coal tar tannin as zealously as the coal tar dyes.

Mr. Pitke, Prices Current Inspector, Akola, writes on "Hides and Skins industry in Berar." In the course of his paper Mr. Pitke, gives a minute description of the actual methods followed by the Indian Tanners in Berar, for tanning the hides, from the unbaring of the skins or hides to their curing, together with a list of the tanning materials used, the Indian names of the tools employed, methods of coloring, the articles manufactured at different places in Berar, the castes engaged in this business, the statistics of exports and imports of wrought and unwrought leather and alizarine and aniline dyes. His specific proposals are that the status of the castes engaged in this trade should be improved with the help of the Co-operative Credit Societies and tannin factories gradually established in Berar with the aid of experts who should train young men, capital should be collected for starting these factories and bye product industries on a small scale established, to be worked by different Societies or Companies.

In the next paper Mr. S. Satyamurti discusses, "Some economic aspects of the Swadeshi movement," which he defines as "an economic one having for its object, the regeneration of the industries and commerce of India by (1) inducing the consumers to pass and observe self-denying ordinance that they will consume only Indian made goods and (2) giving all legitimate encouragement to the production of goods required in India." The Swadeshi movement deserves credit for having turned our attention to the industrial needs of our country. The movement has been abused by unscrupulous men who had a sole eye only to what they could make out of it by means fair

or foul. Some traders palmed off on the public foreign goods with a Swadeshi label and others put in the market unfinished or inferior goods, expecting to find a ready sale in the boom of Swadeshism. But candles that would not burn, soaps that won't wash, matches that won't light, and pencils that won't write, cannot permanently hold the market and the movements naturally received a rude shock as the result of these nefarious practices and tricks. Any movement which is based merely on sentiment cannot last long, unless there is a genuine attempt to keep up the sentiment by all legitimate means. This author is not in favor of protection of infant industries. "What guarantee," he argues "is there that the producers will rise equal to their opportunities and try to reduce the cost of production and improve the quality of their produce?" With regard to goods which India is now producing, Mr. Satyamurthi is right in urging that they stand in need of improvements, which will come only if there is healthy foreign competition. If the quality of home made products compares favorably with that of foreign made goods, home industries need not be afraid of foreign competition.

Mr. L. G. Khare, Hony. Secretary to the Bombay Branch of the Indian Guild of Science and Technology, in his "Notes on industrial organization in India," makes some useful suggestions which deserve careful consideration. It will not be practiceable to give them all here, as they will be found reproduced under "Summary of proposals and suggestions," which follows the Introduction, duly classified. At the very outset Mr. Khare suggests that the Indian Industrial Conference should open industrial Bureaus in several important centres to discuss systematically questions of industrial organization to arouse public interest in the work of the conference by making its activities continuous throughout the year. Mr. Khare is probably not aware that the Conference has established Provincial Committees at a few important centres with the hope that they will act as information Bureaus in

regard to the Province which they represent, keep alive the industrial activity and help the head office with information and funds. But such is the paucity of public workers in the land that the office bearers of these committees have absolutely given us no help. The second suggestion of Mr. Khare is also not practicable in the present state of apathy of the educated classes and the nobility of the land towards the conference work. To keep up the interest in industrial matters all over the country, a permanent staff of itinerant lecturers and agitation is essential which cannot be done in the absence of sufficient funds in the hands in the General Secretary. Out of Rs. 8,000 which the conference authorizes him to raise every year by appealing to the public only about one-fourth of that amount is raised with great difficulty.

The author has made suggestions on the following subjects :—

- (1) To increase the working efficiency of Indian workman by education suited to his needs.
- (2) To improve his physique.
- (3) To improve his dwelling accommodation and insanitary surroundings.
- (4) To educate and train the labourers' children and to improve their lot.
- (5) To establish trade unions for the benefit of working classes.
- (6) To establish Labour Exchange Offices for the benefit of the unemployed workmen and capitalists seeking for suitable servants.

Mr. Khare has also certain other suggestions to make which will be found reproduced elsewhere.

We now pass on to the paper of Professor Balkrishna of the Gurukul academy. He bitterly complains of the "Progressional ruralization of the Punjab." The study of the last census Report has forced on him the following conclusions which may be given in his own words :—

- (i) That the Land of the Five Rivers is becoming more and more agricultural under the British administration,
- (ii) That the indigenous industries are being constantly killed by the stress of unrestricted foreign competition,
- (iii) That low paid workers and tribes of menials are increasing by hundreds and thousands,
- (iv) That we are becoming a nation of petty shopkeepers in the sense of distributors of foreign articles alone,
- (v) That, in short, during the last thirty years, we have been more and more subjected to the dangers pointed out by List. Instead of progressing we are being crippled, our arm of manufacture is being cut from us and we are thus on the way to become a purely agricultural state instead of the agricultural manufacturing state in the pre-British period."

Pandit Balkrishna maintains that this process of ruralization is going on in all other Provinces also and the tendency of the present day economic process in India is to convert the self-supporting man and woman "into a labourer or at least push him or her to lower grades of labour," and there is thus a growth of the hewers of wood and drawers of water in the land owing to the concentration of wealth in six principal Towns.

He concludes :—

"To counteract the effect of the present economical disabilities, let the people themselves awaken to their sense of duty. It should be fully recognised that the silent industrial revolution, the disintegration of old institutions and the extinction of our handicrafts have necessitated an entire change in our economic and social life. We ought not to be wedded to our old systems of production. In the absence of state assistance, we should learn to stand upon our own legs. *Had a people with the ambition, enterprise, perseverance and freedom of the west possessed such a wealth of natural resources, as we do, they would certainly have made this land a veritable paradise.* It is we who are lacking the desirable qualities of self-sacrifice, activity, courage, enterprise originality, industry, prudence, tenacity and perseverance, the study of economic, commercial and industrial questions. Let us, therefore, educate ourselves

in economic, technical and commercial matters and persuade the Government to co-operation with us in building magnificent and numerous technical academies, institutions, schools, stations for testing, well-stocked laboratories and in creating a technical literature, statistical bureaus and research institutes which should drive away the nightmare of harrowing sorrow from this sacred land. Then only shall we enter upon a higher form of life and fulfil our mission, then only industrial regeneration of India, the economic emancipation of the submerged millions and the pulling up of India out of the nauseating mire of dehumanizing poverty, will come within the range of possibility. Let us have a firm faith in the destiny of our Motherland, let all the uplifting influences be brought to bear upon to-day's India and let Education and Production be our watchwords, then alone we can check this unhealthy ruralization of the country, then alone our dreams of economic regeneration will soon be realized. Let us hope that the haphazard and wreckless policy of drift pursued by our Rulers in India will give place to one of effective control over our economic development, that India will be governed in the interests of India."

"Aluminium industry in India" has been ably dealt with by Professor P. G. Shah of the Forman Christian College, Lahore. He points out the importance of the discovery of this metal, gives the early history of the manufacture and its present uses in small and big industries, for military purposes, in the building of steamers, cycles, motor cars, aeroplanes, in electric works, in mining operations, in survey departments, culinary purposes, and several other departments of human activity. The special properties of the metal and advantages it possesses over other metals have been fully described with the aid of figures. The writer also mentions the methods of working this metal and its alloys along with other valuable information.

We now proceed to the paper of Dr. Nilkantrai Dayabhai, the Principal of the Victoria Memorial School for the Blind, Bombay. There is a large population of blind people in India as in other countries, but until recently no systematic attempts were made to ameliorate their wretched and helpless condition by devising means to enable them to read and write and to learn some useful crafts or industries to earn their own living. Dr. Nilkantrai calls the attention of his countrymen to the fact that

in European countries, efforts are being made to impart to them general education side by side with technical training to enable them to earn their own bread either fully or partially. In his opinion, the following professions are suitable to the blind and they can receive training in them under expert teachers:—

- (1) Work as Musicians.
- (2) Work as Preachers and Teachers of religion and morality.
- (3) Carpentry.
- (4) Cane and bamboo work.
- (5) Weaving.
- (6) Tailoring.
- (7) Knitting.
- (8) Brush making,
- (9) Broom and mat making.
- (10) Wire work.
- (11) Working an oil mill.
- (12) Potter's work.
- (13) Gardening.
- (14) Poultry work.
- (15) Snuff and cigarette (bidee) making..
- (16) Shoe making.

It is not to be presumed from the above list that these professions are suitable for all the blind population. But the teacher have to find out which art or craft will suit his pupil and to train him up accordingly. The paper contains much interesting reading.

There are two papers this year on Sind industries, one from Rai Bahadur Diwan Bulchand and the other from Mr. Bulchand Karamchand,

Rai Bahadur Diwan Bulchand in his "Note on native industries of Hyderabad," complains that the old industries of the city are in a languishing state.

Owing to fierce foreign as well as indigenous competition, Hyderabad table-covers, handkerchiefs, curtains and wall hangings worked in gold, silver and silk thread, which were once highly prized are no longer in demand; Chinese, Japanese, Madras, Surat, Benares and Bombay embroideries having driven them out of the foreign markets. Large quantities of wood lacquer work were manufactured and exported in the eighties from Sind and commanded a large and ready sale. This industry is now dying out in Hyderabad, enamel work, art jewelry, leather and ivory industries and several other crafts are fast disappearing.

Mr. Bulchand Karamchand of Hyderabad who acted as the Secretary to the Reception Committee of the last year's Conference writes on "Lacquer industry of Khanoth." According to Mr. Bulchand, Kashmore in upper Sind Frontier District and Khanoth in Hyderabad District are the two places noted for lacquer work. Khanoth is very favorably situated, as the woods required for the articles are close to this place, and the village contains a large population of people whose hereditary profession is Turnery. The dishonesty and indolence of the people engaged in this industry, have seriously affected this trade. With a few suggestions for the revival of this industry Mr. Bulchand brings it to a close.

The Resolutions passed at the Session of the Conference will be found reproduced elsewhere in the body of the Report, together with the speeches delivered during their deliberations and need not be repeated here.

Summary of Proposals and Suggestions.



A.—The work of the Conference.

1. The work now to be done by the conference should be of a detailed and technical character. Sir Fuzulbhoj who is the originator of the scheme for the proposed Indian commercial congress will be the first to welcome a proposal for amalgamating both these ideas, or co-operating with us in a spirit of amity and friendliness, if amalgamation is found to be impracticable. The best thing seems to me to form a small committee to consider the whole question in consultation with the representatives of the Indian Merchants' Chamber and Bureau and submit its report to the next Conference. (*Hon'ble Mr. Lalubhai Samaldas*).
2. I believe a continued interest in the activities of the conference can be created only by making such activities continuous throughout the year. It would be a sound idea, therefore, if the conference considers the question of opening industrial bureaus in various important Indian centres, where questions of Industrial organization can be systematically treated. (*Mr. L. G. Khare.*)

B.—Agriculture.

3. We must first convert the more enlightened and by making such arrangement for the provision of cheap supplies of manure as will convince them that intensive cultivation is, so far as it depends on high manuring, a paying proposition. (*Mr. D. Clouston.*)
4. Cattle breeding to effect improvement must be based on better feeding. (*Ibid.*)

5. In order to prevent the system of foreign exploitation of our agriculture which makes us more and more dependent on the markets of the world and threatens to jeopardise the food-supply in our home market, the present system of agricultural credit should be reorganised. (*Professor Radha Kamal Mookerjee.*)

C.—Education.

6. For the progress of industrialism young men ought to be trained in technological and managerial lines. (*Hon'ble Mr. Lalubhai.*)
7. An institute whether educational or technical must have a suitable environment if it is to make any progress and if it is to be a living institution. (*Ibid.*)
8. Education should be regarded as the hand-maid of industry. (*Mr. A. H. Silver.*)
9. We would suggest that funds started with the special idea of sending young men abroad should make it a point of spending less in merely foreign education by limiting the number of students to be sent out and should invest more on those, whom they have already given a chance abroad by offering them what should be called "maintenance scholarships." A special part of the fund should be set aside for being utilised by foreign trained young men in showing practically to the satisfaction of the capitalists interested in the fund what they have learnt abroad. A contract should be previously made with them before they proceed abroad; that they will (1) consent to remain as working with the maintenance scholarship allowance under the direction of the board of advisers appointed by the fund and (2) that they will agree to serve if the emolument is satisfactory under any concern started under the auspices of the fund. (*Mr. L. G. Khare.*)

10. Let us, educate ourselves in economic, technical and commercial matters and persuade the Government to co-operate with us in building magnificent and numerous technical academies, institutions, schools, stations for testing, well-stocked laboratories and in creating a technical literature, statistical bureaus and research institutes which should drive away the night-mare of harrowing sorrow from this sacred land. (*Professor Balkrishna.*)

D.—Labour Supply.

11. The only point is that in the interests of the public in general and particularly for the future of Banking enterprises themselves in India these concerns (Indian Banks) should be well organised and conducted on proper lines by men of acknowledged ability and integrity. (*Mr. Sorab R. Davar.*)

E.—Capital and Co-operation (Banks.)

12. It is no use, in Banking business, deriving consolation from the fact that the same mistakes were made by people in other countries, and remaining inactive in the face of our present difficulties. What we should do is to find out how they met their difficulties, and to adopt their methods as far as practicable. (*Hon'ble Mr. Lalubhai Samaldas.*)
13. What is required is not merely the training of men as Directors and Managers but educating the general public as to their rights and responsibilities. (*Ibid.*)
14. We want co-operation, but co-operation amongst cultivators alone is of very little use in starting sugar factories on the scale under consideration. The co-operation must be amongst cultivators and business-men. (*Mr. G. N. Sahasrabudhe.*)

15. The capital for sugar factories should be raised by an issue of either all ordinary shares or half ordinary and half Preference shares carrying a dividend of 7 per cent ; Money, should be advanced to the cultivators at the rate of 9 per cent on the understanding that all the cane grown with that money is to be delivered to the factory at a rate which will be acceptable to both the factory-owners and the cultivators. The total amount to be advanced to each cultivator should not exceed half of the estimated value of outturn. (*Ibid.*)
16. I offer a few definite proposals for the formation of Co-operative Credit Societies for mill-hands.
- (1) A mill should be selected in which will be found a large number of needy mill-hands who are sick of being indebted and some of whom are able to read and write.
 - (2) Mill-owners should find out a few Volunteers who would assist them in delivering about half a dozen lectures and lantern shows on the movement of Co-operation, its progress in the West and in India, and its possibilities for the poor mill-hands. They should also explain the by-laws and the working of such a society.
 - (3) When a dozen mill-hands intelligently agree to form such a society, it should be started preferably in a mill.
 - (4) Its affairs should be managed by a managing committee of its own members with certain limitations.
 - (5) There should be a Board of supervisors to guide, supervise, and control the transactions of the managing committee of the society in respect of loans from outsiders and to members. The Board

should consist of five persons, one of them should be the mill-agent, the other should either be the manager or the head jobber, the third should be a pleader, the fourth should be an accountant, and the fifth should be a preacher of co-operation.

- (6) As far as possible, the society should not be considered a part of the mill-machinery but its useful adjunct so as to secure the greatest educational effect.
- (7) Membership ought not to be made compulsory but members should be attracted after careful selection by preaching, moral persuasion and the example of their fellow-workers. Woman should be included among members.
- (8) It should be a limited liability society, in order to secure greater and more direct financial interest of the mill-hands concerned.
- (9) There should be proportionate liability extending over two years.
- (10) The capital should be raised partly by the shares of members to be paid in small monthly instalments, partly by the fixed deposits from those members who are better off, partly by the compulsory small savings of members provided for in the by-laws after the share money has been paid, and partly by proportionate loans or deposits from the mill-owners and lastly by donations.
- (11) Outside loans should, as a rule, bear half the rate of interest charged to members on loans made by the the society to them.
- (12) There should be two classes of loans: short term loans for ordinary needs and long term loans for

redeeming lands or liquidating old debts. In addition to the usual procedure of taking two sureties there should be collateral security on long term loans.

(13) The next step to this should be a co-operative store first to deal in few articles to be worked on the principles of Rochdale Pioneers. Profits should be converted into shares.

(14) Further step should be a co-operative hotel or a refreshment room.

(15) The last step should be co-operative insurance.

(16) The Central Committee formed to guide the policy of such work should engage two paid servants to daily keep themselves in touch with the working of the societies by visiting the Secretary, by attending their meetings, by inspecting the accounts and by advising the committee.

(17) Government inspection and audit should be quarterly.

(18) In the beginning Government should give some loan over a period of five years at a moderate rate of interest. (*Mr. G. K. Devadhar.*)

F.—Fiscal Policy.

17. A revision of our present sugar duties is very urgently desired, not so much for helping the sugar manufacture from sugarcane direct but for the sugar refining industry, especially in the sea coast Provinces like Bombay and Madras. (*Mr. G. N. Sahasrabudhe.*)

18. Government should make duty on sugar *specific* duty instead of *ad valorem* as it is at present and that there should be a distinct difference between the duty on raw sugar (*i. e.* 15 D. s. and below), and white sugar (*i. e.* 16 D. S. and above). (*Ibid.*)

G.—Sugar Industry.

19. With our large cane crop in the U. P. there is ample room for both gur and sugar ; and that in parts of the provinces it would be profitable to utilize part of the cane crop for sugarcane ; while, on the other hand, the present reliance on the gur market only, is economically unsound. (*The Hon'ble Mr. Hailey.*)
20. There should be the profitable utilization of the produce by means of sugar factories equipped with the most efficient machinery, and in this respect Java is supreme. (*Ibid.*)

H.—Paper Industry.

21. Grass-Pulp Industry should be started for the manufacture of paper pulp from grass which the Indian paper mills will consume in large quantities because it will be, very profitable to them. (*Rai Bahadur Munshi Prag Narain Bhargava.*)

I.—Leather Industry.

22. The tanning factories should be gradually established in Berar with the aid of experts first obtained for training young men in this business. Capital should be collected for this work. By-product industries on a small scale may also be set up to be worked by different societies and companies in co-operation with the main industries. (*Mr. H. R. Pitke.*)

J.—Irrigation and Waterways.

23. Watersays ought to be looked upon as an essential and necessary supplement to railways in this country. Bulky goods, raw materials which are cheap and cannot bear costs of carriage, commodities which need not require rapid transit should be transported by waterways. (*Professor Radha Kamal Mookerjee.*)

K.—Miscellaneous Industries.

24. The Tata Iron and Steel Co., Ltd., should start in the near future the manufacture of Sulphuric Acid. The Ammonia which is now a bye-product should be made into the sulphate of Ammonia, which will be very useful as good manure. (*Hon'ble Lalubhai Samaldas*).
25. If the dealers in hand-made paper be satisfied with the proposals of the young man (Mr. D. Sumanas) making them, a factory may be started in Ahmedabad in the course of the next year for the manufacture of hand-made paper. (*Ibid*).
26. Swadeshi as a feeling that every Indian ought to do something for the industrial welfare of his country ought to be cultivated in its intensity. I am only anxious that it ought not to take forms which, while they do not have any chance of enabling us to achieve the end we have in view, only tend to divert our attention from the really effective forms which the sentiment ought to take. (*Mr. S. Satyamurti*).
27. The goal of the Indian aluminium industry should not be only the manufacture of the utensils from imported metal, but to manufacture the metal itself in India. (*Professor P. G. Shah*).
28. The process of the popularisation of the metal should be more thoroughly put into practice if the goal is to be attained sooner. (*Ibid*).
29. For preserving this ancient lacquer industry of Sind an Industrial Association or a Syndicate might advance a sum of money—between two to three thousand rupees—and place it in the hands of a person with business capacity. (*Mr. Bulchund Karamchand*).

30. If the centre of the industry could be shifted to Hyderabad the Association might profitably set aside a part of its funds, for purchasing specimens of lacquered-ware of other parts of India, or from Exhibitions and thus build up a small museum to serve as an object lesson to the workers. A small collection of the best specimens of lacquer ware shall be kept always ready for sending to Exhibitions—Indian or Foreign—to secure orders from abroad. (*Ibid.*)
31. In every industry there must be some artistic elements, and if in Indian industries, Indian art is not given full play, the elements of foreign art are surely to creep in in the manufacture of Indian commodities. (*Mr. Samaerndra Nath Gupta.*)
32. We should strongly recommend the building of improved tenements on the part of mill-owners for their own men. Such tenements can be let out to the men on a graded scale in proportion to the amount of wages they obtain. There should be an annual reduction in rent for the workman who keeps his rooms cleaner than those of others and the inhabitants of such tenements should be encouraged to organise some co-operative work among themselves, such as the institution of a small bank should be started with a good deal of help primarily from the mill-owners but they should have the choice of giving our help at a very low rate of interest to deserving persons. (*Mr. L. G. Khare.*)
33. It is necessary to establish some system of providing work for those who flock into the larger cities in search of employment. We should establish with the help of the capitalist but mainly through the medium of the trade unions *labour exchange offices*, where those in want of work can register their names and obtain information as to where it can be had. (*Ibid.*)

34. What the Indian capitalist is in need of is a kind of agency which will serve as a medium between the capitalist on the one hand and trained labour on the other. (*Ibid.*)
35. We should welcome therefore in connection with the industrial information bureaus the establishment of a registration agency, at which Indian students who return after technical instruction abroad as well as those technically trained here can report themselves when seeking employment, (*Ibid.*)
36. We should have another department of the bureau for the scientific treatment of questions relating to the growth or decline of Indian industries. Such statistical branches should inquire into the more flourishing industries of the district in which the bureau is situated and University men should be encouraged to work out the statistics relating to such industries. (*Ibid.*)
37. We should welcome a proposal which has been made by some members of the Indian Guild of Science, who are themselves manufacturers, that industrial syndicates should be formed locally for the purpose of obtaining through gentlemen of means in the particular locality some substantial loans at a rate of interest not exceeding four per cent, which sums the syndicate should lend out to deserving concerns at a higher rate of interest. The difference between the two rates should be utilised for helping some movement for technical instruction. As such syndicates are to be formed only within a particular locality they will have the advantage of being composed of men who are either directly interested in the industries started in the locality by the fact of their being manufacturers, or who are indirectly interested in industrial development and are willing to finance the local

industries when their capital can be guaranteed. If the latter class of men join the syndicate they can persuade other influential gentlemen in the locality to lend their quota when the syndicate agrees to guarantee to them their interest, just in the same way as interest on Government promissory notes is considered to be guaranteed. *(Mr. L. G. Khare.)*

38. The friends of the blind associating with them should encourage them to begin work again, if they have given it up, that charity, real charity, consists in making the blind take to some work, however humble, than in feeding and pampering them. It is only the very old and infirm blind persons who ought to be fed and lodged while they live. As the curse of ignorance grips the blind more tightly than blindness itself, I would urge that the information regarding industries suitable for the blind of the nature given here be distributed broadcast in villages and cities of this country, through the Vernaculars of the different districts. *(Dr. Kalkanthrai Dayabhai.)*

**Resolutions passed at the Ninth Indian
Industrial Conference held at Karachi on
Thursday, the 25th December 1913.**

I. Indian Banks.

Resolved—With reference to the question raised by the Government of India on which opinions are invited as to whether there should be restrictions about the use of the terms "Banks" and "Bankers" and as to whether there should be any legislation in regard to Banking, this Conference is of opinion

(a) That the use of the term, "Bank" should be restricted only to companies registered under the Joint Stock Companies' Act.

(b) That all Banks not registered in British India having an office or Branch in British India should be registered under the Indian Companies Act, save and except the Banks which are created by a Statute.

(c) That there need be no subscribed minimum capital, but that the paid up capital should be one-third of the subscribed capital and that it should be paid up within six months of registration;

(d) That the Registrar of the Joint Stock Companies be authorized to refuse to register as Banks such companies whose Memoranda of Association provide for and warrant business other than Banking business in the ordinary sense of the term and that an appeal against the Registrar's decision should be allowed to the highest judicial authorities of the place where the Registrar's Office is situated.

(e) That no Bank shall be allowed to use the terms "Saving's Bank" for a department, or a concern except

the Presidency Banks and Government Postal Department, unless the said Department or the said concern is made to invest two-thirds of deposits in securities sanctioned by the Indian Trust Act and ear-marked for that purpose.

(f) No Banks shall be allowed to advance monies against their own shares, unless they are fully paid up.

Proposed by—Mr. D. E. Wacha.

Seconded by—Rao Bahadur Dewan Hiranand Khem-sing.

Supported by—Rao Bahadur R. N. Mudholkar,
Messrs. P. D. Shamdasani and C. P.
Ramaswamy Iyer.

II. Congress of Commerce.

Resolved—This Conference welcomes the scheme of the proposed All-India Commercial Congress, formulated by the Hon. Sir Fazulbhoj Currimbhoj Ebrahim as affording unmistakable proof that the leaders of the Commercial and industrial community are awakening to the need of organising their interests so as to develop greater solidarity of influence and opinion and to be better able to represent with weight and authority the Indian point of view in the counsels of the commercial world of India and the Empire. It appoints a committee consisting of the following gentlemen to consider and report as to how this Conference can best co-operate with the proposed All-India Commercial Congress in advancing the objects, which it is intended to promote:—

Mr. D. E. Wacha.

Rao Bahadur R. N. Mudholkar.

Hon'ble Mr. Lalubhai Samaldas.

Hon'ble Sir Fazulbhoj Currimbhoj.

Sir R. N. Mookerji.
 Mr. J. Chowdhury.
 Hon'ble Babu Ganga Prasad Varma,
 Mr. C. Y. Chintamani,
 Mr. N. Subba Rau.
 Dewan Bahadur P. Rajaratna Mudaliyar.
 Mr. Gulam Hussain G. Chagla.
 Mr. Usufalli.
 Lala Lajpatrai.
 Hon'ble Rai Bahadur Lala Sultan Singh (Delhi).
Proposed by—Mr. Jehangir Bomanji Petit.
Seconded by—Hon'ble Sir Fazulbhoy Currimbhoy.
Supported by—Lala Goverdhandas.

III. Co-operation among Indian Chambers of Commerce.

Resolved—The Conference calls upon all persons taking genuine interest in the advancement of Indian industries—

(1) To bring about co-operation and co-ordination between the existing Indian Chambers of Commerce, Trades Associations, Mercantile Unions and Industrial Associations.

(2) To establish such Chambers and Associations at important commercial and industrial centres, where none such are in existence and for this purpose to widen the scope and enlarge the working of the Industrial Conference.

Proposed by—Mr. C. Y. Chintamani.

Seconded by—Lala Lajpatrai.

Supported by—Mr. C. Gopal Menon.

IV. Weights and Measures.

Resolved—This Conference notes with satisfaction the appointment by the Government of India of a Committee to enquire into the question of Weights and Measures and expresses the hope that as a result of the enquiries of the

committee, suitable action will be taken for securing uniformity of weights and measures.

Proposed by—Mr. J. Chowdhury.

Seconded by—Mr. Gopaldas Jhamatmal.

V. Apprentices.

Resolved—This Conference brings to the notice of Government that in order to encourage enlistment of apprentices by factories carrying on new industries, it is desirable to amend Section 27 of the Indian Contract Act so as to permit agreements laying down reasonable limitations and conditions under which an apprentice may, after the expiry of his period of apprenticeship, establish, carry on or perform work in or for another factory.

Proposed by—The Hon. Mr. Gokuldas K. Parekh.

Seconded by—The Honourable Mr. T. V. Sheshagiri Aiyar.

Supported by—Mr. Shrikishendas.

Omnibus Resolution VI.

Resolved—This Conference while recording its appreciation of the provision which Government have been making for Agricultural and Commercial education and for technical education generally, deems it necessary to re-affirm resolutions II, IV, VI, X and XIII of the last conference in regard to the measures which have to be adapted for making such Provision adequate to the requirements of the country. This conference re-affirms the resolutions passed at the last conference and at previous conferences in regard to (a) Handloom Weaving, (b) Provincial Departments of Industry, (c) Co-operative Banks, (d) Co-operative Credit Societies and (e) Railway Rates.

(From the Chair)

VII. Gift of Dr. Rash Behari Ghosh.

Resolved—This Conference places on record its grateful appreciation of the munificent gift made by Dr. Rash Behari Ghosh to the Calcutta University and appeals to other wealthy gentlemen in the country to follow his example.

Proposed by—Mr. G. K. Deodhar.

Seconded by—Mir Ayubkhan of Las Bela.

VIII. Office Bearers.

Resolved—This Conference resolves that Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference for the next year, and Mr. M. B. Sant, Assistant Secretary, and this Conference appeals to the public for a sum of Rs. 8,000 to carry on the work of the Industrial Conference.

This Conference deems it desirable that there should be a Standing Committee appointed for each year to co-operate with the General Secretary in carrying on the work of the Conference during the year and to advise him on all such matters as he may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1914 :—

Sir R. N. Mookerjee, (Bengal)
 Mr. J. Chowdhury, "
 Honorable Mr. Lalubhai Samaldas, (Bombay)
 Sir Vithaldas D. Thakersey, Kt. "
 Mr. D. E. Wacha, "
 Dr. Satish Chandra Banerjee (U. P. & Oudh)
 Mr. C. Y. Chintamani, "
 Dewan Bahadur P. Rajaratna Mudaliar, (Madras).
 Lala Harkishen Lal (Punjab).

Honorable Rai Purnendu Narain Singh Bahadur,
(Bihar)

Honorable Rai Bahadur Krishna Sahay, (Bihar)

Rao Bahadur Dewan Hiranand Khemsing, (Sind)

Mr. M. B. Dadabhoy, (C. P.)

Rao Bahadur R. N. Mudholkar, (*Ex-Officio*)

Proposed by—Honorable Dewan Bahadur L. A.
Govindaraghava Iyer.

Seconded by—Honorable Dr. Nil Ratan Sircar.

LALUBHAI SAMALDAS,

President,

Ninth Indian Industrial Conference.

R. N. MUDHOLKAR,

General Secretary,

Indian Industrial Conference.

PROCEEDINGS
OF THE
Ninth Indian Industrial Conference.

The Ninth Session of the Indian Industrial Conference met in the Congress Pandal at Karachi on the Xmas day viz., the 25th December 1913, precisely at 12 Noon, under exceptionally favourable auspices. Through the courtesy of the Reception Committee of the Indian National Congress, the Congress Pandal was available for the meeting of the Conference one day before the commencement of the Congress Session, which mainly accounts for the complete success of the Karachi gathering. Men of all denominations, irrespective of caste or creed, hailing from the different provinces of India, and representing various industrial concerns as well as delegates and sympathisers with the aims and objects of the conference movement had assembled. The Conference was also fortunate in securing for its President, a tried patriot and a sound financier of the type of the Honourable Mr. Lalubhai Samaldas of Bombay.

The following gentlemen were noticed among those present :—The Honourable Sir Fazulbhoj Currimbhoy, Messrs. Jinah, D. E. Wacha, Jehangir Bomanji Petit, Hon'ble Mr. Gokaldas K. Parekh and Mr. G. K. Decodhar from Bombay Presidency; The Honourable Mr. Nicholas, Chairman, Karachi Chamber of Commerce, Mr. P. Fister and Mr. Wilson, members of the Chamber, Rao Bahadur Hiranand Khemsing, Honourable Mr. Harchandrai Vishindas, Messrs. Ghulam Ali G. Chagla, Dhanumal Chellaram,

Sirdar Mir Ayubkhan and several other prominent gentlemen from Sind, Honourable Nabob Syed Mohamed, Dewan Bahadur L. A. Govindaraghava Iyer, The Honourable Mr. T. V. Seshagiri Iyer, Messrs. C. P. Ramaswami, K. Sundaram Iyer, N. Subbarao Pantulu from Madras Presidency ; Babu Shiva Prasad Gupta, Mr. C. Y. Chintamani from U. P. ; Honourable Dr. Nilratan Sircar and Mr. J. Chaudhury from Calcutta ; Lala Lajpatrai and Lala Govardhan Das from Lahore.

The proceedings were opened by a song of Welcome sung by a group of young boys dressed in blue with pugrees of green, the pupils of the famous Indian singer Vishnu Digambar. After this song, Professor Digambar also gave a short solo.

Rao Bahadur Dewan Hiranand Khemsing as Chairman of the Reception Committee then delivered the following address in welcoming the delegates :—

Address of the Chairman of the Reception Committee, December 1913

MR. PRESIDENT, BROTHER DELEGATES AND GENTLEMEN,

It gives me the greatest possible pleasure to welcome you to this backward province of Sind, for I feel that your presence in our midst is likely to lift us out of our backwardness and to place us on a par with our brethren in other parts of India. Karachi is a commercial city and on account of the Capital of India having been recently removed to Delhi, Karachi is bound to receive that attention which its position as the nearest port of India demands. But while the produce of northern India is finding its exit through Karachi and while it serves also as an inlet for European goods, the outlook of the industries of the Province remains absolutely gloomy, for there

s not a single textile mill in Sind, nor is there any sugar making or leather tanning factory in it. Karachi can never remain satisfied with this one-sided progress in commerce. Its commerce will receive a double impetus, if the industrial development of the Province were to receive some measure of public attention. I am sure your presence will have the beneficial effect of rousing the people and the Government to the industrial requirements of the Province of Sind and as such your visit to Sind is most welcome.

It might interest you, Gentlemen, to know what we have to show by way of our industrial pursuits. In the textile department, we have a factory of handlooms in Shikarpur which is turning out excellent silk cloth for suiting and durable cotton cloth for the wear of the humbler people. The country weavers of the mofussil have not yet taken kindly to the handlooms of the European make and are still weaving their cloth in the old style of welding the warp and the woof by the clumsy shuttle. They are, however, making excellent living out of the bedsheets which they put in the markets under the names of *Khes*, and of the trouser cloth which is known as *Susi* and *Garbi*. The Tatta weavers make excellent *lungis* which are used as the headdress of the well-to-do Zemindars of Sind. If the improved handlooms of the West were to be used in the manufacture of these articles, the trade in them will grow, for then they will not only be produced for consumption in Sind, but also for use in the other parts of India.

Our next industry is the lacquer work which is providing each home in Sind with beautiful cradles which have not been surpassed by those of any other country. Our only regret is that the manufacture of these articles is in the hands of a few families in Hala and there is no

organised effort to supply the demand which is growing every day.

Then we have our pottery, which at one time was unequalled in India. The recipes of the old artists are apparently lost, and the work turned out now-a-days is not very superior and the industry is languishing, though the artizans are eking out some living by making tiles for adorning the brick buildings in Hyderabad.

The printing of cloth is another industry which supports the dyers of the mofussil, but it is not thriving, and the trade in it is gradually decreasing. The cheap European prints are driving out the local articles out of the market.

Over and above these industries, we have the rice hulling and flour mills and cotton ginning and cotton pressing factories. The Sind cotton is of very short staple and therefore no weaving mill is likely to compete successfully with other similar mills in the Presidency and the Punjab. It is, however, quite possible that where Egyptian cotton has failed, the American cotton might be successfully acclimatized and in that case a weaving mill will not be long in coming.

The bulk of our sugarcane is being converted into the country molasses as in the rest of India so in Sind; and unless sugar making is protected by the Government of India, there is no chance of any sugar factory being started in Sind.

In the matter of leather, it is only the process of curing hides that is undertaken in some places in Sind, notably in Hyderabad, but the tanning industry is unknown here and so also the manufacturing of leather goods, which has been successfully installed in Bombay, Cawnpore and Madras, finds no place in the Sind industries.

At the present juncture, the credit of the country has been rudely shaken by the failure of the Indian banks and by the speculative character of the transactions into which the Indian merchants indulged. Sind has suffered heavily, perhaps more heavily than the Presidency of Bombay and the Punjab and it will take some time before our Province recovers from the blow. Sind will in the meantime be watching anxiously the growth of industries in the other parts of India, which without the support of Protection can only lead a struggling existence. Destiny, however, is shaping our ends and if the British South Africans are permitted to protect their labor and commerce by stringent immigration laws, the industries of India can with greater justice demand their protection against the heavy odds which the Free trade of England has thrown in their way. Your labors, gentlemen, are most arduous and the greater your difficulties, the greater is the pleasure with which we greet you for your noble efforts.

ELECTION OF THE PRESIDENT.

Rao Bahadur R. N. Mudholkar, the General Secretary of the Indian Industrial Conference in proposing the Hon'ble Mr. Lalubhai to the chair, referred in highly eulogistic terms to his vast experience in banking business and a close study of the industrial problems of the country. He said:—

“It is with the greatest pleasure that I avail myself of this opportunity of formally proposing the election of the Hon. Mr. Lalubhai Samaldas as President of the Conference. I have all the more pleasure in doing so, as he is a personal friend of mine, to whom I am bound by many personal and business ties. He comes from a family that has for several generations discharged high political functions in the States of Kathiawar and who have been held

in the greatest respect and highest esteem by all. His father held the highest position in the State which a commoner can hold and he himself started life as an official of the State. But very soon after, he saw that he could best serve the interests of his country by taking up business work. With this intent, gentlemen, he gave up his high official post in which his future was assured, to embark on a career of commercial enterprise. He has carried on the work of a Merchant in various capacities, for he is a man of many parts and exceptional talents. At this time of financial crisis I may point out that he is a Director of one of the soundest and most firmly established banks, 'The Bank of India'. To-day he is one of the guiding spirits of that institution and I do not exaggerate, when I say that the banks present solid and secure position is due to his wise and guiding influence. The cement works which have lately been started at Porebunder are due to his initiation and his support. His activities are many-sided, for he is not only a financier and a merchant of wealth and power but is a man who has followed closely the more sensitive and learned path of literature. He is a keen social reformer and is desirous that the people of India should be lifted to a plane morally and spiritually higher. He is besides a keen politician and has carefully studied the needs and requirements of India. And as the commercial prosperity of India is indissolubly linked up with its political advancement, he recognises fully that politics are not the be all and end all of everything. He is a man who has led a blameless moral and spiritual life, which, no matter what other points are taken into consideration, is at the bottom of all reform and progress. I feel, therefore, that by calling him to the chair, we confer an honor not on him but on ourselves. I firmly believe that the proposition will be acceptable to all members present. The manifold activities of the

Hon'ble Mr. Lalubhai make him a fitting figure to occupy this important position. I have now, simply to ask you to carry the proposal with acclamation.

The proposition was seconded in similar terms by Rao Bahadur Diwan Hiranand Khemsing.

On the motion being carried unanimously, the Hon'ble Mr. Lalubhai Samaldas took the chair amidst loud cheers.

The President then delivered the following address. It was listened to with close attention, as it ably dealt with the grave financial crisis due to the banking failures and other important problems.

**Presidential Address of the
Hon. Mr. Lalubhai Samaldas.**

MR. CHAIRMAN, BROTHER DELEGATES & GENTLEMEN,

I am very grateful to you for the honour you have done me by electing me as your President this year. My diffidence in accepting this post, when it was offered to me by Rao Bahadur Mudholkar, was in proportion to the high value I attach to the post; and I have accepted it because I know you will be generous enough to excuse my shortcomings, and also because my friends in Bombay thought that, as a representative of the Indian Merchants' Chamber and Bureau which has taken up the Hon'ble Sir Fazulbhai's proposal for an All-India Commercial Congress, I would be in a position to remove misunderstandings and to assist in bringing about a complete understanding between the existing and the proposed institutions, and perhaps the amalgamation of the two.

We meet, gentlemen, under the shadow of the gloom

cast by the recent bank failures in the Punjab and in Bombay. As all the cases arising out of these are still "*sub-judice*," we are precluded from discussing the detailed causes of these failures, nor can we pass a final judgment on the methods on which the several institutions which have come to grief, were conducted. The prime cause appears to be either vast speculation or locking up of an unduly large amount of call and short notice deposit money in long period loans, which could not be called up when the depositors required the repayment of their monies. The natural result of these failures must be that the public will lose their faith to some extent in Joint Stock concerns, and that a feeling of despondency will be created in the public mind about the success of similar institutions, especially as it is constantly dinned into our ears that we are inherently incapable of managing Banking institutions on modern lines, and that we must restrict ourselves to our old "Shroff's" methods of banking. I have noticed that such advice is being resented as coming from interested quarters, and attempts have been made to hit back by quoting instances of failures of banks promoted and managed by Europeans, not only in this country but in other countries also. We must not, however, allow our judgment to run away with our feelings in either of these directions, but must keep our heads cool, and direct our energies to finding out the good in the evil; for I sincerely believe that, in the economy of Providence, there is no single evil without its counterbalancing good. His Excellency Lord Hardinge, who has by his recent pronouncements at Madras shown that he is as great a friend of our country as he is a great statesman, in referring to these recent bank failures, said: "I wish to say a word about the future. These failures have evidently caused some distress in Indian banking institutions, and the feeling of disquiet is not likely to be removed. We

must all deplore the set back which these events must be expected to give to the tendency which has been so pronounced in recent years for the savings of the people to be increasingly applied in investment and industrial enterprise. In spite of inexperience or recklessness, the movement was sound in itself. Indeed, it is a necessary condition of India's development and prosperity, and I am convinced that it will be maintained in spite of temporary checks. If the Indian investor is taught by these events to be more careful to distinguish between sound and unsound undertakings, or if they pave the way for some better system of regulation and protection, they will not have been unfruitful of beneficent result. Meanwhile, I earnestly hope that the legitimate caution which these misfortunes inspire will not degenerate into unreasoning dismay, the only outcome of which must be to confound the good with the bad and bring heavy loss upon investors and depositors whose money is lodged with some institutions." These are words of wisdom and show a thorough grasp of the financial situation. They were uttered at a very opportune moment, and we cannot but feel deeply grateful to His Excellency for his sound advice and message of hope.

The Indian Banking movement on the present extensive scale started in 1906, and in a way, it owed its inception and growth to the wave of Swadeshism that was then passing over the country. One of the first large banks promoted by Indian capitalists and restricted by its articles of association to doing practically the same kind of business as the Presidency Banks, was the Bank of India. Its promoters included level-headed financiers like the Tatas, Sir Sassoon David and Mr. Gordhandas Khatau, and they were all anxious not so much for large returns as for safe and sound banking business. About one-half the share capital was subscribed by the promoters themselves and the public.

were invited to subscribe the other half. On the day on which the list was closed, the capital was oversubscribed and the Directors had to cut down the number of shares applied for at the time of allotment. Having got the money the next thing to do was to select a well-qualified man to manage the affairs of the Bank. I have referred here to the details of the promotion of this Bank, not because I am connected with it, but because I believe that this is the proper way to float a Banking concern ; and I am glad to say that this Bank has worked successfully from the commencement and in the present crisis is in an exceedingly strong financial position. There must be expert, efficient and honest management under the active control of the Directors, in all safe and sound banking business, even though accompanied by moderate profits in the beginning. Neither the Manager nor the directors should have any personal interest in inflating the profits of the company beyond a reasonable increase in remuneration of the former, when his management results in increased profits. The fees of the Directors are much lower than in England, and it is generally recognized that the Directors here can only guide the policy of the institution and keep a general control over it. I have laid stress on expert, efficient management, and it is here that our difficulties begin. Till the starting of the present Swadeshi Banking Institutions, the management of the Presidency Banks and their branches as well as of the branches of European Banks, was always in the hands of Europeans. The highest posts to which Indians could aspire were those of Shroff or bill-keeper. No responsible post was given to an Indian, and consequently there were no capable Indians trained in modern methods of banking. We had either to get men from the existing banks who had only an experience in the book-keeping or intelligence department, or to appoint a trained banker to whatever nationality he belonged, and

then to train our men under him. The adoption of the former procedure leads to inefficient management, unless by good luck the person selected proves to be an exceptionally clever man, who picks up the necessary administrative knowledge in the course of his experience as a Manager. Even then the Manager being promoted from the ranks of clerks may not have a social position to command the confidence of the Directors or of the investing public, and he may not be able to give his opinion as freely and fearlessly as he is expected to do. The second procedure, although it led to efficient management, is not likely to help us to train a sufficiency of experienced men as quickly as they may be needed. The Manager naturally attaches greater importance to the successful management of the bank than to the training of his successors and subordinates. He says rightly enough, that if a man wants to get experience as a banker he must do what an English boy of his age would do, that is, begin at the lowest rung, learn all the details of the various departments and then after many years of careful training he may expect to be appointed to a responsible post. Our best educated young men cannot afford to do this as they expect a better start in life than the English boys who go to the bank from the public schools. These difficulties will disappear in course of time as our educated young men find that by dint of hard work and strict integrity they can rise to almost as high a place as they might attain in the various branches of the public service. The difficulties that face us now, faced English joint stock banks in their initial stages and Gilbert in his book on Banking says, "But, after joint stock banks were started as matters of speculation they increased more rapidly than efficient managers could be found. The new Banks naturally enough looked to Scotland. But the Scotch banks had sagacity to raise the salaries of their

principal officers to prevent their emigration to England. In some cases, those Scotch men who were appointed managers of English Banks had never held office in a Bank before, or else it was an office so inferior that all they knew about banking was merely the routine of office." As regards the next important item that leads to the successful working of a bank—the efficient control of directors—we find the difficulties of the first English joint stock banks repeated in the Swadeshi Banks of to-day. I quote the same authority again. He says—"Joint stock banking did not grow up gradually in England as in Scotland. On the introduction of this system in England, the directors were necessarily unacquainted with the practical operations of banking. For all the practice and experience were confined to the private bankers whom the new system was intended to subvert. In some places, there was a prejudice against directors who were in business. Hence officers in the army, barristers, solicitors, medical men, retired tradesmen and country gentlemen were considered as the most eligible directors. These boards of directors, all of whom were unacquainted with banking, and some of whom were destitute of business habits had to encounter difficulties which would have tried the most experienced bankers." I have made these quotations at some length to show that the difficulties we have to face are not in any way unique, or due to national or racial disqualifications. It is no use, however, deriving consolation from the fact that the same mistakes were made by people in other countries, and remaining inactive in the face of our present difficulties. What we should do is to find out how they met their difficulties, and to adopt their methods as far as practicable. "The want of experience in a Board of Directors," says Gilbert, "did not, however, produce any dangerous consequences when they appointed

an efficient manager. He prudently advised and instructed them. They gradually increased their knowledge and adopted his principles, and were guided by his counsels. By their daily intercourse with him, by their own reflections, by the directions given to their thoughts and by the experience they acquired, they became in a few years as conversant with their duties as the manager himself.' Later on he says, "But sometimes the case was reversed. The manager was inefficient, the directors inexperienced, and then the effects were disastrous." The effects would necessarily be much more so, if the management was dishonest also. Fortunately such cases are rare in Swadeshi Banks as they are in English Banks. Another reason for the failure of some of the Swadeshi Banks is that they desired to show higher profits than one another and to do this they had to take up unsound business or to do business which was not pure banking. This also is not a special feature of Indian pioneer banks; English Banks committed the same mistake, when a large number of joint stock banks was started for the first time and they had to be warned by Lord Goschen. He says, "Our duty in these modern stirring days must always be kept in view—the imperative duty to resist the temptations created by excessive and ubiquitous competition. Not to lose a customer by too severe an examination of his overdraft may be assiduously suggested to managers by the 'siren' ambition. It is correctly said that competition among banks has never been so sharp as now. Shareholders too may be exacting as to dividends, and watch for purposes of invidious comparison those of rival banks. Under the pressure of such stress from without and ambition from within, it is imaginable that less steady business might be entertained than the old fashioned banks would have regarded with favour. These are possibilities only, I hope, temptations only."

These possibilities have unfortunately been realities here. I would not refer at length to the necessity of banks holding a fairly large percentage of their current deposits in cash or gilt-edged securities, or of their not confining their advances to one or two trades only but distributing them amongst persons engaged in different trades and industries or of their not locking up a great portion of their capital in unmarketable or inconvertible securities. All these points come under prudent management, and an expert control by capable directors will always bear these points in mind. At a time like that of the present crisis, there is usually a demand for legislation to protect the interests of the shareholders and the investing public. Although it is true that no amount of legislative control can compensate for the absence of ordinary business prudence, yet there are some matters in which the Legislature may be better able to protect the interests of the investing public than at present. That Government are anxious to meet this demand is evidenced by the fact that they have consulted various Chambers of Commerce on the following points :—

- (1) The restrictions to be placed on the use of the term "bank" or "banker."
- (2) The necessity of laying down a minimum subscribed as well as paid-up capital in the case of banks.
- (3) The necessity of making provision for the building up of a reserve fund before dividends are declared.
- (4) Preventing banks from doing any other than pure banking business.

All these points as well as that of allowing banks to have a savings bank department will be brought before

the Subjects' Committee and their recommendations will be submitted to the Conference for consideration. I would also like this conference to express its opinion on the point referred to by the Hon. Mr. Graham in his speech as chairman of the St. Andrew's Dinner in Bombay. As the law stands, even one shareholder may by seeking the intervention of the Court on flimsy grounds, temporarily dislocate and discredit even a well-managed institution. Shareholders have their rights under the Indian Companies Act and the Articles of Association of their Companies. Except in rare cases when the delay in having recourse to the ordinary procedure may mean heavy loss to the Company or undue preference being given to some parties, they should not be allowed to go to Court in the first instance. In the instances mentioned above, the majority of shareholders will naturally combine to protect their own interests, hence a rule providing that Courts should not entertain applications for winding up of companies unless they are supported by persons holding a sufficiently large number of shares, will not in any way affect the real interests of the shareholders and it will protect the interests of companies, a large majority of whose shareholders have sufficient faith in the management to allow the concern to go on.

There is one more point of law regarding which the conference may well express its opinion. The carriage of proceedings in the winding up of a company is given to the solicitors of the first applicant. This is said to be a great temptation to solicitors to discover reasons for making such an application where none may exist ; and persons are sometimes cast on them for a scramble to get first to the court. In the interests of the reputation and good name of the profession, if for nothing else, the proposal to amend this rule is worth consideration.

Even if all these amendments are carried out, the millennium in banking will not be reached. There are no panaceas to replace prudent management. As long as there are shareholders indifferent to their real interests and clamouring for larger dividends, depositors who will not make inquiries into the stability of a concern if they get a larger percentage of interest, and Bank Managers either weak enough to submit to the siren of ambition and invest their funds in second or third class securities, or entirely careless of the interests of the shareholders, banks will continue to fail and spread misery all round. What is required is not merely the training of men as Directors and Managers, but educating the general investing public as to their rights and responsibilities. When this is done, banks will be able to stand the strain of slumps in trade and industries, and will by gaining the confidence of the investors attract deposits and slowly increase their profits. These recent failures and disclosures need not make us unduly despondent. Whenever institutions are started in response to a strong sentiment, there will not be wanting some who will use that sentiment for their own aggrandisement. Though they may go on prospering for some time when a crisis like the present one comes, they will be found out and weeded out, but during the process they will have done an amount of mischief, causing loss to many. That is the price we must pay for purchasing experience, which, if properly utilized, will surely lead to the successful growth of healthy institutions.

I have referred at some length to the present financial crisis, because industries depend to a very large extent on the financial facilities, which they obtain from the banks, mainly for their working capital. One of the reasons for some of the new industrial concerns coming to grief is the want of facilities of providing working capital. If we have

arge well-managed Swadeshi Banks ready to consider favourably sound business proposals for financing industries that are *prima facie* likely to be successful, we may see better success attend those who want to start new industries, and fewer failures among those that are already started.

The industries of the country may for practical purposes be divided, in the first instance, into agriculture and its allied industries and non-agricultural industries; and the latter may be subdivided into manufactures, including mining and chemical industries, and indigenous or handicraft. Progress in agriculture proper has been on the whole satisfactory. Government have been spending large sums in having research work carried on at the Pusa Research Institute, in making experiments to improve the staple agricultural products of the country, and in establishing agricultural schools and colleges.

Amongst private individuals who have helped this staple industry of the country, the largest donor is Sir Sassoon David, who has placed a sum of eight lakhs of rupees at the disposal of the Government of Bombay for the establishment of vernacular agricultural schools and the improvement of agricultural methods. There has been increasing co-operation between the Agricultural Departments and our public men interested in agriculture in adopting various methods, such as the starting of agricultural associations, the establishment of demonstration farms, and the holding of agricultural exhibitions for the purpose of "bringing improvements to the notice, and into the practice, of cultivators." The passing of the Co-operative Credit Societies Act paved the way as much for improving the credit of the agriculturists as for the purpose of inculcating in their minds the principles of co-operation on modern lines. A study of the reports of the various Conferences and the annual reports of the Registrars show that the Co-operative Move-

ment has taken root in the country and is spreading its branches all round. One of our demands was for the establishment of an agricultural bank in the country, while there was another, recommending the establishment of a Central Co-operative Bank in Bombay. The latter proposal was supported by the Bombay Government, and a Bank to finance Co.-operative Credit Societies has been established, and is doing useful work in this Presidency. Other Presidencies and Provinces are trying to solve in their own way the problem of providing capital for the Societies under their control, and they have succeeded to a very great extent, and the need of an All-India Agricultural Bank is not felt for the present.

The most important of the industries allied to agriculture is the sugar industry. In view of the large imports of sugar on the one hand and the large cultivation of sugarcanes on the other, it has been felt that factories for the refining of sugar should be started wherever practicable. The quality of the sugarcane, that is the percentage of sugar contained in the canes and the purity of juice, is an essential factor in the success of the sugar industry. The attention of Government has been drawn to the fact that the canes from which sugar is made in India are of a low percentage and consequently experiments are being made, specially in the United Provinces, to improve the quality of the indigenous cane by the selection of the best indigenous type as well as by the introduction of suitable exotic varieties. Even after the introduction of cane with a higher percentage of sugar, it is doubtful whether we can manufacture refined sugar at a profitable rate. A sugar expert, who went to the West Indies for the study of this subject as a Government of India Scholar, is of opinion that it would be best to begin by establishing Gur or Jaggery making factories; and that when they are found to be working successfully

it would be proper to consider the question of adding a refinery. It may interest you to know that it is proposed to start such a factory at Baramati, and if it shows good profits, a refinery will be added to it later on.

Amongst the "large" industries, the most important are the cotton mills which are situated chiefly in the Bombay Presidency and the Jute Mills in Bengal. The total production of woven goods is steadily increasing and there is a tendency to improve the quality of these goods. American cotton is being imported to a much larger extent than before, enabling the mills to spin finer counts of yarn. The production of woven goods has doubled itself in the last decade, and yet the imports of woven goods do not show any decrease. This is due the fact that the production of white and bleached goods in this country is on so small a scale that it has not affected the import to any appreciable extent. So long as we have to depend for our plant and machinery on foreign countries, so long as we are behind these countries in our knowledge of technological chemistry, and so long as we are not able to produce cotton equal in quality to American or Egyptian cotton, we shall find it difficult to compete on fair terms with Manchester or other centres of weaving industries. In this connection, I cannot help referring to the continuance of the excise duties on cloth produced in Indian mills. The import duties on cloth were imposed for fiscal purposes only and not with the idea of protecting the mill industry of this country. In spite of this fact, the British Government which, by the way, did not levy an excise duty on wheat in England when a duty of 2 shillings was levied on the import of wheat, ordered the Government of India, in obedience to pressure from Manchester, to levy an excise duty on the production of cloth by Indian Mills. It is as a free trader that I ask for the repeal of this invi-

dious duty. The reply of the Government that the income from it has grown so large that it is not possible to remit the duty without disturbing the fiscal arrangement to the detriment of the people of the country, is tantamount to evading the question. The Finance Ministers of the Government of India cannot be incapable of re-adjusting our scheme of taxation, so as to make up for the loss of the excise revenue in a way that will not cause inconvenience to the general tax-payer. The argument that the increase in the production of woven goods, in spite of this duty, shows that the industry is not affected by it, does not take into consideration the strong probability that the industry would have fared much better, if it had not to pay such a large amount in the shape of excise duty.

Similar progress is noticeable as regards other factories, such as cotton and jute presses, ginning factories, iron and brass foundries, rice mills, tile factories, etc.; the only industry that shows a falling off is the indigo industry, due to the introduction of synthetic indigo in the market. Unless the scientific research work that is being carried on by the Behar Planters' Association, with the help of a grant from Government, succeeds in finding out a way to meet the competition of the artificial indigo, the natural indigo, industry is bound to go on deteriorating. Except in respect of tile factories, there has been an increase in the number of factories worked by mechanical power and a corresponding decrease in those worked by hand-power. This means an increase in the demand for trained Mechanical Engineers, which seems to be met by the existing institutions for training them.

Among other "large" industries, the Tata Iron and Steel Company is, perhaps, the largest and the most important Swadeshi industry that has been recently started

in the country. It may be seen from the last annual report of the Directors that, though they have been able to manufacture and place pig iron on the market at favourable rates, they have not been entirely successful in manufacturing steel at a cost that would compare favourably with the price of the imported article and would stand the test of chemical experts. They have recently introduced improvements which enable them to manufacture steel equal to the best British steel at a fairly low cost. This industry was started by the sons of the late Mr. J. N. Tata, though the real credit belongs to that great man himself, who spent about five lakhs of rupees in making inquiries, in bringing out German and American experts to select the best site for the works after due enquiries and in sending to America vast quantities of coal to see that good coke could be made out of the same, to satisfy himself that the industry would be a paying one. Fortunately for him and also for the country, the experiments showed that it was possible to manufacture iron and steel on a profitable basis. It was then and then only that his sons went to the public for the subscription of the share capital, and in spite of all these preliminary inquiries and the expenditure of a vast sum of money, they have had to face difficulties which they are only now likely to conquer. The lesson to be drawn from this instance is that it is no use starting large industries, unless it is seen, after making rigorous preliminary tests, that it is possible to manufacture a particular article of as good a quality as the imported one, and at no higher price. Such inquiries can only be undertaken by men having capital and possessing sound knowledge of the economic and commercial side of a proposition. Unfortunately the number of persons having all these qualifications and the further essential one of capacity to control a business when it is started, is so small that it is no wonder that only a few of the new

"large" industries started in this country are successful. When, after experiments, it is found there is a large supply of raw material suitable for the manufacture of a particular commodity, and that it is possible to manufacture it at a profitable rate, the promoters of the industry would be justified in approaching Government for concessions to support the industry in its infancy. That Government are likely to consider such an application favourably can be seen from the following remark in the report on the moral and material progress regarding the Tata Iron & Steel Works—"The Government of India gave assistance in various ways to this important project and undertook to purchase annually for a minimum period of ten years at least 20,000 tons of steel rails, &c."

The subject of the failures of a large number of joint-stock concerns was referred to by my predecessor, and it has been discussed at the previous Conferences, at one of which the General Secretary was asked to make inquiries into the causes of these failures. He was not able to do so owing to the dearth of funds. May I in a general way outline the causes of most of these failures? These are: (1) want of expert preliminary inquiries as to the possibility of the success of that particular industry; (2) inexpert or inefficient internal management; (3) want of control by the agents; (4) want of commercial or economic knowledge as regards that particular industry; (5) the difficulties in the way of getting the required working capital at a profitable rate of interest. I have used the word "working capital," as the capital for buildings and machinery is likely to be raised by share capital. When this is not done the difficulties are much greater in the case of financially weak management, and the concerns are bound to go down when there is a financial crisis or when there is a slump in that particular industry. May I appeal to you and through you

to the investing public and company promoters to avoid all these shoals and pitfalls and to be very careful in starting new industries ? To emphasise the necessity of careful preliminary inquiries, I beg to draw your attention to a matter referred to in the latest report on the moral and material progress of this country. The report says: "One unsatisfactory aspect of the manganese industry is the loss that India has suffered by exporting manganese ore and importing steel instead of manufacturing at least a portion of the ore into ferro-manganese." On the face of it, the remark seems justifiable. The question naturally arises as to why double freight is paid on the export of the ore—taking manganese at fifty per cent.—and the ferro-manganese imported with the freight added to the cost of manufacturing the same, when both these freights could be saved by erecting a plant in the country to manufacture ferro-manganese. It is only when we begin to examine the details of the question that we find that at present it is more profitable to import ferro-manganese than to manufacture it in this country out of the manganese ore. The Tata Iron & Steel Company, Ltd., which is the largest steel manufacturing company in the country expects to manufacture about 100,000 tons of steel with the present plant. The average output for the first few years will be somewhat less, say, about 80,000 tons. One ton of ferro-manganese is required for the manufacture of 100 tons of steel. The company will thus require about 800 tons of ferro-manganese annually, *i.e.*, a little more than 2 tons per day. It does not pay the company to erect a plant to manufacture only this quantity of ferro-manganese. If the latter material is to be manufactured profitably, it must be done on a larger scale. If that is done, there arises the difficulty of putting the balance of this product on the market. As very little steel is manufactured by the other iron companies, the ferro-

manganese must be exported to Europe. One has then to calculate, whether, even if one is able to manufacture, ferro-manganese to stand the required Chemical tests—and I may say in passing that .01 per cent. excess of phosphorus counts a great deal at the time of selling this article—whether one will be able to compete with the manufacturers in England and on the Continent after paying the freight from here to there. Careful inquiries made by those interested in the industry show that this cannot be done, and hence it is no use establishing a factory for the manufacture of ferro-manganese until the production of steel goes up considerably, or unless some method is found out by which ferro-manganese can be manufactured sufficiently cheap to bear the handicap of the freight. The use of cheap electric power seems to be a probable solution and we may see in the near future a plant for the manufacture of ferro-manganese erected on the Western Coast where it is possible to produce electricity at a cheaper rate than is done by the Tata Hydro Electric Company. The same report says that “there is a great scope for the development of mineral industries for supplying the internal requirements of the country quite apart from any market that may be found abroad,” and “very little has hitherto been done to develop those minerals that are associated with the more complicated metallurgical and chemical industries.” The writer of the report himself gives in the same paragraph the reasons for so little being done in this direction:—“The explanation is to be found to a great extent in the importance of the bye-products in the modern metallurgical and chemical developments.” Till we can successfully start the metallurgical industries demanding a sufficient number of chemical bye-products we must be content to pay the tax on imports. Another industry which it may be profitable for the Tata Iron Steel Co., Ltd., to

start in the near future is that of the manufacture of Sulphuric Acid. The Ammonia which is now a bye-product can then be made into the sulphate of Ammonia, which will be very useful as a good manure.

What the establishment of a big industry means in other directions is illustrated by the Tata Hydro-electric Works which are reaching completion. When the electric power generated therein is fully used, it may mean a great impetus not only to cotton mills, but to other concerns in the need of power in the City and suburbs of Bombay. Moreover there will be a vast amount of tail water which will help irrigation in the surrounding districts. Some of the water will perhaps be used for bleaching and dyeing works to be started in that locality.

Another industry which has made good progress during the year is that of cotton seed oil manufacture. The Tatas were the first to start this industry, and they had uphill work in establishing a market for these commodities. Other people have to a certain extent benefited by their work, and as a result the Indian Cotton Seed Oil Co., Ltd. at Navsari, and similar factories at Akola are able to place their products on the market at a profitable price. There is a large export of oil seeds of all classes chiefly for utilization in soap and candle factories. A large number of factories for the manufacture of these articles was started in several parts of the country, but many of them failed on account of one or more of the reasons which I have already mentioned. It is for industrialists in consultation with experts to find out how they can utilize profitably the raw produce of oil seeds, and until that is done, the exports of these seeds will go on increasing.

A new industry, that has been started during the year, is that of cement manufacture. Two factories are

being erected for this purpose ; one at Porebander in Kathiawar and the other at Katni in the Central Provinces. A third company is floated for preparing Natural Cement. Out of the two companies the first is going to lay down plant for glazed pottery. As both these concerns have been started after making detailed preliminary inquiries and after having cement made in bulk from the material that is to be used in the manufacture, and as they have competent consulting engineers and capable business men as managing agents, they are both likely to be successful. The cost of manufacturing cement will be much lower than that of the imported article of the same quality, so that even if the foreign manufacturers reduce their prices the local concerns will be able to sell at a still lower rate and yet be able to make a profit. A large quantity of marble and other stones is being imported, although there is a large supply of ornamental stone in the country. If cement companies are successful in their undertaking, they will be able to turn their attention in this direction.

There is a proposal to start a factory for the manufacture of hand-made paper. Such paper in a coarse form is prepared in Ahmedabad, and other places. It is suggested that by using similar bulb, but improving the methods, paper as good as English hand-made paper can be manufactured and profitably sold at a lower price than that of the imported article. If the dealers in hand-made paper be satisfied with the proposals of the young man making them, a factory may be started in Ahmedabad in the course of the next year for the manufacture of hand-made paper.

There is not much progress to report as regards indigenous industries except in the case of the hand-loom industry. With reference to the other industries, the Moral and Material progress report says:—"Where ancient industries

linger on in towns to which they have brought fame, the adherence of the craftsmen to stereotyped designs and their general lack of technical skill, tend to prevent any active demand for their wares except as curios." Hand-loom weaving factories have been started in Madras, the United Provinces and in Bombay, where a special officer was appointed to make a survey of the industry. It has been decided on the report of that officer to appoint an assistant to the Registrar of the Co-operative Credit Societies to promote such societies among hand-loom weavers, as it was thought that no real improvement in their condition could be made, till they were able to co-operate for the purpose of increasing their credit and for getting a higher price for their wares.

One of the most important factors in the progress of industrialism is the training of young men in technological and managerial lines. We have during the previous Conferences laid stress on the necessity of having technological institutes and commerical colleges established in the country and also of sending out our young men to England and other foreign countries to get the necessary training. The Government of India has as we know, instituted scholarships to be granted to "natives of India" to provide higher technical education that would qualify the holders to assist in promoting the improvement of existing industries and the development of new industries wherever possible. According to Sir Theodore Morrison's Committee's report, up to 1912, 66 students had taken advantage of these scholarships. The Association for the Advancement of Scientific and Industrial education for Indians has assisted 222 of our young men to go to various countries for technical education. Bengal has every reason to be proud of having done so much in the furtherance of the cause. Some students have been sent by the South Indian Association fund and the Malvi Technical scholarship fund. The Universities of Bombay and Calcutta and the Native States of Baroda, Hyderabad and Mysore have also been sending scholars for a similar purpose. The progress in this direction has so far been satisfactory. The

Morrison Committee found that these students were well able to keep abreast of their work in the Universities and technological schools and were in intelligence quite up to the average of their classes, while some of them have been men of very marked ability and earned from their professors very high praise indeed. Comparing their work theoretical and practical with that of the other students, the Committee's Report says "the average Indian Scholars appear, however, to be quite the equals of their British fellow-students in capacity; in so far as it is possible to generalise, they are rather above the average at book-work and in the class room; they are less good at experimental work in the Laboratory and are said to be somewhat deficient in initiative. To this rule, however, there were certain notable exceptions." From the reports of the England returned young men, it appears that their presence is not looked upon in that country with the favour that it used to be formerly, and that they find difficulty in getting entrance into factories and even in some Universities and Colleges, which now fix the number or proportion of Indian students they will take. Under these circumstances, the appointment of the committee consisting of Sir Theodore Morrison and Sir Krishna Gupta and others was a step in the right direction. Their report shows that though there have been a few cases of back-sliding, the harm they have done is quite out of proportion to their number. Yet on the whole, our young men are reported to be behaving very well. We are further led to hope by the sympathetic tone of that report that the India Office is willing to give every assistance to the Government scholars in getting the training for which they have been sent there. We trust that students going out on their own account or sent by private associations will receive similar assistance also.

On their return to this country such young men who had any connection with the industry which they had gone to foreign countries to learn, do not find it very difficult to get employment in the existing industries in some capacity or other, or in assisting industrialists in starting a new concern

under their supervision. Others who have not had the advantage of such connections, have not fared equally well. They will take some time before they are able to inspire confidence in the minds of Capitalists and Industrialists, to whom they are unknown till then. This difficulty will not arise if it was possible to send young men who have had some previous connection with the trade or industry which they want to study in the foreign country and adopt it after their return. That, however, is not possible for the present as industrialism in the modern sense is a plant of recent growth in this country. The next best thing is to require that the student proceeding to foreign country for further studies should have received some practical training in the subject he is going to study, for that is the only way in which he can be, partially at least, given a taste for that particular industry. There is no other way to select a man for a particular industry. Even in America where some progress has been made in experimental psychology, it is still very difficult to say with certainty which vocation a young man is suited for. Referring to this subject Hugo Munsterberg says—"In the first place young people know very little of themselves and their abilities. When the day comes on which they discover their real strong points and their weaknesses, it is often too late. They have usually been drawn into the current of a particular vocation and have given too much energy to the preparation of a specific achievement to change the whole life plan once more. The entire Scheme of Education gives to the individual little chance to find himself." Sir Theodore Morrison's committee lays stress on preliminary practical work on educational grounds. "The practical experience to which we now refer" says the Committee "is needed to enable him to understand what his University teachers are talking about, and it may, therefore, like a sufficient general education be considered one of the necessary qualifications for his course of reading." The Government will bear in mind the recommendation of the Committee when selecting their Scholars and our

associations should also carry them out as far as practicable. In some cases it may not be possible for those associations to have their candidates taken up by existing industrial concerns as apprentices, for commercial jealousy is prevalent here as in England and an apprentice is looked upon as a possible future rival. This feeling is justifiable on pure business grounds, yet it may be modified by an appeal to the spirit of Patriotism. Even in England where there is bound to be some racial prejudice added to commercial jealousy, Mr. Levinstein told Sir Theodore Morrison's committee, "We do not want Indians, but there is a certain amount of Patriotism and we will help England to help India." Sir William Mather said "I do not think it is possible to meet the case except by the Council of India in London making it a matter of patriotic duty on the part of employers in certain industries to contribute to the welfare of India by affording opportunities for some of these well selected fellows." Our Industrialists, one feels confident, are not likely to be less patriotic than those high-minded Englishmen, and if they are properly approached there seems to be every probability of finding opportunities for our young men as apprentices. Even if students with a previous practical training were sent for further Technical Education and even if these young men returned with a complete theoretical and practical training in their own subjects they will not all at once be able to start new industries or be given respectable posts in existing industries. If they have a small capital of their own, or can secure that amount from persons who have faith in them, they must be satisfied with starting small industries or they must accept the posts which the proprietors or agents of existing industries consider suited to them and then by showing their mettle rise to the highest place in course of time. But even in this matter, these young men need guidance and assistance. The Indian Guild of Science and Technology which is recently established and has several branches in England and India is doing some useful work in this direction. The Morrison Committee recommends that the existing provincial Advisory Committees might act as appoint.

ment boards. With this end in view, the leading business men of Bombay have latterly been nominated to the Advisory Committee. I would however prefer the existing commercial bureaus and similar other institutions taking upon themselves this duty. If they keep themselves in touch with these Indian students both while they are studying abroad and after their return they will be in a better position to help them in securing work suitable to them. The knowledge and abilities of these young men will then be utilised in developing the industries of their country and not be merely wasted.

There seems to be some difference of opinion as to whether we should have at least one fully equipped polytechnic college in the country, or whether we should have a technical institute in each Presidency and Province equipped with special reference to the important industries therein. Personally I am of opinion—and I speak with all due deference to the great men that hold the other view that an institute whether educational or technical must have a suitable environment, if it is to make any progress and is to be a living institution. If a technical institution is started amidst industries for which it is equipped, it will not only be able to assist the industries but will continue to prosper. Moreover the promoters of the several industries, knowing what class of men they want, will be in a better position to exercise a healthy influence on the institution. They will also be able to make themselves heard in respect of the scope and methods of the institution, either through their own associations or through their representatives in the Local Legislative Councils. The other idea which naturally appeals to patriotic feeling can well be carried out when we have a large number of institutions suited to the requirements of the various provinces. As regards one branch of technology, chemical, industries, we already have an All—India Institute at Bangalore. Unfortunately the Tata Research Institute has not been able to do all the good which its generous founder expected it to do. We are anxiously awaiting the report of the Committee of inquiry into the affairs of the institute and we sincerely

trust that if it is found that there has been mismanagement and lack of sympathy with the students, as is alleged by them, the Government of India will boldly remove the men who have brought this institute into disrepute and that they will put it on such a sound basis that the country may have all the benefit which the Tatas intended. Having got technical men for the internal management of industrial concerns the next important thing is to have men trained up for external, that is, economic and commercial management. The theoretical training can be given by commercial schools and colleges, and practical training can be had as apprentices in large offices. The University of Bombay has—thanks to the persistent efforts of Mr. Aiyar and the cordial support of the then chancellor—instituted a degree in commerce, Lord Sydenham's Government had made provision in the Budget for the starting of a College of Commerce from last October and the present Government has shown its keenness in the matter by starting the college manned for the present by local men under Mr. Aiyar, who has agreed to work as Honorary Principal till the arrival of a full time Principal from England. The Allahabad University has taken up this question and established a faculty of Commerce. Other Universities and Local Governments will follow the example of Bombay and within a few years we may hope to see such colleges affiliated to all Universities. No Offices or firms, as far as I know, except that of the Tatas, have introduced the system of taking up one or two educated men every year as apprentices with the idea of training them as mill managers.

We have reason to be satisfied with the progress made since the inception of the Conference; our demands about granting facilities for technical and commercial education, for improvement of agriculture, for an industrial survey and for the establishment of a central Co-operative Bank have been carefully listened to by Government, which have granted them in the way they thought best and practicable. Committee has been appointed to make inquiries about

the desirability of standardisation and uniformity of weights and measures. In the matter of industrial development of the country, the sympathy of Government, we must gratefully acknowledge, is not merely lip-sympathy. The institution of State industrial and technical scholarships before the Conference began its sittings, shows that Government was trying to gauge the feelings of the country on the subject and of meeting it. It will thus be seen that much spade work has been successfully done by the conference. The work now to be done by the conference will be of a detailed and technical character. Commerce and Industry are in a way allied to each other and though there may arise occasions when their interests clash it is not impossible for both of them to work harmoniously. In this connection, I may refer to the scheme for an Indian Commerical Congress, which has been prepared by the Indian Merchants' Chamber and Bureau on the basis of Hon'ble Sir Fazulbhai's proposals outlined by him in his letter to the *Times of India*. The idea of this conference originated I believe, with my friend, Mr. Chintamani, who may well be called the god-father, if not the father of this conference and who sees in this proposal an attempt to strangle his god-child. Let me pray assure him and you all on behalf of Sir Fazulbhai that he had no idea of strangling our conference at the time of making his proposals. Not only that, but he will be the first to welcome a proposal for amalgamating both these ideas, or co-operating with us in a spirit of amity and friendliness, if an amalgamation is found to be impracticable. The best thing seems to me to appoint a small committee to consider the whole question in consultations with the representative of the Indian Merchants' Chamber and Bureau and submit its report to the next Conference when we all hope to meet under more cheerful circumstances.

The flowing tide is with us and though the line of progress is not soon marked, every wavelet assists to push the boundary line forward. There are bound to be set-backs. for there can be no continuous progress in this as in all matters and the only thing we have to be careful about, is to see that

even after each set-back we are further on the road and nearer our goal than when we began. In spite of the present gloom, the future does not seem to me to be devoid of hope ; and it is entirely in our hands as to when and to what extent we are able to realise our expectations. What Lord Haldane so well expressed about success in individual life applies as much to races and nations as to individuals, and I cannot bring this address to a better close than repeating his message: "We all or nearly all get a fair number of chances in life. But we often do not know enough to be able to take them and we still more often pass them by, unconscious that they exist. Get knowledge and get courage and when you have come to a deliberate decision, then go ahead, and go ahead with a grim and unshakeable resolution to persist."

The Annual Report.

After the Presidential address was over, Rao Bahadur Mudholkar, the General Secretary of the Conference presented the report for the past twelve months on the working of the Industrial Conference Office, comprising a general record of the Industrial activity on the part of the Imperial and Provincial Governments, the Rulers of Indian States and the people, during that period. The Report being a lengthy document Rao Bahadur Mudholkar contented himself with reading only a few extracts there from before placing the same on the Presidential Table. He specially drew the attention of the meeting to the apathy of the educated classes and the nobility of the country towards the work of the Conference in the following words :—

" This, gentlemen, is a slur on the country and should not be allowed. There is a class among you, the middle classes who can come forward now and by raising the required sum of Rs. 8,000 which is needed for the continuance of the work of the Conference show that they at least are alive to the importance of this institution, the work of which I am very sorry to have to say had this year to be curtailed for want of funds. I beg to place the report on the table for your approval."

The Report was unanimously adopted.

Papers Contributed.

The General Secretary of the Conference then read a list of the papers contributed by officials and non-official gentlemen in the country. For want of time the papers were taken as read and submitted to the Conference. They will be found reproduced below. Many of the papers contributed this year contain a mine of valuable information of a practical nature which deserves to be fully utilized by our countrymen.

THE PAPERS
MANURES TRIED IN THE CENTRAL PROVINCES
AND BERAR AND EXPERIENCE GAINED FROM
THE USE OF THE SAME.

BY D. CLOUSTON, ESQ., M. A., B. SC.

Deputy Director of Agriculture, Southern Circle, C. P., Nagpur.

Agriculturally the Central Provinces and Berar may be divided into four tracts—the wheat tract, the cotton tract, the rice tract and, lastly, the plateau tracts,—where millet, rice, wheat, pulses and oil seeds are grown in varying proportions. In the wheat tract, manure is seldom applied to a rabi crop. Broadly speaking only the cattle dung that accumulates during the rainy season is saved for manurial purposes ; it is used as fuel during the rest of the year. A small quantity of manure collected during the cold and hot season is applied in the hot weather to fields intended for rice, juar or sugar-cane. It is a general belief among cultivators, that for dry crop wheat manure does more harm than good. The only cultivators who make a rule of applying it to wheat lands are those, who can irrigate their fields from wells as in Nimar District. The amount of damage done to rabi crops, especially in years in which cold weather rain falls, and the extent to which the mischief is intensified by applying partially decomposed cattle manure, mixed with village rubbish, which undoubtedly attracts white ants and dries up the soil, probably accounts for the aversion to the practice of manuring rabi crops in unirrigated land.

2. The same remark applies to plateau tracts. The manure is used for manuring kharif crops and for sugar-cane, vegetables, tobacco etc. where these are grown.

In the cotton-tract, on the other hand the value of manure is better understood, but there, too, cattle dung is the only one in general use at present. It is applied in the hot weather to fields which are to be cropped with cotton and juar. A

few of the more enterprising cultivators near the larger towns are beginning to use poudrette also, and to conserve their cattle urine by the dry-earth system.

In the rice-tract most of the cattle dung is still used for fuel. The small quantity of so-called manure collected consists largely of ashes and village rubbish and is applied to the rice fields only.

Few cultivators in any of these tracts use any other form of manure. In certain cases a malguzar in the rice tract, at the time of cleaning his tank, applies the silt to his rice fields; this practice is fairly common in parts of Bilaspur. A few scrape the mud from their cattle stalls and use it as a manure. In still more exceptional cases, sann-hemp, Jagni or til are grown as green manures for sugar-cane and are ploughed in during August. In parts of Chhattisgarh some rice-growers collect a weed called kutwa (*Xanthium strumarium*) which grows in the black soil, burn the stalks and plough the ashes into the ground. This is said to be of some value as a manure though the aim of the cultivator in collecting it is rather to destroy the weed, as it makes a second crop impossible. The burning of branches of trees is regularly practised in the Wainganga rice tract, wherever there is available jungle. Saj trees (*Terminalia tomentosa*) are preferred.

3. The only other method of manuring, which is worth mentioning is that of sheep-folding, which is a practise prevalent in parts of certain districts, more especially in those of Berar and Nagpur Divisions. The sheep belong to shepherds (dhangars or Karumwars) who hire them out at so much per night. For a flock of about 1000 sheep, the cultivator pays in rice or juar grain to the value of from Re. 1 to Rs. 8 per day. The sheep are penned in the area to be manured during the night, whilst during the day they enjoy free grazing in the fields of the village. In districts where there are large waste areas this is the most economical method of manuring possible at present. Under a more intense system of cultivation, it would be capable of great development. Cane-growers in Chanda manure their cane crop in this way at a cost of

about Rs. 15 an acre ; the rice grower manures his rice plots for $\frac{1}{6}$ th of that amount.

The practice is well worth fostering and this the Department of Agriculture has set itself to do. With this end in view sheep breeding has been started on two of the Government farms, and Merino rams are being imported for crossing with the local ewe. Should it be found possible to improve the quality of the wool in this way, sheep breeding would become a profitable industry, and an industry which would greatly benefit the farmer too, as it would increase the supply of locally available manure.

4. It is a recognised principle in manuring that the composition of the manure should be regulated by the deficiencies of the soil. The poverty of our soil, both that derived from trap and metamorphic rocks, is nearly always due to its deficiency in nitrogen, and organic matter—the great source of the same. Black cotton soil especially is deficient in nitrogen which accounts for its being very responsive to applications of nitrogenous manures. Such manures may be roughly divided into two classes (1) bulky slow acting manures such as cattle-dung, ashes, green manures, dried leaves and bone meal ; and (2) artificial quick acting manures, such as saltpetre, sulphate of ammonium, nitrate of soda, calcium nitrate and calcium cyanamide,

5. Cattle-dung will, as a manure, always be the most important. It is a cheap product and in India it is available every where. It supplies organic matter and nitrogen and thereby helps to enrich our soils and to improve their physical texture ; but the supply is very inadequate. There were in 1912, 11,458,019 heads of cattle, including buffaloes, in these Provinces. From the observations made at Government Farms, the quantity of dung obtained per working bullock annually, is about $3\frac{1}{2}$ tons, when the stall droppings and the litter used during the night were collected. On an average, then, mixed herds may be expected to give nearly $2\frac{1}{2}$ tons per head annually. A considerable portion of that is wasted, owing to the large number of cattle sent to distant grazing

grounds, where their dung is not collected ; on the other hand that loss is probably balanced by the large additions made to the manure supply from other sources *e. g.* the dung of other animals kept by the cultivator, refuse of crop and village rubbish. The cattle of the provinces should therefore give annually nearly 28,645,047 tons of well rotted manure. If it were all applied to the land, it would suffice to manure the whole area under cultivation at the rate of about one ton a year per acre: but probably less than one third of the total quantity is actually applied to the land. Out of the remainder, much is used as fuel, and some is washed away owing to the careless manner in which it is stored in loose heaps above ground. The quality is poor for two reasons : (1) the manure is carelessly stored (2) the animals except those in the cotton tract are badly fed. I have recommended certain methods of conserving both dung and urine in my article on cattle manure, published in part III, Volume II of the Agricultural Journal of India in 1907. The dry earth system of conserving cattle urine recommended by our Department has been adopted by several cultivators in Berar. The relative manurial values of cattedung and urine applied separately and in combination have been tested for the past seven years on the experimental Farm. Akola. The results prove conclusively that the manurial value of the urine given by a herd of cattle is about equal to that of their solid-excreta for the same period.

6. The supply of cattle manure is insufficient over the whole Provinces but especially in the cotton and rice tracts. In the former it is of better quality owing to the quantity of cotton seed fed to the bullocks. There is some possibility of supplementing the supply in that tract with artificials. The increased yields of cotton obtained on the Akola Farm from an application of cattle manure, followed by a top-dressing of nitrate of soda in one case, and by saltpetre in the other, after the plants had been thinned out, are noteworthy. The clear profit due to the combined manure has ranged from 20

to 40 per acre. The exact quantities applied are given in the Annual Report on the Akola Farm.

As a manure for cane, ammonium sulphate has given promising results on the Tharsa and Raipur Farms. Calcium nitrate as a manure for irrigated wheat has been found to add very considerably to the outturn of irrigated wheat, but in no case does the value of the increase cover the cost of the manure.

Calcium cyanamide and saltpetre have been tested as manures for rice and wheat, but these again have always been applied at a loss. It is very doubtful whether any of these artificial manures can under any circumstances be applied alone at a profit to cereal crops at present prices. The cost of the manure landed in these provinces is so high that the increased outturn, though considerable, does not cover it. Of course if it were possible to manufacture them locally, and to put them on the market at about half their present price, the whole question would then become one of great economic importance, and their use would probably become general. At present they cost too much per unit of nitrogen.

7. The productiveness of a soil, I believe, depends largely on the amount of nitrogen giving organic matter present in it; for the ordinary cereal crops this organic matter can be supplied very much more economically in the form of cattle dung or green manures. Though the supply of cattle dung is very limited, it can still be purchased in most parts of the wheat and rice tracts at 4 per cart-load, which shows that its manurial value is not fully appreciated. Under the circumstances, it is hopeless to expect indigent cultivators to purchase costly artificials. The introduction of the latter at present prices will only be possible where the more profitable crops *e. g.* cane and cotton are grown. For these crops there is good reason to believe that artificial fertilizers can be used economically to supplement the supply of cattle manure. That the present supply of manure will not suffice for intensive cultivation will be felt more and more as irrigation spreads, for irrigation increases the drain on

the soil's fertility. A supply of one of these nitrogenous manures, rich in nitrogen, if manufactured locally, and at a comparatively cheap rate would give an impetus to the cultivation of cotton and cane.

8. It should be possible to practise green soiling in rice tracts on a larger scale. Sann-hemp, ploughed in, gave an increase of paddy varying from 500 lbs. to 700 lbs. per acre on the Raipur Farm last year. It has also been observed on the Telinkheri Farm that *Melilotus alba* sown as a mixture with rice and allowed to flower in the cold weather, increased the outturn of the succeeding rice crop.

9. *Sesbania aculeata*, too, is under trial for green soiling ; and I anticipate that much will be made of these as green manures in future, especially in the large areas commanded by Government tanks. Sann-hemp, bawchi (*Psoralea corylifolia*) and tarota (*Cassia occidentalis*) have been tried as manures for wheat, but have on the whole proved unsatisfactory. When the green manure is left standing till the end of the rains, it fails to rot in time, owing to lack of moisture ; it forms an attraction for white ants, and keeps the soil too open. When ploughed in about the middle of the rains the operation has nearly always to be carried out when the soil is wet, which is fatal to the wheat crop which follows. In short, there is very great scope for green soiling of rice lands, but for wheat the operation is a much more critical one, and a lot of experimental work will have to be done before the practice can be recommended to cultivators. It is just possible that for wheat a legume, grown as a previous kharif crop, might serve the purpose better, Wheat following ground-nut has done exceptionally well on the Raipur Farm.

10. The export of oil seeds from the provinces undoubtedly constitutes a great drain on the fertility of the soil. The total area under oil seeds in these provinces last year exceeded $2\frac{1}{2}$ million acres and the export of oil seeds over 48 lakhs of maunds, leaving but a small share of their rightful dues for the cattle and soil. Oil pressing is carried on to a small extent by Telis of whom there are two or three in almost

every village. In certain villages, however, the majority of the population belongs to this caste. They are not all engaged in oil-pressing. Many of them are cultivators pure and simple: others are petty traders. In towns and some of the larger villages there are, however, Telis who devote their whole time to this work. In other villages there are cultivators who also do a little oil-pressing. The latter work is mostly done by the women. The *Teli* puts his *ghani* (oil mill) in order in the morning, yokes the bullock to drive it, and gives the necessary order as to the quantity of seed of each kind to be crushed. To facilitate the process, it is customary to mix two kinds of oil seeds together for crushing.

The oil-seed is cleaned before it is added to the hopper. To facilitate pressing half a cocoanut-shellful of water is also added. The hopper of the *ghani* holds 7 to 8 pailies (*i.e.* 14 lbs. to 16 lbs.) of seed at one time, and three hoppers of seed *i.e.* 45 lbs. approximately can be crushed in a day of 8 hours. The seed for one day costs Rs. 4-8. This gives 18 lbs. of oil worth Rs. 5-2 and 27 lbs. cake worth Re. 1, giving a gross profit of Rs. 1-10. In the case of linseed the proportion of oil to cake is less than this.

Having set everything in order, the *Teli* proceeds to his fields and attends to his every day cultivation. His wife, or it may be his daughter-in-law, whom he has left in charge of the *ghani*, sees to the driving of the bullock and her household duties as well. So long as she hears the creaking of the mill, she is content that the bullock is doing his duty. If need be she leaves her household duties to urge him on to a quicker pace. The bullock is blind folded to prevent his seeing that his driver is not following at his heels. The cake takes its cane-like shape from the hopper of the *ghani*. It is sold in the bazar at a price varying from 26 to 32 lbs. per rupee. These sales are generally effected by female members of the family. The work of pressing goes on for 6 days *i.e.* from Tuesday to Sunday. Monday is a holiday, the day being

dedicated to the God Shiva, the bullock being the emblem of that God.

The quantity crushed every year in each district is very considerable. The oil is in general use for cooking purposes. In addition to this a small quantity of castor seed is used for greasing cart wheels and for lamps. It is seldom used nowadays for the latter purpose, having been replaced by kerosine. Cake is used as a cattle food more especially by *malguzars* and well-to-do cultivators. To extract oil from castor, the dry seed is first heated in an earthen pot, crushed by hammering on a stone, and then boiled in water. The oil floats to the surface and is then skimmed off, leaving the water and broken seed behind. The latter being non-edible is usually thrown on the manure heap. It is customary for cultivators of all castes to extract castor oil in this way.

Oil pressing, as a village industry, has suffered since the opening of factories for oil-pressing. This competition has lowered the price of oil and led to adulteration of *til* and linseed oil with inferior oils at the hands of the retailer, and has also helped to ruin the trade of the village. *Telis*, many of whom have discarded the wooden *ghanis* for the more profitable business of retailing imported factory made oils, which they do not hesitate at times to adulterate. The quantity of oil-cake suitable for manurial purposes obtainable from this source, is small, and costly. Moreover, it contains such a high percentage of oil, that it would be of much more value to cultivators, if fed to their animals, which assimilate only the constituents of the cake which are of little manurial value. In the Industrial Survey of the Central Provinces and Berar, 1908-09, Mr. Low says "While truly recognising the extreme desirability, on economic grounds, of substituting an Indian Oil-milling industry for this large export of oil-seeds, it is clear that the only agency by which this can be done is by the power mill." There are already 5 such mills in these provinces, two in Akola, one in Amraoti, one in Raipur and one in Itarsi. These sup-

ply cake with a lower percentage of oil and at much cheaper rates than the village telis can ; while the latter's cake sells at the rate of 30 lbs. per rupee. The Akola mills supply undercorticated cotton cake at 38-per ton or approximately 60 lbs. per rupee. But even at these cheap rates there was no market for cake as a manure in these provinces three years ago, except on an insignificant scale as manure for pan. To remedy this state of matters, the department was to demonstrate its use on a fairly large scale as a manure for sugar-cane to start with, in connection with its work of extending the cultivation of that crop under the larger Government tanks. Over 6000 maunds were purchased; mostly til, for this purpose last year, while this year there has been a still greater demand. The demand is steadily growing as the area of cane is being increased. When the Central Provinces Sugar Syndicate, which is to start sugar-making in Chanda shortly, is in full working order, a great impetus will be given to cane cultivation of a more intensive kind than is practised at present, and we have reason to believe that considerable quantities of cake will be required for the large area of cane to be grown for the factory.

Analysis of four of the factory cakes manufactured in these provinces, gave the percentages of nitrogen shown below :—

Castor	4.12	o/o	Nitrogen.
Til	4.53	o/o	do
Sarson	4.78	o/o	do
Kardi	8.00	o/o	do

At this rate the cost of their nitroen per lb. is Re. 0-9-7 for castor, 0-5-9 for til, 0-7-8 for sarson and 0-9-5 for kardi respectively. But at this rate there was, as has already been pointed out, no appreciable demand for these cakes till lately. Consequently, though these mills can manufacture about 40 tons in the case of smallest, to 150 tons in the case of the largest per month, the out put is much less than this. There being no good local market for the cake, it has nearly all to be exported,

edible cakes to England and non-edible cakes to the Bombay Presidency, where they are used as manure for cane.

12. Bone meal as a manure for rice has done well at the Raipur Farm. In the four series to which it is being applied at the rate of about 7 maunds per acre, it gave an average increase of 878 lbs. of paddy last year, and an average of 896 lbs. for the previous years. At present, however, all the available bones are exported and the bone meal has to be ordered from Calcutta. With the view of encouraging the manufacture of bone meal by private enterprise, this department purchased and worked a No. 2 bone disintegrator three years ago. Over 7 tons of fine grade bone-dust were manufactured and tried as a manure for paddy at different demonstration centres under Government tanks. The disintegrator has been taken over by the Manager of the Raipur Oil Mills who has started the manufacture of bone meal as a private enterprise.

Poudrette and night-soil are the two most effective of the bulky manures obtainable. Near the larger towns they are supplied at purely nominal rates. In most cases the night-soil is pitted at some distance from the town. In the cotton tract some part of it is sold to enterprising cultivators, chiefly pleaders who have purchased land, and who seek to be leading lights by discarding old prejudices. But most of this valuable product still continues to be wasted. The department is trying to demonstrate the manurial use of this valuable produce on some of its Experimental Farms. Some of the members of the agricultural associations living near the larger centres of population, have also started to use it.

14. To sum up, extensive as apposed to intensive cultivation prevails in these provinces and manure is not highly appreciated except by the very few—*e.g.*, the best of the cotton growers and those who grow garden crops. The ordinary village *ryot* is content with poor outturns and does not trouble much about the quality or quantity of this farm-yard manure. He is a man of prejudices too, and will, for religious reasons, not willingly agree to apply bone-

meal, sann-hemp, night-soil or poudrette except under pressure. He is poor and cannot afford to take risk in purchasing costly manures, which for all he knows, may bring him no profit. Added to this, being a poor observer, he can never tell with any degree of accuracy what profit he derives from manuring his different crops. He has yet to learn economy in manuring, and the best way to teach him is to work from within. We must first convert the more enlightened people by making such arrangement for the provision of cheap supplies of manure as will convince them that intensive cultivation is, so far as it depends on high manuring, a paying proposition. This the department is trying to do through its District Agricultural Associations, practical training classes and its Experimental and Demonstration Farms.

15. The steps now being taken by Government to improve cattle-breeding in the provinces will be the means of improving the quality and of increasing the quantity of cattle manure very largely, we hope: but cattle-breeding to effect improvement must be based on better feeding. One of the cheapest forms of concentrated cattle food on the market at present is undoubtedly cake. Given more and better food cattle will give more and richer manure, which in turn will be the means of producing better crops. The efficiency of the well-fed draught bullock will also be greatly improved. The factors which make for intensive cultivation are thus interdependent. We must start with better feeding and the others will follow naturally.

We have with this aim in view compared the nutritive values of edible cakes with the view of recommending the best as a cattle food. Some hundreds of tons of undecorticated cotton cake and til cake are now being fed on Government Farms to our draught, dairy and breeding stock, and experiments are being carried out to ascertain their relative values as feeding stuffs with that of cotton seed.

In conclusion let me add that some of the manufacturers of cake in these provinces have yet to learn that it is not good

policy to unduly raise the price till the demand for this commodity as a feeding stuff and a manure justifies them in doing so. The merchant from whom the Department of Agriculture purchased cake in 1911-12 was so ungrateful for the favour shown him that he increased the price last year by nearly 3h %, with the result that the department had to get it from other firms.

THE SUGAR INDUSTRY IN THE UNITED PROVINCES.

BY THE HON. MR. HAILEY, DIRECTOR OF
AGRICULTURE, U. P.

A good deal of attention has of late years been attracted to enormous imports of foreign sugar into India. In the year 1911-12 these amounted to no less than 12,241,000 cwts ; these provinces taking 1,536,000 cwts. As is well known, the great bulk of these imports come from the island of Java, which in 1911-12 sent to India 10 million cwts. Looking only to these figures, one might imagine that to enable Java thus to swamp India with its sugar and to completely undersell country made sugar, its area under sugarcane was very large and that of India relatively small. This, however, is very far from being the case. The area actually under cane in 1911 in Java was the largest up to date, but it amounted only to 385,591 acres ; whereas in these provinces alone the area under cane now amounts to one million and a half acres. Taking India as a whole, the Java croppage would be lost ; and if added or subtracted would amount to nothing more than an annual fluctuation.

In Java practically the whole of the cane crop is devoted to sugar making, as the most profitable form of the utilization of the cane. In these provinces the great bulk of the crop is made into gur for eating purposes. Now if the producer utilized his produce to the full in gur making and made the best profit thereby, there would be nothing more to be said. A large

section of the Indian public prefer to eat their sugar-food in the form of gur ; and, if the cultivator is obtaining the maximum amount of gur from his cane and realising more profit thereby than by selling the cane to a sugar manufacturer there is no reason for apprehension about the increases in the sugar imports. These imports might be regarded with the same unconcern as the imports of glass, railway material, or any other article which it is at present not economically profitable for India to turn out.

Unfortunately the facts are otherwise. There is an enormous wastage even in gur making. This is so great that I feel no hesitation in saying that the amount of sugar burnt in the megass as fuel would amply supply all the needs of this province and obviate any necessity for imports. Again, the gur market is a somewhat limited one. The annually increasing imports of sugar into these provinces show that the taste for sugar is growing and there is no doubt that the well-to-do-classes prefer to eat their sugar food in the form of sweetmeats. The result of these imports has been to lead to the abandonment of a very large number of small indigenous factories which formerly made sugar from rab. The area under cane is steadily rising, which means that more gur is being thrown on the market for eating purposes, while less of the crop is being converted into rab for sugar-making. Thus we can trace clearly several causes at work leading to over production in gur. There is in the first place a rising demand for sugar : not necessarily limiting the consumption of gur, but at any rate checking the expansion of the demand for that article. Secondly, a decrease in the local manufacture of sugar means that more of the crop is being converted into gur for eating purposes ; and finally an increase in the area under cane. This area has risen from 1,147,101 acres in 1910 to rather over a million and half in the current season. There is no doubt that some of the area formerly under poppy has come under this crop, as the cultivator must find another rotation crop to take the place of the former.

The most obvious proof of over-production would of course be a fall in prices. This it is not easy to point to, because the quoted price of gur seems to differ considerably in the different markets of the provinces. In the western districts of the provincer, which have still the Punjab and Central India market to rely on, prices, during the past five years appear to have been more or less stationary. But during this period the prices of every other article of consumption have risen—in some cases considerably—and there can be no question that the cost of production, owing to rise in price of labour and cost of cattle, has increased to a very marked degree. The profits therefore realised are less even in these favoured tracts. When however we take districts at a greater distance from these markets a distinct fall can be observed. In 1912 the price of gur had fallen so low in Gorakhpur that it did not pay the cultivator to make the cane into gur and the district reports stated that the young cane was being ploughed up for rice. I heard this year again a number of complaints about the very poor prices being realised for gur in the eastern and south-eastern districts. It must be remembered that gur is a very perishable article and does not stand transport well; nor will it keep long unless heavily limed in which case it is less fitted for eating purposes.

My point therefore is that with our large cane crop in these provinces there is ample room for both gur and sugar; and that in parts of the provinces it would be profitable to utilize part of the cane crop for sugarcane; while, on the other hand, the present reliance on the gur market only is economically unsound.

To revert now to the case of Java—what is the reason that this island, which has a large number of other strings to its bow in the shape of tea, coffee, rubber, can flood India with its produce. It is true that its canes are much better than ours. The tonnage per acre is about 40 tons while in our best sugar-growing tracts the average is about 20. The sucrose content is also higher. But obviously this will not

account for the whole matter. Higher yield can only be obtained by increased, though not of course proportionately increased, cost of cultivation. The costs of manuring sugarcane land in Java are put down at Rs. 85 per acre and the quoted rents for land are considerably higher than in these provinces. The estimated cost of cane production in the field, viz., 5-4 to 6-11 per ton does not appear to be much less than in many parts of these provinces. Great cheapness of cane production is not therefore the sole or even chief secret of Java's success. Supposing that in these provinces we had the same climatic advantage as Java and could produce as good a cane, how should we benefit under the present conditions? Unless we had some efficient means of utilizing the produce we should still be using imported sugar and the risks of over production in the matter of gur would be accentuated. The whole question therefore comes back to the profitable utilization of the produce by means of factories equipped with the most efficient machinery, and in this respect Java is supreme. Their factories extract the maximum amount of sugar from the cane. Without going into general details it may be mentioned that the power of the modern large mills is so great that their normal extraction of the sucrose present in cane is 95 per cent; while even as high as 95 per cent and 90 per cent are obtained with the largest mills. In this part of India we have the extraordinary position of the cultivator, as manufacturer. He has few equals as a cultivator, but does not shine as a manufacturer: it is not his business and he has been compelled to take it up by force of circumstances; experience shows he will gladly drop it if he gets the chance. It is quite impossible to say what the extraction ordinarily obtained by the cultivator is. A good small iron mill properly adjusted and worked by sufficient powerful oxen will give an extraction of 95 per cent but the cultivator has usually weak oxen and in consequence prefers loosely adjusted mills which give greatly inferior results. If it is pointed out to him that by crushing again

he could obtain much more juice his usual reply is that the megass will not then burn in his furnace as fuel. In other words he is using much of his sugar to burn. A great deal more of the sugar is wasted by direct heating over the fire—a system long since abandoned elsewhere. The result of this is that it is expensive to manufacture sugar from gur as at present made and can only pay when prices are low, because so much of the sugar has been wasted before it formed into gur. The only method likely to prove a success in the long run is by means of cane crushing factories which treat the cane as received from the cultivator,

It is by this process only that the maximum quantity of sugar can be obtained from the cane and the whole business of manufacture taken out of the hands of the cultivator. In this connection it may be pointed out that nothing but disappointment can attend attempts to manufacture sugar in competition with foreign countries by means of small plant. Their employment only results in waste of material. The initial waste takes place in the crushing, which can only be properly carried out by powerful machinery, and after that by evaporating in open pans. In a modern factory evaporation takes place in vacuo for which special and somewhat costly plant is required. If such plant is to be put up at all, it will cost little more to work it on a large than on a small scale.

There are two cane-crushing factories at present working in these provinces which are equipped with modern machinery of the type adopted in other sugar-making countries of the world, viz., the Rosa Factory at Rosa, and Raja Lalta Pershad's factory at Pilibhit. Of the first of these which is run by Europeans, I propose to say nothing, except it has conferred a signal benefit on the agriculture of the district. The second is owned by an Indian gentleman and worked entirely by Indian employees: though very ample assistance has been afforded by Mr. Hulme, the Government Sugar Engineer. Its avowed object was to demonstrate that sugar could be manufactured in a factory in a manner which

could not offend the most orthodox and at the same time on thoroughly hygienic principles. The Raja had the usual troubles of all pioneers of a new industry owing to the lack of skill of his workmen and in parts to the defects in the machinery. These have by Mr. Hulme's assistance been largely overcome and the factory last year had a prosperous season. To any one interested in the industry, I would strongly urge a visit to this factory, and I am sure that they will receive a cordial welcome from the Raja, because his one idea is to invite the greatest possible publicity to the methods adopted to show that no conceivable objection on caste or other grounds could be raised to the sugar his factory turns out. The factory has already been visited by numbers of Brahmans, specially invited to watch the whole process from the putting of the cane into the mill to the turning out of the sugar from the drying machine. If he succeeds in breaking down the prejudice against this sugar and in securing the same price as is realised for the country-made article, the Raja will have conferred a very marked benefit on the sugar industry generally in Upper India.

As to the claim regarding manufacture on hygienic system—any one who compares the process of manufacture at a modern factory, where the material is untouched by hand, with the disgusting method followed at a factory working on the indigenous system, where the sugar is trodden out by the bare feet of coolies and the adherent sugar scraped from their perspiring limbs, will readily concede that the claim is fully substantiated.

To give some idea of the avoidance of waste ensured by up to date methods, it may be mentioned that the production of sugar to weight of cane was at the Pilibhit factory last season $7\frac{1}{2}$ per cent, in other words, that $7\frac{1}{2}$ maunds of sugar were obtained from a 100 maunds of cane. It is extremely difficult to state with any degree of exactness what the average percentage obtained at factories working on the khandsari system amounts to. From some figures obtained

last year, it would appear to amount to about 3.33 per cent. When the rab prepared in the ordinary manner is centrifugalled, the outturn appears to be slightly less owing possibly to the large quantity of water used which carries through some of the finer grains. In an article recently written by an Indian gentleman, I see that the average is put down at 3.66 per cent but it is utterly impossible to arrive at anything but rough approximation. Which ever figure is accepted, it is quite obvious that, as the owner of a factory, such as that at Pilibhit, obtains double the amount of sugar from the same weight of cane as the khandsari, he can afford—as he does in fact—to pay the cultivator better prices for his cane, after paying interest on the cost of his machinery.

I do not propose in this brief article to dwell on the advantages following the establishment of such factories and from the employment of well paid engineers and chemists. My object is merely to point to the waste that now takes place ; and all waste is industrially bad. If proper means for the utilization of the raw material existed, the amount of sugar now wasted would amply supply all the needs of the provinces. I do not wish to decry gur making for eating puposes as compared with sugar manufacture. I believe that there is ample room with our present material for both businesses but, if our sugar is to compete successfully a with the foreign sugar, it must be made in the most economical way not from rab or gur, prepared on the most rough and ready processes by the cultivator. I believe that the increase of central sugar factories would to a large extent actually benefit the gur manufacturer, because it would reduce the present tendency to over-production.

I am well aware that there are difficulties in the way of the establishment of central factories ; but they have certainly been exaggerated. The cultivator so far from being wedded to gur making, shows a cheerful readiness to abandon it if he is ensured a good price for his cane otherwise.

What he is wedded to is a system of taking advances, and this very readily falls in with tactory methods. I do not allude further to these difficulties because they have been, as I have pointed out, overcome in one case and there is no reason why they should not be overcome in another given similar conditions which are by no means uncommonly met with in these provinces.

There is however one point I wish to allude to as it specially affects the agricultural department. All familiar with the agricultures of these provinces are aware of the rapid rise in the price of cattle within the last few years. Though there is no evidence of any actual scarcity of cattle yet the fact, that prices have risen places a limit on the power of the cultivator to increase his stock and renders it very desirable that no undue tax should be imposed on them. The cultivator requires all the bullock power available for legitimate agricultural work and has none to spare for extraneous operations. The Agricultural departments are urging improved methods of cultivation with a view to obtain higher yields from the land, most of which make further demands on the cattle. Cane crushing tells very heavily on the light cattle of these provinces and takes them away from other work on which they could be more profitably employed. As an instance, I may mention that I came across cases early in this year in which cultivators had to leave their land unirrigated because their cattle were engaged in cane crushing. It is very desirable that the cultivator should be able to devote himself to his legitimate function of agriculture and not called upon to divert his own labour and that of his cattle to the manufacture of his produce. As already pointed out his methods are extremely wasteful and inefficient and I think he would be among the first to appreciate the introduction of mechanical means for its disposal—certainly his cattle would.

CO-OPERATIVE CENTRAL SUGAR FACTORIES.

By G. N. SAHASHABUDDHE Esq.

(*Sugar Expert, Poona.*)

In my paper on "Prospects of Sugar Industry in India" read before the Industrial Conference last year at Bankipur, I have already shown that the present grave situation of our sugar industry is mostly due to our primitive methods of manufacture. At present our sugar manufacturers cannot compete with foreign countries simply because they are losing nearly 50% of the sugar in cane in the shape of half crushed megass and exceedingly rich waste molasses. Though our cane in the major portion of India is not as rich in sugar as in some foreign countries yet its sucrose content compares well with that in Java—our most important competitor—and with modern machinery, expert knowledge of manufacture and proper organization for a continuous steady supply of cane to the factory we can produce sugar at as cheap a cost as in Java or Mauritius

Although these points are not altogether lost sight of by some, yet majority of the sugar manufacturers in India and others interested in the industry have not sufficiently realized them. I am fully aware of the difficulties that are in the way of organising and starting modern type sugar factories in India, yet if we are to place our sugar industry on a sound financial basis, we must push our way through all these difficulties. The object of the present paper is to see how some of these difficulties can be surmounted.

To conduct the factories on modern lines, the factories must be sufficiently big to enable the manufacturer to work the modern machinery economically and skilfully. It is no use working with a milling plant which cannot extract at least 90% of the sucrose in cane, it is no use working with an evaporation and curing plant which cannot extract at least 80% of the sucrose in juice as white sugar. These are the economic limits of working under modern conditions of the sugar mar-

ket. Such extraction cannot be expected from the tiny factories equipped with so called "modern machinery" at present working in many parts of India. To realize the above results the size of the machinery must be sufficiently big to work it economically. It is practically useless to expect these results with a factory capable of dealing with less than 300 tons of cane in 24 hours, and to give decidedly good results the capacity of the factory ought to be considerably more than this, about 500 to 600 tons of cane per 24 hours.

To start a factory of 500 tons of cane capacity and with the number of working days that are available in such important centres of sugarcane as the United Provinces and Bengal means an area of at least 3,000 acres under cane within a reasonable distance from the site of the factory, and it entails a capital expenditure of at least Rs. 500,000 for the factory alone! Assuming that the requisite capital for the equipment of the factory is forthcoming, yet to secure this much area under cane within reasonable distance of transport presents enormous difficulties. If bullock carts and light tramway lines or motor tractors are the only means of transport available then all this area must be found within a radius of 5 to 6 miles. Where railway facilities are available cane can be economically transported over longer distances. An area of 5 mile radius means about 16 square miles. This means that we must have about 200 acres under cane per square mile. In many of the canal irrigated tracts in the United Provinces this condition is easily fulfilled.

The difficulty is not so much of finding suitable sites for factories where there are 3,000 acres under cane within a radius of 5 to 6 miles. The difficulty is to secure all this area for the factory. Those who have had experience of organizing sugar factory projects in India can readily understand this difficulty. Given sufficient cane, to equip and work skilfully a modern factory is comparatively simple. Securing of cane is the most difficult problem. Our small holding system is the greatest obstacle in solving this problem. To secure

3000 acres means dealing with 1000 to 2000 cane-growers who are mostly ignorant, illiterate cultivators. To deal with such a large number of cultivators is not an enviable job!

In other sugar producing countries this difficulty seldom occurs, and where it does occur, it does not become so serious. In some countries all the area required for the factory is owned or financially controlled by the owners of the factory. In others, where this is not possible and where the factory has to depend on cane purchased from a number of individual planters, some difficulty is experienced but there the holdings are fairly big and the planters are usually educated businessmen who are in a position to deal with the owners of the factory in a business like way. In a few places where cane has to be purchased from small holders, it represents only a small portion of the total cane supply, the bulk of which comes from an estate owned by the owners of the factory or from big estate-owners and even the small holdings there are controlled directly or indirectly by the big estate-owners.

In India big sugarcane estates are practically absent except in Bihar and Eastern Bengal, and formation of new estates in the midst of areas already long under cultivation is practically out of question. If we want big modern type factories, we have to deal with a large number of small holdings. This means that the factory is dependent upon the good-will and co-operation of a large number of poor, illiterate cultivators who are ignorant of the business methods necessary for conducting a big factory and who are likely to be suspicious, at any rate in the beginning, of the capitalists who finance the factory. Success of such a factory will depend upon the extent to which good-will and co-operation of these cultivators is secured by the manager of the factory.

The principle of co-operation is not now unknown in India. Under the fostering care of the Government the co-operative movement has made rapid progress. Hence it

is not necessary for me here to dwell on the advantages of co-operation or the general methods of working on co-operative lines. But it must be pointed out that co-operation as applied to Central Sugar Factories has necessarily to assume a somewhat different meaning from that usually accepted for this word. To start and work modern type Central Sugar Factories, co-operation amongst cane-growers only is not sufficient. The expenditure involved in the modern type Central Sugar Factory business is very heavy and quite beyond the means of ordinary cane cultivators.

In the island of Barbados, in the West Indies attempts are being made to start Central Factories on pure co-operative lines. There the Government have passed an Act empowering any group of cane planters to join together for starting such factories. The capital required is to be raised by means of Debentures, the Agricultural Bank there acting as Trustees for the Debenture holders. The estates of the cane planters are held under mortgage.

Though this idea appears very sound in the beginning, yet the actual working is very difficult and it will be much more so under Indian conditions. Here the cultivators will never come forward to mortgage their estates (many cultivators do not own any land while the land of others is usually mortgaged for some purpose or other), and even if they do come forward all the land will have to be mortgaged for the factory alone. Then how are funds to be obtained for their usual cultural operations and the working capital required for working the factory. Besides this when the cultivators themselves become the owners of the factory, the management of the factory business must naturally go into the hands of their representatives. For the proper working of the factory such an arrangement is very undesirable and unsatisfactory. The management of a modern Sugar Factory must be in the hands of capable business-men who have got requisite skill and experience and must have good business connections with

banking houses in order to get the requisite working capital. These difficulties are already experienced in Barbados and though it is now 8 years since the Act is passed, yet so far very little progress has been made in starting such Central Factories on purely co-operative lines.

We want co-operation, but co-operation amongst cultivators alone is of very little use in starting factories on the scale under consideration. The co-operation must be amongst cultivators and business men. I have carefully studied the work of two Central Factories in the West Indies, one in Antigua and one in St. Kitts, which are conducted on this principle. The details of organization in these two factories differ but the principle adopted is as follows :—

The cost of the factory is defrayed by an issue of Debentures bearing 5% interest, and are to be amortized in 15 years. There are two kinds of shares "A" and "B." All these shares have only a nominal face value (one shilling each). Both the shares are equal in number. When debentures are amortized, each debenture holder receives a certain number of "A" shares without payment in proportion to the number of debentures held. The cane growers get for their cane a definite price according to a scale based on the sugar prices. At the end of 15 years when all the debentures are amortized the "B" shares are distributed amongst those who have sold cane to the factory in proportion to the amount of cane delivered. In this way the cane growers get full price for their cane and at the end of 15 years become half the owners of the factory. Besides this, during the first 15 years they are entitled to a bonus equal to half of the surplus profits. The capitalists who had taken the risk of advancing money for erecting the factory on the basis of the good-will of the cane growers, get all their money back in 15 years, get 5 per cent. interest on their money and half of the surplus profits till that time and at the end of 15 years they become half the owners of the factory. The debenture holders are mostly business men and their representatives who manage the factory, during the first 15

years at least, are in a position to run it on thorough business lines.

This arrangement has been found to be very satisfactory in actual practice and in my opinion with some modification is likely to suit best to our Indian conditions. In the above arrangement the chief modification that is required is the condition about part ownership of the cane growers. As far as my experience goes, our cultivators will not understand the advantage of this and if they do understand they will not care for it. So that it will be better if the cultivators are allowed to derive profit in some other way. The best way by which they will be profited will be to arrange to give them advance of money at a reasonable rate of interest on the security of their crop. This will benefit both the cultivator as well as the factory owners.

Since the complication in the ownership is thus removed there remains no necessity of issuing any debentures. I think, organization of a factory dealing with say 3000 acres in the United Provinces should be as follows :—

The total capital required will be say Rs. 10,00,000 made up as follows:—

Factory	...	...	Rs. 6,00,000
Advance to cultivators		...	" 8,00,000
Working Capital	...	...	" 1,00,000
			<hr/>
Total	...	...	Rs. 10,00,000
			<hr/>

The capital should be raised by an issue of either all ordinary shares or half ordinary and half Preference shares carrying a dividend of 7 per cent. Money should be advanced to the cultivators at the rate of 9 per cent. on the understanding that all the cane grown with that money is to be delivered to the factory at rate which will be acceptable to both the factory-owners and the cultivators. The total amount to be advanced to each cultivator should not exceed half of the estimated value of outturn.

At the end of each financial year, after paying all the factory expenses, a dividend of 7 per cent on the paid up capital and after allowing for depreciation at 5 per cent on plant and buildings and leaving aside a reserve fund equal to 10 per cent of the gross profits, the surplus profit that may remain should be distributed equally between the ordinary shareholders and cane-cultivators, the share of each cultivator being in proportion to the cane delivered by him in that year.

Such an arrangement will, I think, be advantageous to both the cultivators and the capitalists who finance the factory, and under the present circumstances this is the only way that I can see of securing the good will and co-operation of the cultivators towards the cause of the Central Sugar Factories on modern lines. And the extent of co-operation involved in this is by no means small. Such an arrangement will not only bring together a number of cultivators who, left to themselves, can only follow primitive methods of manufacture, but this will bind together the capitalist and the cultivator with a harmonious bond of mutual benefit. The Capitalists cannot start modern type Central Factories without the co-operation and good-will of the cultivators and the cultivators can not improve their lot without the aid of cheap capital. In the arrangement described above the attempt is to meet both these ends.

**THE INDIAN SUGAR TARIFF
AND
THE INDIAN SUGAR REFINING INDUSTRY.**

BY G. N. SAHASRABUDDHE, ESQ.

Sugar Expert, Poona.

The question of the revision of Indian Sugar Tariff has been discussed several times during recent years. On two occasions Resolutions have been brought before the Imperial Legislative Council and, as could be expected, the first

resolution had to be withdrawn and the second one failed for want of proper support on the part of both the Official and Non-official members of the Council. The arguments brought forward in support of the resolutions on both the occasions were non-convincing and unsatisfactory. It was argued that if the duty on foreign sugar be raised to say, 10 per cent. *ad valorem* it would materially help the indigenous industry, which is at present in a very precarious condition. As matters stand at present, unless radical improvements are made in the manufacturing side of our sugar industry, mere increase in the duty on foreign sugar to the extent of 10 per cent. *ad valorem* will be of very little use. On the other hand, if we improve our methods of manufacture, we will be in a position to compete with foreign sugar even with our present Tariff except perhaps in the sea coast provinces like Bombay and Madras.

A revision of our present sugar duties is no doubt very urgently desired, but it is required not so much for helping the sugar manufacture from sugarcane direct but for the sugar refining industry, especially in the sea coast provinces like Bombay and Madras. In these provinces the demand for white sugar far exceeds the supply that is available or is likely to be available from the present area under sugarcane. The present area is hardly sufficient to supply the demand for Gul, which has a steady demand and very little cane is available for making white sugar, the demand for which is increasing every year.

In other more inland provinces, no doubt, the bulk of the demand for white sugar can be met from the present area under cane if the factories are conducted on modern lines yet even there the demand is increasing so rapidly that unless we can increase the area under cane or increase the outturn per acre materially to the same extent as the increasing demand we shall have to go on importing larger and larger quantities of foreign sugar. Even if we strive hard to improve our manufacturing side and at the same time to increase the area under cane and the outturn of cane per acre still it will be

several years before any appreciable progress can be made and till that time at least the imports of foreign sugar will go on increasing. So that the fact remains that however we manipulate our Sugar Tariff that will not stop the increasing imports of foreign sugar. At present the bulk of our imports of Sugar consists of white or semiwhite grades, *i.e.* above 15 D. S. Now the question is, why should we go on importing sugar in this form? Why should we not get raw sugar and refine it here? India is not the only country where large quantities of sugar have to be imported, but there is hardly any country outside India, where imports of white sugar are tolerated to any appreciable extent. In practically all other countries the bulk of the imported sugar comes in the form of raw sugar (gray crystals) below D. S., and it is refined on the spot. In this way, a local sugar refining industry is carried on in every large sugar importing country. Why should we not have the same arrangement in India?

In order to make this possible we shall have to revise our present sugar tariff. The conditions of the sugar market make this absolutely imperative. The difference in the C. I. F. rates of raw and refined sugar is usually R 1 to R 1-4 and this difference is just sufficient to meet the cost of refining, the profit of the refiner being the difference between the import duty on these two grades of sugar. In our present sugar tariff, there is not any appreciable difference in the duty on raw and white sugar, our present rate being 5% *ad valorem*. Under these circumstances there is practically no profit for the sugar refiner. In all other countries there is a distinct difference in the duty on these two grades of sugar. For example in Great Britain the duty on raw sugar is 10*d.* per cwt. and that on the refined sugar is 1*s.* 10*d.* per cwt. a difference of 1*s.* per cwt. Thus the British refiner derives a profit of, about Rs. 15 per ton of raw sugar melted. In other countries, this difference is still higher. Why should we not have such an arrangement in India?

What I beg to propose to the Government is that the

duty on sugar should be made a *specific* duty instead of *ad valorem* as it is at present and that there should be a distinct difference between the duty on raw sugar (*i. e.* 15 D. S. and below), and white sugar (*i. e.* 16 D. S. and above). After taking into consideration our Indian conditions, I should think that a duty of as. 4 per cwt. on raw sugar and as. 12 per cwt. on white sugar would serve the purpose. At the usual prices of raw and white sugar this is equivalent to about $3\frac{1}{2}\%$ on raw sugar and 7% on white sugar, such an arrangement will not materially increase the retail price of sugar in India (which is the chief argument against the revision of our present Sugar Tariff), and at the same time, it will leave a profit of about Rs. 10 per ton of raw sugar melted, to the refiner. A refinery melting say 100 tons of raw sugar per day will cost about Rs. 10,00,000 and will melt about 30,000 tons of raw sugar per year. A profit of Rs. 10 per ton means a gross profit of 30% on the capital outlay. Of course, the net profit will be smaller than this but it will be a steady one and will be sufficient to carry on the industry successfully.

At present, we import something like 5,00,000 tons of white sugar (16 D. S. and above) per year. If all this sugar be imported in the form of raw sugar and refined here, it will mean about 20 refineries working, and will represent a gross profit of about Rs. 60,00,000! This shows that it will be an industry of no small magnitude. All this profit can be derived without affecting the retail price of white sugar or the custom revenue of the Government. The effect of such an arrangement on the local industry can be only small but whatever it is it will be certainly beneficial. The profits in this refining business being steady and fairly remunerative as pointed above, it attract the attention of the capitalists because these refineries can be located in large sea-port towns where it is more convenient for the capitalists to work them and also in this way people will get more and attracted towards the use of the modern machinery.

SHORT NOTE ON AMERICAN COTTON IN SIND.

BY

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Cotton is cultivated in Sind, in Hyderabad, Thar Parker and Nawabshah districts. The area is increased considerably in the last few years. The present outturn is about 150,000 bales per year; besides what is used locally in the villages. Before the North Western Railway was opened in Sind, the amount of cotton exported from Sind was practically nil. Cotton cultivation is generally spreading North along the left bank of the Indus and east on the Eastern Nara.

It is a very profitable crop and there is no reason why it should not be cultivated to a large extent in Upper Sind in the non-rice lands. These latter are lowlying lands having a large supply of flow water and the excessive flooding necessary for the rice is not suitable for cotton. The comparative costs and returns of cotton and other staple crops from the Government farm at Mirpur Khas and Sukkur are given in the following statement for comparison :—

STATEMENT showing comparative costs and returns of crops.

1912.	Sindhi Cotton	American Cotton	Egyptian Cotton	Jowari	Wheat
Grown on the Mirpurkhas Farm	Plot No. E. 11.	Plot No. E 10.	Plot No. C-3.	Plot No. D-5.	Plot No. B-9.
	Yield in lbs. 936	Yield in lbs. 750	Yield in lbs. 594	Yield in lbs. 317	Yield in lbs. 407
	Value in Rs 116-14-5	Value in Rs 112-8	Value in Rs 76-0-11	Kadbi 6700. Value in Rs 49-5-7	chaff 889. Value in Rs 24-10-2
	Cost of cultivation in Rs. 28-6-4	Cost of cultivation in Rs. 35-2-3	Cost of cultivation in Rs. 31-0-3	Cost of cultivation in Rs. 27-9	Cost of cultivation in Rs. 20-10-1
	Profit Rs. 88-7-9	Profit Rs. 77-5-9	Profit Rs. 45-0-9	Profit Rs. 21-12-7	Profit Rs. 4-0-1
Grown on the Sukkur Farm ...	Plot No. A-5.	Plot No. A-4.	Plot No. A-1.	Plot No. B-5.	Plot No. D-3.
	Yield in lbs. 800	Yield in lbs. 456	Yield in lbs. 820	Yield in lbs. grains	Yield in lbs. 740
	Value in Rs. 90	Value in Rs. 66-5	Value in Rs. 52	620 straw 160 bds. Value in Rs. 32-2-6.	Value in Rs. 44-2
	Cost of cultivation in Rs. 44	Cost of cultivation in Rs. 31-4	Cost of cultivation in Rs. 30-8-6	Cost of cultivation in Rs. 19-0-6	Cost of cultivation in Rs. 29-1-6
	Profit Rs. 46	Profit Rs. 35-1-1	Profit Rs. 21-7-6	Profit Rs. 13-2	Profit Rs. 13-0-6

NOTES:— All figures are per acre.

Cost does not include Government Assessment.

Plots in Sukkur Farm are still not uniform owing to presence of " Kalar " or salt.

Sindhi Cotton is a short stapled, coarse and strong cotton with a particularly good colour. In the market it ranks about the same as "Bengal." In the last few years the price has gone up considerably and now runs about Rs: 8-9 per maund of 81 lbs, say, 5½d. per lb. of lint, as compared with the middling American at 7.80 d the present quotation from Liverpool. Sindhi cotton gains upto 38%. The best cotton comes from Shah-jo-Bhit near Hala.

Sindhi cotton cultivation is simple in the extreme. After irrigation, seed is broadcasted on the surface and ploughed in. Thereafter the crop receives one or two hoeings and nothing further except irrigation from time to time till picking is ready.

The improvement of Sindhi cotton could have been attempted in several ways.

(a) By producing a still coarser cotton with higher ginning outturn. It is in this direction that some export firms wish to direct the work.

(b) By producing a finer and long-stapled cotton suitable for spinning higher counts and weaving finer materials.

The problem was to experiment and find a cotton suitable to the country but of a much higher grade. To grade up the indigenous cotton held out but little promise in comparison to adopting a superior variety from some other part of the world. Other Indian growths of superior quality as Broach were soon discarded as undesirable, Egyptian was then tried and finally American.

When the Agricultural Department was first established in Sind about 8 years ago, it was thought by the Deputy Director of Agriculture, Mr. Fletcher, that Egyptian cotton would thrive in Sind. It did well on all Government farms and it was decided to get a large area cultivated in the district. 4,000 acres were cultivated in one season by Zamindars on the Jamrao Canal. Outturn probably averaged 5 to 8 maunds per acre. The disposal of the crop was difficult as Egyptian is not used by any of the mills in Bombay and the produce was not sufficient to put the article on a commercial

footing. The Mit-Affifi variety was of good quality and was favourably reported on by brokers in Egypt. Auction sales were established by Government at Mirpur Khas to dispose of the produce, but the price obtained was very uneven. Up to Rs. 14 per maund of 81 lbs. of seed cotton was obtained on some occasion when the presence of buyers anxious to obtain a sample caused some competition. At other sales there was little or no demand. The ginning was another difficulty, the local gins were adapted to the local cotton and did not make good work with the Egyptian. Also the local gins were not at all anxious to handle this cotton and buyers often found these difficulties.

The disadvantages connected with Egyptian Cotton in Sind are :—

(a) It needs more careful cultivation than the Sindhi. It ought to be grown in ridges.

(b) It has a long growing period. It needs to be sown at latest by beginning of April, and first picking is not generally ready till October. This entirely prevents the cultivation of Egyptian Cotton on the inundation canals. In fact, it is practically on the Jamrao Canal where it can be grown at the present time.

Still the results obtained by the efforts to introduce Egyptian cotton in Sind are very interesting and instructive. It has been proved that given proper conditions it will thrive well in Sind, and Sind is one of the few places outside Egypt where this class of cotton has been successful. So in the future when the country fills up and more intensive cultivation is adopted it is possible that Egyptian cotton may be cultivated in Sind.

Experiments with American cotton began several years ago. It was found to be promising and among its advantages were :—

(a) Quick growing period; it can be sown in June and the first picking is available by the end of September. This is most important for Sind as it enables it to be cultivated on the common inundation canals.

(b) It was a good yielder and on an average land will produce as much as Sindhi cotton per acre.

(c) It seems to be hardy and can be cultivated in exactly a similar manner to Sindhi cotton.

(d) The marketing of the crop is much easier than Egyptian cotton.

The writer paid a visit to the Chief American cotton growing centres and selected the variety called ("Triumph") as being most suitable for cultivation in Sind.

It is a big balled variety, it is an early and good yielder and it is adapted for growth under irrigation.

From repeated trials on the Government farms at Mirpur Khas and Sukkur and on sub-stations at Jacobabad, Shikarpur, Nawabshah and Tando Mahomed Khan, it was decided to begin in the district on a large scale. Forty tons of Triumph seed was obtained from America and this was distributed in the beginning of 1918; 10 tons in Sukkur and Upper Sind Frontier and 80 tons in the Jamrao area, respectively. The seed was distributed in good time and members of the department conducted village touring interviewing all growers personally.

A considerable amount of American cotton is used in Bombay mills, so it is much to their advantage if they can buy a high grade of American cotton in India. A syndicate chiefly consisting of Bombay millowners was formed to buy, gin, bale and dispose of the produce of the Triumph seed distributed by the Agricultural Department. The Syndicate erected cotton gins at Mirpurkhas and Shikarpur and the former is now in operation.

As this is the first season it was not possible to fix a price per maund of Kapas to be paid to the growers, as the amount of expenses for ginning, baling and freight could not be calculated in the first season. The syndicate however has arranged to pay on delivery of the Kapas at the gin one half of the current price of Middling American cotton as quoted in the. ("Times of India") and the remainder of the price will

be paid to the grower after the cotton and cotton seed has been sold in Bombay or in Liverpool.

It is unfortunate that the season and inundation have been quite unsuitable for cotton in Upper Sind and only 300 or 400 maunds of seed cotton will be obtained. However where the cotton has had a fair chance and conditions have been observed it has been successful.

In Lower Sind most of the growers are satisfied and the cotton is coming in satisfactorily to the gin. One large owner has indented for 300 maunds, *i.e.* sufficient to sow 1,200 acres, for the next season.

A seed farm has been acquired by Government to prevent deterioration and mixing up of the seed.

It is too soon to say if the cotton is established on a practical basis in Lower Sind or not. But it is undoubtedly a fact that a high grade American cotton can be grown here under ordinary Sindhi cultivation and will give a good return. Economic conditions may, however be too much for its permanent establishment.

FRUIT CULTIVATION AND FRUIT INDUSTRY

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Last year, when I was called upon by the Secretary to the Indian Industrial Conference to read a paper on an industrial subject, I did not accept the invitation, fearing lest my undertaking to read a paper in an Association like the Indian Industrial Conference would be incompatible with my meagre knowledge, and experience. But the invitation was received again this year, and I felt that I should not lose this opportunity of placing before the public such facts as I have been able to collect during my short connection with this subject. If it does not represent a complete study of the questions raised, it is hoped that it at least summarises all important facts and results of experiments and that it will awaken public interest in this important industry.

Fruit cultivation is a subject which covers a large field and cannot be confined within the narrow boundaries of a single paper. The importance of the subject can, however, be easily proved by illustrating the various uses of fruits from the ancient times. Let us see how far "fruit culture" was known to the people of India in former times and for what purposes they were cultivated. A short history of fruits, therefore, will not be out of place here.

History of fruits.

Fruits are being grown in India from times immemorial. Mention has been made by learned writers of Sanskrit works of a number of fruits, describing their various medicinal properties, among other valuable uses. The following are only a few of the instances of the important fruits mentioned by them :—

Mango :—Grown in India from pre-historic times and well known as the most delicious of Indian fruits. The ripe fruit is laxative and useful to persons of constipated habits. The bark and kernel are regarded as useful in hæmorrhages, diarrhœa and other discharges. Besides these, there are many more uses, both as a fruit and also for medicine. *Vide* Mad. by Dutt.

Grapes :—Known in India from a very remote time. Spirits such as *Muddlika* (from grapes-brandy) date back to the classic periods and were used in sacrifices in the early Vedic times. During the time of the Emperor Jahangir the grapes of Kashmir were improved. Grapes have been mentioned by *Susruta* and *Charak* as medicine (dried fruits) for cough, hoarseness, consumption, etc., as they are demulcent, laxative, sweet and cooling. (*Materia Medica*, by Dutt.

Pomegranate :—Indigenous to North-West India. Best fruits from Kabul. Fresh juice of the fruit is much used as an ingredient of cooling and refrigerent

mixtures and of some medicines for Dyspepsia. The rind of the fruit is used in Diarrhoea. (*Ibid*),

Cocanut :—Essentially a tropical plant. There are numerous economical uses of this fruit and commonly known to all. The water is a cooling and refrigerent drink in thirst and urinary disorders. The tender pulp is nourishing, cooling and diuretic. Besides many uses as medicines. (*Ibid*).

Plantain:—Commonest and most highly prized of all the Indian Fruit. The unripe fruit is considered as cooling and astringent. The young leaves used as a dressing for blisters, burns, etc. The root and stem are reputed to be tonic and used in blood disorders. A kind of decoction is given in Diabetis (Watt's *Commercial Products of India*).

Lemon:—Lemon juice is cooling, refrigerent, and useful in indigestion, dyspsia, intoxication from Narcotics etc. Besides these there are a number of uses. (*Materia Medica by Dutt.*)

about the beginning of 16th century the Portugese brought with them the art of grafting, which produced better fruits such as Alphonso. The value of fruits for medicines which was predominant in the olden times gradually came to be overlooked by the people, as the mineral drugs were available from the West (Dutch). The contact with the western nation introduced a taste for fruits among the people which marked the beginning of the modern fruit industry in India. In the 17th century Plantations of Fruit trees smiled over the land, "as the late Justice Mr. M. G. Ranade says in his famous work on the "Rise of the Maratha Power," "and still bear testimony at Shivapur to the wisdom of the great Brahmin minister Dadoji Konddeo." But this state of things did not last owing to adverse times.

At the close of the 19th century, the activity of the Agricultural Department awakened the minds of the people to renovate their gardens once more and to lay out new ones.

Practical Hints on general Fruit-Culture.

It is not possible to deal with each and every point in such a short paper ; so I shall try to give some hints about the general principles applicable to all fruits. The chief and essential points are only described below one by one.

1. *True plants* :—Many complaints have been raised by the fruit growers that they never get the plants of the sorts ordered ; some inferior sorts are mixed to make up the number ; for instance, Alphonso and Piari grafts with Shabbuddin and other useless varieties. Orange plants budded with Kowla, Reshmi, Mahalung, and sometimes with Jamburi too.

Whether the plant is a true one or not, is known only when it attains a bearing age which is a pretty long time ; and when it is found out that the plant is altogether a different one after so much care, money and energy, spent on it, really it is a great discouragement to the owner. On questioning some of the cultivators at Rahori in Nagar District as to why they should not make their own grafts and buddings, a reply was given saying that to graft or bud a plant is against their religion. I could but laugh at the silly answer. The art of grafting and budding is a simple one and could be mastered by constant practice and a little skill. It is always better to make one's own grafts, etc., and to keep a Nursery, until a number of honest nurseries are established. Besides, by means of grafting and budding, the desired qualities of fruits may be retained ? for instance, the good varieties of mangoes, jujuphus jujuba, etc., found in various places. Those qualities are now disappearing as the art is not known to the farmers.

The Bombay Agricultural Department has made arrangements to coach up the mailes in Horticulture in Geneshkhind Botanical Gardens without any fees. The cultivators may very well take advantage of this.

2. *Proper soil for fruit plants* :—Different plants require different plant-food ; plants take their food through the medium of soil hence they require different soils ; the growers

always make mistake in this as they do not know the proper requirements, they put all sorts plants in whatever soils they may possess. I observed many instances where plants were wrongly put:—

- (a) At Mukutkhan Hubli (Belgaum District) Figs have been planted in black cotton soil which is entirely unsuitable for this plant. This soil is always cool when wet and hot when dry, these extremes injure the crop. Again if the plant grows it would only make vegetative shoots (only woody matter) and whatever small fruits that might be formed would drop. Figs generally require a sandy loam, reddish or medium black with plenty of lime in it.
- (b) Pomegranate in clay soil. This crop thrives and bears very well in poor soils if on the contrary but in rich soil it grows vigorously at the cost of reproduction.
- (c) Many plantations have been observed where the plants have been put in soil which is only a foot or even less deep, and rock below. For instance, mango plants in front of Civil dairy, Poona, and some fruit plants at Agar in Central India where the soil is very shallow and below it, is the rock. The plants did grow and bear as long as they could send their roots in pits dug while putting the plant but flowers dropped soon as the roots reached the rock.

3. *Site*:—If plants are not put in proper site, they struggle for nothing. A good protection for every fruit plant is quite necessary. A gentleman at Pimpalgaon in Nasik District has planted Figs and Grapes in an open place. There is neither natural nor artificial protection to the plants from the south and west winds which are said to be severe to the crops. The winds from these directions are severe and cold and keep the plants always shaky which is injurious to the crop : because it, always in this case, tries to struggle with unnatural forces and gets no energy and time to establish itself in the soil. Still worse is the effect

at the time of bearing. Many of the flowers and fruits drop adown and the whole crop is lost.

4. *Situation*.—This is also an important factor. Plants require neither low nor high levels, but the flat ones are beneficial to them. In a low level, water always collects round plants and thus prevents the entrance of air, light and sun which are the chief agents in the preparation of plant food ; thus the plants suffer. The same sanitary principles which are necessary to animals are also essential to plants. This has not been realised by our growers. Fruit plant must necessarily have some sort of rest before producing flowers which is not obtained in low level. While on a high level the same effect is produced as in the case mentioned above. Besides, the soil in this case, is heated more than necessary and much of the water given to the plants goes down at once without benefiting the crop.

5. *Preliminary operations of the field*:—The neglect in this case is quite harmful. The land should be thoroughly and deeply ploughed or dug, all the trees and shrubs that might interfere with the crop should be entirely removed before putting the plants. The care of fruits plantations is quite different from that of the cereal crops in which case the harvest is made the very next year, and the fields get ready again for operation. While in the former case when once the crop is put, it takes at least ten to fifteen years to get the land for operation. Plough and other implements cannot work in a fruit crop of three or four years' standing and the fruit plantation, if not kept clean, will not bear satisfactorily.

6. *The Distance*:—The distance between plants should always be determined according to the nature of their growth. Plants growing straight should have less distance than those with spreading habits. Our people have got the habit of putting plants quite close with an idea that more plants would give more outturn but in this they make a mistake. In the first place, they do not thrive well and even if they do,

the bearing is defective. The fruits might be small and the roots in the soil spread like the branches above ; so when planted nearer the roots of high-bearing plants get entangled and there is an obstruction to the easy spread of roots which is harmful to the plants. The branches also get crowded and prevent the entrance of light, air and sun, the result being the prevalence of diseases. The beneficial effect of keeping the proper distance, has been well realised by the fruit-growers at Rahori in Ahmednagar District. Almost all the old plantations of oranges and Mosambi have been planted with a distance of 8 to 10 feet between each plant ; but the plantations made recently, say, during the last ten years have been planted with a distance of 15 to 18 feet. The bearing of this plantation is satisfactory. The distances for oranges grown on a large scale in West Indies is 20 feet in poor soils and 25 feet in rich soils, thus getting good quantity and quality (Nicholl's book of Tropical Agriculture, page 125). Again the distance in lime plantation is 15 feet between each plant and thereby the outturn is better (Nicholl's book on Tropical Agriculture, page 155).

Too much distance is not advisable; because it causes waste of water, some other useless stuff might grow in the vacant space and thus rob the main plants of the plant-food.

7. Planting :—While planting, roots that are injured while removing them from the nurseries should be well-trimmed before putting them in the field ; otherwise the injured roots get decayed and produce some sort of disease which kills in the end the whole plant. This principle or the advantage of this, is either not known to the growers or is neglected altogether. Straight planting in the ground without twisting or bending the roots is quite essential. Otherwise plants grow awkwardly and make themselves uncomfortable. Again plants should be planted neither too deep nor too shallow in the ground. The best and the safer method is to keep the collar mark (the distinct line separating the stem and the root) a little bit below the ground, which, after the natural sinking of the earth in a few days, keeps to

the level of the ground. It is always safer to plant one stick near the plant newly transplanted, as a support, so that the wind might not disturb it.

8. *Sub-Crops* :—Any sub-crops suitable to the market and other circumstances may be taken between the plants so long as they are not bearing allowing sufficient space to the plant to grow.

After the plant begin bearing it is not desirable to continue the sub-crops. Only such crops, as require generally less plant food from the beginning of the plantation to the time of bearing and also deep and thorough cultivation which will be necessarily shared by the main crop, should be taken.

A judicious and skilful system of taking ginger and turmeric in the 1st year, the onions, the garlic the 2nd year which require thorough cultivation and the light vegetables in the 3rd year between guavas is practised at Limbgaon in the Satara District.

9. *Watering* :—Water is the most important and essential ingredient as plant wood since rainfall is invariably insufficient and sometimes it completely fails; scarcity of water is being felt very keenly every where hence much economy is desirable.

Plantations near the canals are watered without any principle; they are always over-watered while in the case of well irrigations, plants are neglected, as the draining of water entails some trouble. Some plants are watered continuously without any rest, which is quite essential to fruit plants. For instance, lemons are watered throughout 12 months in the Presidency but the yield is poor and the quality also is not so striking. At Muddebihal (Bijapur Dist.) I saw a small plantation of lemons during my tour in 1912 the fruits of which were extraordinarily big and the colour also was very attractive. On inquiry, I learned that the plants were rested during the summer by stopping water for about two months, when they dropped their leaves and water was begun from June. Besides Mr. Phadke in his Book *Krishi Karma Prakash* while dealing with lemons, says that the lemons if rested

during hot weather would give more yield and better quality. Again in West Indies where limes are cultivated on a large scale, water is stopped to the plants during summer ; thereby the plants are rested and the outturn is satisfactory. (Agri-News, Vol. VIII, No. 186, Page 180). The outturn mentioned in Mr. Phadke's Book is in a good season about 3000 to 4000 lemons per tree per annum, but the average is 1000 fruits. In West Indies also the average yield per tree as about 120 lbs. in weight while in this Presidency, the average yield from large cultivations is only 60lbs. equal to 500 lemons roughly. I also heard from Captain Pitcher the Commanding Officer at Agar, Central India that his mali always persisted in watering the fruit plants throught the year. This shows, the ignorance of fruit-growers with regard to watering.

Regular watering, say, every week on ten days according to soil and climatic conditions should be given from the bearing time, quantity of water should only be sufficient so long as the fruits, are undeveloped, but some two months before the ripening of fruits, the intervals of watering should be shorter, so that the fruits might swell and get bigger in size. The quantity of water should be lessened gradually towards the close of the harvest. Water should no longer be given to the plants after the harvest is finished and until the fresh fruit season begins. By constantly stirring the soil under fruit trees, the evaporation from the soil is checked, the moisture is preserved, and a sort of mulch consisting of dry leaves when spread round the fruit trees conserves the moisture to a great extent. (Indian Agriculturist, May 1909.)

By adopting the above mentioned principles considerable economy in water is gained.

10. *Manures*:—Fruit plants require larger quantities of plant-food to develop proper kinds of fruits. This shows that they absorb more plant food from the soil which soon gets exhausted, if not regularly manured in some form or other. Our people only know Farm-yard manure and sheep dung which are now scarce on account of the fall in the number of attle and sheep owing to frequent famines. Every plant

requires a special manure to produce superior kinds of fruits; besides the fertility of the soil is kept up. The commercial fertilizers will do a lot of improvement to fruit trees, and will also keep up the fertility of the soil. Even the poorest soils are made to give good fruits, for instance, in Florida before commercial fertilizers were used, only hammocks were supposed to grow good fruits, but since the introduction of these fertilizers even the worst soil, say, a sandy soil with 90% of sand was made the ideal soil for the purpose of fruit-growing (Cyclopedia of American Horticulture.)

The advantage of fertilizers is shown below. The basic slag was used for apples and compared with the results obtained from farm-yard manure.

Basic slag.		F. Y. M.	
Flower buds.	Fruit buds.	Flower buds.	Fruit buds.
2025	255	712	105
712	296	595	98
2735	315	728	120
1287	150	342	50
1625	180	285	42
4288	487	1235	162
1085	127	322	48

(Vide) *Gardeners Chronicle* of 27th September 1913, page 224. The plants treated were 2000 in number and the experiments were repeated for 6 years.

11. *Pruning*:—This art is quite unknown in India. Young plants should be pruned to get strong and vigorous trees in future; various branches that come out irregularly from the stem near the base and interfere with the proper aeration and light through the plants should be pruned to get more food for the remaining ones. All branches spreading outside should get sufficient light and air to get stronger. The small ones in the body of the plant struggling for existence, should be removed. It is always better to keep a clean straight stem about a foot or two from the base. In West Indies five feet are generally left for oranges (*Nicholl's Tropical Agricultural* page 150). It is also advisable to keep as few branches as

possible. The future bearing of good quality depends on the strength of the branches. The dried and dead wood should be removed close to the stem by a clean cut and tar applied; otherwise, they get wet and decay during the monsoons, the consequence of which is the production of some fungus or insect disease which at last spreads to the whole plantation and ends in complete ruin of the garden. Besides, the removal of the dead wood and other barren branches increases the quality and quantity of fruits.

In the Botanical Gardens at Ganeshkhind, experiments were made on custard apples in 1918; the branches were so much over-crowded that light and air could not possibly enter. The outturn also was not great, the quantity being poor; but since the over-crowding branches were removed air and light could freely enter and the fruits were extraordinarily of large size. They were exhibited in the last flower-show at the Empress Botanical Gardens where they were highly commended by the Judges.

A second example was at Dholka, where dead and extra branches of Guavas were removed soon after the harvest of 1917, that is, April 1918, the result of which was that the plants so treated bore bigger fruits than the non-treated ones. The cultivators there admitted the advantage of the operation. The outturn is still to be seen. Our people do not know the principles which are quite essential to plants as well as to animals; hence they do not give so much importance to it. Pruning for fruit depends on individual fruit tree, so it is not possible to deal here separately with each crop.

12. *Thinning* :—As already said above, this operation also is not practised by the growers in India. Thinning flowers and fruits in proper times is most beneficial; on the contrary if it is neglected a great loss is sure to await the grower. Take any fruit tree, when flowers are in abundance, all do not form fruit, some must drop. It is only very few that last to the end. So looking to the nature's work, the process of thinning is nothing but helping the nature. Look to the grape bunch where majority of fruits remain undeveloped

and struggle for existence; thus they decay there the result of which is that the whole bunch gets spoiled. If some of the fruits be taken from the very beginning, the rest would be sufficient space and necessary plant-food and would completely develop.

Thinning is beneficial if practised judiciously. It may not be applicable to all fruits.

13. *Diseases* :—The knowledge of disease either fungus or insect is quite unknown to the fruit-growers. They are strict fatalists. Their opinion is, that when an epidemic appears, it is only a divine curse and cannot be cured. This superstitious idea is a great block in the study of science. Many plantations were abandoned on account of some disease or other. Vine cultivation which was very extensive at one time was altogether abandoned on account of mildew (see proceedings of the Agricultural Conference held in Bombay in 1906, page 107). But the Bombay Agricultural Department took up the question, studied the subject thoroughly and the spraying of Bordeaux mixture was found effective, this remedy has been popularised now everywhere in vine-growing districts, which is really a great boon to the cultivators. In America, the disease question has been thoroughly studied and spraying is common in every farm.

14. *Harvest* :—This is one of the important operations which deserves great attention. On this, the market solely depends and I am sorry to say that it has not received as much attention from the growers as it deserves. The hired coolies who are quite ignorant about this business are entrusted with this work without any special instruments in their hands to pluck the fruits. Sometimes this work is given on contract to the labourers who are equally ignorant and careless.

Each one goes with a bag round his neck and carelessly tears off the fruit from the tree, injuring the stem and fruit, and drops it in the bag. Similarly fruit after fruit is plucked until the bag is full. Many fruits drop on the ground while carelessly tearing and instead of being separated they

are also picked and put into the very bag. The consequence of this is that a sort of blemish or a spot is made on the fruits which get larger and larger by pressure of the fruits above them. Still worse is the case when the bag is shaken to accommodate more fruits in order to get the work done more quickly. By the time the bag is brought to the storing hut, more than 25 per cent. get bruised and above 25 per cent spotted. Again, fruits are dropped abruptly on the rough and hard ground when the spotted and the bruised ones get worse, and so sound ones also are stained. Thus, roughly it may be said that 50 per cent. only remain good.

Sorting is strictly observed in very few places. In the majority of cases, all sorts of fruits semi-ripe, ripe and over-ripe, are put together in baskets and kept the whole night in the huts. The baskets are removed early in the morning to the market. During the period of 12 hours the heat produced in the basket spoils many of the fruits. Thus, such baskets get no customers, in the first place, and if they get at all they get very little price. The owner when he does not get good price, thinks of giving up the profession; but one good thing, now-a-days observed, is that the whole plantation is sold to the contractors, who are by profession the bagwans (market-men), and hence know the markets better. In such cases a little care and prudence is used.

The bagwans pluck only the ripe fruits and semi-ripe, when to be sent to distant markets and drop them carefully, sort, and carry them to markets personally. So these people get naturally better price. Still the care, attention, prudence, &c., are far below the mark when compared with the methods of foreign countries.

I shall now say a few words as to how harvesting, sorting, &c., are done in foreign countries.

Harvesting of Oranges in South Africa :—In order to harvest oranges properly and with the least possible chance of injuring the fruit in the operation, says Mr. R. A. Davis, Govt. Horticulturist, a special clipper, is made for the purpose. It will be noticed that the points of the blades are rounded

so that the risk of pricking the fruit is reduced to a minimum. The stem of the orange is first severed perhaps an inch or two away from the fruit ; then a second cut should be made, removing the entire stem, with the exception of the extreme end by which it is attached to the orange. The removal of the stem close to the fruit is of much importance, because when it is left, half to three-quarters of an inch long, it is a constant menace to other fruits with which it may come in contact. The stems left having punctured the skin of the adjacent fruit afford an opening for the *Penicillium digitatum* or blue mold.

Pickers should be made to understand that their work must be done carefully ; their finger nails should be trimmed so that there may be no danger of even the slightest puncture of the skin from that source, or, better still, cotton gloves may be worn—these are cheap and easily obtainable. In this country, where so much coloured labour is used, it is imperative that some responsible person should be placed in charge of the picking gang, and it should be his duty to watch each man at his work and see that it is done as it should be. The fruit should be picked with the idea of giving as little work in sorting for blemishes afterwards, as possible ; to that end no fruit with any kind of a blemish should be picked for export. That which is picked should be ripe, but not over-ripe. It is quite useless to pick green oranges with the idea that they will colour up in transit ; even if this were the case, which it is not, fruit picked in a green state does not open up sweet at the journey's end. Pickers should carry bags, or some other appliance in which to place the fruit when picked. In either case, the receptacle is empty by allowing the fruit to escape through the bottom, which is kept fastened whilst picking is carried on. The oranges should be carefully emptied into picking boxes placed in the shade of the trees to receive them. These boxes should form a part of the outfit on every orange grove. Care should be taken not to fill the boxes too full ; if this were not done and the boxes piled one on the other, the fruit would

get bruised. Before use, each box should be carefully turned upside down and tapped smartly with the hand to dislodge any particles of soil or gravel which may have got inside, and which, if left, would certainly cause punctures to the skins of the fruit.

Under no circumstances, should picking be done when there is dew or mist on the fruit.

The tendency amongst buyers of citrus fruits is to purchase that which they see and prove to be good ; therefore, if good fruit only goes forward, the sorting for quality and varieties is but a secondary consideration. Sorting for the removal of blemished fruit, however, is another matter, and this should be done both as it passes through the sizing machines, commonly called a grader, and as it is wrapped prior to being placed in the boxes.

Grading for size:—This is one of the most important of all the details which go to make up a perfectly packed box of fruits. Unless oranges are perfectly graded for size they do not pack property. On the other hand, when sizing has been carefully and well done, the packing of the standard box of oranges is simplicity itself.

Wrapping the fruit :—For this purpose a thin tough tissue paper should be used of size convenient for the fruit which it is desired to wrap.

Packing :—With oranges correctly graded for size, packing in the export box is very simple and easy. A well packed box of oranges on arrival at its over-sea destination should open up with a neat, attractive appearance ; this cannot be obtained, should the fruit be placed loosely in the box.

Loose packing is not only the abomination of the fruit-dealer, but it is far from economical. Wrapping and packing the fruit should be done by the same individual and should form one operation.

I shall try to show how far fruits are growing at present and whether the supply is adequate or not, to the demands, and

the special qualities of fruits that will stand the competition of other markets.

Well, let us consider, how far the fruits are grown now the total area under fruit from 1908-09 to 1912-13 of the Presidency including Sind is as follows :—

Statement showing area under various fruits in the Bombay presidency including Sind.

	1908-09.	1909-10.	1910-11.	1911-12.	1912-13.
Cocoanut	20,467	20,569	20,682	20,840	20,993
Mango	16,292	16,934	17,632	16,886	16,844
Plantain	15,442	15,368	16,489	15,358	14,661
Guava	3,039	3,469	3,850	3,919	3,667
Pomegranate	1,792	2,154	1,899	1,834	1,846
Lime	1,314	1,358	1,194	1,321	1,217
Orange	396	...	1,180	1,289	810
Sweet Lime	905	1,351	658	432	753
Fig	426	475	488	476	478
Grapes	405	432	517	489	467
Custard apple	115	146	118	107	79
Papaya	167	194	211	176	257
Pine apple	20	43	105	57	26
Pumelo	129	38	43	18	230
Citrus	9	5	134	20	...
Bullock	27	29	25	37	...
Total ...	60,974	62,565	65,225	63,254	63,858

The population of the Presidency including Sind (excluding Native States) according to the latest Census is 1,96,26,477.

Looking to these figures of population and area under fruits any layman can say that fruits are grown in the Presidency on a large scale. Yes, he is sure to say so, because fruit is not the chief article of food to the Indians; while to other nations the table is never complete without fruits fresh or dried. From a commercial point of view these figures are quite insignificant; they are far below the mark.

Look to other places, for instance, to South Africa and America which are now exporting fruits on a large scale to be foreign markets. Fresh Exports.

Union S. Africa		Florida.	
1899	10817	boxes	In twenty five years the
1900	17336	"	production of oranges was
1901	17265	"	from nothing to about
1902	14998	"	50 million boxes a year.
1908	21968	"	
1904	34728	"	
1905	28832	"	

From the rapid increase of exports of fruits it is quite clear that area under the same has been proportionately increasing year by year.

I may say that the produce from the present area is not sufficient even to the demand in India itself and less for exports. Look to the quantity of fruits imported and exported for the last three years. The table kindly supplied by the Commissioner of Customs of Bombay is as follows :—

Names of Fruits.	Imports.			Exports.		
	1910-11	1911-12	1912-13	1910-11	1911-12	1912-13
Coconuts ...	Rs. 120	...	610	76,88	5,123	18,522
Apple ...	Rs. ...	94,978	124,626	25	200	...
Grapes ...	Rs. 86,775	87,546	58,122	...	...	...
Pomegranates..	Rs. 77,227	80,345	33,603	50	15	...
Mangoes ...	Rs. 10	...	...	18,864	19,753	19,118
Oranges ...	Rs. ...	567	520	...	...	...
Fine apple ...	Rs. 284	159	60	...	3	...
Plantains ...	Rs. ...	...	...	75	25	...
Pumelo ...	Rs. 20	...	8	144	65	54
Lemons ...	Rs. 12	317	228	...	...	...
Fresh fruits ..	Rs. 497	868	1,365	7,289	15,812	29,080
Dates (green)...	Rs. 6,575	4,051	55	...	...	...
Mangosieen ...	Rs. 360	1,157	...	...	...	...
Quince ...	Rs. 25	...	...	...	...	...
Pears ...	Rs. 10	...	...	...	...	...
Tomato ...	Rs. ...	...	10	...	...	...
Total.	Rs. 283,767	269,628	214,207	33,630	41,058	61,784

Value of Fruits as Commodity of Export.

Fruits to the value of more than 2½ lakhs of rupees are being imported into the Bombay Harbour alone. Apart from

such fruits as are not growing in India for instance quince, mangosteen, pears &c., even those that are thriving extremely well and highly appreciated by the Europeans have to be imported, not because the quality of the fruits grown here is inferior but the supply is not equal to the demand. I do not mean that all our fruits are superior to those of foreign countries but many of them are so, for instance, the mango—it has been highly appreciated in foreign countries and is not less nutritious as compared with apples and peaches, the most important fruits of foreign countries as will be seen from the table below :—

Mango	Apple	Peach	
17.2	14.96	17.99	Solids
13.24	7.58	1.5	Sugars
0.22	0.22	0.39	Proteids

(*vide* Agricultural News, Vol. 12. No. 298, page 308).

Banana flour.—It has been stated according to the Anglo-Indian Review in Agricultural News, Volume II, page 218 that there seems every prospect of good English trade in the industry. An analysis conducted by Mr. David Hooper F. C. S., of the Indian Museum, shows that the Indian product contains about the same quantity of Carbo Hydrates, as the West Indian and is about 1 per cent richer in Albuminoids. Its nutritive properties exceed that of Arrow-root and other starchy food usually administered to invalids.

The plantains from the Poona market analysed by the Agriculture Chemist, Poona, give the following percentage of sugar,

Varieties : Reducing Non-reducing Total Mois- Nit. Phos.

	Sugar.	Sugar.	Sugar.	ture.		
Rajeli ...	8.57	1.01	4.58	76.6	.19	.18
Sonakeli ...	5.95	11	7.05	66.0	.21	.14
Welchi ...	8.68	1.94	10.67	62.0	.19	.15

Further investigations may show other varieties that may be used for extracting starch.

Indian fruits compare to Foreign ones in respect of food stuffs as follows :—

Indian (analysed by the Agricultural chemist, Poona.)				Foreign (Vide Agricultural News, Vol. XII, Page 276.)			
Name of fruit.	Total solids.	Pro- teids.	Solu- ble carbo- hydres.	Total solids.	Pro- teids.	Total sugars.	
1 Papaya ...	9.0	.40	7.42	10.5	.44	5.97	
2 Guava ...	24.40	1.56	12.13	24.2	1.38	7.54	
3 Mango ...	17.0	.61	15.27	17.2	.23	13.24	two varieties
				25.7	1.13	17.54	
4 Custard Apple	35.38	...	6.55	22.6	...	18.80	
5 Rambhal ...	37.50	3.180	21.67	...	...	...
6 Fig, Fresh ...	28.5	3.25	18.46	...	...	...
7 Do. dried ...	96.6	3.25	62.30	...	...	* 58.15	

* Obtained from the market and analysed by the Agricultural Chemist, Poona.

1. Country variety from the Ganeshkhind Bot. Garden.
2. Allahabad variety obtained from Baroda.
3. Piarai variety from the Ganeshkhind Bot. Garden.
4. Country variety, Do.
5. Do. Do.
6. Diva variety, Poona District.
7. Saswad variety Do ; this variety may be dried scientifically for export purposes.

From the analysis it is quite evident that Indian fruits are not in any way inferior to the foreign ones. It was not possible to get, in such a short time the analysis of all the common fruits in this Presidency (Bombay), and of those that

were analysed some were taken from the common groups from the markets and some from the gardens.

Still more encouraging results may be obtained if choice fruits in a good condition were collected in a proper season.

Again, there are fruits which keep for a month if well packed and properly stored, for instance, the mango varieties *viz.*, Alphonso of Bombay, Fernands of Goa do not lose their taste for even a month if well preserved ; the Dholka Pomegranate with its small and soft seeds is far superior to the Poona one.

Some fruits like "Guava", "Ramphal", "Custard Apple" excel the foreign varieties in their value as food.

Mango:—The most popular and (when really of a good quality) the most highly esteemed of all fruits, has been much neglected. Though native of India, its cultivation is not conducted upon any recognised plan. There are a few ardent amateurs who devote some attention to its cultivation; the rest even in large private and public gardens, are left to themselves. The result of this is, that trees that would give good fruits, yield only fruits of indifferent quality.

There are some varieties which are famous for one or more qualities *viz.*, flavour, taste and keeping. Some fruits are more pulpy or more juicy. All such sorts are now gradually disappearing as trees grow older. Farmers being ignorant of the art of grafting and budding are losing such varieties.

Besides, there are early and late bearing varieties in some places.

All such varieties should be carefully surveyed and the properties to be retained by means of grafting and the species to be increased on a large scale so as to get large quantity of fruits for the market abroad where actually high prices are offered, for rare varieties. There are, again, thousands of useless trees that cover the land. Attempts should be made to improve all these by means of grafting, the advantages of which are: (1) fruits are obtained earlier, say, within 3 or 4 years, (2) the desired quality of fruit is retained, (3) trees grow

to a moderate height, which facilitates easy harvest and control over the disease insects or fungi.

Owing to the abundant supply and cheapness of fruit, preserves such as Jam, Jelly and Marmalade from the ripe and green fruits, pickles, chutney and alcohol out of green bruised fruits give a vast field for industry.

This year, we are informed, only 3,000 dozens of mango Fruits—'Alphonso' variety—were shipped to Europe from Bombay. While a tiny Island like Jamaica exported fruits worth £ 725 in 1902, as the 'Agricultural News,' Vol. II, No-22, gives. Why should not our country, which claims to be the home of the mango, do better with regard to the improvement of this valuable fruit and export larger quantities and also the preserves, just as apples are imported into India from foreign countries? Surely this is a question, which needs urgent attention of those who are interested in the subject of fruit cultivation. The mango fruit is, therefore, worthy of consideration; so are other fruits referred to above, viz., guavas pomegranates, custard apples, &c., which are exported from other countries to British markets, and which fetch fair prices, (Gardener's Chronicle, December 26, 1908, page 454).

Similarly, certain soft fruits, such as *Annona squamosa*, *Seetaphal annona reticulata*, *Ramaphal psidium guava* (Peru or Jamb) and papaya, containing high percentage of sugar, can very well be made into jelly, jam, &c., and placed in the British markets where they are sure to be highly appreciated if they are palatable. Besides, there are other fruits, such as pine apple (*ananas*), growing wild in many places, is worthy of cultivation, like the orange in Florida, and may fetch high prices in foreign markets.

The second fruit, which has great possibility of trade is the 'lemon'. This fruit, though a native of India, like 'mango', has been equally neglected. Under the present conditions, every tree produces on an average, only 500 fruits of inferior quality; hence the produce does not get satisfactory market and the growers feel discouraged.

Under careful and systematic cultivation, *viz.*, proper distance between plants, the interculture, the use of mulch spraying for disease in proper times, the pruning of dead wood, the resting of plants during hot weather, uses of fertilisers, the thinning of fruits, proper packing and handling and marketing, will certainly give encouraging results; the out-turn in this case generally may double with superior quality. It would then naturally find market abroad as fresh fruits, concentrated juice or citrate of lime. Essential oils from the rind of ripe fruits can also be extracted by means of distillation of the pressed juice.

Large quantity of lemon juice is imported for the preparation of lemonades and other drinks.

The preparation of lime juice is simple and does not cost much. It sells at 10 pence per gallon in London. The bottles, full but uncorked, are placed in pans of cold water, which is then boiled for some minutes. The cork too floats in water. The bottles are then removed from the hot water and immediately corked. In this way, they keep without moulding, and do not need the addition of any chemical preservative (Agricultural News, Vol. II, page 28).

The lemon industry in the United States commenced from a commercial point of view, in 1884, but owing to the difficulties in preserving the fruit and want of knowledge in general method of agriculture, it was dropped in 1899. Now, however, owing to the increased knowledge in manuring and pruning, the extreme care practised in handling and packing and co-operative methods of shipping and selling, the industry has greatly revived and supplies $\frac{1}{3}$ to $\frac{2}{3}$ of the total number of lemons consumed in the United States. The remaining are shipped from Sicily and West Indies. The demand for lemon is steadily increasing.

Well; all this is only suggestive with a view that the question of fruit industry, which is doubtless worthy of consideration and enterprise, may receive greater attention than what has hitherto been paid to it by those who are really interested in the subject.

Then comes the question as to what steps should be taken for the exports of fruits from India.

Measures adopted by foreign Countries to develop Fruit Industry.

Let us now see what the other countries, under similar circumstances, did, for the development of their fruit industry.

New York was a nonentity in fruit industry only about 15 years ago, but it stands now as the foremost country in exporting large quantities of fruits fresh as well as preserved to the British Markets. I will tell you how New York succeeded in such a short period to achieve its present success.

Mr. L. H. Bailey, professor of Horticulture, Cornell University, New York who was first deputed by the State, to investigate the problem of fruit-growing, determined the extent and condition of the industry, discovered the chief difficulties, devised means to combat the insect and fungi and advised fruit-growers by means of lectures and publications. He states that, in order to compete in foreign markets, we should know something of the condition under which the fruits of our competitors are grown. Further, while describing the importance of America as a land of fruits, he mentions that fruit-growing interests of the United States are very large and rapidly expanding, and gives the following chief reasons that are here worthy of mention. He says:—

1. " America is a land of fruit, because for one thing, its agriculture, is so recent and so little bound by tradition that the farmer feels himself free to discard old and unprofitable enterprises for new and relatively profitable ones....."

"2. Again, North America is the leading fruit-growing country of the world because large areas are available for the business....."

"3. The climate of North America is congenial to fruits.

" 4. The American Farmer has more help from teachers and experimenters than other farmers have....."

Now let us see how far Mr. Bailey's line of argument for New York and his comparison hold good, and apply to the existing state of things in India in respect of fruit Industry.

1. India also is an agricultural country from prehistoric times, but unfortunately the farmers are much bound by tradition, which however is gradually disappearing owing to the wide spread of Western education and particularly the efforts of the Agricultural Departments in various ways.

2. India too, like America, has a vast area for the business ; 1,2,15,000 acres under culturable state in *Bombay Presidency* alone. (*Vide* figures for Bombay Presidency available in Season and Crop Report for 1911-12).

3. The climate is congenial to most of the fruits in India too. India grows various sorts of fruits and in this respect she may stand first. (*Vide* India Agriculturists, dated 1-5-1909).

4. Lastly, the farmer class is receiving ample aid and benefits from the improved methods and ways of the Agricultural Departments of the different provinces of India.

I shall now say a few words, with regard to *South Africa*, which developed its fruit industry. Mr. Pickstone, with his experience as Horticulturist in California in 1892, established a nursery of 50,000 fruit-trees and imported all the best varieties from California in 1893, with the Royal help.

He then started branch nurseries and other farms for demonstration purposes, and thus he was able, in the course of only 12 years, to export more fruits from his farm than the whole of the South African export a few years ago. He was desired by Lord Milner to establish similar fruit-farms in the Transvaal and Free State with the object of developing fruit-trade of the Colony.

Under the new Mail Contract arranged by the Government and Sir Owen Phillips, the fruit-farms had the best seaborne freight rates in the world, which gave a permanent safeguard and a very strong impetus to the fruit industry of South Africa.

Similarly, Mr. W. W. Symington, the Chairman of the Firm of Messrs. Thomas Nash & Co., of Plymouth, established a trade in fruit between some of the Lesser Antilles and Great Britain, by making experimental shipments of such fruits as were available in 1903 (*vide* Agricultural News, March 1903).

In Queensland, an expert in horticulture, was deputed to British markets to report on the state of fruit ark et or the improvement of fruit industry. He made thorough inquiries as to the quality of fruit required, the price likely to be obtained, the best methods of packing and the best time for export, and emphasized the standard quality of fruits.

To sum up :—

1. To improve the indigenous fruits by means of up-to-date scientific methods, such as grafting, budding, spraying, &c.

2. To depute an expert to make a careful survey of fruits.

3. To depute an expert to British Markets to report on the state of fruits and their market prices.

4. To devise means for their easier conveyance to those markets and better prices.

These are the main points deduced from the aforesaid instances of the foreign countries, which may be taken as directions for the work of development of *Fruit Industry* in our country.

CONCLUSION.

Like New York, South Africa and other foreign countries, India as well expects us to do something substantial towards the improvement of her *fruit industry*. As New York prospered by the deputation of Mr. Bailey, whose careful and close survey of fruits helped a good deal the ultimate success, as South Africa succeeded by the knowledge, experience, perseverance and enterprise of Mr. Pickstone, who rendered a great service to the country, so also India too—rich in agricultural and other conditions—must naturally—aspire to rise and

prosper and have a trained 'Bailey'—if not a born 'Pickstone'—to work for her heartily and enthusiastically in the interests of the advancement of *fruit industry*—who would one day say "*India too is a land of fruits.*"

I beg to emphasize once more that the practical and useful suggestions contained in the paper are worthy of consideration and I think my humble efforts will be amply rewarded if something in the direction is done by the time of the next Conference.

Before concluding, I must express that in the general get up of this paper, my friend, Mr. B. D. Mulgund of the Office of the Imperial Cotton Specialist, Poona, has rendered me invaluable help, for which I take this opportunity to offer my sincere thanks to him.

INDIAN PAPER-MAKING MATERIALS.

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Increasing attention has recently been given to the necessity of obtaining larger supplies of raw material for the manufacture of paper. India is said to require 70,000 tons of paper pulp annually of which only about 25,000 tons are supplied by the mills in this country. The existence of the local industry depends chiefly on the supply of Sabai grass which on account of unfavourable seasons sometimes yields short crops. It is of great importance, therefore, to look for materials affording a constant outturn. One requisite is an abundant and lasting supply easily procured and cheaply prepared for exportation. In the hands of the paper-maker it should work up cleanly and at a moderate cost and present no difficulties in bleaching; the fibre should have a certain amount of roughness to enable it to felt or cohere in the mass, and lastly it ought to turn out at least 50 per cent. of marketable paper. In the following report notes are made of most of the paper-making materials of India arranged under the scientific names of the plants yielding them with remarks on the distribu-

tion of the species and the results of experiments. The author has also utilized the more recent reports on bamboo and Savannah grasses by Mr. R. W. Sindal, Mr. R. S. Pearson, of the Forest Service, and Mr. W. Raitt, Fibre Expert.

Agave Species. American Aloes.

The species of *Agave*, natives of America, have become so naturalised in India that they appear to be indigenous. The leaves are from eight to ten feet in length and yield a fibre of great length and considerable strength useful for making ropes. 30 to 40 years ago, numerous experiments were made with the agaves in India for the purpose of growing them for the fibre. In 1878, 300 acres of waste land at Hazaribagh were put down with Aloes to furnish stock for the Central Jail Paper Mill. Munj grass and other fibrous plants were also grown on the paper factory lands. It was expected that mills would require from one to two tons of paper stock daily. The Bally Steam Paper Mills in 1874 reported that the fibre yielded a good paper soft to the feel and of considerable strength; there was, however, a great waste in working the material and the cost of bringing the fibre from Hazaribagh to Calcutta was so great as to prohibit its further employment.

Allacanthus Kurzii, Hk. f.

A small urticaceous tree the bark of which is used for making paper in Bhamo. It is allied to the paper Mulberry (*Broussonetia*).

Alpinia Allughas Rose. Tara or Wild Cardamom of Assam.

This is a leaf plant of the Ginger tribe that attracted some attention a few years ago on account of its abundance in moist valleys and its supposed suitability for paper making. The leaves afforded 21·3 per cent. of cellulose, the stems 81·7 and the stems, after immersion in water and drying 44·9 per cent.

Alpinia nutans, Rose.

An allied plant growing in Burma and Sylhet. It has been suggested as a source of paper.

Andropogon conlorius, Linn. Throughout India and Burma.

The common Spear-grass of the plains. *Sarwala*.

Punj. ; *Surala*, U. P. ; *Kher*, Beng. ; *Kusal*, C. P.

"The nodes are not reduced during digestion with soda ;
not suitable even when mixed with other grasses."
(Raitt).

Andropogon intermedius, Br. Throughout India and Burma.

Sandhor, U. P. ; *Sudugan*, Beng. ; *Kharjhara*, C. P.

"Though somewhat inferior in quality and strength of
fibre is admissible in moderate quantity with other
grasses." (Raitt).

Andropogon Nardus, Linn. Chiefly Sub-Himalayan tract

and Burma. Lemon grass *Parabya*, U. P. ; *Gandha-
bena*, Beng. ; *Kaing Pynni*, Burm.

Quality as above.

Anthistiria gigantea, Cav. sub spec. *arundinacea*, Hackel.

The Giant Spear Grass of North India, usually char-
acteristic of the Sal forest tracts. *Dhala*, *Ulloe*, U. P. ;
Bara tanga, Assam.

Anthistiria gigantea, Cav. sub spec. *villosa*, Hack.

From Dehra Dun to Assam. *Dhala*, U. P. ; *Chota tanga*,
Assam.

These two grasses form a first class material for paper
pulp.

Aquilaria hgalloca, Roxb. Eagle or Aloe Wood Tree.

In Assam the prepared bark of the Sachi tree is used in
place of paper. The *Sachi pulhis*, as the prepared
leaves are called, contain sacred writings of the
Brahmins and Goshais and are very lasting.

Airshida cyanantha, Steud. North-West India, ascending
to 5000 feet. *Suni*, U. P. ; *Matri jara*, C. P.

This species is quite inadmissible in mixture. (Raitt).

Arundo donax, Linn. Himalaya from Kashmir to Assam,

Burma, Nilgiri and Coorg Hills. *Baranal*, U. P. ;
Gaba nal, Beng. ; *Alokyu kaing*, Burm.

Yields a first class paper pulp (Raitt).

Bambusa, sp. Bamboo.

In 1875 the bamboo plant was brought to notice by Mr. T. Routledge, a paper manufacturer of Sunderland, as producing a material suitable for paper making. Experiments satisfied him that the bamboo yielded a fibrous paper stock which made a quality of paper superior to esparto grass and at a considerably less cost. It was estimated that one acre of bamboo would yield 10 tons of dried stems equivalent to 6 tons of merchantable cellulose. In 1905 Mr. R. W. Sindall was invited by Government to visit Burma with a view of enquiring into the possibility of manufacturing paper pulp. His report on the subject appeared in March 1906 and is of great value. He made numerous experiments with bamboo and woods of Burma and laid down lines along which further enquiry should be made. Subsequently Mr. W. Raitt, a pulp expert, was engaged at the Forest Research Institute in conducting tests on the treatment of bamboos by the soda and sulphate processes, the treatment of bamboo before boiling, with remarks on the utilisation of nodes and internodes. His results were embodied in the "Report on the Investigation of Bamboo for Production of Paper-pulp," published in 1911. Lastly, Mr. R. S. Pearson of the Forest Service, Dehra Dun, as the outcome of enquiries made throughout India published in 1912 a note on the Utilization of Bamboo for the Manufacture of Paper-pulp.

The chief bamboos of India are :—*Bambusa arundinacea*, "Dangi" of Kanara, *Bambusa polymorpha*, "Kyathaungwa" of Burma, *Cephalostachium tergracile*, "Tinwa" of Burma, *Melocanna bambusoides*, "Wanwe" or "Muli" of Burma and Assam.

The fibres of bamboo are fine and silky and of great strength. The culms being hollow can easily be crushed and the fibrous portion removed like tow. The stems rapidly grow again after being cut so that the same area can be worked for several years. The yield per acre is larger than that of grasses usually used for paper. The cost of working into pulp has been estimated to yield a product cheaper than

imported unbleached spruce sulphite and unbleached baisa grass pulp.

Mr. Pearson has suggested the following areas for manufacturing paper from bamboos :—The Fhonze Reserve of the Tharrawaddy Division ; the Hlaing Yoma and Okkan Reserve of the Rangoon Division ; Pyinmina Division ; Toungoo Division ; Arakan Division ; the Gangagalli Catchment Area in the Ankola and Yellapur Ranges of the West and East Kanara Forest Division ; the Kali Nudi Catchment Area in the Karwar and Supa Ranges of the West and North Kanara Forest Division ; the Mangoo Forest of the East Kanara Forest Division ; South Kanara ; North Malabar ; and South Malabar.

Bauhinia Vahlia, W. & A.

An extensive climber found abundantly along the lower Himalaya, North and Central India and Burma. The stems are 100 to 200 feet long climbing over the highest trees. Known as *Malu* and *Mahalyne*. Strong cordage prepared from the bark is an important article with the hill tribes. Mr. Routledge of Sunderland reported in 1879 that it yielded an excellent and strong fibre, yielding 60 per cent. green, and 54.7 per cent. bleached. Later experiments showed that with alkalis it yielded a strong dark liquor due to tanning and colouring matter and the fibre worked well on wire and freely came off the press roll. The dye in the bark is a great obstacle in its success as a paper material. The bark yields 48.4 per cent. of cellulose.

Betula Bhojpatra, Wall. Indian paper Birch.

This tree is found in the higher ranges of the Himalayas. The inner bark is used as a substitute for paper. The earliest classical Sanskrit writers refer to the employment of birch bark for literary purposes.

Borassus flabellifer, Linn. The Palmyra Palm.

Strips of the leaf, carefully cut, smoothed and dried in the sun were formerly used in place of paper. These are called "ola." The leaves contain a strong fibre and it has been

suggested that they could be manufactured and exported as half stuff from Ceylon and South India where the palm is abundant.

Broussonetia papyrifera, Vent. The Paper Mulberry.

A small tree of Japan, China and Burma. The bark of this tree is made into paper by the Japanese and the Karens of Burma, it forms the Tapa cloth of the South Sea Islands.

Calotrops gigantea, and *C. Procera*. Mudar or Ak.

This plant exists in abundance in the Punjab and Sind and generally in other provinces. It grows in waste and dry situations sometimes, to a great size and it contains in its stems a strong white silk like fibre used for paper making in Peshawar and Sirsa. The chief difficulties in its use are the extraction and cost of the fibre.

Canabis sativa. Indian Hemp.

Paper was formerly made from this fibre in Hyderabad, Sind.

Corchorus sp. Jute.

Before the introduction of mill-made papers, the jute paper industry was very general throughout Eastern Bengal. As a result of competition jute paper has been thrown out of the market. Traces of the industry are, however, to be found in the district of Pabna (Serajganj), Chiltagong, Dacca (Munchiganj), and in the Manipur State. Used gunny bags are still used in paper factories.

Crotalaria juncea. Sun Hemp.

Old gunny bags made from the fibre of Janapar or San hemp was at one time the principal material used in making paper in Madras districts. It was also used for this purpose in the jails of the United Provinces and the Punjab where the fibre cost twelve annas to one rupee per maund.

Daphne cannabina, Wall. Nepal Paper Tree.

This is a large shrub found on the Himalaya from the Indus to Nepal, between altitudes of 8000 and 10,000 feet. The bark of this and other species of *Daphne* have been used

from very early times in the manufacture of the well known Nepal paper.

Desmodium tiliaefolium, G. Don. Paper Tree.

A large tree in the Himalaya from the Indus to Nepal. *Kalanchi Kanti* Pb.; *Shak sing* (Paper tree) Rotang Pass. The bark is used in many parts of the Himalaya in paper manufacture, also in Hazara and the Jail at Dharmasala. A trade existed in exporting this paper from Kumaon to Tibet.

Edgeworthia Cardneri, Meissn.

A large elegant shrub found along the Himalaya from Nepal to Sikkim and Bhutan. The finest qualities of Nepal paper are made from this plant.

Eragrestis cynosuroides, Beauv. Throughout India, Upper Burma. Ascends 4000 feet on dense or water-logged soil or in hot dry places. Dab, Punj. and U. P., Bengal and Bombay.

"Although somewhat difficult to bleach and of rather inferior quality is admissible in mixture up to 10 per cent. without detriment to the product (Raitt)."

Erianthus Ravennae, Beauv. North west India in Punjab and United Provinces. Extends to Sind, Kashmir and Westwards to Mediterranean. *Dolsar*, *Dolu* U. P., *Kurosar*, Sind.

"Somewhat inferior in quality and strength of fibre but admissible in moderate quantity with better grasses." (Raitt).

Girardinia heterophylla. Done.

The Nilgiri Nettie is a tall, stout tufted stinging herb; exceedingly common in the temperate and subtropical Himalaya, Assam, Burma, Travancore and Ceylon. The stems yield a fine strong fibre much used for cordage and twine. Experimented with as a paper making material the results were not encouraging. The cost of digesting the substance into a pulp rendered the specimen quite prohibitive for conversion into paper.

Hedychium coronarium, Koen.

This is a native of India distributed from the Himalaya to Ceylon and Malacca ascending to 4000 feet in the Khassia

Hills and 6000 feet in Ceylon. It grows abundantly in Brazil. The plant belongs to the same natural order as the Ginger-Messrs. C. Beadle and H. P. Stevens have lately discussed its possibilities as a new material for the manufacture of paper (*Journ. sec. Arts* 1913, 61, 347-63). It is estimated that any land planted with the shrub four inches apart would give seven tons of dried fibre, equivalent to four tons of fibre per acre per annum. The stems could either be dried and crushed for shipment or paper manufactured on the spot from the green stems. The paper manufactured from *Hedychium* fibre are said to be among the strongest hitherto recorded and equal to the best Manilla papers.

Hibiscus cannabinus, Linn.

This plant called *Ambari* in Bombay and *San kokra* in the Punjab yields the Deccan or Ambari hemp. The fibre was formerly used in mixture with other materials for paper making in Bengal, Bombay and the Punjab.

Imperata arundinacea, Cyrill. Throughout India and Burma ascending to 7000 feet. *Sil*, Punj.; *Siru*, usir, U. P.; *Ulu*, Beng.; *Chola elua*, Assam; *Thelke*, Burm.

"Although somewhat difficult to bleach and of rather inferior quality, this grass admissible in mixture up to 10 per cent. without detriment" (Raitt).

Ischaemum angustifolium, Hack.

This is the well known *bhaib*, *bhabar* or *sabar* grass of Northern India, the leading Indian paper grass for the last thirty years. It is a perennial grass plentiful in drier tracts from Chota Nagpur and Rajmahal to Nepal and Garhwal. The Calcutta mills draw their supplies from Sahibganj, Chota Nagpur and the Nepal Terai. The quantity annually exported from Sahibganj is between three to four lakhs of maunds. The cutting in these districts is said to commence in October when the plants are six or seven feet high. Sabai grass yields from 36.6 to 45.5 per cent. of bleached cellulose. It has been said that the grass from different districts varies in composi

tion, but from analyses made a few years ago of the grass from three localities in the United Provinces it was found that the amount of cellulose was uniformly near 40 per cent. Other grasses have a similar composition. Any variation appears to be due to maturity. Twelve samples of grass of different botanical origin were sent from Kathiawar and the cellulose content ranged from 31.8 to 43.9 per cent. The variation is considered to be due to the size and age of the grass rather than to any inherent high or low value in the individual species.

Linum usitatissimum, Linn. Linseed Flax Als.

Since linseed is cultivated in India for its oil seeds, the fibre is a waste product. The flax, however, was formerly used at Sialkote and Lahore as a paper making material mixed with other fibres.

Nipa fruticans, Wurm.

This small palm, termed *Golpatta*, grows profusely in the Sunderbans. Several maunds were collected and sent to a paper manufacturer in 1898, and the pinnae and midribs were treated separately. A fair amount of half-stuff was produced, but the cost of the process rendered the material too expensive for paper making.

Phaenix paludosa, Roxb. Hental.

This is a dwarf palm forming impenetrable thorny thickets in the Sundarbans and in the deltas of rivers in Burma and the Andaman Islands. It is known as Hental and the leaves are used for making rough ropes and also for thatching. The dried bark and leaves cost Re. 1 per maund in Calcutta. An experiment was made in 1901 and it was found to yield 40 per cent. of pulp. This worked easily on the machine but the shade was low and it cost 3 pies per lb. more to obtain this than with Babul grass.

Phragmites Karka, Trin. Null grass. *Nal*, Punj., U. P. Bengal, Assam, *Nar*, Sind.

It is a very coarse grass in appearance and much resembles bamboo in the stem. It grows to a height of 9

to 12 feet. It was crushed so as to open out the stem and bruise the joints. During the process of boiling the stuff was liable to form into the appearance of "sago," a most unfortunate transformation of taking place in the machine chest. The agitator in the chest was too rapid and caused the stuff to become knotty or commonly called 'sago.' A little strong fibre added would be advantageous; nearly every grass is the better on having a strong fibre mixed with it. The material is easily treated and can be rapidly put through a mill. Mr. Raitt finds it to be a first class paper making grass, yielding 89 per cent of unbleached pulp.

Plecanthus Wighii.

This plant of the nettle tribe is found in large quantities in Assam and is known as *aduvantum*. It affords 83.6 per cent. of a strong white fibre.

Saccharum arrundinaceum, Retz. Bengal, Assam and Burma, often cultivated ascends to 4000 ft. *Ramsar*, U. P.; *Teng*, Beng.; *Paung kaing*, Burm.

The culms attain a height of 28 feet. The grass is capable of yielding as much as 14 tons of dry material per acre per annum.

Saccharum fuscum, Roxb. Bengal, Assam and Burma *Ralwa*; U. P.; *Khuri*, Beng.; *Yin kaing* Burm.

Though somewhat inferior in quality and strength of fibre is admissible in moderate quantity with better grass without prejudice to the yield and quality of the pulp.

Saccharum Munja, Roxb. Punjab, Sind. U. P.; Behar, Chota Nagpur, *Sarkara Panj.*, *Munj sar*, *ekar*, U. P., *sara Sarkanda*, Beng.

Saccharum Narenga, Ham. Sub-Himalayan tract from Dehra Dun to Assam, Central India and Burma. Usually characteristic of sal forest tracts. *Kanwal*, U. P.; *Bala* Assam; *Thetkagyi kaing*, Burm.

Saccharum spontaneum. Linn. Throughout India and Burma ascending to 6000 feet *Kank*, Punj. *Kans*, U. P., *Khano* Beng., *Sit kaing*, Burm.

These four species form a first class material for paper pulp manufacture. (Raitt).

Saccharum officinale Sugar-cane.

Paper from *Megass*, the fibrous residue of the cane after sugar has been extracted, has been made into paper in Trinidad. This process is only applicable where sugar is made with modern machinery and with a large and continuous supply of water.

Triticum sativum. Wheat.

Papers was formerly made from wheat straw in Rawal Pindi and Jhelum. The paper is brittle. The straw of cereals is now too extensively used for fodder to be available for this purpose.

Veliveria zizancides, Stapf. (*Andropogon squarrosus*), F. B.)
The Khas-khas grass.

"Somewhat inferior in quality and strength of fibre to the best paper making grasses". (Raitt).

PAPER PULP INDUSTRY IN INDIA FROM BAIB GRASS.

BY RAI BAHADUR MUNSHI PRAG NARAIN BHARGAVA

Director, Lucknow Paper mills, Lucknow.

In this paper, I shall confine my remarks to the manufacture of grass pulp the chief ingredient of paper in this country

Before I enter into the subject proper, I wish to give a few figures which will show that this industry in India requires an overhauling in order to be able to create a satisfactory market for itself.

In 1908-04, the quantity of paper imported into India from Europe was about 11,000 tons valued at about 50,000 rupees. In 1911-12 these figures were 41,000 and 111,000 respectively. The total consumption of paper in India at present is about 70000 tons of which only 25000 tons are manufactured in India the remaining 45,000 being imported from Europe. With the progressive advance of education and expansion of commercial and industrial enterprise in india, the foreign imports

of paper are likely to increase considerably with the lapse of time unless means are devised, whereby this increase in the imports is materially arrested.

I will now make an attempt to examine into the causes why Indian paper does not favourably compete with its foreign made rival.

1. In Europe almost every paper mill is situated within an economic radius of the supply of raw material whereas in India there is no pulp mill and the paper mills are situated at long distances from the sources of supply of raw materials.

2. In the Western paper manufacturing countries, paper is manufactured mostly from pulp and the paper mills have very little directly to do with the handling of raw material. In India, the paper mills collect their own grass, pay freight on the full quantity, reduce it to pulp after throwing away 60 per cent of refuse which the grass contains and then manufacture paper.

3. In Europe, again, the pulp mills are able to manufacture and supply cheap pulp to the paper mills and thus are a direct cause of the reduction in the cost of manufacture of paper. In India, the scarcity of the supply of raw material from the close proximity of paper mills, has compelled the latter to obtain their supplies from distances which they can hardly afford to pay. In addition to it, they have to import large quantities of wood pulp.

These facts clearly demonstrate that unless cheaper raw materials are made available, the Indian paper mills cannot hope to compete with the European manufacturers. The Indian paper manufacturer in the past had to rely upon rag, jute, hemp, straw, etc., but when there was a scarcity in the supply of these materials or the prices ruled high, he had to look out for a cheaper material.

After due trial, Baib grass was found to be a suitable substitute, and having been successfully used for the last 20 years, it has come to be recognized as the ideal paper-making material and at present Baib grass is the chief mainstay of the

principal Paper Mills in India, though an admixture of grass and chemicals is also used. This grass is variously called Bhaber, Sabaie, or bunkas according to the different provinces where it grows. It is extremely fibrous and strong, retaining its green colour for a considerable time after being cut. It occurs in large quantities in Bengal, Chhota Nagpur, the Nepal Terai and the Oudh forests of the United Provinces, generally on the warmer slopes and on steep hill sides. It is also used extensively for making coarse ropes, string and cordage.

As a paper pulp material, it may be said to hold at present the premier place in India. One proof of it, if such a proof were needed, is that as much as about 6 lakhs of maunds or even more, finds its way annually to the Indian paper Mills.

Regarding the pulp industry, Mr. William Raitt, F.C.S., the Cellulose expert attached to the Imperial Forest Research Institute, Dehra Dun, in his recent note on 'Indian Fibre for Indian Paper' says :—

“ It has been found that in bamboo and several of the coarse Savannah grasses, which cover much of our waste land and thinly forested areas, an almost unlimited supply is available which if manufactured into pulp (technically half-stuff or half made paper) in the districts where it is produced can be delivered to the paper mills at a cost considerably under that at which they now prepare their own pulp, and at the same time the barrier to an extension of their manufacturing operations, *viz*, the impossibility of increasing their supplies from the limited area now available, will be removed.”

The chief staple of Indian paper-makers has hitherto been Baib or Bhabhar grass, a material which does not yield more than 40 per cent. of paper. Consequently cost and freight charges have to be incurred on $2\frac{1}{2}$ tons of raw material for each ton of manufactured product. The radius from which a mill can afford to collect its supplies is therefore strictly limited. But if the 60 per cent. of waste is eliminated at the point of origin, it is obvious that the radius can

be considerably extended. To produce a ton of paper, 68 maunds of grass are required.

'To a mill situated in Calcutta, or its neighbourhood, the cost of this is Rs. 87 ; but there are many producing districts such as the Northern and Central India, the Nepal hills, the Oudh Frontier forests, where the cost of collecting it to a railway centre, does not exceed annas 12 per maund or Rs. 51 for the quantity required to yield a ton of paper. The pulp manufacturer, therefore, working in such localities, starts off with an advantage of Rs. 34 to his credit, and he pays Railway charge upto the paper mills on one ton of partially manufactured material instead of on $2\frac{1}{2}$ tons of raw material.

'India does not at present manufacture more than a third of the paper she uses, so that there is a large local field for extension, and there is the China and Japan demand, which is rapidly increasing and is at present almost wholly supplied by imports of European wood pulp. Add to these the possibility of an export to Europe opened up by the increasing scarcity and advancing prices of wood pulp, and it will be realized that there need be no fear of flooding the market. There is room and to spare, for all the pulp India can produce from bamboos, coarse grasses, or Baib, and the latter possesses qualities so peculiarly suitable for certain grades of paper, that it will always be in high favour with paper makers'.

The following is an extract from a note published in the Paper Makers' Monthly Journal of England, in its issue of 15th August 1913, regarding the Japanese demand: 'The import of pulp is now valued at about £300,000 per annum. By reason of the development of the Japanese industry, there is a ready market for pulp and some difficulty in obtaining supplies. There is of course a large production in the country itself, as near the forest region of Hokkaidu, there are several large works, whilst other mills make a speciality of using bamboo procured from Formosa. Notwithstanding these sources of supply, the paper industry is largely dependent on the import and great quantities of pulp are imported

from Sweden and Germany, the united share of these two countries in the total import trade being about 80 per cent.

Nepal grass is of course much superior to all other Indian grasses for paper-making, because its fibre is thinner, heavier, and stronger than that of any other grass and requires much less chemicals.

Any new industry which supplies a want and tends to diminish the foreign imports of any article, is one which deserves the support of all capitalists. Now such an industry is the Grass-Pulp Industry for the manufacture of paper pulp from grass which the Indian paper mills will consume in large quantities because it will be, as shown above, very profitable to them. If this industry is started, it will inevitably tend to a decrease in the imports of wood pulp from foreign countries, because wood pulp, owing to the exhaustion of the European spruce and fir forests, and the consequent diminished yield from them, is steadily rising in price which the Indian paper mills cannot afford to pay ; and also because for many kinds of paper made for the Indian market, grass pulp is more suitable than wood pulp as well as much cheaper than the imported wood pulp. Besides India produces suitable grasses of various kinds in unlimited quantities, as they spring perennially and the crops can be cut every year. This being the case, the question arises what is the reason that India does not produce more than one-third of her requirements of paper ?

The reason is that the transport of grass in bulk to the paper mills involves such a heavy charge for freight that under present conditions it precludes Indian paper mills from successfully competing with foreign paper mills and holding their own against them because Indian paper mills, can afford to buy grass only within a certain radius from their mills, beyond which they cannot go owing to prohibitive freight charges. This difficulty will be at once overcome if grass pulp mills are established near the grass forests or the grounds, to reduce the grass to pulp near the place of origin

thus eliminating heavy freight charges and considerably extending the area of supply.

It will therefore be seen that though raw material is plentiful, it has to be carried long distances to the mill and consequently freight charges, loss of material in transit, loss during stacking in mill compounds, all militate against Indian mills successfully competing with European manufacturers.

Take another industry—cotton—when the trade had been a few years in existence, exporters realized that some methods should be adopted for reducing freight charges. The necessity gave birth to the first cotton press in India.

As early as 1864, attempts were made to save freight by compressing cotton bales with the aid of machinery; and now cotton presses are flourishing every where and the railway and steamer freights have been materially reduced. The salvation of the paper industry in India lies in the reduction of grass to pulp *in situ*, thus eliminating at the point of origin the unnecessary and unproductive costs referred to above. After the grass is reduced to pulp and pressed into air-dry bales, the latter can be sent to the paper mills at much less cost than at present.

There can be no two opinions as to the fact that the material prosperity of a country entirely depends upon its commerce and the industrial development of its resources. That we are advancing, there is not the least doubt as is evident from the feverish activity in every department of life. It is for Indian patriots, financiers, and well-to-do people to educate the people at large, and to explain to them the absolute necessity of making a united effort as far as it lies in their power to come forward and to help the growing industries of the country and to provide the necessary capital for their development.

There is plenty of wealth in India in the deposit vaults of Maharajahs, Rajas and talukdars and the tiny hoards of the thrifty agriculturists and unless it is made available for remunerative industrial enterprises, the economic development of the country will be arrested. It is, therefore, the

duty of all enlightened men to show the way to their wealthy neighbours and less advanced brethren how to invest their savings in commerce and industry, which will start India on a career of prosperity and accelerate her economic regeneration.

PAPER MAKING INDUSTRY IN INDIA.

Dhruva Sumanas, Esqr. Paper Technologist (London)
(Ahmedabad).

The East has been credited from times remote for its civilization and like so many arts and industries, it taught the West Paper Making too.

Eastern Turkestan, or call it China, has the honour of teaching the art of making paper of the kind most familiar to us, that is from fibrous material first reduced to the condition of pulp. Leaving aside for the present the consideration of the materials used for writing purpose we shall only try to find out the substances which were reduced to pulp for the purpose of making paper.

The date assigned for the invention of the art of paper-making is 105 A.D. The Chinese used tender shoots of young bamboos in paper-making. Professor Giles says that the earliest paper in China was made from tow, old linen, fishing nets &c. The modern paper of China is made from bamboo fibre, the bark of paper-mulberry tree, and rice-straw.

Professor Wiesner, reviewing the information to hand regarding the paper-mulberry, says that in Japan the fibre has been used for the manufacture of paper since the 6th century of our era.

But the word "paper" in English derives its origin from a plant called "Papyrus" which grew in the marshes, of the river Nile in Egypt. This papyrus served as a writing

material till the 3rd or the 4th century of our era. The discovery of its value led to an extensive industry, through which the land of Pharaohs was enabled to take a high rank in letters, and learning and to maintain a position of wealth, dignity, power, and influence that otherwise would have been impossible even in those remote days when printing was beyond their dreams. The Greeks called this plant "Papyrus" or "Byblus", from whence come the words "paper" and "bible or book", of which paper was made even as early as the times of Isaiah, now nearly 3000 years ago !

Regarding the mode in which the paper was manufactured from this plant, two different opinions have been handed down to us. One is that the epidermis being removed the spongy part was cut into thin slices, which were steeped in the waters of the Nile, or in water slightly imbued with gum ; after which the two layers were placed one above another carefully arranged in contrary directions, that is, lengthwise and breadthwise, which after being dried, were finally smoothed, and brought to a fit surface for receiving writing by being rubbed with a piece of polished ivory. Another method was simply that of separating the thin concentric coats, or Pellicles of the plant which surrounded the stock, by means of a needle or polished shell (on an average about 20 from each) and afterwards extending them longitudinally side by side on a table, a similar layer being placed accross them at right angles ; in which state they were moistened with water, and while wet put under pressure, being afterwards exposed to the rays of the sun, and finally polished as in the former case, not merely for improving the surface, but to prevent its absorbing the ink. The saccharine matter with which the whole juice of the plant is said to have been impregnated, being quite sufficient to cause the adhesion of the layers.

It has been inferred, that paper had been made in Tibet in the middle of the eighth century A. D., from a manuscript found and examined by Professor Wiesner. This has been determined as made of Daphne bark and is noted to have had the surface sized and dressed with rice-water in order to render it suited for writing purposes. It is, therefore, permissible to regard this as the oldest recorded sample of what is commonly spoken of as "Nepal Paper". In passing, it may be added that the further advance of sizing with gluten was not made until the 14th century. So again, it may be added that a dressing with rice water was and still is a universal practice in the manufacture of the once famed "Kashmere Paper, an article greatly in demand some centuries ago for making copies of the koran.

It has been commonly asserted that raw cotton, or cotton wool was first used by the Arabs in the beginning of the 8th century for the manufacture of paper, they having learnt the art from certain Chinese prisoners captured at the occupation of Samarkand in 704 A. D. by them. Professor Wiesner has found out that the earliest dated paper made of linen rag, with an occasional trace of cotton was a letter dated 792 A. D. This proves that at the end of the 8th century the Arab understood the art of making linen paper on network moulds and further that they added starch for the purpose of sizing and loading the paper. The present researches further show that the beginning of the preparation of rag paper can be traced back to the Chinese in the 5th or the 4th centuries or even earlier. The Chinese method of preparing rag paper never progressed beyond its initial stage. It was the Arabs who having been initiated into the art by the Chinese improved it to that stage of perfection in which it was received from them by other nations.

There is no accurate knowledge when the art of paper-making came to India. Paper was introduced by the Muhammadan conquest and has been very extensively used since that time for the writing of manuscripts. The oldest

known example of a paper Sanskrit MS, written in India is one from Gujarat, belonging to the early part of the 13th century. In Northern India where ink was employed for writing, birch and palm leaves went out of use after its introduction. Recently, it has been affirmed that paper-making was practiced at Sialkot 620 years ago (1200 A. D.)| Nicolo Conti who visited India in the early part of the 15th century says "The inhabitants of Cambay alone use paper; all other Indians write on leaves. It is supposed that paper making was introduced into Hindustan from Kashmir in the 16th century about the time of Emperor Akbar. Lawrence tells us that Kashmir was once famous for its paper. It was made from rags and hemp fibre sized with rice-water. He then adds that it is believed the art was introduced from Samarkand. Gibbon mentions that the knowledge of paper-making from linen rags spread from Samarkand and Cassire is of opinion that it reached Mecca in the year 710 A. D. It is however highly likely that Nepal possessed the same knowledge, and probably both may have learnt it from Tibet or China, prior to Akbar's time.

Ovington in his voyage to Surat less than a century after Akbar's time speaks of merchant's account books. The paper books in use among the inhabitants of India, on which they write are long scrolls of paper, sometimes ten feet in length and a foot broad, sewed together at the top containing as many long sheets as the occasion of the writing requires.

Ironside published in 1774 an account of Indian paper Manufacture. He says that material was sann hemp, but old ropes, clothes and nets, made from the same hemp were preferred to the fresh fibre for cheapness. These same rags were cut up into small pieces, macerated in water for a few days. Washed in the river in a basket, and thrown into a jar of water lod-

ged in the ground ; the water being strongly impregnated with sadgi khar or the crude carbonate of soda, six parts and quick lime seven parts. After remaining in this state eight or ten days, they are again washed, and while wet broken into fibres, by a stamper and then exposed to the sun, on a clean terrace, built for this purpose; after which they are again steeped in a fresh alkali liquor as before. When they have undergone three operations of this kind, they are fit for making coarse brown paper; after seven or eight separations, they are fit for making paper of a tolerable whiteness. The pulp thus produced is taken up on a fine-wire frame just as in the English manner.

From our knowledge that the oldest Sanskrit M. S. on paper was found in Gujarat dated the 13th century, and from other accounts we might say that the Gujarat knew the art of paper-making very well even in the 13th century. In Ahmedabad, paper making was a prosperous trade many years ago. To the north of the present city which was built on the sites of an old town Aşaval in 1411 A.D., are still seen the ruins of old vats used for soaking rags. Hence too the name of one locality, Kagdi Pith which is outside the city. Similar vats are to be found in Kochrab Paldhi, a village on the further side of the river Sabarmati and in its vicinity there is a similar ruined place known as Kagdi Pura. Ahmedabad paper was famous for its whiteness, toughness, and in the old days all account books, letters, and deeds of that and neighbouring Districts were written on it. In the year 1848 about 800 men and boys were daily employed in the paper works. In 1878, the number declined to 600. The workers do not trade in paper. They are generally employed by rich musalmans, chiefly of the sunni Bohora sect. The employer supplies the materials, chiefly old bags and sacking, much of it brought by vanjaras from Marwar and mixed with pieces

of damaged European paper. Formerly damaged European paper was not used for reasons more than one. Firstly no European paper came to India. Secondly no other fibrous material other than cotton rags, gunny and saun hemp, was known to them; and lastly they had no reason to deteriorate the paper, there being no rival trade in it. Ahmedabad paper was and is used even now in Government vernacular registers, in native states and by native traders, whose ways of book-keeping and book-binding require tough and close-grained paper. Besides the Bombay Presidency, Ahmedabad paper goes to different parts of Central India. Even now a large number of people use this paper for their account books and is well-known as the "Amdabadi Kagal."

About the year 1872 A. D., a factory was built in Ahmedabad to manufacture paper by steam power instead of by manual labour but in the year 1875, it was destroyed by the flooding of the river Sabarmati; but the machine was any how saved and was replaced. For some reason or other, the work was stopped, and was sold out and the machine was again erected and rag pulp was only manufactured. Here it worked for some time but was afterwards given up owing to the orthodoxy and inability of the owners. Since then no effort has ever been made either to improve the primitive method of making paper by hand process or by machine process by erecting an upto date paper machine Mill. The industry is a decaying one and is confined only to a few families who are very poor and are forced to work long hours on low wages in order to earn their living. Now the quality is quite becoming inferior owing to their using two penny European damaged paper made from straw and wood-pulp and heavily loaded with clay and rosin, to cheapen their native article in competition with the foreign product.

Paper-making by hand process flourished in almost

every province and large towns in India but after the rise in the imports of foreign paper and owing to the introduction of the Fourdrinier paper-making machine, this Native craft gradually began to decline. Ahmedabad, Kaira, Baroda, Surat, Broach, Naosari, Bassein, Junnar, Erandol, Nasik, Poona, Bagalkot, Gokak, Daulatabad, Moradabad, Cambay, Vijaynager, Sialkote, Multan, Shrinagar, Serampur Ludhiana, Gujranwala, Jhang, Montgomery, Ambala, Hissar, Ferozepur, Rangoon, Calcutta, Delhi, Lahore, Lucknow, Dera Gazikhan, Muzaffargarh, Gujarat, Chittagong, Dacca, Agra, Allahabad, Karachi, Cawnpore, Amritsar, Pabna, Manipur, Kamarupa, Kanouj, Bareilly, Benares, Cochbin, Travancore, Shahjahanpore, Bijnor Budaon, Gazipur, Azimgarh, Mirzapur, Gorakhpur, Mathura, Kotab, Indore, Hathrus, Goa, Akola, Hushiarpore, Bangalore, Sitapur, Peshawar and numerous other places used to make paper by hand and some of these cities made very good paper and are manufacturing it even now.

Up till the year 1799 A. D., paper was entirely made by hand all over the world. It was about the middle of the 19th century that the Fourdrinier paper-making machine was brought to perfection. Again the raw material was only rags.

Prior to 1840, India obtained a large portion of her paper-supplies from China. After the rag-famine in England and then after the introduction of mechanical wood-pulp and esparto in 1869 and the chemical wood-pulp, England received a great impetus in the manufacture of paper which was enhanced by her finding India a very suitable market. All these innovations stirred India too, and hand (and Machine made) paper factories were established throughout the country. "The Times of India of 22: 9: 1865 says Bombay began to stir itself for establishing a paper mill in 1854 and a company was brought into existence. There are no traces found of this company but in

1862 the paper mill now known as "The Girgam Paper Mill" was established. It is the first and oldest paper mill in India and is now owned by a Musalman Bora who purchased it in 1908. The annual production was about 500,000 lbs. *i. e.*, about 225 tons annually until the close of the last century when the business suffered from depression consequent upon irregular working and the increasing competition of other mills as well as foreign competition. As a matter of fact, it is owing to the defect in the machinery which is half a century old. No one looks to an improvement in spite of such a quick advancement in the labour saving and high-speed appliances. Its present output is 60 to 100 tons only.

After this, the second mill in India was opened in the year 1882 at Lucknow, as a joint stock company with a capital of Rs. 8,00,000 known as "The Upper India Couper Paper Mill Company Limited" and is managed by an efficient English foreman. This mill has been a success since its beginning. It has got the advantage of the raw-material in the sabai grass and of its nice situation on the left bank of the river Goomty. This mill has been a success since its beginning and is paying handsome dividends every year, and from the savings it has been able to double the capacity of the original mill. The mill started with one paper making machine with a producing capacity of about 1600 tons a year and now it has got five machines with a maximum capacity of approximately 4000 tons of paper a year.

In the year 1881, the Government of India issued orders directing that country made paper should as far as possible be used in all Government offices instead of the imported articles; and this attracted the public attention to the development of the paper-making industry in the country. Accordingly in the year 1885 "the Reay paper Mills Company, Limited," was organised in Poona

with a capital of Rs. 5,00,000 which is now enhanced to some where about Rs. 10,00,000 by loans, &c. This Mill is owned and managed by Indians and its present output is about 1000 tons of paper annually. This Mill uses the imported wood pulp as the raw material, in addition to rags and sabai grass which they grow.

The first paper-mill in Bengal was erected at Serampore and is reported not to have been a success. The next venture was the Bally Mills in 1874, which worked very well for about 10 years ; after that it did not pay and finally was taken into liquidation in 1906, and was eventually bought up by the Titaghar Paper Mill Company. In 1883 the output of this mill was about 2432 tons of paper valued at Rs. 6,00,000.

Following the Bally Mills, the next mills constructed on thoroughly new and sound principles were those of the Titaghar Paper Company. This company was registered in 1884 with a capital of Rs. 6,00,000 and with one paper-making machine. When set to work the success was quite phenomenal, resulting in 1881 in a second mill being ordered from Europe, consisting of a plant the duplicate of the original. For this purpose the capital of the company was raised to Rs. 9,00,000 and further. In 1902, the "Imperial Mills, a local company started in 1891 which after a disastrous career went into liquidation and was bought up by this company for Rs. 800,000 being considerably cheap. Similarly in 1905, the goodwill, Machinery &c., of the Bally Mills were bought up for Rs. 5,90,026, the necessary capital being raised by debentures and preference and ordinary shares, thus raising the the capital to its present total of Rs. 25,85,000. In 1909, in view of the heavy cash outlay on additions and improvements, the Debenture loan was raised to Rs. 10,00,000. The Titaghar Paper Company

now controls eight paper making machines with a capacity of 15,000 tons a year.

Other Mills of any importance erected were the Bengal mills in 1890 situated at Raneegunj. They began working in 1891 with one paper-making machine and a capital of Rs. 600,000. The very next year the mill was doubled and capital was raised from Rs. 6,00,000 to Rs. 8,00,000. The need for working capital being felt the capital was further raised by Rs. 1.25,000 and in 1900 a third machine was added raising the capital by Rs. 2,50,00 more. It was however found impossible to place the working of these mills on a satisfactory basis. Hence in 1903, the capital was reduced from Rs. 12,00,000 to Rs. 4,00,000. In 1907, in order to increase the output of paper it was decided to increase the capital to its present figure of Rs. 6,00,000. At present, the company has three machines with a capacity of 5,400 tons of paper a year.

About the same time "The Imperial Paper Company was formed in Calcutta which began working with three paper-making machines in 1891. But this mill not being ably managed was taken into liquidation and was sold to the Titaghur Paper Company.

In addition to these, a few small mills were also started; among them may be mentioned, one at Morar in Gwalior entitled "The Scindia Paper Mills," at Surat "the Gaiikwar Paper Mill" in 1901 and another in 1878 by one Bora Jamaludin Kagdi.

In view of the fact that all the Indian Paper Mills turn out lower grades of paper and realising from their experience that there is a fair margin of profit in this industry and that there is further an ample scope for better classes of paper, the late managers of the Poona Ray Mills have erected as a private company, a new paper mill in Bombay and are turning out good paper.

For a long time, the Indian hand-made paper held

its own but once the machine made paper took its place in the markets, the doom of the hand made Paper Industry was so to speak sealed and the cheapness of woodpulp paper still further tended to depress this beautiful art and to rob it of its native stimulus without which all art inevitably tends so decay. In a way this is true but there is ample scope for the advancement and revival of this indigenous industry of hand made Papers as well as for the erection of new paper machine mills. It is surprising why this industry is not flourishing in an agricultural country like India teeming with forests and large tracts of land lying waste. The success of an industry does not depend only on the easy service of money but on so many other things. It requires a careful examination of all the factors that help production, cheapen distribution, avoidance of waste of commodities and energy and a systematic study of its development and progress up to date.

The ordinary paper is made from certain kinds of wood, grasses, straw, and grain refuse. The superior kinds are made with an addition of rags. The best especially Hand Made Paper are made purely from good quality rags. The process of paper manufacture consists of two main divisions (1) The treatment of the raw material, including cleaning, dusting, boiling, washing, bleaching and reducing to pulp; (2) the methods by which the pulp or the fibres are converted into paper ready for the market; this is paper making proper and includes the operations of beating, sizing, colouring, making the sheet or web, surfacing, cutting etc.

There are two different processes of producing the finished paper from the pulp, known respectively as "Hand made" and "Machine made". The entire process on the machine occupies a few minutes while in the ordinary state of the weather it could not be done by hand in

less than two or three days. The expense of manufacturing paper in this way is very much greater than by machinery but the gain in strength partly owing to the time allowed to the fibres to knit together, and partly to the free expansion and contraction permitted when drying, still maintains a steady demand for this class of paper, which is further proved by the statement that while in 1803, the United Kingdom had 762 vats for Hand Made Papers and only three machines, in 1903. there were 102 and 538 respectively. Even with the progress of the Engineering and labour saving appliances, the vats have comparatively made a bold stand.

Now, regarding the process of treatment of the raw material, the fundamental principle is the same, viz: digesting or cooking with an alkali whether it be wood, or straw, esparto or rags. But there are different processes for reducing the raw material to the state of 'pulp'; and pulp-making itself forms altogether a separate industry in Europe. Of the wood pulp, there are two main varieties: mechanical and chemical. Chemical wood pulp is again sub-divided into soda, sulphite and wood pulp. Of all the known paper-making fibres, cotton, linen, and hemp are the prototypes of cellulose and are very strong and yield about 80 to 90 per cent. of pure fibre. Rags and waste of these are used only for the best sorts of paper but they are very often mixed with other fibres. Wood and straw yield only 45 per cent of pure fibre. For this reason, it is always advisable to get pure cellulose from these materials on the spot where they abound and therefore they are generally found in the market in the ready shape of wood pulp sheets, packed in bales. All the raw materials except rags require a large amount of chemicals to reduce them to the fibrous condition.

Since the middle of the 19th century "bamboo" has been suggested as a useful material for paper making

History tells us that the Chinese used bamboos for paper-making and now the researches of Routledge, Sindall, Raitt and Richmond all confirm this view. There is now no reason to suspect their reports. If attention is directed to the treatment, cultivation and utilization of bamboo for paper making, a new industry of pulp-making will arise in India, will give impetus to the Indian paper making and will remove the burden of our paper-makers, facilitating their progress. Bamboo has so many advantages over spruce, poplar, and pine that it can be easily brought under cultivation in any part of India and owing to its perennial growth every pulp mill can manage to cultivate the bamboo area for itself thus controlling the yield and cost of the raw material.

Mr. W. Raitt of the Forest Research Institute has, in the fifth volume of Part III of "The Indian Forest Records", given a report of the investigation of the various grasses of Northern and Central India and has suggested about a dozen grasses for the use of paper-making. So now with bamboo for wood and savannah grasses for esparto, the Indian paper maker is well equipped to manufacture sufficient quantity of paper for his country. It is with him now to develop the industry and make it successful. It is no use crying that there is no raw material in India suitable for paper making and therefore they cannot compete with foreign wood paper. With so many cereal straws, cotton and jute mills the Indian paper-maker has got every thing which many of the paper-making countries do not possess.

In Europe, rag-collecting and sorting, waste-paper gathering and pulp-making are all separate industries. In India, on the other hand, the paper-maker is forced to do all these things by himself. If therefore all these industries are separately undertaken and well-managed, they will give employment to so many, will facilitate the work of the Indian

paper maker, doing away with the so-called want of the raw material and will be an additional means of prosperity to India.

In the same way, the native industry of hand-made paper may be very easily improved. It is strange to find all over India that the Indian paper-maker as well as paper merchant is a Borah, a Muhammadan; and he is generally backward in the social and the intellectual progress of the age. The orthodox artisan who makes hand-made paper, even in this age according to the primitive method, does not care to know whether his craft has sunk or risen in importance or whether any improvements have taken place or can be made, so long as he gets his six to eight annas in the evening for the maintenance of his family. This native craft has gone down in proportion to its progress in Europe. This is due solely to the ignorance not only of this paper-maker but also owing to the paper-merchant who has no knowledge of the composition of paper. The majority of people believe that the Hand made paper is made merely by manual labour i.e. entirely without the help of machinery. This idea is ridiculous in this age of engineering and scientific advancement. Their funny methods of treating their raw material and making paper are extremely amusing. When in all countries, the raw material is digested with an alkali in proper digesters, these artisans allow their raw material to rot in small tanks, filled with necessary water, for two to four days. After they are sufficiently soaked they are taken to stampers for beating. After beating to a fine pulp by these stampers, the beaten stuff is taken to the river for washing and after it is washed it is brought back and mixed with sajikhar and quick-lime. The mixture is just allowed sufficient water to cover it, and left to soak for 15 days or more till it becomes white. This washing and beating is repeated several times until the mass is absolutely white

and thoroughly broken. After the sheets of wet paper are made, they are carefully skinned off the pile and treated separately on the chunam covered wall. Here they are left to dry till they drop down by themselves. After this they are sized and polished with a black, round and smooth piece of wood.

These ways of making paper might have sufficed when there was less education and no printing and the demand was strictly limited. Europe did the same when there was no machinery, no printing and limited demand, yet it ever went on making improvements as necessities arose. Now Europe has made so many improvements even in the method of making paper by hand, that the modern beater does the work of two to three hundred stampers, and at this rate a modern paper-making machine would require four to five thousand stampers and about fifteen thousand persons. Again for drying sheets of paper formed at the rate of 250 to 375 feet per minute, miles and miles of cemented walls would be required. Just imagine, how crude and ridiculous this is when land and labour are scarce and have a high value, and when there are simpler and economical ways of doing it. In order to improve this situation the knowledge of the progress and improvements should be diffused among our artisans and men engaged in industry and commerce. If this is calmly and carefully done this industry will soon progress and prosper. Now we see that the drawback of this industry in India is due not to the want of wood-pulp. The lack of intelligence, enterprise, cooperation, confidence, originality, manufacturing skill and organising power is the root cause of the decline of this important indigenous industry of India viz., Paper Making.

A FURTHER NOTE ON THE PROSPECTS OF
ESTABLISHING MATCH FACTORIES IN
SOUTHERN INDIA

BY RAO SAHEB M. RAMA RAO, CONSERVATOR OF
FORESTS, TRAVANCORE.

1. In para 24 of the Note on the above subject published in the Proceedings of the Travancore Government No. S. R. 3470 dated 14th July 1911, it was stated that samples of untesed woods would be sent to existing Match Factories for testing their suitability for matches and boxes. Accordingly, samples of 112 species of Travancore woods were sent to '*The Karnatak Match Factory*' at Dharwar, the proprietor of which, Mr. R. V. Alagwadi, very kindly undertook to test the woods and to send samples of out-turn and a report, *free of any charge*. This he has since done, forwarding six sample boxes and splints of each species tested and a detailed report on the quality and suitability of the woods. His report is Published as Appendix A, to this Note. From the report it will be seen that out of the 113 samples of woods sent, one was found to be a duplicate and three others reached the factory in a condition unsuitable for testing. Of the remaining 109 species, 42 have been found to be suitable for splints for boxes—18 of them being found very good—22 of the other are suitable for boxes only and one for splints only, while all the other 44 have been found to be unsuitable. For ready reference, a statement classifying the several woods tested by Mr. Alagwadi according to their suitability for matches is given in Appendix B. If to the 42 species which are now found to be suitable for splints and boxes, are added the 18 others occurring in Travancore and previously ascertained to be suitable for the purpose, the total number of the soft wooded species fit for match making both boxes and splints) comes to 60.

Omitting from consideration other soft woods found in the State forests and still remaining to be tested, it may now be safely stated that the 60 species already tested and pronounced suitable are sufficiently abundant both in quality and quantity, to justify the starting of one or more Match Factories in the State with every assurance of a profitable business. The 18 species previously tested found suitable are noted at foot of Appendix B.

2. The sample out-turn of splints and boxes made of Travancore woods was carefully examined by Mr. A. G. Rossner Agent of Mr. A. Roller, Manufacturer of Match Making Machinery, Berlin, in January last and he has given his opinion thus:—

“I visited together with Mr. Desikachariar of Messrs. Ally Brothers, the Travancore State and had an opportunity to see the Conservator of Forests at Quilon. This gentleman could show me a great number of samples of various woods available in the forests of Travancore. Many match splints and boxes were shown to me made from Travancore timber and I *must state that many of the samples produced are excellent match splints and boxes.* Besides others, I only mention the following trees found suitable for the manufacture of matches and the wood of which has been tried by myself:—Bombay malabaricum (Matipal) Semecarpus tranvanco-rica (Avukaram), Spondias mangifera (Ambalam), Anthocephalus Cadamba (Attuthekku), Symplocos nucrocaspia (Paralei), Gmelina arborea (Kumbil, Myristica malabarica (Ponnampantu), Trewia nudiflora (Malamkumbil), Holoptelia integrifolia (Aval)”. Mr. A. H. Bastow, the Chief Engineer of the State and the writer of this Note tested the burning quality of the splints of many of the species and found that splints of almost all the species lighted well and burned with a steady flame. The splints of a number

of woods tested are coloured but this does not really detract from their suitability and in many cases the colour may probably be got rid of by bleaching or polishing the splints or by artificially colouring them as is done in the case of some of the foreign matches imported into India.

3. As a result of the publication of the first Note referred to in para 1 *supra* in the Travancore Government Gazette, a Company styled "The South Indian Match Factory, Limited" has been formed in Madras under the Directorship of M. R. Ry. Dewan Bahadur K. Krishnaswamy Rao Garu, C. I. E. (a former Dewan of Travancore) and four others, with a proposed capital of Rs. 2,00,000 divided into 8000 shares of Rs. 25-each. The Directors, in a memorial dated the 29th August 1912 submitted to His Highness the Maharaja of Travancore, prayed for grant of certain concessions with a view to establish a Match Factory in Travancore. The Government have thereon passed their order No. 10508 L. R. & F., dated 2nd October 1912. A copy of the Proceedings of the Government is attached to this Note as Appendix C. Briefly stated, the concessions granted by Government are as follows :—

(1) Site for the Factory.

25 acres of land on the Thenmala—Kulathupuzha road about $2\frac{1}{2}$ miles from the Thenmala Railway Station opposite the junction of the Shenduruni river with the Kulathupuzha river, free of value and free of tax for 20 years, the Company possessing no right to alienate it. Should, however, the Company prefer to acquire full rights over the land, it should pay Rs 50 per acre and an annual assessment of British Rupees two per acre. Should the Company need more land later on, an additional area of 25 acres will be given, if Sirkar land is available.

(2) Timber for constructing Factory buildings.

Only junglewood timber actually required for the *bona fide* construction of the Factory buildings on payment of the actual felling and transport charges for delivery at the site.

(3) Soft wood timber for matches and boxes.

(i) For the first three years 3,60,000 cubic feet at 1,20,000 annually at $3\frac{1}{2}$ annas per cubic foot delivered at Factory Site.

(ii) For the next 5 years 10,80,000 cubic feet at 2,16,000 annually at $4\frac{1}{2}$ annas per cubic foot delivered at Factory Site.

(iii) For the next 4 years 8,64,000 cubic feet at 2,16,000 cubic feet annually at 5 annas per cubic foot delivered at Factory Site.

(iv) For timber required beyond the 12th year, at such rates as may be fixed in the 11th or the 12th year.

The dimensions of timber supplied should be not less than 28 inches in length or 3 feet in girth. Should the Company prefer to arrange for its own supply from the neighbouring forests through its own contractors who should work under the general control of the Forest Department, the Company is given the option to do so and need not pay any seigniorage or profit to Government for the first three years but after that period should pay at the rate of pies 3 per cubic foot.

(4) Firewood for consumption in the Factory.

When firewood is departmentally supplied, the Company should pay for the first three years at Rs. $3\frac{1}{2}$ per ton of 80 cubic feet (stacked), for the next 5 years at Rs. 4 per ton and for the next 4 years at Rs. $4\frac{1}{2}$ per ton.

Should the Company choose to collect its own firewood, it should pay seigniorage to Government at 4 annas per ton on the quantity removed.

(5) Freedom from payment of Export duty.

The Company is assured that no duty or tax will be

levied on the manufacture, sale or export of the matches.

(6) Grant of supply Bills.

Grant of supply bills at the nearest Government Treasury on the Bank of Madras at Madras and *vice versa* for *bonâ fide* remittances in connection with this work.

4. It need hardly be stated that the foregoing concessions are very liberal and ought to ensure a good profit *if the undertaking is economically and carefully managed.*

5. As regards the value of the concessions granted by the Travancore Government to the South Indian Match Factory Company Limited, Mr. Rossner, after inspecting the locality, says as follows:—

“ The site for the Match Factory is also very suitable being situated directly on the junction of the Shenduruni and Parappa rivers. The wood is rafted down on the two rivers to the Factory and can be stored into water until it is required. As a Match Factory requires only fresh timber, this means a great advantage especially in Southern India where the climate is very hot”.

“ A good road is connecting the Factory with Thennala Railway Station, the latter being only about 3 miles distant from the factory”.

“ The concession obtained from the Travancore Government by the South Indian Match Factory is a very favourable one because the Travancore Government guarantees to supply all the wood required free (at) Factory Site at the rate of $4\frac{1}{2}$ annas per cubic foot. So the Company will have nothing to do with the felling, extracting and carrying of the timber from the forests but can reckon with the fixed rate of $4\frac{1}{2}$ annas per cubic foot. This fact makes the new enterprise not a speculative sort of business. Other Match Factories had an enormous difficulty in felling and extracting timber from the forests and had to pay dearly for that experience. I further beg

to state that Match Factories in European countries must reckon with the cost price of 12 to 13 annas per cubic foot ”.

6. A detailed estimate of the Machinery required and cost thereof at the current rates as prepared by Mr. Roller of Berlin and sent to the writer by Mr. Rossner a few weeks ago is given in Appendix D.

7. The writer is much indebted to Mr. R. V. Alagwadi of the Karnatak Match Factory, Dharwar for the readiness with which he undertook to test the Travancore woods and for the excellent report he has furnished on their suitability. Mr. A. G. Rossner has very kindly furnished a price list of the machinery required for a complete match factory and other information on the subject, and the writer takes this opportunity of thanking Mr. Rossner for the help so rendered.

APPENDIX A.

Woods tested by Mr. R. V. ALAGWADI, Match Expert,
Dharwar, Samples from the forests of Travancore.

1. *Macaranga Roxburghii* :—
Pink, darkens after peeling ; smooth, close-grained,
brittle, suitable for inside boxes only. Covers weak.
Splints good. To be boiled for 10 hours.
2. *Cryptocaria Wightiana* :—
Colour cream, straight fibred, good for splints and
boxes. To be boiled for 10 hours.
3. *Myristica attenuata* :—
Light brown, soft and smooth, suitable for boxes
Splints good. To be boiled for 10 hours.
4. *Garcinia ovalifolia* :—
Yellow, hard, rough, unsuitable for boxes. Splints
not good.
5. *Antiaris toxicaria* :—
Whitish yellow, soft, smooth, suitable for boxes ;
splints very good ; can be peeled fresh. To be
boiled for 5 hours.
6. *Hydnocarpus Wightiana* :—
Yellow, soft, close-grained, suitable for splints and
boxes. To be boiled for 10 hours.
7. *Garcinia Cambogia* :—
White, hard, may be used for boxes. Splints not bad.
To be boiled from 10 to 15 hours.
8. *Mastixia pentandra* :—
Light yellowish grey, soft, can be peeled fresh ; very
suitable for splints and boxes. To be boiled for 5
hours.

9. *Vateria indica* :
Not suitable for boxes ; splints not good. To be boiled for 12 hours.
10. *Polyalthia fragrans* :—
Light yellow, hard, smooth, suitable for boxes. May be used for splints. To be boiled for 12 to 15 hours.
11. *Myristica magnifica* :
Pink, turns brown after drying ; smooth, soft suitable, for boxes and splints. To be boiled for 10 hours.
12. *Xylophia parvifolia* :—
White with yellowish grey patches, suitable for boxes and splints. To be boiled for 12 hours.
13. *Canarium strictum* :—
Sap-wood white and heartwood pink, suitable for boxes, Splints not good. To be boiled for 10 hours.
14. *Semecarpus auriculata* :—
Pink with dark brown patches. Soft, grains wide, good for boxes only. To be boiled for 12 hours.
15. *Myristica canarica* :—
Pink, unsuitable for peeling. Veneers break.
16. *Myristica Beddomei* :—
Light brown, suitable for boxes ; may be used for splints. To be boiled for 10 hours.
17. *Elaeocarpus serratus* :—
White, very suitable for boxes ; splints good. To be boiled for 10 hours.
18. *Elaeocarpus oblongus* :—
Pink with brown patches, suitable for boxes, splints not good. To be boiled for 10 hours.
19. *Cinnamomum zeylanicum* :—
Brown, suitable for inside-boxes only. To be boiled for 10 hours.

20. *Aporosa Lindleyana* :—
 Greyish brown, unsuitable for boxes, splints not good.
21. *Milusa velutina* :—
 Yellow, may be used for inside boxes only. To be boiled for 12 hours.
22. *Carallia lucida* :—
 White, unfit for boxes ; splints not good.
23. *Stereospermum chelonoides* :—
 White with grey patches, very suitable for splints, boxes good, can be peeled fresh, soft and smooth. To be boiled for 6 to 8 hours.
24. *Alstonia scholaris* :—
 Rough, hard, unfit for peeling.
25. *Ormosia travancorica* :—
 White, soft, straight-fibred, smooth, grains wide ; very suitable for splints, boxes good. To be boiled from 6 to 8 hours.
26. *Chrysophyllum Roxburghii* :—
 Yellowish white, soft, very smooth, straight-fibred, grains fine. Splints and boxes very good. To be boiled for 12 hours.
27. *Trema orientalis* :—
 Sap-wood white with yellow patches, heart-wood grey with dark and yellow patches; straight, soft, smooth, grains wide, boxes good, may be used for splints. To be boiled for 10 hours.
28. *Fvodia Roxburghiana* :—
 White, soft, smooth, fibres straight grains fine ; *most suitable for splints* and boxes very good. To be boiled for 10 hours.
29. *Albizzia stipulata* :—
 Sap-wood white, heart-wood light brown, soft, smooth, straight, close-grained ; *most suitable for splints*, boxes good. To be boiled for 12 hours.

30. *Adma cordifolia*:—
Greyish yellow, hard, brittle, *not suitable for match making.*
31. *Semecarpus travancorica*:—
Pink white, soft, smooth, straight, close-grained; splints good, boxes very good. To be boiled for 10 hours.
32. *Eicus Beddomei* :—
Pink, soft, smooth, fibres interwoven, unsuitable for splints, boxes good, to be boiled for 12 hours.
33. *Celtis tetrandra* :—
White, soft, smooth, straight, suitable for splints and boxes. To be boiled for 12 hours.
34. *Ficus Benjamina* :—
Yellowish grey, soft, rough, splints not good, may be used for boxes.
To be boiled for 12 hours.
35. *Casearia esculenta* :—
Unfit for peeling.
36. *Mallotus albus* :—
Pink white, soft, a little rough, grains wide, fibres crooked, boxes good, splints not bad. To be boiled for 10 hours.
37. *Albizia procera* :—
Unfit for peeling.
38. *Machilus macrantha*:—
Dark brown, soft, straight; grains wide; boxes good; splints not bad.
To be boiled for 10 hours.
39. *Xanthophyllum flavescens* :—
Unsuitable for match-making.
40. *Symplocos macrocarpa* :—
White, soft, very smooth, straight, *very suitable for splints*. boxes good. To be boiled for 12 hours.

41. *Ficus glomerata* :—
Brownish grey, soft, rough, grains wide, fibres crooked
not suitable for splints : may be used for boxes. To
boil 10 hours.
42. *Ficus religiosa* :—
Light grey, soft, rough, grains wide, fibres slightly
crooked, not suitable for splints ; may be used for
boxes. To boil 10 hours.
43. *Ficus asperima* :—
Grey, soft, rough, fibres crooked ; unsuitable for
splints, boxes not good.
44. *Randia Gardneri* :—
Hard, unsuitable for any work.
45. *Pterospermum reticulatum* :—
Sap-wood light yellow, heart-wood brown, soft,
straight, suitable for splints and boxes. Boil 12—15
hours.
46. *Litsæa coriacea* :—
Light grey, soft, very suitable for boxes, splints good.
Boil 10 hours.
47. *Actinodaphne madras patana* :—
Pink white, soft, very good for boxes, splints good.
Boil 10 hours.
48. *Diospyros panicuata* :—
Light brown, hard, rough, suitable for inside-boxes
only, splints not good. Boil 12 hours.
49. *Phyllanthus Emblica* :—
Unsuitable for peeling.
50. *Lagerstræmia lanceolata* :—
Brown, rough, straight fibred, suitable for boxes,
splints good. Boil 12 hours.
51. *Dillenia pentagyna* :—
Light brown, smooth, fibres slightly crooked, suitable
for boxes. Splints not bad. Boil 12 hours.

52. *Buchanania latifolia* :—
Light grey, soft, smooth, very suitable for boxes, splints not bad, boil 10 hours.
53. *Caryya arborea* :—
Unfit for peeling.
54. *Olea dioica* :—
Unfit for peeling.
55. *Ficus Tjakela* :—
Yellowish white, grains wide, boxes good, splints not good. Boil 10 hours.
56. *Nephelium longana* :—
Brown, smooth, suitable for inside boxes only, splints not good. Boil 12 hours.
57. *Erythrina stricta* :—
White, too soft, unsuitable for boxes or splints.
58. *Lagerstræmia Flos Reginae* :—
Light brown, soft, smooth, suitable for boxes, splints not bad. Boil 12 hours.
59. *Cassia marginalata* :—
The sample not received in good condition. May be sent again.
60. *Grewia tiliaefolia* :—
Unfit for peeling.
61. *Anacolosa densiflora* :—
Unfit for peeling.
62. *Dipterocarpus Bourdillonii* :—
Pink, discolours in logs, soft, rough, straight, may be used for boxes and splints. Boil 12 hours.
63. *Artocarpus hirsuta* :—
Light yellow, soft, smooth, grains wide, boxes good, splints not bad. Boil 10 hours.
64. *Diospyros microphylla* :—
Brown, soft, smooth, straight, suitable for boxes and splints. Boil 10 hours.
65. *Cyclostemon macrophyllus* :—
Unfit for peeling.

66. *Ficus callosa* :—
Light brown, soft, smooth, grains wide, boxes good, splints not good. Boil 10 hours.
67. *Pterospermum rubiginosum* :—
Sap-wood white, heart-wood pink, soft, smooth, boxes very good, splints not bad. Boil 10 hours.
68. *Bocagea Dalzellii* :—
Unfit for any work.
69. *Mangifera indica* :—
White, soft, boxes very good, splints good. Boil 10 hours.
70. *Wrightia tinctoria* :—
Light pink, soft, smooth, suitable for splints and boxes. Boil 10 hours.
71. *Stephegyne parvifolia* :—
Light pink, soft, very smooth, straight, very suitable for splints and boxes. Boil 12 hours.
72. *Ficus hispida* :—
Light greyish brown, soft, rough, may be used for boxes. Splints not good. Boil 8 hours.
73. *Terminalia bellerica* :—
Light yellow, soft, grains wide, suitable for boxes splints good. Boil 10 hours.
74. *Buchanania lanceolata* :—
Light gery, soft, smooth, straight fibred, suitable for splints and boxes. Boil 12 hours.
75. *Dysoxylum purpureum* :—
Not suitable for match-making.
76. *Aglaia Roxburghiana* :—
Not suitable for match-making.
77. *Vitex altissima* :—
Not suitable for match-making.
78. *Artocarpus Lakocha* :—
Sap-wood white, heart-wood yellowish, soft, straight

fibred, very suitable for boxes and splints. Boil 10 hours.

79. *Hymenodictyon exsertum* :—
Not suitable for match-making.
80. *Tetramelos nudiflora* :—
Dark-yellow, fibres crooked, rough, may be used for inside boxes, not suitable for outside boxes and splints. Boil 12 hours.
81. *Eugenia Mundagani* :—
Not suitable for match-making.
82. *Eugenia hemisphaerica* :—
Light brown, hard, smooth, may be used for boxes. Not suitable for splints. Boil 12 hours.
83. *Flacourtia Cataphracta* :—
Light brown, smooth, may be used for boxes, not suitable for splints. Boil 15 hours.
84. *Melia dubia* :—
Greyish-white, straight fibred, soft, smooth, very suitable for boxes, splints not bad, Boil 10 hours.
85. *Hardwickia pinnata* :—
Grey, rough, slightly hard, grains wide, boxes not good, may be used for splints. Boil 12 hours.
86. *Eugenia Gardneri* :—
Not fit for match-making.
87. *Bridelia retusa* :—
Dirty green, not suitable for match-making.
88. *Pajanelia Rheedii* :—
Not suitable for match-making.
89. *Aparosa acuminata* :—
Light brown, hard, smooth, may be used for boxes Boil 15 hours.
90. *Eicus Dalhousiae* :—
Not suitable for mach-making.

91. *Ficus engalensis* :—
Not suitable for match-making.
92. *Pongamia glabra* :—
Not suitable for match-making.
93. *Sarcocephalus Missionis* :—
Not suitable for match-making.
94. *Mallotus repandus* :—
Not suitable for match-making.
95. *Calophyllum Wightianum* :—
Brown, straight fibred, smooth suitable for boxes,
splints not good. Boil 12 hours.
96. *Bauhinia malabarica* :—
Not suitable for match-making.
97. *Pithecolobium bigeminum* :—
Brown, hard, fibres straight, may be used for boxes.
Not suitable for splints. Boil 15 hours.
98. *Evodia Naxburghiana* :—
Cream-white straight fibred, soft, smooth, very suitable
for splints and boxes. Boil 10 hours. (See No
28 supra).
99. *Ixora Notoniana* :—
Not suitable for match-making.
100. *Walsura Piscidia* :—
Not suitable for match-making.
101. *Artocarpus integrifolia* :—
Sap-wood yellowish white, heart-wood deep yellow,
soft, straight fibred, may be used for boxes, not
suitable for splints. Boil 12 hours.
102. *Humboldtia Vahiana* :—
Brown, hard, smooth, may be used for boxes, not
suitable for splints. Boil 15 hours.
103. *Sapindus trifoliatus* :—
Not suitable for match-making.

104. *Pterospermum galbrescens* :—
Sample was hollow in the centre. Could not be tested.
105. *Antidesma Menasu* :—
Not suitable for match-making.
106. *Disopyros sulcata* :—
Sample fluted. Could not be tested.
107. *Dysoxylum malabaricum* :—
Cream-white, soft, smooth, straight fibred suitable for boxes. Splints not bad. Boil 12 hours.
108. *Garcinia morella* :—
Not suitable for match-making.
109. *Diospyros Bourdilloni* :—
Not suitable for match-making.
110. *Vitex pubescens* :—
Not suitable for match-making.
111. *Vitica chinensis* :—
Not suitable for match-making.
112. *Bassia malabarica* :—
Not suitable for match-making.
113. *Ficus Talboti* :—
Not suitable for match-making.
- Dharwar, 25th December 1912.
Pro. Karnatak Match Factory.

APPENDIX B.

Statement showing tabulated results of the tests of sample woods of Travancore sent to
Dharwar Karnatak Match Factory.

Very suitable for splints and boxes.	Suitable for splints and boxes.	Suitable for boxes, not suitable for splints.	Suitable for splints, not suitable for boxes.	Unsuitable for splints and boxes.	Remarks.
Antiaris toxicaria.	Macaranga Roxburghii.	Canarium strictum.	Harwickia pinnata.	Garcinia ovalifolia. Valeria indica. Myristica canaric.	I. Cassia, <i>disarghata</i> .
Mastixia pentandra.	Cryptocarya Wightiana.	Semicarpus auriculata		Aporosa Lindleyana. Carallia lucida.	Sample not received.
Elaeocarpus serratus.	Myristica attenuata	Elaeocarpus oblongus.		Alstonia scholaria. Adina cordifolia.	in good condition.
Stereospermum chelonoides.	Hydnocarpus Wightiana.	Cinnamomum zeylanicum		Cascaria oculenta. Albizzia procera.	May be sent again.
Ormosia travancorica.	Garcinia Cambogia.	Millettia velutina.		Xanthophyllum flavescens.	
Chrysophyllum Roxburghii.	Polyalthia fragrans.	Ficus Beddomei		Ficus asperima. Randia Gardneri.	Pterospermum <i>glabrescens</i> .
Evodia Roxburghiana.	Myristica magnifica.	Ficus Benjamina.		Phyllanthus Emblica. Careya arborea.	Sample was hollow in the centre.
Albizzia stipulata.	Xylocopa parvifolia.	Ficus glomerata.		Olea dioica. Erythrina stricta	Could not be tested.
Semicarpus travancorica.	Myristica Beddomei.	Ficus religiosa.		Grewia tiliacifolia. Anacolosa densiflora.	
Symlocos macrocarpa.	Trema orientalis.	Diospyros paniculata.			
Litsaea coriacea.	Celtis tetrandra.	Ficus Tjakela.			
Aeginodaphne madraspatana	Mallotus albus.	Nephellia longana.			
Buchanania latifolia.	Marhilus macrantha.	Ficus callosa.			
Pterospermum rubiginosum	Pterospermum reticulatum.	Ficus hispida.			
Mangifera indica.	Lageraestrnia lanceolata	Tetrameles nudiflora.			

Stephegyne parvifolia. Artocarpus Lakodcha. Meha dubia.	Dillenia pentagyna. Lagerstræmia Flos Reginæ. Dipterocarpus Bour- dillonii. Artocarpus hirsuta. Diospyros macro- phylla. Wrightia tinctoria. Terminalia belerica. Buchanania lanceo- lata. Dysoxylum malabari- cum.	Eugenia hemispherica Flacourtia Cataphrac- ta. Aporosa acuminata. Callophyllum Wigh- tianum. Pithecolobium bige- minum. Artocarpus Integri- folia, Humboldtia Vahlana.		Cyclostemon macrophyllus. Rocagea Dalzellii Dysoxylum purpureum Aglaiia Roxburghiana. Vitex altissima. Hymenodictyon excelsum. Eugenia Mundagam Eugenia Gardneri- Brideli retusa Pajanelia Rheedii. Ficus Dalhousiæ. Ficus bengalensis.	8. <i>Diospy- ros sulcata</i> . Sample fluted. Could not be tested.
<i>Woods previously tested.</i>	<i>Woods previously tested.</i>	<i>Woods previously tested.</i>	<i>Woods previously tested.</i>		
Bombax malabaricum. Ailanthus malabarica.	Sterculia alata Lophopetalum Wigu- tiana.	Sterculia urens.	Odina Wodier. Spondias mangifera.		
Anthocephalus Cadamba.					

Very suitable for splints and boxes.	Suitable for splints and boxes.	Suitable for boxes, not suitable for splints.	Suitable for splints, not suitable for boxes.	Unsuitable for splints and boxes.	Remarks
<p><i>Woods previously tested.</i></p> <p>Hymenodictyon excelsum (See Troupejs memoirs) Gmelina arborea. Myristica Malabarica. Trewia nudiflora.</p>	<p><i>Woods previously tested.</i></p> <p>Semicarpus Anacardium. Ehretia laevis. Excoecaria Agallocha (Not found in forest but sparsely along backwater). Holoptelea integrifolia.</p>	<p><i>Woods previously tested.</i></p> <p>Sterculia villosa. Mallotus philippinensis</p>		<p>Pongamia glabra. Sarcocephalus Missionis. Mallotus repandus. Bauhinia malabarica. Ixora Notoniana. Walsra piscidia. Sapindus trifoliatus. Antidesma Menas. Garcinia Morella. Diospyros Bourdillon. Vitex pubescens. Vatica chinensis. Bassia malabarica Ficus Talboti.</p>	

APPENDIX C.

Mr. A. Roller's Estimate for the complete machinery for a Safety Match Factory situated in Travancore, with a daily (10 hours) out put of about 750 gross boxes, each box containing about 63 matches.

	Page in Roller's catalogue.	Space packed cubic feet.	Gross Kilo-grammes.	Nett Kilo-grammes.	Price.		
					£.	s.	d.
A. Machines for making Splints.							
1. Automatic Cross Cut saw, type B Q S	11	140	1750	1375	89	10	0
1 Wood-peeling machine with double driving gear, fixed knife, 1 lancet holder and 1 change wheel for veneer for splints, 18 inch width of cut, and with attachment for peeling veneer smooth and free from breakage, type S D H	19	105	1500	1200	92	0	0
1 Splint chopping machine with vertical roller feed for the width of 3—4 splints, type V A B	21	62	715	600	67	15	0

	Page in Rollet's catalogue.	Space packed cubic feet.	Gross Kilogram- mes.	Nett Kilogram- mes.	Price.	
					£.	s. d.
1 Splint drying apparatus with polishing drums and 2 compartments, type H T H 2 ...	29	1040	8400	6750	330	0 0
1 Splint cleaning machine on Iron Standard with single grill, type V E P ...	44	155	625	520	27	15 0
1 Large size labelling machine with 2 removable box frames arranged side by side, type E G A ...	53	70	500	375	40	0 0
1 Splint case Filling Machine, type H A M ...	49	40	340	255	60	0 0
<i>B. Machine for Match Boxes</i>						
1 Wood peeling Machine with double driving gear, 18 in width of cut, with 3 lancet-holders and 1 change wheel for veneer for boxes, type S D H ...	19	105	1533	1233	101	7 6

1	Match Box Veneer Chopping Machine, type S P R	95	70	765	600	61	10	0
2	Single Action New Outer Case Pasting Machine for roll paper with uninterruptedly running mandril, type S H R	99	51	620	480	166	0	0
3	High Speed Inner Drawer Pasting Machines for roll paper, type J K S	111	84	1185	990	304	6	0
3	Combined Box Closing and Labelling Machines, type E C C... The complete automatic Transport Arrangement for the automatic transport of the boxes from the pasting machines to the drying apparatus, from there to the bunkers for inner and outer cases, and for the transport of the closed boxes from the labelling machines back to the lowest story of one drying apparatus, which story is arranged for drying the labelled boxes. This arrangement includes all the iron parts, transport and driving rollers as well as drawing for the erection, but not the necessary wooden parts which have to be made on the spot, according to the drawing delivered with.	107	96	870	600	111	10	0
			33	550	450	100	0	0
1	Box Drying Apparatus for outer cases on the chain screen system 5 metres long with 8 superposed travelling screens the lowest of which is arranged for drying the labelled boxes. The							

	Page in Roller's catalogue.	Space packed cubic feet.	Gross Kilogram mes.	Nett Kilogram mes.	Price.		
					£.	s.	d.
apparatus being connected with the beforementioned-transport arrangement. This apparatus consists of wood frame work and is fitted with wood pannels complete with the ribbed heat radiating pipes, and all the fittings for the steam heatings, type R S T 5 ..	121	355	4500	3800	218	6	0
1 Box drying apparatus for inner drawers on the chain screen system, 5 metres long, with 7 superposed travelling screens. This apparatus consists of wood frame work, and is fitted with wooden pannels, complete with the ribbed heat radiating pipes and all the fittings for the steam heating, type J S T 5 ...	121	345	3250	2900	190	10	0
<i>C. Machines for preparing Composition.</i>							
2 Large Conical Grinding Mills with exchangeable cone casing height; 40 in. for grinding the composition for heads, type R K M..	148	50	720	560	43	10	0

1	Cylindrical grinding Drum, type M T	...	151	35	480	390	21	15	0
1	Mixing and sieving Machine for dry chemicals, type C M S	...	146	29	165	110	21	15	0
<i>D. Machines for Paraffining dipping drying the dipped splints and filling the ready matches into boxes</i>									
1	Continuous Machine Simplex for automatically setting, paraffin and drying the matches, type S C M	...	61	525	10000	8700	1230	0	0
2	Jonkoping Box Filling Machines with 4 filling apparatus, type G J F	...	135	498	4800	3900	925	10	0
<i>E. Machine for Painting and Packing boxes.</i>									
1	Machine for painting boxes with friction composition for safety matches, type S A M 4	...	139	70	800	640	83	5	0
1	Match Box Packing Machine for pasted wrappers, type, R P M.	...	145	88	800	575	216	0	0

	Page in Roller's catalogue.	Space packed cubic feet.	Gross Kilogrammes.	Nett Kilogrammes.	Price.		
					£.	s.	d.
F. Sundries							
1 Large Circular Saw for making Packing cases, type G K S ...	12	84	580	470	33	5	0
1 Automatic Knife Grinding Machine, including countershaft and emery wheel for Knives up to 29 inches in length, type K S M. ...	27	42	530	415	40	0	0
1 Mississppi Oil Stone, type M O S	0	18	6
Total	4162	46278	37888	4576	3	3

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154b

A NOTE ON CO-OPERATION AMONG THE MILL- HANDS.

BY G. K. DEVADHAR, ESQ.

Member, Servants of India Society, Bombay.

CO-OPERATION AS A REMEDY.

It is a matter of satisfaction that the subject of the unsatisfactory condition of the mill-hands is receiving greater attention at the hands of those to whose care they have come to be entrusted, and that the bulk of the mill-owners is now roused to the consciousness that there is something wrong in the condition of the mill-labourers which deserves to be righted as early as possible. As a proof of this it is to be noted that the President of the mill-owners' Association in Bombay at their last annual meeting, dwelt in his speech, among other things, on the condition of mill-labour; and the Editor of the *Times of India* in an able article, while discussing progress of mill-industry, suggested that in order to improve the state of the mill-employees, which was every day attracting greater attention on the part of the sympathetic Captains of mill-industry, there were two remedies that could be applied to bring about the desired result; one was the provision of better-housing and the other was the spread of co-operation. I believe the article strikes the right note in making these recommendations to better the lot of the poor mill-hands and I venture in this paper, to offer my views about the possibilities of co-operation, if spread among these people, and to suggest a scheme by means of which the work could be successfully started.

ARE THE LABOURING CLASSES, A FIT OBJECT OF CO-OPERATION.

2. Now it might be asked are the mill-hands, which is a steadily growing class in this country among the labouring population, a fit object for co-operative movement both on account of their habits and their economic position? My firm

answer to this question is in the affirmative. In my opinion, the condition of our labouring classes does not materially differ from the condition of our agriculturists. These tally in their main features, and a detailed examination of these will shew that if co-operation could be successfully launched in mitigating the miseries of the agriculturists, there is no reason why our labouring classes should not be made to reap the benefits of co-operation if its man-making principles be made applicable to their daily life.

A COMPARISON.

3. The mill-hand is not better educated than his agricultural contemporary; in his habits of business, wider outlook, thrift, temperance, and forethought he is not the superior of his brother the cultivator; the mill-employees or the labouring classes are as dull as the agriculturists in their capacity to comprehend how their present position badly needs improvement mainly at their own hands; and their ability to take the initiative in making even a slow beginning without outside lead in this respect is practically nil. The poverty and improvidence of one find an exact parallel in the indigence and the spendthrift habits of the other; both are compelled to borrow mostly for their real ordinary needs from Sowkars or the moneylenders that charge them usurious interest on their loans, not always without sufficient justification; and the result of these circumstances is that his indebtedness becomes chronic. This condition of the Indian peasant is described by Mr. H. R. Crosthwaite, I. C. S., the Registrar of the Co-operative Credit Societies in Central Provinces, as "an economic malady of long standing, an insidious disease but an exceedingly dangerous one which must, in the end, prove fatal unless vigorously and continuously treated. The symptoms are complicated, and if the diagnosis is to be correct, attention must first be directed to the causes at the root of the trouble. What is true of the poor Indian peasants is almost true of the labouring classes.

THE DIFFICULTIES IN THE WAY.

4. Granting, however, that the application of co-operation to the daily life of the mill hands is logically sound, it might further be questioned whether there exist insuperable

difficulties that beset the path and that render the work risky and uncertain of success. In replying to this objection I venture to state that while recognizing that there are difficulties attending such an attempt—and there is no effort that is absolutely free from difficulties and risks—they are not of such a nature that we should altogether leave the question as one out of the pale of practical solution. Let us examine the nature of the difficulties. The ignorance of the mill-hand, his habit of intemperance, his lack of thrift, his feeble sense of responsibility, his weak credit, his unsteadiness which makes him leave his service more often than he really ought and, lastly, his want of attachment to his mill, are some of the defects that are alleged to exist in the character of the mill-worker. I have no sufficient data to institute a true comparison between the life of mill-hands in Western countries and the life of the mill-hands in India. But it must be readily admitted that the Western mill-labourer and a cultivator is more educated, disciplined, and watchful over his interests than his contemporary in India to-day is.

THE TEACHINGS OF THE HISTORY OF CO-OPERATION.

5. But we find from the history of co-operation that at the commencement of the movement in Western countries like England, Germany, Italy, Denmark, Ireland, etc., etc., the labouring classes and the agriculturists were almost in a hopeless plight. But with the gradual diffusion of the principles of co-operation among the masses of labourers engaged in various industries, as the result of the self-reliant efforts put forth by those to whom the shoe of poverty pinched, assisted by the disinterested attempts of public-spirited workers whose name was legion, new hope dawned on the horizon and the prospects became bright to them. Thus, the present improved economic condition of these classes and their keen and intelligent interest in their own well-being are largely the outcome of the spread of co-operative and other educational endeavours made by those who were touched by their condition.

INFORMATION OF 100 MILL-HANDS.

6. But the Indian mill-hand hemmed in on all sides by the above mentioned disqualifications entertains no ambition.

of getting his position bettered and he more or less resigns himself to his lot. But my belief is that if we gradually take them in hand the work of helping them out of their present economic depression is sure to yield good fruit. I tried to collect detailed information of 100 mill-hands working in four mills in Bombay situated in two localities distinct from each other, *viz.*, Chinchpokali and Tardeo and the following summary will be found interesting. The average age of a mill-hand is 32.96. 80 of these have come from Kankan districts, whereas the remaining 20 hailed from the Deccan districts. The average period of his stay in Bombay is 17.37 years, and during this period they have changed their service only 2.37 times, but 37 men have stuck to their first service, 41 changed it owing to low pay and 22 had to change owing to sickness. Out of these 100 mill-hands, 67 are unable to read and write, 8 can only sign their names but the remaining 25 can both read and write well. Owing to several causes mill-hands shift their lodgings and every man changes it on an average 2.46 times during the period of 17 years' stay. But there is a large number among them that stick to one service and one abode. The monthly earnings of these 100 men show an average of Rs. 20.17, while the monthly average expenditure of a mill-hand's family is Rs. 20.31. The members of some mill hands' families work in the mills. Out of 100 mill-hands' families only 49 families have additional income, which works an average of Rs. 15 a month. Out of this number 35 mill-hands go to their native place for one month every year; 13 persons go for one month in two years, 14 of them spend a month at their native place in three years, 6 persons go for one month in four years; three persons leave Bombay for one month in five years; while the remaining 29 scarcely go or do not go out of Bombay at all. A mill-hand has an average of 3.77 persons in his family. Out of 100 mill-hands 45 are total abstainers, 23 drink occasionally, while the remaining 32 are confirmed drunkards. Out of these 100 mill-hands 25 persons have no debts; but the remaining 75 have borrowed to the extent of Rs. 7,827, or an average of Rs. 104 per mill-hand who has borrowed. There are various rates of interest charged on these loans ranging from 12 per cent to 75 per cent. The

better class mill-hand gets loans at a lower rate of interest, that is 12 to 25 per cent; but the majority of them have to pay 75 per cent or one anna per rupee per month. The duration of these debts extends from 6 months to 30 years and the major portion is repayable within two years. This amount of Rs. 7,827 has been borrowed for various purposes; Rs. 1,837 for the maintenance of the family; Rs. 3,795 for marriages; Rs. 120 for agricultural purposes, Rs. 1,200 for paying off ancestral debts; Rs. 1,250 were borrowed during the period of sickness or for funeral expenses or for performing last rites of the deceased relations and only Rs. 125 were borrowed for litigation.

FOUR MILL-HANDS' SOCIETIES IN BOMBAY.

7. The above analysis will set forth that the problem of the improvement of the mill-hands' economic condition by means of co-operation is not quite beyond hope. His mental horizon is sure to widen with the expansion of the system of elementary education without which no thorough improvement is possible. But even in the present state of vast illiteracy of the masses, Co-operative Credit Societies during the last 8 years have materially contributed towards the improvement of the agricultural class; nearly 3,50,000 agriculturists have so far become members of about 800 rural societies and have used nearly two crores of rupees in one year for their agricultural needs. Surely if some systematic work had been begun for a labouring class like the mill-hands some progress might have been made. Co-operation has been able to influence small industries in some places; but the progress is very little. As for mill-hands nowhere has any effort been put forth except in Bombay Presidency in which there exists only 4 small societies. In Bombay Sir Vithaldas started last year a Co-operative Credit Society of unlimited liability in his Western India Mills on Chinchpokali side. There are 203 members but no women among them. There are no deposits from members themselves. The Society borrowed Rs. 1,149 from the Bombay Central Co-operative Bank at 8 per cent. Small amounts are given as loans on personal security of two sureties to members at 3 pies per rupee per month, which works at 18 per cent and are recovered in 6 months, by easy instalments of from Rs. 2 to Rs. 4 per month which are regularly paid. These loans were

made first, for making up the deficiency of pay; secondly, for payments of Marwadis' debts, thirdly, for sickness, and fourthly for meeting demands from their native place. There have been no defaults. Three members went away without giving their addresses but their dues were realized from their sureties. During the past 9 or 10 months Rs. 1,361 were given away as loans and the amount of interest realized is Rs. 314. After paying the interest on the borrowed capital and other charges, this society has Rs. 305 as its capital including the income of entrance fee of annas 8 per member. Thus, though the working of this society leaves much room for improvement; it is beyond doubt that it has benefited its members considerably.

TARDEO MILL-HANDS SOCIETY.

In November last just with a view to try an experiment of teaching co-operation to mill-hands outside the mill, a bumble and a very cautious beginning was made by me. After explaining to them the principles and history of co-operation in Western countries and in India at regular four or five meetings, a Co-operative Credit Society of limited liability was formed with 11 members. The number is now raised to 17 including one woman. Each member has to buy at least one share of Rs. 10 the amount of which is paid by monthly instalments of Re. 1. After a member has fully paid his or her share amount a compulsory deposit of annas 8 is to be paid per month. The better class members were asked to make deposits. In May last a beginning was made to give loans to members and the transaction of this little society have been very regular and satisfactory. There are regular monthly meetings which are well attended. Till 11th of August 1913 Rs. 143 were realized as share capital and Rs. 12-7 as entrance fees and miscellaneous charges. Rs. 49-8 were received as deposits from 7 members and 2 outside women. Five loans of the value of Rs. 160 have been given, two for redeeming old debts and one for going to native place, in three months by regular instalments, Rs. 50 have been received back with interest on account of these five loans. There have been no defaults or delays of payment and no complaints about recovery. Members prefer the Co-operative Credit Society

to the provident fund or to the Postal Saving Banks. Now that the members have understood the nature of the work, more members will be admitted and more loans will be given. Thus the transactions of this tiny society, without a pie from outside, amount to Rs. 254-10-8. The third society organized for the benefit of the mill-hands is at Broach called the **BROACH INDUSTRIAL MILL EMPLOYEES URBAN CO-OPERATIVE CREDIT SOCIETY, UNLIMITED.** It was started in July 1911 by Mr. Ambashankar Mulji, a leading member of the Bar and the agent of the mill. Every employee of the mill from the Manager downward has to enlist himself as a member of this society. Re. 1 is charged as an entrance fee. There are no rules for compulsory deposits. There is a store department for which each member has to pay annas 2 a month; any member or mill operative can buy his provisions at cost price. In addition to the credit and store departments there is a tea shop and a hotel attached to the establishment where members can partake of good tea and wholesome meals; members of this society get loans at 9 per cent and receive 7 per cent as interest on fixed deposit of their savings. At the beginning of April 1913 the total membership was 899, the capital of the Society amounted to Rs. 4,541,4767 loans were made and Rs. 21,488 were advanced in the course of one year and the turn over came up to Rs. 21,564 during the last year and the profits amounted to Rs. 4,784 and the reserve fund which includes entrance fee and profits now amounts to Rs. 1,600—The working of this society affords a fair illustration of how co-operation can help mill-hands in some of their needs. But with option to join, with greater co-operative education, and with more intelligent interest on the part of the people, this society will be a good model of mill-co-operation. The fourth Co-operative Society is in Belgaum District at the Gokak Mills and is thriving under the supervision of Rao Saheb Shivamurti G. Kenbargimath and has a capital of Rs. 1,915. Its work is "supplemented by an unregistered co-operative grocery store situated in the mill compound."

MILL-HANDS' INTELLIGENT INTEREST IS THE KEY TO SUCCESS.

8. The above outline of the four mill hands' societies will convince that a successful beginning could be made to spread

co-operation among this class with slow and cautious steps in a place like Bombay. Difficulties there are and there will be and there may be risks also, yet they need not overawe the workers, they must, however, be boldly faced. But real key to success is the intelligent interest of the mill hands, to create which a well-planned scheme of co-operative education by lectures and practical work will have to be adopted. The mill-hands when they are told of the benefits of the co-operative methods of work to secure the needful financial accommodation, express their willingness. The 100 mill-hands, from whom information was gathered, have, when questioned, expressed without exception, a desire to join a co-operative credit society, a co-operative store and co-operative insurance society. Of course, much importance cannot be attached to such a desire, yet this declaration can be safely taken as an indication of the fact that if mill-owners and the other well-wishers of these people interest themselves in this question there will be an encouraging response on the part of the mill operatives and that they will gradually lend themselves to be educated, trained, and disciplined co-operatively. This is the sure way to success. If this part of the work be neglected or not sufficiently emphasised, it will degenerate into charity or benevolence; and co-operation is neither charity nor philanthropy, but pure business carried on the basis of self-help, thrift and mutual trust.

THE MILL OWNERS' INITIATIVE.

9. In this way, if the intelligent interest of the mill-hands be coupled with the hearty co-operation of the mill owners it should not be difficult at all to commence the work. But one thing is certain that the mill managers must take the initiative assisted by a band of disinterested co-operators. In this connection, I consulted a few leading mill-owners and co-operators in Bombay and outside, who are known for their public spirit and I am glad to say all of them have encouraged me by promising their enthusiastic support if a modest scheme for undertaking such work be submitted to them. Mr. H.R. Greaves, the Sheriff of Bombay, who has 7 mills under his control writes:—"After hearing your views, I shall be very pleased

indeed to give you any support I can for the furtherance of the object you have in view." Dr. Stanley Reid who takes very keen interest in the growth of co-operative movement writes as follows:—"With regard to joining your Committee, I do not see that I can do much but if it will be of any assistance to you for me to join I will do so with the greatest pleasure." The Hon'ble Sir Chinubhai Madhavlal Bart, the leader of the Ahmedabad mill-owners writes as follows:—"I have carefully read the copy of the 'Note' sent by you along with your letter of the 17th inst. and I approve of the principle described therein. You will agree with me that in order to put this principle in practice it will require some manipulation to suit the peculiar circumstances of each place." Sir Vithaldas Thakarsey says:—"I shall be glad to associate in any movement which has for its object to take practical steps for educating the mill-hands in the principles of co-operation, and you may depend upon my full support in the movement. The Hon'ble Sir Fazulbhoy Currimbhoy writes—"On perusal of your paper I find myself in agreement with your views and I shall be glad to co-operate with you, if my help would be of any use." The Hon'ble Mr. Lalubhai Samaldas writes:—"I really believe that if proper efforts were made by enthusiasts like yourself to inculcate ideals of co-operation amongst the vast mill-hand population of Bombay, as an immediate result there would at least be about 50 people in a locality convinced of the benefits of co-operation and ready to form themselves into a Co-operative Society. Such a society would be a centre of education and would be a means for converting other mill-hands. It is acknowledged on all hands that the major portion of the mill-hands population is hopelessly in debt, having to pay interest up to 75 or so. The society would charge interest at rates lower even than one-fourth of this and enable the members to liquidate all their old debts. The details may be worked out by a small committee, which I am given to understand you are thinking of forming, a store worked on Co-operative basis may be started in connection with the society but that may be undertaken if the movement shows signs of success. I hope that you will secure the earnest co-operation of mill-owners you have consulted, and that, ere long, Co-operation

will bring as great a relief to our urban labouring classes as it has already brought to the rural working classes in many places. Mr. Chunilal V. Mehta writes:—"I think your idea regarding co-operation among the Bombay mill-hands is an excellent one and it wants persevering enthusiasts like you to carry it out. I shall be glad to give you what assistance I can." Mr Jehangir Petit writes—"I hereby authorize you to put my name—along with the names you mentioned yesterday—as one of the Committee for the proposed Co-operative Credit Society that you want to start among the mill-hands of Bombay. Of course, as arranged, you are to send me the details of the scheme before it is made public." Mr. Purushotamdas Thakordas gladly promises to help the movement. Mr. Hansraj Pragji Thakarsey writes:—"I am glad to see that you have taken up the work of co-operation among the poor mill-hands. I am willing to help you in what little I can do." As suggested in the opinions of the mill-owners quoted above, a small committee for the first year will be formed in Bombay to work out an unambitious programme of starting a few credit societies on right lines. If they succeed, store co-operation may be then taken in hand to be soon followed by Co-operative Insurance for sickness. But these may not be taken all at once and a very cautious and slow beginning might be made to ensure success which, with the education of the people in the principles of co-operation, with good management, and with the hearty support of mill-owners, it is not difficult to achieve. It need hardly be added that the formation of such societies in a mill, will not in any way interfere with the working of the mill but on the contrary will secure greater attachment and discipline on the part of the mill-hands. Mr. Ambashankar Mulji of Broach, who has successfully run a mill-hands society and has thus experience of this work, writes to me, "In my opinion there is no objection if mills advanced loans to better establish their workmen and thus to promote their own interest." Thus it is clear that such work is twice blessed. It blesseth the poor mill-labourer directly and it also blesseth the generous mill-owner indirectly.

DEFINITE PROPOSALS.

10. With a view, therefore, to receive suggestions from those fellow-workers who carry on organized efforts in this

field I offer a few definite proposals for the formation of Co-operative Credit Societies for mill-hands.

- (1) A mill should be selected in which will be found a large number of needy mill-hands who are sick of being indebted and some of whom are able to read and write.
- (2) Mill-owners should find out a few Volunteers who would assist them in delivering about half a dozen lectures and lantern shows on the movement of Co-operation, its progress in the West and in India, and its possibilities for the poor mill-hands. They should also explain the by-laws and the working of such a society.
- (3) When a dozen mill-hands intelligently agree to form such a society, it should be started preferably in a mill.
- (4) Its affairs should be managed by a managing committee of its own members with certain limitations.
- (5) There should be a Board of supervisors to guide, supervise, and control the transactions of the managing committee of the society in respect of loans from outsiders and to members. The Board should consist of five persons, one of them should be the mill-agent, the other should either be the manager or the head jobber, the third should be a pleader, the fourth should be an accountant, and the fifth should be a preacher of co-operation.
- (6) As far as possible, the society should not be considered a part of the mill-machinery but its useful adjunct, so as to secure the greatest educational effect.
- (7) Membership ought not to be made compulsory but members should be attracted after careful selection by preaching, moral persuasion and the example of their fellow workers. Women should be included among members.—
- (8) It should be a limited liability society in order to secure greater and more direct financial interest of the mill-hands concerned.

- (9) There should be a proportionate liability extending over two years.
- (10) The capital should be raised partly by the shares of members to be paid in small monthly instalments, partly by the fixed deposits from those members who are better off, partly by the compulsory small savings of members provided for in the by-laws after the share money has been paid, and partly by proportionate loans or deposits from the mill-owners and lastly by donations.
- (11) Outside loans should, as a rule, bear half the rate of interest charged to members on loans made by the society to them.—
- (12) There should be two classes of loans: short term loans for ordinary needs and long term loans for redeeming lands or liquidating old debts. In addition to the usual procedure of taking two sureties there should be collateral security on long term loans.—
- (13) The next step to this should be a co-operative store first to deal in few articles to be worked on the principles of Rochdale Pioneers. Profit should be converted into shares..
- (14) Further step should be a co-operative hotel or a refreshment room.
- (15) The last step should be co-operative insurance.
- (16) The Central Committee formed to guide the policy of such work should engage two paid servants to daily keep themselves in touch with the working of the societies by visiting the Secretary, by attending their meetings, by inspecting the accounts and by advising the committee.
- (17) Government inspection and audit should be quarterly.
- (18) In the beginning Government should give some loan over a period of five years at a moderate rate of interest.

CO-OPERATIVE SUBJECTS.

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NOTE 1.

CO-OPERATION AS A MEASURE OF FAMINE INSURANCE.

Now that the famine in Gujarat and Kathiawar is fortunately ended and has become a matter of past history, its lessons are occupying the minds of some thoughtful and earnest men who have the interests of Indian agriculturists at heart. The recent famine was mainly a fodder famine ; and one of its valuable lessons is the condition of preparedness to promptly deal with the situation created by the total failure of crops and the consequent scarcity of fodder supply. This question of readiness to fight out such a famine by affording assistance to agriculturists in the shape of fodder or money to purchase it, from the moment the signs of an approaching famine become imminent, centres round the eternal problem of funds to be utilised for the purpose of either storing large quantities of hay ready for immediate use or for the purpose of helping the agriculturists with money grants to meet their various wants during the period of stress. To achieve this two or three schemes have been proposed. Broadly speaking, they are based upon the principle of securing some sort of famine insurance. Without, however, entering into any examination of the merits of those recommendations, let us ask ourselves the question whether we co-operators have any scheme to propose, calculated to promote the same object ; and this note is written with a view to attempt an answer to this question from the stand-point of a co-operator.

2. Any scheme which has for its immediate objects the granting of facilities which the agriculturists as a class so badly need, particularly in India, to tide over the evil effects of a famine must be based upon a foundation that will develop self-reliance, sense of responsibility, thrift, and foresight on the

part of the agriculturists and that will organize their credit. Without these the superstructure cannot be permanent and abiding in its results. The history of agriculture in all countries where it has prospered under modern conditions, boldly points out to the fact that co-operation has very largely supplied these needs; and while giving the agriculturists a co-operation immunity from the evil effects of famine, if not from famine itself, it is co-operation alone which has put the agricultural industry on a sound economic basis.

3. There is no industry which is so much exposed to the freaks and frowns of seasons as the industry of agriculture and this great element of uncertainty enters so largely into the prospects of agriculture that its position in a country like India is rendered very precarious owing to this and several other causes. A famine is far-reaching in its effects. It affects most of the industries in a country, in a smaller or greater degree, but the one that suffers most at its hands is agriculture which forms the bedrock of numerous industries and many industrial and commercial activities. Though the ravages of famine paralyse for a time the industrial fabric of a country, it is agriculture that receives the hardest blow on account of its resources, which are already very meagre, being exhausted and because of the credit of the agriculturists having sunk very low. It thus takes agriculture very long to recoup its lost strength and vitality. If, therefore, these dangers are to be averted and agriculturists are to be rescued from this element of uncertainty of prospects, we must think of measures of insuring agriculture against famine, and the most effective measure of famine insurance in the interests of agriculture is, in my opinion, the organization of Co-operative Credit Societies.

4. It is possible that at one time or another some portion of this vast Indian continent may find itself in the grip of famine or scarcity of food. But with the advancing tide of modern industrialism it is refreshing to note that the rigor of famine at the present time is much considerably mitigated. Moreover, the daily increasing means of transport of fodder and grain to feed the cattle and human beings in the famine stricken

areas, have removed many difficulties in the path of the poor agriculturists whose sole need now is the supply of cheap money for the purchase of grain and fodder, which, as a rule are available "at a price no longer affected by local scarcity but regulated by the market price of the food in the great distributing centres plus the cost of conveyance to the place where the scarcity exists". It is one of the functions of co-operation to enable the agriculturist to secure cheap money by organising his credit. Mr. H. Dupernex, I. C. S., in his admirable book on "*People's Banks for Northern India*" treats of the relation which Co-operative Credit bears to famine. In this connection he observes as follows:—

"Now that India possesses every facility of transport and conveyance for moving her food stocks from place to place wherever scarcity exists, famine may be said to have entered on a new phase. The organization of transport is complete, the next step is the organization of credit. The more a country engages in commerce, the more its wealth accumulates, the better able it is, to withstand the shocks of famine. Industrial development is intimately connected with a properly organised system of credit. If it is conceded that famine is to a great extent the result of the dependence of the great mass of the population on agriculture alone, that some of the worst evils of famine may be removed by the establishment of other industries, then the first requisite for attaining the latter desirable object is by fostering the widespread institution of popular banks."

5. The Indian Famine Commission's Report of 1901 discusses both the curative and protective or preventive measures of famine relief. The third or the last part of this valuable document is devoted to the consideration of protective remedies in the scheme of which a distinct place is assigned to the formation of agricultural banks. The Commissioners say:—

"We attach the highest importance to the establishment of some organization or method whereby cultivators may obtain without paying usurious rates of interest, and without being given undue facilities for incurring debt, the advances necessary for carrying on their business. Agriculture, like other

Industries, supported, on credit." The whole of Section 4 of this Part is devoted to the definition, principles, objects and the working of these agricultural banks or what we call Co-operative Credit Societies. In dealing with the comparative merits of State-aid, the Commissioners observe as follows:—

"But even the fuller measure of State-aid in the shape of *takavi* loans, which we shall recommend, will go but a small way towards removing the difficulties of the whole class. Government cannot possibly finance all the cultivators of a district, still less of a province. In the establishment of Mutual Credit Associations, lies a large hope for the future of agriculture in India, and from the enquiries we have made there is reason to believe that, if taken up and pressed with patience and energy, such associations may be successfully worked." After dwelling at some length on the details of their working, the Report of the Famine Commission goes on to say:—

"The above is only a brief sketch of the principles, organization and object of village banks founded on the Raiffeisen system. It appears to us that there is in every province, which we have visited, a wide scope for the establishment of such banks; some have been already established in the North-Western Provinces and Oudh. In some provinces the hope of successful working is better than in others, but everywhere there is justification for an effort. No doubt such banks may, in the commencement, meet with opposition from the money-lender, who already occupies the field, and they may also meet with suspicion and half-hearted support from those who do not understand their principles. But Indian native life presents us with instances of co-operation for mutual benefit, and the principle which underlies the Raiffeisen system is not really foreign to the thoughts of the people."

6. It will be clear from the foregoing paragraphs that eminent advocates of co-operation have shown the potency and efficacy of co-operation as a measure of famine insurance. Mr. Dupernex has dealt with the subject at great length and Sir Fredrick Nicholson whose name very familiar to Indian co-operators by the "Monumental" volumes which embody

the results of a most pains-taking inquiry and study of the theory and practice of co-operative credit in Europe conducted by him, served on the Famine Commission of 1901 and has fully explained how co-operation prepares cultivators to cope with the famine. Mr. Wolff, who is the greatest existing authority on co-operation, while discussing the urgent need of teaching the "debt burdened" rayats how "certainly to India Co-operative Credit promises to prove a boon", remarks that "in rural districts its need is great rising from time to time to the *point of famine*." Thus the testimony of these three great authorities in co-operative matters is ample in my opinion to convince us of the power and usefulness of linking co-operation to agriculture so as to gradually free the latter by means of the former from the havoc which a year of famine works upon the agriculture of the land.

7 Granting, therefore, that the organization of co-operative credit is an effective remedy to achieve the object we co-operators have in view, the next question is which is the best time to commence that work. Considering the state of ignorance in which we find the vast majority of our masses at the present moment, and considering also their condition of utter dependence upon the village bunjah, the work is bound to be very slow. The popular adage that "Rome was not built in a day" will literally prove true in this case. The present, however, is the best time to give our thought to this subject particularly when the famine-stricken people have emerged out of their troubles with the lessons of famine quite fresh in their minds. Mr. Dupernex has to make the following recommendations in this connection. He says:—

"But a system of credit is not to be created in a day; it requires several years' work, to organize on a fitting scale and, if reliance is to be placed on an organized system of credit as a means of combating famine in the future, it should be taken in hand during the seasons of comparative plenty that usually intervene between two famines." Moreover, there is no reason to despair. Mr. Wolff who is so very searching in his examination of the methods and results of co-operation, speaks in very appreciative terms of the achievements of the first four years

working of these societies in this country (when there were only 2,008 societies existing) and expresses not only satisfaction, but even surprise at the progress made by the co-operative movement in India. He says "That is a record which has nowhere yet been equalled within the very first stage. The elasticity shown by the co-operative credit presents a striking contrast to the stagnancy displayed by the *lakkavi* business." Looking, however, to the stupendous amount of work that lies before the Indian co-operators we have no reason to feel overjoyed.

8. At this stage it may be asked that the theory sounds well but has it answered well in practice. To this I reply in the affirmative by taking my stand on the results actually secured both in Western countries and also in India. Co-operation has proved a veritable blessing both during the period prior to the famine and also during the period of famine in two different directions. It has increased the staying power of the agriculturists who are the first to fall victims to the evils of famine, and secondly it has enhanced their credit by popularising it. The Report of the proceedings of the Eighth Congress of the International Co-operative Alliance held in 1910 states that by the end of 1908 there were over 91,083 co-operative societies in 15 leading countries of Europe. Of these 20 per cent were Distributive Societies and nearly 60 per cent must be those that benefited the agricultural classes, in a variety of ways. The figures relating to Germany alone will be found very interesting. Out of a total of 26,802 Co-operative Societies in Germany in 1908 consisting of a membership of 4,105,602, there are 20,310 Co-operative Societies serving the rural population and bearing the proportion of 75 per cent to the total number. Of these latter 16,062 are Credit Societies with a membership of 22,02,940. Mr. Wolff says that "In Germany alone, in 1908, 919 banks of the Schulze-Delitzsch type only dealt out in advances of various kinds the huge sum of £ 175,000,000 which has in this way been made to fructify in commerce, industry and agriculture, purchasing raw material and paying wages. The sum lent out in the same year by about 17,900 co-operative banks registered in Germany reached altogether the huge figure of nearly £4,240,000,000 which in Indian

coin means 860 crores of rupees. Considering the growth of agricultural co-operation in other countries, it can be easily seen what a gigantic stream of wealth is made to flow into channels of agricultural development. If one want to know what the condition of the agriculturists without this aid of co-operation had been in these countries, let the pages of German and Italian history dealing with the condition of the peasants in these countries, in the early fifties and sixties of the last century be perused and a moment's reflection will convince the reader that co-operation has not only been their salvation but it has proved a real resurrection. As regards India we have the following interesting figures. During the year 1910-11, we had in all 5,432 societies (showing an increase of 270 per cent over those of 1908) consisting of 3,14,101 members and with a working capital Rs. 2,06,76,693. We in Bombay, however, are very backward having to day only 368 societies consisting of 29,419 members and with a working capital of Rs. 32,08,911. The rural societies in India number 4,957 with a membership of 2,38,978 and these have a working capital of Rs. 1,10,18,863. All this money courses into the veins of agricultural occupations followed by the members of these societies and supplies their immediate wants by grants of money at much cheaper rates. To that extent their staying power is improved and their credit has been argued. Thus to some extent the position of Indian agriculture is strengthened. Having regard to the needs of our vast cultivating population though this is very small relief, still it is a matter for some satisfaction that a sound beginning has been made in that direction.

9. So far an attempt is made at showing how co-operative credit can work as a preventive or protective measure of famine insurance. Coming more closely, however, to the time when the cultivators find themselves actually in the midst of a famine it is not difficult to point out how co-operation has stood them in good stead. Mr. Dupernex observes that "the utility of an organized system of popular credit in time of famine is one that has been abundantly demonstrated by the working of the Raiffeisen banks in Germauy during a year of scarcity and by that of the popular banks in Italy

during times of depression and distress." Here in India we too have a few telling instances to prove how members of Co-operative Credit Societies have been enabled by means of their systematised and organized credit to procure cheap money for meeting the needs created by the recent famine or scarcity. Mr. R. B. Ewbank, our present Registrar, drew my attention pointedly to the societies of the Gadag Taluka in the District of Dharwar. This Taluka suffered severely from the famine of fodder as did several other districts in Gujrat and in the Deccan. Out of the 33 rural societies in the Dharwar District, 21 Gadag societies have raised altogether Rs. 30,390 from members, Rs. 22,933 from non-members, and Rs. 5,000 from other societies up to 31st March 1912. Besides these loans, 13 of these societies were granted a total loan of Rs. 59,500 by the Bombay Central Co-operative Society. This brings the total of their loans to Rs. 1,17,823. Now I ask would these agriculturists have, during the time of the famine when their credit in the market is very feeble, got such a large and cheap supply of money in such a self-respecting and self-reliant manner if they had not come together and grouped themselves as co-operators. I for one do not think so. Again, in Gujrat some of the rural societies in the three famine-affected districts of Ahmedabad, Kaira, and the Panchmahals, on the strength of their co-operative character, could get some assistance from the charitable Famine Relief Agencies like the Central Famine Relief Committee and the Wadia Charities in Bombay. Besides the Bombay Central Co-operative Bank granted them loans at 7 per cent for the purchase of hay for their members. The Wadia Charities in recognition of their co-operative basis sold nearly to half a dozen societies grass worth about Rs. 1,000 at Rs. 8 per 1,000 lbs, and made a free grant of Rs. 1,200 to enable small societies, with a portion of this grant as a nucleus to build up a famine fund and the Central Famine Relief Fund paid them a sum of Rs. 1,000 to enable them to purchase grass for their members at cheaper rates. Two things stand out boldly. First, the principle of self-reliance is gaining a stronger hold on these societies and secondly, their credit with outside financing agencies is assuredly growing.

10. A stage has now been reached in the development of Indian co-operation, when agriculturists can be asked to concert measures of direct utility by providing a separate famine fund with their societies as a means of insuring their agriculture against famine. If co-operation is to be true it must teach its votaries the lesson of foresight. In Burma, Cattle Insurance Societies have been a success and there is no reason, therefore, why famine insurance funds to be built by societies or Unions of societies should not be successfully started. If each society instead of keeping a store of hay in readiness from year to year makes it a condition that every member will contribute one rupee to form a separate famine fund and if to this fund the society will add 1/10 of its annual profits and invest the same at 5 per cent with the Central Bank to be utilized only during the time of famine, a sufficient amount will be made, easily available for famine purposes in this way. An average society with a membership of 50 and making an annual profit of Rs. 200 will easily have by this method in the course of ten years, which is generally considered to be the intervening period between two famines, a sum of Rs. 750 as a result of co-operation coupled with thrift. Again this readiness and foresight on the part of the members of these societies will enable them to procure sufficient and cheap loans without depending upon the sweet mercies of the village sowcars with whom their individual credit is generally shaken. This, in my opinion, is the real solution of the question of famine insurance in favour of agriculture, and co-operation alone will afford the agriculturists the help and the relief which they so sadly need both before and during the period of famine. "To sum up" in the words of Mr. Depernex, "the relations of credit to famine, we claim first, that with an organised system of credit, the village co sharer, the better class cultivator, the struggling clerk would all be better able to stand the strain if familiarity with credit institutions had previously taught them the lesson of thrift, and if, when the real pinch came, the doors of such an institution were ready to open for them and provide means for enabling them to tide over the worst till the advent of better days."

NOTE II.

STATE-AID IN CO-OPERATION.

However conflicting the views of co-operators may be on the subject of "State-aid *versus* Self-help" in co-operation in general, it can hardly be questioned that the most magnificent edifice of agricultural and working class co-operative association reared up in many Western countries is based upon a foundation characterised by a correlation of national or State aid and self-help made materially to assist and supplement each other in the province of agricultural and working class co-operation. The object of this note is to discuss the relation of one to the other and particularly to point out the scope and the limits to which the State can and should engage itself actively and strenuously to foster co operation among classes that must, for a time, lean upon the support of Government. The Indian Co-operative Act 11 of 1912 has justly widened the sphere of the principle of co-operation being extended to various fields of activity. We co-operators, both official and non-official, must keep our eye steadfastly to the goal which we have set before us. We have the whole country, backward in education and deficient in knowledge of modern forces, thoroughly disorganized and undeveloped in its resources, and without any thought of its economics; there is the vast problem of the indebtedness of the agriculturists staring in the face; and their moral and material progress is anxiously awaiting our helping hand. If we once recognize unhesitatingly that we have undertaken the solution of these problems by applying the lever of co-operation to fit up the inert mass and to fulfil the mission on which we are engaged, we must closely examine our achievements both from the qualitative as also from the quantitative points of view and decide whether our labours are proportionate to the immensity of the task before us.

2. At the outset, it might be asked why does this question arise now and I must briefly state my reasons for opening it. First, our work has not touched even the fringe of the field we have yet to cultivate; I do not hesitate to confess that our labours have been feeble and insufficient it not quite half-hearted;

thirdly, there does not seem to be an adequate recognition of the principle of co-ordination that must exist between State-Aid and private initiative; fourthly, there is a greater need, on the part of those to whose lot this reforming, emancipating and man-making mission of co-operative organization has fallen, for clearly understanding their responsibility in this matter; and fifthly, I submit this year to this Conference as I did last year, that our Presidency, which is so very ahead of other provinces in many matters, unfortunately lags behind them in several aspects of co-operative advancement. I feel sure that, with more vigorous and sustained efforts assisted by more liberal financial support from the State for some time more and with greater private enterprise to be initiated by our farseeing and earnest-minded countrymen, the movement has a very great future before it. I frankly recognize that the responsibility which rests upon the shoulders of the educated and patriotic Indians in this respect is serious and readily admit that the full measure of success of this most beneficent movement depends ultimately not upon the artificial means and spasmodic attempts made but upon their spontaneous interest and patient work carried on in a spirit of faith and sacrifice. I do not wish to dwell further on that aspect of the development of co-operation which relates to public enthusiasm and popular support, but confine my remarks to that aspect of the question which makes it incumbent on the State to play a more active part in the gradual growth of this movement till it reaches the stage when it can be left to take care of itself.

3. There seems to be a feeling lurking in some minds that State-Aid and Co-operation are a contradiction in terms, and if co-operation is to be sound and self-reliant it must be thoroughly independent of State-Aid. There are others who think that co-operation is the business of the State and people have little or no responsibility with regard to its advancement. Even in Western countries there are two schools of co-operative thought; one champions "pure absolute, and unadulterated self-help and the other is in favour of conditional State-Aid." The advocates of unconditional self-help depend only upon people's initiative requiring Government to put no obstacles, legislative or otherwise, in their path; whereas the

partisans of conditional State-Aid agreeing with the absolute self helpers in the main, depend upon the State for certain facilities in the infancy of this movement. Here in India an impression is gaining ground that Government feel that what they have done so far—and it must be gratefully recognised that they have done much—is sufficient for the successful growth of this movement and beyond merely giving the legislative and administrative help immediately necessary they have no responsibility to bear. I am an ardent advocate of self-reliance ; but I feel that within certain limits co-operation is not inconsistent with State-Aid. I need not tell the Conference that some of the best authorities on co-operation are dead against State intervention, Mr. Wolff being one of them. But in Western countries political considerations enter largely into this opposition to State Aid, which also is based on strong moral grounds ; here in India there are no such political considerations as must drive us to completely set our foot upon State-Aid: besides, even the uncompromising self-helpers do recognize the justice or usefulness of the assistance of the state in certain matters, their attack being mainly directed against State interference or State subventions. If we want to be practical let us appeal to history—both of European and Indian co-operation. In co-operative assemblies of the West this subject has been discussed threadbare and I specially mention the heated controversy on this topic at one of the sittings of the Sixth Congress of the international Co operative Alliance held in 1904 at which delegates from almost all the countries in Europe were present. The discussion centered round the question, the "Duty of the State towards co operation: should it subsidize it or not?" The debate was led by Count De Rocquigny of France who, in proposing a motion took a rapid survey of the origin and growth of co-operation in several countries of Europe showing the part which the different States played in its working and the contribution made by the people to its success. The motion which was adopted by 102 to 55 votes advocated the principle of State-Aid in a moderate degree in co-operation "for the purpose of encouraging its application and favouring its development in countries in which private enterprise is not strong enough to serve such purposes by itself."

4. From the course which co-operation has followed so far in most countries where it has flourished, it can be stated without the least fear of contradiction that the bulk of it had been State-initiated, State-aided and State conducted in its cradle stage. There are, however, some countries like England and Germany "which have the good fortune to have centuries of civilization and economic organisation to look back upon." But they are exceptions and not a rule. Concerning countries which are backward in many respects Count Alexander Karolyi of Hungary who laboured long in his country in promoting co-operation and who was the President of this Congress, observed as follows :—

"No doubt it would be ridiculous to say that in England or in Germany, the classical countries of co operation, State subventions are necessary for co-operation. However, there are countries where such subventions are bound to be useful ; and may even be necessary. Of course you should rely upon subventions, only during as short a time as they are really wanted and give them up as soon as organizations have wing of their own wherewith to fly." Moreover, His Excellency Luigi Luzzatti of Italy, the founder of the Italian *banche popolari* or the Popular Banks, as President of the Seventh Congress of International Co-operative Alliance of 1907, while speaking of the relation of the State Aid to co-operation, remarked as follows :—

"We have not argued as much in Italy as you have abroad, and this is really not our fault, we are poor metaphysicians (laughter), we have not argued much about pure autonomous co-operation as opposed to State-aided co-operation. We believe in the need of both the one and the other, as the capacities of the workers and local conditions may require ; we look upon the single co-operator, armed with his capacities multiplied by associations as the main strength of the social peace army marching in the vanguard to great battles and great victories (loud applause), the State is the reserve force, which on certain occasions and in certain contingencies places itself in the front rank to win the battle (Applause). We think all theories are good, but the best is that which saves the greatest number from the usury of money,

the usury of rent, the usury of food, the best is that which most fully achieves the purpose of raising these people bowed to the ground, of uplifting their faces towards the radiant sun of liberty. That doctrine is the purest even if it disobeys some metaphysical laws of economic principles.' (Applause.)

5. Coming nearer home, what do we find? The history of Indian co-operation is plain in its teachings. We clearly see that it is Government, who, after they realized the insufficiency of the several agrarian measures introduced by them in order to ameliorate the position of the Indian rayats, discovered the usefulness of the application of the principle of co-operation to Indian conditions. It is Government who first gathered through their competent officers the technical knowledge of the theory and practice of co-operation by deputing them on that work to European countries. It is Government who did some pioneering work before undertaking the legislation of 1904. It is Government who supplied the administrative and supervising agency. It is Government who in the beginning granted subventions. And lastly it is Government who are doing some propagandist work by issuing pamphlets and Reports of Cooperative Credit Societies and by holding district, divisional, provincial and all India Registrars' Conferences. It is mainly due to these efforts that we find to-day a net-work of more than 5500 Co-operative Credit Societies in India having a membership of over 3,25,000 and with a working capital exceeding 2 crores of rupees. I do not mean to suggest in the least that people had no share in our present achievements; but I do want to suggest that it is doubtful, whether anything worth the name could really have been done, if the State had remained absolutely indifferent in this matter. Further, from the inquiries that I could make I have come to the conclusion that the movement has not yet taken any deep root, and if, Government were to withdraw what little support they now give, the danger is that it may wither away. This brings us nearer the main issue, *viz.* the scope and limits to which the State can and should engage itself in promoting co-operative organization.

6. Let us first consider the principles which the State in other countries have followed in giving their assistance and

the limits to which their operations have been extended. The States have been actuated by the object of stimulating private enterprise and of giving it the necessary encouragement and help so as to enable it to overcome initial difficulties. In introducing co-operation in different forms, local conditions and the aptitude of the people have been taken into account and co-operation of an unsuitable kind has never been forced. Though, as a rule, the first impulse must proceed from individuals, it is sometimes necessary to prompt some individuals, and to put them in such a position as to warrant their counting upon the necessary facilities by the authorities. Such an attitude on the part of the State will give a push to co-operation without in any way impairing its self-reliant character. The scope of State-aid has been much wide and varied and the following, among others, are its prominent features.

(1) Legislative facilities and exemptions from certain fiscal charges have been provided by the State.

(2) They have taken a leading part in educating public opinion. This aid has been enthusiastically received by the opponents of State-aid. In fact Mr. Wolff is very particular about it. He wants the State to spend as much money as it can spare upon the provision of proper education in co-operative principles to the masses of the people and upon leading them to co-operative action. The States have in some of their schools and high-schools regular courses of co-operative training and have appointed experts to disseminate co-operative knowledge and teach methods of working various industries on co-operative basis. They have spent a large amount of money in distributing pamphlets, model rules, manuals and forms, and in supplying lecturers or gratuitous expert advice. Distinctions and rewards have been awarded to co-operative institutions and medals and prizes have been distributed among societies.

(3) By means of State legislation in France and Italy special facilities were given to co-operative associations of working men to compete with contractors for public works.

(4) The most efficacious, but the most criticised, form of State-Aid has been the subventions made by States to some

kinds of co-operative undertakings. Large grants have been made in Italy, France, Hungary, Austria, Belgium, Roumania, Prussia, Bavaria, Saxony and Switzerland to societies for the purchase of agricultural materials and for the sale of agricultural produce, to cattle breeding societies, to cattle Insurance societies, to granaries and for co-operative insurance against fire and hail. The limited space at my disposal prevents me from quoting figures from various countries to show how great and useful has been the assistance of the States at the commencement of new co-operative enterprises, they never forget the proper limits beyond which they would not allow their help to go. Once the rough ground is got over, the States have said "now shift for yourselves, you receive no more from us."

(5) The most direct assistance in the shape of grants of money or advances has been given by some very prominent countries from public funds to agricultural co-operative credit institutions. The need for such support has been considered to be very great when it is specially remembered that without such outside initial backing much of the present agricultural co-operation would have merely remained a matter of speculation or imagination. In this connection Count De Rocquigny observes:—

"Productive co-operation, labour co-operation, and credit co-operation are in a totally different position. Their want of sufficient capital may prevent their very coming into life. They have risks to run from locking up capital. They necessarily require working capital from the outset, and from the outset they must accumulate a reserve fund to secure them against unforeseen contingencies. Pecuniary assistance rendered to them by the State at the starting is no doubt calculated to promote their creation, and so encourage them, in the face of threatening difficulties, to push on, and overcome obstacles by sturdy perseverance! Without such useful aid how many societies, flourishing to-day, never have been formed; how many grown strong under encouragement, would have remained timid, hesitating and unfruitful!

7. Judging from this standard of State-Aid dealt out in Western countries, I humbly submit that Indian Government

will do well to extend a more liberal help to hasten the growth of co-operation on sound lines in the various directions in which European States have exercised their healthy influence. Let us see what our needs are in these various directions with regard to which we should appeal to our Government which is ever watchful and anxious to improve the condition of the vast bulk of our agricultural and industrial classes.

(1) As regards legislation I believe the State has been ever ready to give us the necessary facilities both by legislative enactments and administrative orders the evidence of which is amply afforded by the Co-operative Act II of 1912 and the amendment of the Deccan Agriculturists' Relief Act.

(2) In the matter of co-operative education and propaganda my opinion is that there is much room for improvement in the present programme of Government help. Though efforts are being made by Government to instruct people in the the methods of co-operation, they have been very feeble and in that direction we should expect more direct work by Government by sending out paid and travelling lecturers and organizers who will not only teach people the methods of co-operation but also its principles and its history. Meetings could be organised in villages for this purpose and pamphlets and literature dealing with these subjects could be distributed broadcast. In other provinces there is much larger staff of inspectors, honorary and paid supervisors, and honorary organizers; but after reading the latest Reports of Co-operative Credit Societies in these provinces the impression left upon my mind has been that we in Bombay are less fortunate in the matter of administrative facilities than the people in other Presidencies and provinces. The assistance which our Registrar has been receiving in this direction is very inadequate; besides it is not sustained and systematic. In other provinces there is much larger and trained staff engaged by Government to help the Registrar in organizing and supervising the work of the Co-operative Department. I am quite certain, therefore, if our Registrar secures the services of an Assistant and a staff of trained organizers and inspectors or supervisors then will be better able to show decided improvement in

our present position, in respect of the education of the people in co-operative principles, their loyalty to them, soundness of the results, their expanded application and the formation of Unions. Government have already given certificates of merit to some successful co-operators and they may as well think of the usefulness of awarding medals and prizes to successful societies.

(3) Concerning the third aspect of State-Aid it is premature to think of our co-operative concerns, entering into the field of private competition for securing contracts of public works.

(4) Regarding the fourth form of State-Aid, the urgency is not so great though several co-operative experiments in the fields of agriculture and industry are being made in several places. In India, silk industry, sugar industry, brass industry, weaving industry, tanning industry, and others are trying to organize themselves on co-operative basis. Coming to our Presidency, weaving industry in Ahmednager and Dharwar and weavers' and shoe-makers' associations in Poona and Satara are budding into life ; if Government would lend them a guiding and helping hand they may show satisfactory results.. In the matter of agricultural industry solid work might be shown by bringing the Agricultural Department into closer touch with Co-operative Department as is the case in Burma. By rendering direct assistance and by enlisting private support, Bombay Government can launch into existence many needful undertakings, such as Manure Societies, Cattle Insurance Societies, Fodder Depots, Famine Insurance Funds, Seed-stores and Grain-backs.

(5) The fifth and the most important form of State-Aid, is the Government loans to small societies intended for the rural population. The organization or rural credit is not an easy task, it is beset with difficulties which are too familiar to need mention here. In other provinces of India the system of Government loans was not much relied upon and it is a matter of some satisfaction that even without such assistance the agriculturists have been

taught by the method of share-capital—a special feature of unlimited liability in the Punjab, Madras, and Burma—to enhance their credit with financing agencies and thus to secure a portion of money they need for their ordinary requirements. But the rural banks in our presidency have not even a rupee of their share-capital—such being the basic idea of popular credit banks—and consequently their credit with central societies is very meagre, though a decent amount has of late been available on account of the establishment of the Central Bank. But this does not and should not go very far. The real question is how to attract local capital and make it flow into the channel of rural societies; that is not possible for some time to come till these credit societies establish a reputation for honesty and business management. The development of confidence must be a matter of slow growth considering the present conditions of our village life and without such confidence or sense of security “the old stockings will not give forth their coin” or the buried hoard will not be unearthed as happened in the Punjab and at Barsi. Thus, without waiting for the long period of tutelage, if the people, taking them as they are, have to be given a go-cart, the Government ought to renew and to revise its policy of making grants on certain conditions to the rural societies. The policy of the Government of India has been in the direction of withdrawing totally these grants, but fortunately for Bombay a sum of Rs. 80,000 is made available for the current year. Though this may be a drop in the ocean, yet Government in the eyes of the people stands for many things; its financial interest in these societies will not only generate confidence in the minds of the local capitalists, but will also create a sense of security. Government loans not only attracts more money and afford greater financial facilities, but also inspire into the minds of the villagers a feeling of safety regarding their transactions. It must be admitted that Government loan has a charm and a potency of its own. Though I would not lay the whole blame of the backwardness of this movement at the door of the recent Government policy of withdrawal of loans still I have no hesitation to say that premature curtailment of State-Aid must be responsible to some extent for the slowness of its expansion which cannot be interpreted

as a sign of sure growth. Many organizers have felt the inconvenience of it in more ways than one, and this has been the verdict of the Divisional Conferences. Government must buttress specially the agricultural credit co-operation by identifying itself with it in a substantial manner and the best way in which they can do it is to adopt a more liberal and expensive policy of State loans; on the recommendations of the Registrar. The large sums of money which Government use as takkavi loans can be advanced to the cultivators through the co-operative credit societies and there could not be any opposition to this proposal. In fact Government have proposed the adoption of this method wherever possible. If larger purposes of co-operative credit are ever to be achieved, Government must generously take the lead in this matter.

8. I have thus set forth at great length my scheme of State-Aid in co-operation. And till the people are educated and made conscious of the vast possibilities of the moral and material benefits of this movement, it must wheel round the fulcrum of the whole-hearted aid of the State. In conclusion, in the words of Count De Rocquigny, "My belief then is that State-Aid, as a means of stimulating co-operation promoting the formation of co-operative societies, furthering their development, and vivifying private enterprise, is wanted and is not open to any tenable objection.....However, when all is said, I remain convinced that the uses of State help to co-operation overbalance the danger of abuse and that there is real advantage to be set to its credit.

NOTE III.

SUPERVISING AGENCIES OR UNIONS.

: Last year when I read a note before the Conference on the subject of 'Boards of Supervisors' it was resolved that I should bring the same subject before this year's Conference making definite proposals. In pursuance of this resolution I have selected this subject and beg to propose to the Conference the formation of Unions in suitable areas mainly for the purpose of supervising the working of the existing Co-operative Credit Societies :—

2. In Co-operative circles, the subject of Unions, along with the question of finance, is assuming a position of extreme importance. The Registrars' Conference has discussed their bearings upon the successful growth of the co-operative movement. Their need is being felt every day owing to various causes, the principal among which, are the following:—(1) the steadily rising number of societies is increasing the difficulties of the Registrars and their staff who have to inspect and supervise their working and audit their accounts and who thus are unable to cope with the work; (2) they can hardly spare any time, even when they so desire, to do any propagandist work and rouse popular enthusiasm in favour of Co-operation; (3) there is a growing need felt for an effective control over such societies as are being daily launched into existence without thwarting their independence and sense of responsibility; (4) the necessity of a medium or a link between the financing agencies and the distributing societies is being increasingly recognised; (5) there is a demand for a central institution which, while consolidating the credit of these small societies that lie scattered, will by winning local confidence, command local capital for their use. If the Co-operative movement is to avoid pitfalls and run a smooth race this deficiency is required to be supplied and even we in Bombay have come to a stage in its growth when the consideration of this important problem can no longer be put off.

3. In other provinces its solution is being attempted and a great measure of success has been achieved in the formation

of Unions, mostly as supervising agencies, and in some places as financing agencies also. In Burma, there are about 24 Unions comprising of over 280 societies and working as propagandist supervising and mutual guarantee association. They charge $\frac{1}{4}$ per cent cess in the transactions of loans effected. In Bengal, nearly 240 societies have been grouped into 8 Unions, 6 of which are made up of societies only, all discharging also the function of financing the affiliated societies. There are also District Co-operative Committees mainly intended to spread the knowledge of co-operative principles. In Central Provinces, in the District of Balaghat there are 4 Unions which finance the affiliated societies. In Madras, there are 2 Unions in one District which work as a connecting link between the societies and Central Banks or the Registrar; the former grant them a commission of $\frac{1}{80}$ of the interest paid every year to the Banks by the affiliated societies, while the latter gives them a special contribution from the funds of the affiliated societies served by the Unions. In the Punjab, there is only 1 Union financing the societies. In Bombay, one is recently formed at Satara. In the U. P. the District Banks serve, in an indifferent manner, the purpose of a Union and some work in the direction of propagandism is done by Co-operative Organization Funds, started in a few districts, that employ a paid supervisor to organize societies and supervise their working. Now that the difficulties in the path of the registration of these Unions under the old Act are removed by the present Act, their number, which is slightly above 40 today, is sure to grow very soon.

4. There is no clear definition of the functions of a Union. But its chief object is to unite the societies into a group or central association just in the same way in which a single society brings the individual members together to form a corporate body of mutual benefit. Its functions are three-fold. It works as a missionary agency; it acts as a controlling and supervising authority; and it tries "to balance the excess and deficiency of funds" of affiliated societies and in short become a "common cash box equalising excess and want." Its uses are manifold. By its constitution it clothes the societies under its protection with a recognized status and stability; it

provides the Registrar with the necessary and responsible agency for gauging of the assets of the societies and examining their financial solvency ; to the small capitalists it secures a field for safe investment and thus finds an outlet for a pent up treasure ; it brings a needful relief to the Central Banks either as a Central Banking Union or as an inspecting machinery, by scrutinizing demands for loans made by societies under its care ; it gives an impetus to agricultural advancement by enabling Co-operative Credit Societies to secure more funds for improvement ; it rouses public confidence in Co-operative Credit by its careful selections ; and lastly it conducts not merely the arithmetical audit of books and balance sheets of societies but trains them into the working of Co-operative principles and enforces their strict adherence to these. Thus in the process of centralisation the Union supplies a great want. The Provincial Central Bank at the top, and the small Co-operative societies at the base, need these Unions to stand at the centre, as an integral part of the co operative structure.

5. The foregoing sketch will make it clear how necessary and useful is the institution of a Union of Co operative credit societies. By its constitution it can affiliate as many societies as lie within a convenient area. It is registered under the Act as a Co-operative Society with limited and unlimited liability. The Union should be managed by a general body of representatives appointed by societies and should have an executive committee consisting of a few members elected by the delegates. It should employ a trained staff of inspectors to inspect the work of societies and to preach co-operative truths ; and the expenses are to be paid by the societies forming the membership of the Union by the levy of a small commission. The Union, by means of a close and searching examination of the assets and liabilities of the various societies and by the inspection of its dealings, is better able to negotiate for loans to the societies within certain limits and stand guarantee for the security of their transactions.

6. Even if the Union be not required to serve the purpose of a Bank, the refinancing agency readily available for immediate use, its need as a means of effective preaching efficient

control and strict supervision is very great in our midst. In our Presidency, there are 8 or 9 Centrals which are ready to give financial accommodation to rural societies but they have neither the means nor the facilities to appoint a paid staff of supervisors to make sure that their transactions with such societies situated at considerable distances are secure except the insufficient agency of the Registrar on whose inspection reports they have to depend for their action. The Registrar complains that he can hardly be expected to visit all the societies much less to keep in close touch with them. If, therefore, Unions or supervising agencies are created the Central Bank with their guidance can easily supply a portion of the capital which the societies need and the Registrar and his staff may devote a part of their time to the expansion of this movement. If the Registrar forms half a dozen Unions in selected areas by holding conferences of the representatives of societies in some districts an impetus will be given to the formation of such Unions. In this, he will of course be cordially helped by people of local influence interested in co-operation and such a beginning could be made in the districts of Ahmedabad, Surat, Broach, Poona, Ahmednagar, Dharwar and Bijapur. On the Madras system, if Taluka Unions could be formed, they would be more workable today and more useful in the future for further organization. Such a Union will facilitate "the taking of common counsel", the discussion of questions affecting common interest, the quicker spread of co-operative knowledge and will keep the societies free from the contamination of base motives. Such a Union, in the opinion of the Registrars of Burma and Central Provinces, will be a great economic factor of our social life. In conclusion, these supervising agencies will prove that a *Union of Co-operative Credit Societies* is a source of great *strength* particularly to them and generally to the movement.

ECONOMIC CONDITIONS IN INDIA.

BY C. GOPAL MENON, F.I.P.S., F.C.I., A.I.B.

The fact that Indians have begun to take a deep interest in the economic progress of their motherland is evidenced by the remarkable economic developments that have recently taken place in the country. Hitherto the attention of the educated classes have been entirely absorbed by their political aspirations and activities. But it must be said to-day that the political aspirations have, to a large extent, to be conditioned by the present economic situation of the country and to understand India's present economic condition, it is necessary to know the vicissitudes, political, industrial and economic through which she has passed. The interest which Indians have begun to take in economic studies is only of very recent origin. This lack of interest on the part of Indians may be ascribed to various causes. In the first place economic science is one of recent origin and has not therefore received that share of their attention which it deserves. In the earlier stages of its growth and development the economics had been called the cold-blooded or dismal science. Although Aristotle, Pláto and even Sir Thomas Moore—had something to say upon the economic facts of their times, not until modern conditions began to prevail was the full significance of the science grasped. Further Indians lack that spirit of industrialism and commercialism which are such marked characteristics of the West. It is but recently that India has begun to take an interest in her economic condition, taking into account the actual situation of the country. India has given to the world some writers of authority in recent researches in Medical science, Law and Physical sciences, but it may almost be said that no economist of note has yet appeared in the country. This drawback may be attributed to the fact that there are no "prizes" in the field of Indian economics. The professorships are few in number, the talent which might be exercised in economic work is diverted into more profitable vocations. Economics is the youngest of

all sciences in India, and offers virgin soil for study and research. That the economic side of Western life has considerable interest to the easterner may be seen from the fact that the east has begun to westernize itself in some of its important aspects, particularly in matters political and economic. It must be said that in India one sees the advent of a new era, a desire to meet its own economic necessities, pushing out through all obstructions. Industries organized on modern methods have just begun to spring up. India is just beginning to grow, we see that more implements and machinery are being imported from England, the Continent and America. The agriculturist is endeavouring to study the method of handling the Oil Engine, Western plough and Rotary Force Pump. Even in remote villages we observe here and there jacks used for lifting heavy weights. Where this present tendency will lead to, no one can exactly say. It is premature to say how far the transforming East will ever grow and expand in the way the West has done. This much is clear judging from the present economic situation of the country, a beginning in India's economic transformation has just begun and the evolution cannot be resisted.

In order to understand India's present economic transition, it is necessary to know the vicissitudes she has gone through. There is no literature which approaches our national history from the standpoint of economics with scientific precision. Of ancient India it is only since yesterday that early records have to any large extent begun to be accessible. Ancient India suffers heavily in her supply of economic lore. But since the publication of the sacred books of the East, people of India have had some glimpse of the ancient economic customs respecting trades, taxes, exchange and credit and a considerable number of so called law books or text books on conduct and custom are taught in various ecclesiastical colleges, to young Indian laymen. More details of the ancient economic and social institutions are obtained by the publication in English of a large part of the original Buddhist canonical works, the compilation of which is ascribed to the fifth and fourth centuries B. C. In the volumes of the sacred books of the East there are the questions of the king Milinda (Menander of Bactria) in the first centuries A. D., containing several

references to the economic usage. Then there are the Law books known generally by the name of Manu which date between B. C. and A. D 200, as also manuals written by Brahmin Priests dealing with the spiritual and material interests of the age. These are some of the noteworthy records of ancient India from which we obtain a complete economic survey and get an insight into the economic institutions prevailing in the last six centuries of the pre-Christian era. When an enquiring mind gets access to the materials in the above works, it will be possible to make a solid contribution to the history of political economy of Ancient India. The economic ideas of the orient may be reducible to a few ethical precepts. The people extolled agriculture and decried arts and commerce; while agriculture flourished, division of labour though politically free, stiffened into a system of hereditary caste and arrested economic progress. Any insight into the nature of money is credited to the Chinese.

The Commercial development of India, particularly of the peoples dwelling on the Ganges, and its tributaries was left undisturbed by foreign invasion and when Alexander the Great had come disturbing as far as the western limits and finally culminated in the establishment of an Empire of India by Asoka, which in extent fully equalled the present British Indian Empire with the exclusion of Burmah, it was observed that agriculture and commerce had fully developed with all the striking elements of economic and social organization needed for a civilized nation. An active maritime trade was then carried on from Broach and other ancient ports in the Gulf of Cambay above Bombay, through the Persian Gulf to Babylonia. Rural economy was based on the system of village communities of land-holders, kings are never mentioned to have interfered with the rights of tenure. In return for political safety a tithe on the raw produce, chiefly rice and cattle of each village, varying between a tenth and a sixth had been levied. Ample traces of Corporate initiative were seen among the people of this period in the shape of the dwelling houses appearing in groups, existence of a common grazing ground, villagers themselves co-operating to keep the roads and lanes clean and attend to their repairs; it is said that

even the village crop of grain is bought and stored in a common granary—Such in brief were the salient features of the ancient rural economy of India. Industry is also specialised and localised in the shape of villages of carpenters, of iron-smiths, of villages of trappers, and of Brahmins whose business was to attend to the sacrificial celebrations, possessing the necessary equipment of Sacerdotal knowledge. Those who undertook the sacerdotal functions undertook no worldly callings, abstaining absolutely from all material pleasures. The profession of agriculture and trade according to the law books were conducted by the Vysias alone. Industries were grouped within the towns themselves, as in the present day European economy ; say in the shape of an ivory-workers' street, a dyers Street and so on. During the Mauryan rule and up to the age of Gówtama Buddha, the chief industrial and commercial centre was Benares which had then possessed an entire monopoly in the manufacture of muslins and silks. After the sixth and fifth centuries B. C. Patna became a great emporium. Communication during these periods was effected by caravans and by water. Foreign commerce in those days was carried on between India and its adjacent countries, the Red Sea, Persian Gulf, East Coast of Africa, Arabia and the Arabian Sea, Burma, Pegu, Malacca and China. The origin of this trade dates back to remote antiquity. It is a matter of history that India had intercourse with foreigners even to the remotest classic period and from the nature of the articles exported then, there is no reason to suppose that the geographical or climatic conditions at that time differed very much from those prevailing at the present day. Pliny who visited the East and wrote about his adventures in the first century gives many interesting details of the commerce then existing between India and Ethiopia, Egypt and Arabia by Greek and other merchants ; much merchandise being forwarded to Rome, where, Pliny tells us, that it was sold for a hundred times as much as it costs or yields in its price a hundred-fold again.

It is well nown that Indians were not lacking in their enterprise about this period. Indians (Hindoos) during the era of *Ptolemy* visited Alexandria, then one of the trade centres of

the world, doubtless having made themselves acquainted with the requirements and exports of the places which they visited. Authorities can be cited as to the presence of Indian merchants in Africa, Socotra, Persia, Malaysia, and Egypt, during the Roman era, and it is probable that the great Geographer, *Ptolemy* largely obtained his knowledge of India and its environs from intercourse with the traders.—Chronicles however bearing on the "Country Trade" between the third and fifteenth centuries are scarce. There is record of Chinese merchants calling at Indian ports. In the seventeenth century "Pilgrim Traffic" commenced. The old caravan route across Asia became unsafe owing to the constant trouble and lawlessness prevalent in Asia Minor; Red Sea became the route and the Arabs on the Western Coasts of India soon got the sea-borne trade into their hands, retaining a practical monopoly of it until the advent of the Portuguese. What sort of ships took the place of the galleys of the Greeks, we have no information, but Harris in his collection of voyages in describing the nature of an Indian ship in the thirteenth century mentions that "the greater ships have 300 mariners, the others have 200 or 150 according to their size, and burthen from 5000 to 6000 bags of pepper." The Pilgrim Trade to Mecca which began in the 7th century assumed great proportions. The Arabs retained the greatest share of the Indian trade, until the first Portuguese ship arrived off Calicut in 1498; The advent of the Portuguese gave the Mahomedan merchants an opportunity to see how much more cheaply and safely goods could be carried to Europe all the way by sea than by succession of transportations, partly by sea, partly by river and partly by caravan.

I may be excused for this digression, but you will observe this is necessary to obtain a knowledge of the commercial history of the period under review to get at the economic condition of India. Commerce differs from agriculturs and manufacture in that it calls into existence no new material products. The latter industries employ labour in the production and shaping of nature's products for the service of man. Commerce brings the producer and the consumer into direct

relationship so as to afford a maximum of satisfaction to both parties to the transaction. In other words, commerce being an exchange of values, the results accruing therefrom are of mutual interest and advantage to both parties to the transaction by reason of the difference in time and space of the values exchanged. Exchange of goods necessarily implies a division of labour, and both of these are rightly called, "the organised process of creating wealth." Exchange of goods is to bring soils, climates and natural geographical conditions into an organic relation, while division of labour is to organise the skill and industry of mankind. Such is commerce and its appearance in human society is accompanied by the development of division of labour and intercourse between distant and varied climes. Intercourse between the most distant lands gradually stimulates trade and commerce, as the necessary complement of the industrial organization of society. All these involve the application of man's labour to materials, and the social relationship between man and man. Local trade brings a single community into close association while foreign trade or international commerce, binds mankind into close relations of mutual advantage and advancement. Economics may be defined as a scientific study of these social actions of men and may lead not necessarily directly or immediately, but at some time and in some way, to practical results in social improvement. Economics therefore is a study of mankind in the ordinary business of life. Bagehot very properly called the English system of Economics "the Science of business done in large and trading communities." The motive forces of economic life are satisfying the desires of men. The various phases of industry and trade and the outward activities of men are determined by the intensity of their desires. In short, human wants are the dynamics of wealth. Economics therefore is the study of mankind in relation to wealth. I shall explain the development of the Science in the 16th century. The one dominant factor that prevailed in the western part of Europe during this time was the growth of commerce and the development of money economy. With the development of this growth, local self-sufficiency had given way to the activities of commerce; and the substitution of the

old feudal economy founded on exchange in kind by the new money economy, gradually led to the introduction of the wage system, industrial capital, and the relation of contract between employer and employed. Social growth therefore gave rise to change. With the age of Mediævalism a change from local institutions to national ones took place. It was the age of materialism and struggle for money. Every nation began to work in the direction of increasing national power and national wealth. This led to the discovery of the new world, and the opening of the eastern trade which brought much wealth to Europe and the scope of money economy was considered as the one object of desire and was counted as the one essential item of wealth. On account of this idea the nations began to vie with each other for the accumulation of treasure. Foreign trade was the ideal means of accomplishing this desire, consequently national industries were encouraged in order that the products might be exported and to bring into the country an accumulation of precious metals. This movement was the social product of the times which has come to be understood as "Mercantilism." Schmoller says that "this system lies not in some doctrine of money, or of the balance of trade; not in tariff barriers, protection duties or in navigation laws; but, in the total transformation of society and its organization, as well as of the state and of its institutions in the replacing of a local and territorial economic policy by that of the national one." The policy is, therefore, not the product of any scientific thought but was wrought out by the force of circumstances and conditions. This system assumed different forms among different nations, and was known by different names. In France it was known as the Restrictive System or "Colbertism," while in other countries it was known as the Industrial system and the balance of trade. The impetus given to manufactures, shipping and foreign commerce by state encouragement resembles the program of socialism to some extent, the end being in the one case, aiming at self-sufficiency and in the other seeking to improve the condition of wage-earners—judged by the standard of modern economic theory, mercantilism is seriously defective, but at the period it was brought into force it produced important results.

This extension of money economy and the disruption of the guild system gradually led to the appearance of the capitalist class. Along with this began the rise of competition and competitive price in the place of the former self-sufficiency of a place of former monopoly, and fixed prices. Karl Marx says " industrial capital originated in the sixteenth century. Lassalle ascribes the overthrow of mediaevalism to the growth of capital through trade, and attributes the enormous increase of capital to the discovery of the new world and the opening of the trade routes to the East.

The struggle for economic supremacy among the European nations led to the formation of Regulated and Chartered Joint Stock Companies. The States stood behind the companies and the principle of mercantilism was extended to commercial exploitation in the East. Various companies of " Adventurers," as they were called, sprang up, and to this epoch we may ascribe the rise of the East India Coy., (1600), the Levant Coy., the Russian Coy., the Virginia Coy., (1606), and various other trading corporations. These were the large capitalists that entered into the foreign trade of the period.

This narration of the political history of Europe is necessary to obtain a clue into the economic history of India at this period ; for the history of India does not stand alone ; it was mixed with the political history of Europe. The ascendancy of the Portuguese in India was followed by that of the Dutch, who, in their turn yielded place to the French. The struggle between the French and the English resulted in the latter building up a mighty Empire.

We now come to the period of the advent of the East India Company in India. There is hardly time in a short and rapid review such as this to go into the progress of economic thought and the development of political ideas during the period the great trading companies were formed. Suffice it to say that, throughout the 17th century, controversy raged round the monopoly enjoyed by these trading concerns, just as we find today controversies on the tariff question, socialism, &c. Prior to the Tudor period trade questions had all been

within the sphere of the Royal prerogative and the grant of monopoly by Queen Elizabeth was considered to be quite within the right of the Crown. Economic theories prevalent at that time justified the existence of such things.

I may in a few words now run over the conditions of economic affairs just after the East India Company established their factories in India. India had a large overland trade with the East and the articles sent out from India were many and varied. The articles imported into England by the East India Company since they came to India were so numerous and the range so large, it is difficult to go into them fully just now. Cotton goods, of course, formed the most important article imported from India. So skilful were the Indians in its manufacture, until the invention of the spinning Jenny, that no European manufacturer could compete with the Indian weaver. Their introduction into England was considered even inimical to the English wool trade. Silk was another important article of commerce, the chief centre for collection and distribution being at Kasim-bazaar in Bengal. The Company's agents did also a considerable trade, in articles such as Salt, Opium, Saltpetre and several others.

The Company's agents had however great obstacles to contend against in their dealings on account of the primitive methods of the industrial skill of the Indian craftsmen. James Forbes in his "Oriental Memoirs" gives an interesting sketch of the weavers in their rustic surroundings. "The weavers' houses" he writes, "are mostly under the shade of tamarind and mango trees, under which, at sunrise, they fix their looms, and weave a variety of very fine baftas and muslins. In summer, they worked over bowls of water, in order that the vapour might keep the thread soft. Yet it was not until the end of the 18th century that the English manufacturers were able to make fabric with both warp and weft of cotton, as was the case with Indian muslins. The cotton fabric made for the European market was of different lengths and breadths from that employed by the natives in their own dress; quite early in its history, the Company sent out patterns for the natives to copy in order that their goods might be saleable in

"England." Spinning and weaving were the great national Industries of India next after agriculture.

The Company's export trade from England never formed an important part of its trade on account of the difficulty experienced by the Company's agents in India to push the sale of English goods due to the aversion of the people in the country to use foreign goods. The bulk of the Company's exports at this period were Camblets, cloth and other woollen goods, tin, copper, naval and military stores. The export of bullion from England was, however, little owing to the mercantile theory then prevalent.

Now came a crisis in the Company's affairs in the first few years of the 19th century, when the question of renewing the Company's Charter was brought up. In the Charter which was renewed in 1834 it was provided that the East India Company should henceforth "discontinue and abstain from all commercial business and stand forth only as administrators and rulers of India."

It is necessary to dwell upon the economic thought in England at the time the Charter was renewed. At this period there was controversy all over Europe on the theory of Mercantilism; its opponents severely criticised the trade policy which arose out of this theory and consequently we find from the middle of the 18th century a more liberal thought in economic matters. It was Quesnay (1694-1774) who maintained that complete liberty of commerce for the regulation of internal and external trade that is most profitable to the nation and to the State and it alone can bring about a full freedom for competition. He had the support of philosophers like Locke, Hobbes and Rousseau. The growth of this liberal view resulted in the development of individualism in economic affairs and the doctrine of Laissez-Faire in Governmental activity. It was an age which objected to state interference with any kind of exchange on the ground of man's natural right to exchange his own products with whomsoever he wishes to do. This led to the collapse of mercantilism and a new fiscal theory of free trade was promulgated. In England

Adam Smith led the controversy and the death-blow for monopoly in trade matters was given in 1776 by the publication of the *Wealth of Nations*. Adam-Smith protested that all monopolies and exclusive companies were pernicious except for banking, insurance, and public works. He enunciated the doctrine of competition and also the theory of the division of labour. There is neither time nor space to go more into the details of economic thought prevalent at this time in Europe. Adam-Smith's theory of "Cosmopolitan Economy" was however attacked by Frederick List's "National Economy". List opposed strongly the balance of trade theory and the old mercantile system, as well as the doctrine of free trade. He pointed out that cosmopolitanism could be attained only by the development of the ideal of nationalism.

We now come to the threshold of the nineteenth century. While England was busy establishing her Colonial Empire and her supremacy on the sea, there came the series of transforming and striking inventions which precipitated the Industrial revolution and transformed industrial conditions in all the Western Countries. These inventions revolutionised the industrial methods of the great powers and brought about wonderful progress in their commerce. The insular position gave security to those men of genius—those humble workmen—who in quest of their daily bread, fed and clothed multitudes with the results of their inventions. This age of scientific invention is the natural sequence of the physical discoveries which preceded it. Although England cannot claim a Columbus or Magellian, the names of Kay, Hargreaves, Arkwright, Crompton, Cartwright, Watt, Boulton, Horrocks, Roberts, Bulloigh, Smeaton, Stephenson, Brindley, Clement and others are so well known as masters over nature's forces. In a study of the manufacturing countries Britain claims more attention than all other nations of the world, for here is the seat and throne of manufactures. That development is based on the Steam Engine of Watt, the steamship of Symington and the Locomotive of Stephenson. Here is the great triad which has built up the modern material world. The age of Geographical discovery thus paved the way for the age of invention and expansion; and England's success in trade and industry

became an established fact. English shipping opened up new markets and an unlimited supply of her manufactures was thrown on these markets. England's enormous profits, industrial and commercial, made her the financial and economic centre of the world. The invention of Arkwright, Hargreaves and Cartwright brought economical shipping and weaving of textiles, those of Nelson Cort, cheap iron; those of Bessemer, Siemens, Martin and Thomas, cheap steel, the most important article for making not only edge tools but also the basic element of so many other articles. With the advent of this state of affairs in England, imports into India went up by leaps and bounds. Till the East India Company obtained a footing in India, India's foreign trade in her manufactured articles was enormous, but with the advent of the Industrial Revolution in England, India was thrown open to the competition of the world, with the result that her hand industries could no longer face the struggle with the articles made by the modern complex machinery. All industries in India crippled and the people devoid of the skill and experience, with scarcity of capital, lack of machinery, and with the want of co-operation, had to fall back upon the only resource of agriculture. The country that once had been famous for its manufactures of the most delicate fabrics in the world, had become a purely agricultural country, exporting food-stuffs and raw materials. Prior to this period, there were no manufacturers in England opposing the importation of Indian fabrics as harmful to national industries. On the country, their carrying trade was mostly the manufactures of India, and consequently the Company was interested in the development of Indian Commerce.

No enquiry is more interesting and instructive and at the same time more difficult in the history of nations than the survey of economic and material conditions of a country; and in a short and rapid review such as this I can only give you the salient features of it.

India is a vast expanse of naturally rich country over one and three quarter million of square miles in area—larger in fact than the whole of Europe excluding Russia—watered by some of the noblest Rivers in the world; and supporting

roughly three hundred and fifteen millions of people, approximately one-fifth of the whole of the human race. Of the total area of India, nearly 109,000 square miles are under rice cultivation, 50,000 square miles produce millets, 81,000 square miles wheat, 16,000 square miles are given up to the cultivation of cotton, about 4,100 miles under jute, 4400 under sugarcane and so on. We have, therefore, a sufficient supply of natural products although there is still room for considerable expansion. Only we want ability and skill to convert these natural resources to meet the necessities of life and cater to the ever growing demands of civilisation. The textile industry is taking deep root in the country. Taking all these facts into account there is no doubt that the material development of India is encouraging and, year after year, our total volume of trade is increasing. The seaborne external trade of India in 1884-85 amounted to Rs. 14,84,22,900 and today it is 390,77,87,833. The opening up of the Suez Canal in 1869 became an important economic factor and so altered the channels of commerce and trade that distant markets having been brought near by rapid means of communication it became necessary to produce on a large scale to meet their large demands. The opening of the Suez Canal has enabled India, as Sir William Hunter has said, to appear in her true commercial character as a producer of raw materials upon an enormous scale, the essential feature of that competition being a rivalry between the productive powers of the tropics and the temperate zone. With this era of development, Steam displaced the sailing opium-clippers, once the pride and fortune of Calcutta, and railways were introduced. The first Guaranteed Indian Railway was formed in 1849-50. More and more lines are being added every year and numerous other factors are being brought into existence tending to the economic development and progress of the country. The railways enabled the new Indian staples to be taken to the sea, the substitution of Indian for English coal, and the great increase in steam shipping brought about a reduction in rates; in conjunction with these changes and largely as the result of the above factors, the manufacturing system of India has had to be re-organised, and an industrial impetus imparted.

British capital flowed into the land seizing the opportunities afforded thereby, and as a result India began to compete keenly with the farmer of Norfolk, and the manufacturer of Lancashire.

Let us pause for a moment and compare the state of affairs in India prior to the advent of these new influences of Western Science and commercialism. What was the old economic order in India? Prior to the remarkable movement now taking place in India towards modern industrialism and Western education and ideas, and the decadence of the old caste and communal system of the past, was the archaic economy of isolation, self-sufficiency of the village which are beginning to disappear to-day giving place to the complete structure of modern society basing its requirements upon the different industrial units. A word of explanation is necessary here with regard to the great feature of Indian social life communism, which we find existing under three great forms agriculture, caste and family communism. In the words of Sir Henry Maine, "the agricultural communism was the unit of a self-governing, self-sufficing democratic municipal institution. The conditions of village tenure vary largely all over India but in every part there was the custom of holding lands in common, as in the primitive village life of Germany and England."

Of the second caste communism which cannot be said to be altogether an unmixed evil, a great many of the castes, were founded on hereditary occupations and practically formed trade guilds and societies, having their own committees of management and rules and regulations, fines, feasts, mutual benefit arrangements, almost quite similar to old trade-guilds and modern unions in Europe. Thus there are the goldsmiths (a powerful caste which in South India, says Sir Wm. Hunter, for centuries resisted the rule of the Brahmins and claimed to be the religious teachers,) and wore the sacred thread), the brass-workers, the weavers, the fishers, and scores of others, each divided into numerous sub-sections. The caste guild in these cases regulated wages, checked competition, and punished delinquents; the decision of the guild

being enforced by fines, by causing the offender to entertain all his fellows at a feast, and in various other ways. The guild derived its funds not only from fines, but also from the entrance fees paid by those beginning to practise the craft, and from other sources. In any case, whether trade-guild or not, the caste exercised a great influence over a man or woman of the particular section to which he or she belonged. Caste-guild assured its members against starvation and exercised a continual surveillance over them. Thus we see that the caste system contained its valuable social and economic elements, and ancient though it may be, has lessons for us in regard to the organization of trades. Caste thus existed as a sort of mutual communal feeling and interest and some degree of mutual assistance among the members of the caste. When the great industrial awakening which I may be permitted to say is gradually coming into the country, becomes an accomplished fact, and when the two great western influences of commercialism and education have been widely spread, whether the different castes retain their influences over the land is a profound question? There is no doubt that caste has taken a deep root in the land but it may be fairly hoped that modern influences will tend to remove a great deal of its objectionable features.

At the present time the greatest industrial occupation of the country is agriculture. Roughly speaking from two-thirds to three-quarters of the population are engaged directly in agricultural occupations, and a large portion of the remainder who are weavers, black-smiths, carpenters, and other artisans is just as much dependent upon the chances and fluctuations of that industry as are those actually engaged in agriculture. India is the home of agriculture and has been from ancient times the granary of the old world. Though it is so, the introduction of western ideas has set in an overwhelming tide of opinion against the continued ruralization of the people. Realising the fact that India was once industrially great and also taking a lesson from England, Germany, the United States and the various self-governing Colonies that excessive dependence on agriculture and the production of raw

materials for the benefit of more advanced industrial countries, is quite inadequate, it would only be just and wise, believing in the principle of diversity of industry theory, if we try to build up manufactures in the country. We are endeavouring to enter upon a new commercial policy and are doing so under very good auspices. We have the example of the foreign countries before us as to the courses and methods to be adopted to improve our industries. Our old arts and manufactures have decayed owing to the severe competition of production. These workers who were thus thrown out of employment in these old industries instead of adopting then a superior method of production had to resort to land. Now taking an example from the methods of western civilization, people are slowly trying to build up manufactures on the Factory System of Europe and America. We are hoping to become once again a great industrial nation not on the revivals of the old methods, but upon the adoption of the latest methods. We have to carefully examine the different methods adopted by other nations, especially those of the West, and profit by their mistakes. What the possibilities of our becoming an industrial nation again are, is well worth our consideration. The question of a country becoming an industrial country is mostly to be determined by the natural facilities it can command. We have first of all to consider the natural resources. Apart from this, we have also to consider the type of labourers. Labour is, and always has been, the fundamental basis of a nation's opulence and will be the great commodity of a nation's progress. No doubt, we have an abundance of labour at low wages, but they have to be trained in the use of the modern complex machinery, in other words converted into skilled labour. When the economic transition takes place, the independent craftsman will fall into the position of a wage earner; and the people from the villages will come over to large towns for the sake of employment and thus there will be a thorough change in the constitution of society. My paper is on the Economic Conditions of India, calling attention to her resources in the way of modifying and improving our economic condition. But we must remember Mills' fundamental theory of Capital, that "Industry is limited by Capital". If

India should want to introduce a new industry or rehabilitate the one already in existence or languishing, to utilise the raw material so much in abundance, she would require capital and unless this is forthcoming India will always remain in a stagnant condition. Affairs in Europe prior to the development of the Capitalist enterprise proceeded slowly just on the same lines as we find in India at the present moment. It is not that there is scarcity of capital in the country. We have ample resources for our present purposes, but it is the want of skill and experience, lack of machinery and severe foreign competition that are among the obstacles in the way of the development of the capitalist industry. Capital is necessarily and wisely timid in regard to new industries and undertakings, and in order to develop the resources and capacities of the country, the Government must lead the way by establishing state industries of a promising character and working them successfully, so that they may form as an incentive and encouragement to private enterprise. All the more incumbent is this on Government in India because it is well that in the days of Company Government all the forces of Government were directed to check Indian commerce and trade. The industrial policy of a nation is, therefore, not a mere bookish theory, but a practical work, based on existing political and economic facts. It should also be borne in mind that the vast enterprises of modern industry such as railways and mills which always require a larger outlay of capital before they can begin to be in any way remunerative.

There is neither time nor space on this occasion to trace the growth and nature of the institutions by which capital is collected and distributed, and to illustrate clearly how what has been saved by one man comes to be used productively by another. For the advent of the capitalist era, there must at first be the accumulation of capital, money must be found to make money. The method of finding money to finance a great industrial concern or a trade is perhaps the most important problem which the modern business world has to tackle. The science of financing is the method of raising money by contribution, and the employment of it in loans for carrying out public or commercial concerns. In Europe, the science of banking

business has reached a stage of perfection which admits of the financing of any great undertaking through the medium of bankers. The art of banking in India is still in its rudimentary stage; there is a great deal of moneylending at an exorbitant rate, but there are no facilities for raising money at cheap rates for industrial purposes. Mutual credit is at a low ebb. In order to achieve eminence in the new era of industrial development, a great amount of financial capacity, skill, insight and knowledge of financial operations are necessary. The business man and the industrial captain of today must possess the talent to turn over his capital much oftener than his ancestors did. Indians should learn financing in all its aspects. Many banking and industrial concerns today would have given far better results had the problem of financing not been neglected, and had those who had to buy or sell in foreign countries chosen the proper time to operate. This knowledge is obtained only by the study of economic, financial and monetary problems and these have become so prominent factors in the history of any nation, that they cannot be too carefully studied.

In laying so much stress on the study of banking I have not ignored the co-operative movement that is started in India in the direction of production and distribution which are bringing together men who have previously had no dealings with each other and it teaches us a lesson that self-help and co-operation are important factors in creating a bond of brotherhood between man and man.

What I mean by banking is the provision afforded for financing huge Joint Stock Companies and for providing, circulating capital for industry and commerce. It is only the development of banking which will permit of the systematic lending of capital by one man or body of men to another.

I hope that I have succeeded in bringing out some points of interest not only to economic students but also to those who have given any thought to the economic and social development of India which at the present time is of so vital importance to the welfare of our country.

OUR INDUSTRIAL FUTURE.

BY A. H. SILVER, Esq.

Cawnpore Wollen Mills Co., Ltd.

I make no pretence of startling you with new theories or even of setting forth old ones in a new garb. But I feel that when an opportunity such as the present offers itself of meeting in Conference a body of Indian gentlemen animated with the common object of furthering the Industrial progress of our provinces, advantage should be taken of it to repeat some of the axiomatic truths which are the foundation of industrial prosperity.

Firstly, let us take stock of our mental attitude towards labour, as such, and as distinguished from the practice of a profession. I do not think it can be doubted that a large—a very large—proportion of the aristocracy of India are inclined to regard all labour as menial and degrading, with the consequence that youths with receptive brains take up educational courses which can lead them only to appointments under Government, to clerical service or to practice at the Bar. How many of you, gentlemen, can point to youths of your acquaintance who, after receiving the foundations of education, have directed their later energies to an attempt to master the intricacies of a modern manufacturing industry? We speak glibly of the dignity of labour in the abstract; have we accorded the honour and dignity which are the due of the skilled craftsman? I hold that the man who can fashion crude metal into a useful utensil of beautiful design, the craftsman who from the raw fibre produces the means of clothing his fellowmen in fine raiment, is of more value to the community than the learned clerk who expounds the intricacies of our various Codes, and should be honored accordingly. Let education be regarded as the handmaid of industry, a means to an end rather than an end in itself. His Majesty the King Emperor, as you will have doubtless noticed, makes a special point of honoring the manufacturers of England by his visits, and the Government of

India are earnestly doing all that lies in their power to guide the undoubted skill of Indian people into profitable industrial channels.

Now at the last Congress held in Cawnpore (at which you did me the honor of appointing me President) my friend Rai Bahadur Pandit Bishambhar Nath said, in speaking of technical education:

' Though all knowledge is partly inherited in the blood and therefore so easily acquired by boys while young, the training of the eye and the hand is only specially successful when begun early in boyhood, for it is acquired largely by imitation and in associating with the skilled workers around you.

' For these reasons the artisans and mechanics, the artists and mechanicians of India have always put the boys to a course of apprenticeship in the workshops of their own guilds as early as possible in life. But this system has been found wanting and defective in these days of big factories and large concerns. Though it gives scope to the play of individual talents and energy it has failed to produce good captains of industry, skilled foremen, and talented managers.'

Why should this be, and what is the remedy, if any? The difference between the old style and the new is that the craftsman of old, who carried out all the operations of manufacture himself, is replaced by the skilled specialist of the new age, dealing only with one or two branches of the manufacturing processes involved in the production of the complete article of merchandise. This is not to be regretted, save by sentimentalists, for it is in accord with the economics of production, which demand a combination of labor without which, according to John Stuart Mill, there cannot be the first rudiments of industrial civilization. That great economist in 1848, or 65 years ago, wrote in terms of the backwardness of India in industrial matters, but spoke hopefully of the time when by the growth of India's export trade in products of the soil and the resultant increase in wealth the people of the land would have more extended wants and desires directed

either towards European commodities or towards things which would require for their production in India a larger manufacturing population. That time is *now*, gentlemen, and the object of this Conference is to see that the extended wants and desires of the people are met by our own productions rather than by importation from Europe or elsewhere.

And if we are to produce these requirements at a price which will enable us to compete successfully with the merchandise of western peoples, our own industries must proceed on Western lines. The only factor we have in our favor is that of cheap living, which in other word means cheap labor, but that factor can be nullified if our cheap labor is not utilized to the best advantage, which means by specialisation or combination. I don't think I can better illustrate the effectiveness of combination in labor than by quoting a report by M. Say which is included in J. S. Mill's work in a reference to the manufacture of playing cards. He says: 'It is said by those engaged in the business, that each card, that is, a piece of paste-board of the size of the hand, before being ready for sale, does not undergo fewer than seventy operations, every one of which might be the occupation of a distinct class of workmen. And if there are not seventy classes of work-people in each card manufactory, it is because the division of labor is not carried so far as it might be; because the same workmen is charged with two, or three or four distinct operations. The influence of this distribution of employments is immense. I have seen a card manufactory where thirty workmen produced daily fifteen thousand five hundred cards, being above five hundred cards for each labourer, and it may be presumed that if each of these work-men were obliged to perform all the operations himself, even supposing him a practised hand, he would not perhaps complete two cards in a day; and the thirty workmen, instead of fifteen thousand five hundred cards, would make only sixty.'

But don't run away with the idea that I am decrying village industries as opposed to large factories—far from it. I believe that there is a wide field for both, but the village

industries need to be organized and with the help of you, gentlemen, they *can* be organized. In the few minutes which are at my disposal I cannot here enlarge upon details of possible organisation, but with a beneficent Government anxious to help, I foresee that within a period of a very few years we shall have a revival of our smaller industries based upon a more economical division of processes. You, gentlemen, can help largely in this revival by exercising a little care in your purchases. As John Ruskin points out at some length, whenever you spend money, you set people to work, greater or less of course, according to the rate of wages, but in the long run, proportioned to the sum you spend. Many unthinking people, because they see that however they spend money, they are always employing somebody, and therefore doing some good, say to themselves that it is all one how they spend it. Adopting John Ruskin's argument to our case, let us assume that whenever we spend ten rupees we provide an equal number of people with healthy maintenance for a given time. But by the way we spend it, we entirely direct the labour of those people during that given time, and compel them to produce for us a certain article. It is for us to decide whether that article shall be a useful, beautiful and lasting one calling forth skill on the part of its producers, or a useless and perishable one needing no special exercise of handicraft and of interest only to ourselves. We have maintained in each case the same number of people, but in one case we have directed their labour to the service of the community, in the other case you have consumed it wholly upon yourself. I think I have said enough to indicate how, in this manner, you may help to stimulate the craftsmen of your country to the production of merchandise which shall be a credit to themselves and to the community.

I had intended saying something about the possibilities which are opened up by the prospect of an early opening of the Technological College for these Provinces, and of the means by which our industries can best utilize its advantages, but I fear I have already transgressed beyond the space usually allotted to a paper at these conferences. I would, however, like to urge just one more point upon this conference

before closing and that is with regard to the great harm which is done by the slavish observance of the many holidays current in these Provinces. I know it is only human nature to take advantage of any excuse for a day's rest from work, but if we are to succeed in reviving our industries we must restrain that inclination. I need hardly tell you that the ultimate or minimum cost of production is the cost of living; that the minimum cost of an article is the original cost of the raw material plus the cost of subsistence of the worker during the time he is engaged in transforming the raw material into an article of commerce. Thus we suppose three men, A, B and C. A is a skilled workman and produces the article in 3 days working a normal number of hours. B is an average workman slightly less skilled than A and takes $3\frac{1}{2}$ days for the same task. C, on the other hand, observes certain festivals while engaged in the manufacture of the article and is consequently employed upon it for 5 days. In order to exist C must get the cost of 5 days living for his wages, but B can sell the same article for $3\frac{1}{2}$ days' wages, and C therefore loses his business. A, on the other hand, although he has worked for 3 days only will probably sell his article at the same price at which his competitor B, the average workman, has to sell in order to live, and consequently reaps the fruit of his skill. This is but a homely example in homely words but I think you will appreciate the point and realize that unless an Industry be carried on with energy and perseverance it must fail. I refuse to believe that energy and perseverance are lacking, they merely require directing into the right channels, and the earnest attention which you, gentlemen, are now bestowing upon the subject will, I am confident, eventually bear fruit in the shape of a revival of industry in our midst.

DEVELOPMENT OF BANKING IN INDIA .

BY SORAB R. DAVAR,

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Law and Banking.*

Banking enterprise in India seems to be developing to a large extent and there are many who seem to be a little nervous over the sudden increase in India in the number of Joint Stock Banks during recent years. It is of course a matter of common knowledge to all students of Banking, Commerce and Economics that the only medium which can stimulate enterprise both in the departments of business and industries is a well organised Banking Community which would serve as a main reservoir of all extra wealth which forms part of the savings of a nation and redistributes same in the channels where it would be most profitably employed to the advantage of all three, viz., the investor, the borrower and the Bank. The larger the number of Banks the better we should be in regard to our capacity to launch into various enterprises which the unexploited resources of this country open out to us. The only point is that in the interests of the public in general and particularly for future of Banking enterprises themselves in India these concerns should be well organised and conducted on proper lines by men of acknowledged ability and integrity. Of course safeguards by way of careful legislation are absolutely necessary in public interests to protect the investors against any dishonest dubbling with their money and whenever Bank-Managers and Directors are found guilty of fraud or

negligence they should be severely dealt with. But it cannot be denied that, with all that legislature has done and will do in future, much will depend on the business morality of those in control of Banking Institutions. Business education would do much to supply qualified men to work these Institutions and would also in a large measure maintain the high moral standard required as the responsibilities of office and the great stake involved in perfect working of such Institutions are more likely to be appreciated by trained men.

Banking is based on credit. The importance of this fact is usually lost sight of by an averageman. It helps men to put through a transaction of a lac of rupees with hardly one-tenth of the actual money in cash. It is therefore quite imperative that public confidence should be maintained. A panic caused by the failure of two or three Banking Institutions would soon spread into a catastrophe which might involve even the best of Institutions in the whirlpool. Large payments in the Business World are made by cheques. These cheques are nothing but instruments of credit. The payees of these cheques seldom go and demand cash for them. They generally pay them into their current accounts with a Bank. The Bank simply passes an entry in their books adjusting this item by means of clearing with the Bank against which the cheque was drawn. The Bills of Exchange also perform the functions of money and that to a greater degree as they are generally drawn for periods varying from one to six months and during the time of their tenure they pass from hand to hand every time helping to settle some business transaction which in absence of the facility afforded by Bills would in a large measure not have seen the light of day. Prof. Sykes in his excellent Book on Banking says that if these cheques and Bills are by law prohibited there would not be sufficient gold and silver in the world to make coins to answer the business demands of the modern world. The fact that these cheques and Bills circulate not only in place of actual gold and silver coins but in addition to it, is borne out by the figures given by Mr. G. H. Ponnall. In London the whole of the circulation is given as follows :—

Coin	...	...	1 per cent.
Notes	...	...	2½ "
Cheques and Bills	...	...	96½ "

This shows how highly developed is the system of credit in that Metropolis of the Business World and also demonstrates to a large measure the extent of public confidence enjoyed by Bankers in that City. It should be always the endeavour of all Indian Bank Managers and Directors to win over the confidence of Indian investors and to break them of what is frequently called the "Hoarding Habit." In old days when both life and property were insecure, such a habit was quite in accord with the circumstances but in these days of settled Government there is no reason why the public should not be induced to get into what is known in England as the "Banking Habit" in a greater degree day by day. I am sure our leaders of Banking enterprise would see that the moral tone of our Banking Institutions is zealously maintained to a very high level.

India is essentially an agricultural country and is likely to remain so in a large measure. We hear repeatedly of our small cultivator and producer being ruined by the village sabukars. This evil is not peculiarly the product of our country but in the various agricultural districts in Europe the small cultivator was in a similar situation until what are known as Co-operative Credit Banks were established all over Germany, Italy and the Continental countries. This system of Co-operative Credit Banks brings, through the medium of Association, all the advantages of credit one finds enjoyed by businessmen in a business city, within the reach of these small agriculturists and help them to secure loans at a reasonable rate for which they had formerly to pay heavy interest invariably to their ruin. This is done by bringing into existence in every village an association of fifty to one hundred small cultivators. These cultivators make themselves jointly and severally responsible for debts contracted by one of their

members with the consent of the general body. These associations are run on the principle of unlimited liability and each of these banks is open to agriculturists only and that too of their own parish. These banks make loans only for productive purposes to its members and for every loan ought to be produced two sureties who should also be members who guarantee that the loan is for a strictly productive use. Every member as is usual in a village community, is known to others and generally speaking there is no possible chance of any one getting a credit or advance he does not deserve. The Bank insures the articles such as tools, machinery, cattle, etc., for the purchase of which loans are made. Each of the members is made to take up one share. These banks are not intended to work for profits but the idea is to arrange facilities for small loans to its members. These banks also exercise indirectly a beneficial influence in improving the general moral tone of the village community because a drunkard, a profligate, or an idler, would not stand any chance of being supported by his fellow villagers. Efforts are being made in India to encourage the spread of similar Institutions and let us hope that they would conduce to the advancement of our agriculturists as in the case of the various European countries.

After I had written the above I read the telegrams from different parts of India announcing failures of some of our indigenous banks. Regrettable as these ugly incidents undoubtedly appear to all friends of Indian Banking enterprise, it has neither alarmed nor surprised the students of Banking History of Europe. The whole of the History of English or Scottish Banking is punctuated with failures of various concerns though during recent years such failures have grown rarer. This is owing to both the Financiers and the public having learnt to be more cautious in their dealings with past experience. The same process would have to be gone through in India though, fortunately for us, we shall learn our lessons at much less cost as we have the experience of Europe to guide us. We should impress on our countrymen not to be too nervous when they hear of the failure of any concern and

make a run on all other concerns where they may have deposited money because by so doing they would be committing financial suicide. This tendency was noticed in India during the past few weeks following up on the failures of one of two of our indigenous Banks and it is a matter for congratulation that results have not proved as disastrous as one would have expected. The fact that our Indian Banks have stood the test of these frequent runs is in itself a great factor in support of the contention that our men can manage Banking concerns on Western lines as well and they did and do our Oriental Pehdies of Shroffs.

THE PRESENT DOWNFALL OF SWADESHI BANKS.

Its causes and precautions necessary
to avoid a recurrence.

(B. B. MASTER, ESQR, F. C. R. A. &c.,
Corporate Accountant, KARACHI.)

I consider it an honour to be called upon by the Indian Industrial Conference, as well as by the Government in their letter No. 3832 of 17th instant to give my opinion on the proposed Banking Legislation.

Some six months ago, my wide experience in this line led me to believe that most of the Swadeshi Banks in the Punjab and Bombay were working on defective financial methods. I then knew that their fall was certain and I expressed these views to some of the leading gentlemen of Karachi who are now convinced of the truth of the statement.

IMMEDIATE STARTING OF MANY BANKS.

There was a field for banks in India, but as usual with the Indians, success of one or two led many to follow suit. The result was immediate competition. In order to make business remunerative headlong anxiety was shown to advance money to traders who seeing money thus easily obtainable went headlong into all sorts of speculations in land, cotton, grain, resulting in sudden rise of prices in all articles and properties and in fact this is one of the main reasons of high prices of

food in India. The speculation continued. The merchants who speculated more, were taken as large merchants.

However great the present shock may be, however much it may have ruined the people, however serious the present position may be, such is human nature that all these will soon be forgotten and the same financial methods will again be adopted, unless the people are fully made known of the numerous causes of the present crisis.

There is another fear that on account of the recent failure of many banks, the illiterate class of people would again stick to the old method of hoarding up money in their coffers, thereby causing a loss to themselves and the public.

It is therefore necessary for the future progress of India that their doubts should be cleared at the present stage. Banks play an important part in promoting the trade of the country and under no circumstances can India do away with Swadeshi Banks, even if she has recently suffered heavy losses. There is urgent need for legislation for control and guidance of Swadeshi Banking enterprises. England has known the difficulties and dangers arising from Banks investing too much in industrial enterprises. The great aim of banks is to advance loans for short periods only, and on securities which are easily realisable.

At this stage I respectfully beg to suggest to Government some of the points which are necessary to be inserted in the Indian Companies Act with a view to strengthen the position of Swadeshi Banks, as desired in their letter quoted above.

I. It is not advisable to force the new act on shroffs or Native Bankers. They do not advertise for

deposits as ordinary Banks do. It is left to the investing public to decide whether to deposit their money with Shroffs or to deposit it in Banks brought under new legislation. This class of bankers is known in the History of India for a long time past and India's advanced position in trade is to some extent due to the facilities given by such Bankers to their clients. This class may therefore be exempted from the new legislation, provided it does not advertise for deposits.

2. That the Registrar of Joint Stock Companies shall have the power to eject any of the clauses from the Memorandum or Articles of Association which may be found objectionable or against the interests of the public. They shall have to be approved of by him before they can be issued to the public.

The above clause is necessary because in one of the Companies started by Lala Harkishen Lal, there is a clause that no shareholder of that Company can transfer any of his shares without obtaining permission from the directors to transfer it to a particular person.

3. That one third of the subscribed capital shall be paid up within one year of the registration.

4. That in all six monthly reports shall be stated whether the Reserve fund is employed in business, or is invested in outside securities, and if so, name the class of securities, so as to enable the shareholders to fully understand the position of the Bank.

No restriction need be imposed to invest the Reserve Fund only in Government or authorised securities.

5. It is not desirable to force the directors and shareholders to carry the net profit of the first few years to the Reserve Fund.

6. To fully protect the people from the recurrence of such crises it is highly necessary that English and

Foreign Banks in India should also be registered under the new act. India has suffered heavily on account of the failure of Foreign Banks too.

7. That the directors shall be jointly and severally liable for the mismanagement and fraudulent maladministration of Banks and their liabilities shall be unlimited.

The present break up of Swadeshi Banks is to a certain extent due to the negligence and liability of directors. Most of them were unfortunately such as may be divided into two classes :—

(a) Those entirely ignorant and guided by Managers in whom they had full trust.

(b) Those in want of money. They remained silent because of their own wants and purposes. They did not show a proper sense of responsibility in dealing with the funds entrusted to them.

8. That auditors shall be liable for *Knowingly* or *Negligently* certifying a balance sheet showing fraudulent maladministration.

Most of the auditors were in need of business and they succumbed to the manager's arguments and requirements.

9. That no one holding office as Manager or Managing Director of a Bank shall do any private business.

The above clause is necessary because the present downfall is due mostly to Managers and Managing Directors themselves being traders and speculators. Seeing lacs of rupees handy, they had great temptations which they could not withstand.

10. That an auditor shall have full power to bring to the notice of shareholders any mismanagement or fraud or unsound methods adopted in the conduct of the business and that no auditor shall be removed from his office unless there are strong reasons which shall have to be proved in a court of law.

11. That auditors at present carrying on the business of auditing shall apply to the Government for permission to work as such. That an examination in auditing shall be held once a year and only those who possess a certificate of this examination shall be eligible for election as auditors on and from 1st April 1914 except those who have got permission from the Government before this date.

12. That a bank may advance money to its directors on substantial security but not on that of the shares of the bank.

13. That no petition for the winding up of a bank shall be heard unless it is supported by shareholders representing one third of the share capital.

14. I beg to differ from the following views of the Karachi Chamber of Commerce:—

“That as at present efficient and reliable auditors possessing the confidence of the public do not seem to be available outside the ranks of chartered or incorporated Accountants, the audit should be done by Chartered or Incorporated Accountants.”

I beg to differ from the above views on more points than one:—

(a) In the case of one of the banks which lately failed, it was found that a Chartered or an Incorporated Account is not infallible just as a barrister or solicitor is not. It all depends on the character of the man.

(b) It is, in justice to some of the accountants in Bombay and elsewhere who are efficient and reliable and possess the full confidence of the public, as Messrs. Bilimoria & Co. in Bombay, and others.

(c) Some of the leading accountants of England such as Mr. Dickshee and others are corporate Accountants (not chartered nor Incorporated.) They enjoy a prominent position and are considered reliable authorities whose text books on auditing are made use of by Chartered and other students, appearing in examinations.

I beg to give below some of the points, a knowledge of which is indispensable to auditors. The present crisis would not have been so serious, had auditors done their duty.

The Balance Sheets of some of the banks which lately failed, contained such false accounts to maintain the confidence of shareholders or the public, in the shape of increasing the commission on the net profit payable to them.

I. An auditor is liable in the event of winding up to contribute to the company any loss occasioned by misfeasance or breach of trust on his part. He is liable to fine or imprisonment for signing a false Balance Sheet or report, knowing it to be false. He has to make good any damage resulting from such negligence.

In a case against the auditors of the London and General Bank which was being wound up, the court held that the failure of the company was principally due to the fact that large sums had been advanced to customers on loan and current account, in respect of which the security lodged was entirely insufficient and the divi-

dends in question were paid off from sums taken to the credit of the profit and Loss Account in respect of interest on such advances, which interest was never as a fact paid. Had proper provision been made for debts in respect of sums advanced and interest accrued thereon, the accounts of the Company would not have shown a profit but a loss. That the auditor was liable to refund by way of damages the amount of dividend on the ground that he was aware of the critical position of affairs and acted negligently in not reporting the facts to the shareholders, although he reported them to the directors.

The affairs of some banks which lately failed show in many of their advances that the banks were in fact short of security. They had no tangible security. A greater portion of the amount due to depositors was advanced to such concerns as were not in a position to repay at call.

II. In the case of the Irish Woolen Co., Ltd., V. Tyson auditor and others (1900) it was held that an auditor is liable for any damage sustained by a Company by reason of falsifications which might have been discovered by the exercise of reasonable care and skill, in the performance of the audit. The invoices outstanding at the date of the balance sheet were suppressed, thus reducing the amount of purchase and the amount of creditors. The goods were however taken into stock and a fictitious profit was therefore shown to that extent.

III. In the case of Leeds Estate Building and Investment Co. V. Shepherd it was found that according to the Articles of Association of this Company, no dividend was payable

In the case of the London and General bank, Lord Justice Lindley states "An auditor is not a servant of the directors. He is appointed by the company to check directors. He is an officer of the company."

A FEW POINTS FOR DIRECTORS TO NOTE.

I. The directors of some of the banks which recently failed, who are really innocent, can, I believe, take advantage of the following decisions:—

"A director if he acts *bonafide*, is entitled to rely on the officers of the company to prepare true and honest accounts, as was decided in the case of Dovey V. Cory, National Bank of Wales, case 1901, Kingston Cotton Mills, Co Ld, No: 2.

II. In the case of Verner V. General, and Commercial Investment Trust Ld. 1894, it was held that dividends must only be paid out of profits and never be paid out of capital and if the Memorandum or Articles of Association give power to the Company to do so, such power is invalid.

III. Directors who knowingly pay dividends out of capital are personally liable to make good the amount of such dividends to the company as was decided in the case of Oxford Benefit Building Society 1887, London and General Bank 1895, Kingston Cotton Mills Co. 1896.

IV. Directors may be liable for improperly obtaining qualification shares from promoters or vendors as was decided in the case of Ravigne 1877.

Or for receiving gifts of shares from the vendor as was decided in Portage Stamp Co. 1892.

Or for making gifts to themselves without the sanction of the Articles (Geo Newman & Co. 1895).

Or for making illegitimate profits by dealing in the company's shares (Parker V. Mc. Kenna 1875).

V. Directors are liable to the Company for the assets which have come into their hands or are under their Control.

In the case of the Great Eastern Railway Co. V. Turner 1872 Lord Selbourne states "The directors are the mere trustees or agents of the company, Trustees of the company's Money and Property, Agents in the transactions which are entered into on behalf of the Company."

ORIGIN OF BANKING.

In various shapes and forms, banking is of great antiquity. It is said that Bills of Exchange were known in Assyria and Babylon and that Jews derived much of their banking knowledge during the period of their captivity. The banking was known to the Greeks, the Romans and the Jews. Although Lombardy and Venice are so closely connected with early banking, it has been asserted that modern Banking owes most of all to the money lenders of Florence, who were well known and had connections all over Europe in the 14th Century.

One of the most celebrated banks belonging to what may be called modern times, was the bank of Amsterdam established in 1609. It was the first to perform all the principal functions. Amsterdam was the central exchange of the world and the Dutch were very proud of their Banks rightly considering them to be largely responsible for their own prosperity.

The history of the banking in England does not really begin, until the foundation of the Bank of England. The functions of banking so far as they extended had been carried out by the Gold-smiths, and some of the oldest private banks are descendants of celebrated goldsmith firms. The goldsmiths had strong

except out of profits and no profit was made by this Company, during the whole period. The shareholders brought an action against the directors, The Manager and the auditors to make them liable in respect of certain sums paid out of capital as dividend. The Balance Sheets were false and misleading and contained fictitious items. They were prepared with a view to declare dividend. The directors *were not aware* that dividends had been paid out of capital or that the Balance Sheets were inaccurate. In the course of his judgment, Justice Sterling said "It is the duty of the auditor not to confine himself merely to the task of ascertaining arithmetical accuracy of the Balance Sheet but to see that it is a true and accurate representation, of the Company's affairs. It was [no excuse that he had not seen the Articles when he knew of their existence."

- IV. In the case of the London Oil Storage Co. Ltd., V. Shear Hasluck & Co., it was held that an auditor is liable for any damage sustained by a company by reason of his omission to verify the existence of assets stated in the Balance Sheet. It was an action brought by the company for damages for alleged neglect by the auditor in omitting to verify the existence of a sum of £ 760/-, shown in the Balance Sheet as petty cash in hand. As a fact the balance in hand was only £ 30., and the difference had been misappropriated by Secretary who kept the petty cash book. The auditor did not count the balance in hand but merely referred to the petty cash book to

see that the amount shown in that book agreed with that shown in the Balance Sheet. The Chief Justice Alverston held the auditor had committed a breach of duty.

V. STOCK-TAKING.

In the case of the Kingston Cotton Mills (No. 2. 1896) there was a charge against the auditors of the Company that the profits of the Company were fictitiously increased by deliberate manipulation of the quantities and values of the stock in trade. Whether the auditors were guilty of negligence in accepting the certificate of the manager as to the correctness of the stock in trade without checking the stock in detail, Lord Justice Lindley gave the following Judgment. :—

“For several years frauds were committed by the manager who in order to bolster up the Company and make it appear flourishing when it was the reverse, deliberately exaggerated both the quantities and values of the cotton and Yarn in the Company’s mills..... It is no part of the auditor’s duties to take stock. He must rely on other people for the details of the stock in trade in hand. They are not guilty of negligence if they accept the certificate of a responsible official in the absence of suspicious circumstances.”

VI. The remarks of Lord Justice Lindley in re London & General Bank, No. 2. 1895, are worth noting.—

“The auditor is not bound to do more than exercise reasonable care and skill in making the enquiries and investigations. He must be honest that what he certifies is true. “He must not be hurried into signing a report or balance sheet until he is fully satisfied. He must be honest, cautious, accurate prudent, and practical possessing common sense.”

VII. An auditor is the representative of the Shareholders and not a servant of the directors.

rooms to preserve their own property and when law and order were not so well established as at present, it was considered an excellent plan for private individuals to utilize these strong rooms, the goldsmiths undertaking to restore goods and money entrusted to them when called upon to do so.

The credit of devising and founding the Bank of England in 1694 is due to William Paterson, a Scotchman.

Speaking on the Bank of England, Adam Smith says "She acts not only as an ordinary bank but as a great engine of the State." So high is the credit established that there is a saying "safe as the Bank of England." As Bills of Exchange form the best part of investments for surplus funds, the Bank of England is naturally anxious to obtain a good share of that part of the business. The investments are in first class securities which are easily realisable in case of necessity.

Banking in Scotland is eminently successful. In fact no other people possess so many facilities for banking as the Scotch. The nature of securities which a banker should accept in return for the loan he grants to his customers requires particular attention. His chief care is to see that the securities can be readily turned into money, if the occasion arises. A banker must never forget that he, in the course of his business, has laid himself under the necessity of providing gold on demand for his customers and his failure to fulfil his obligation on any occasion would spread distrust and probably entail ruin on large numbers of people. In his operations therefore he must bear in mind that it is of paramount importance that he should always keep in hand or possess in some easily convertible form, a sufficient supply of gold to meet his average requirements and take care that his best investments are such that he can meet if necessary the whole of his obligation.

Lastly I beg to thank Messrs. Dickshee, Stevens, Spicer, Pegler for the aid they have rendered me in preparing this article.

THE TRANSITION IN THE INTERNAL TRADE OF INDIA.

BY PROFESSOR RADHA KAMAL MOOKERJEE, M.A.,

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There is, at present, going on a gradual process of change in the methods of trade organisation of India. Not only the middleman who carries on his trade individually with his own small capital but also the method of his buying and selling are gradually becoming things of the past. The middleman now carries on his trade on an individual proprietary basis. Again he purchases and sells at retail rates, and he deals only with those commodities which are purchasable and saleable in a particular locality. He commands a local area selling all the characteristic economic products of that area. In India, the specialisation in the trade in the economic products is not carried to as great an extent as in the west, but is dominated by the conditions of the local area exploited and served. Throughout the country no shop specialises in oil, ghee, sugar, or in food-grains. Very frequently the shop sells all the food-grains, salt, sugar, &c., all the commodities which are required for Indian consumption. Only in towns some specialisation has been effected in the sale of cloths and of toys and trinkets, imported from abroad, in villages there is little specialisation. All these main features of the present internal trade of India are disappearing as trade increases in volume and extent. The retail trade will be superseded by wholesale trade. The trade on an individual proprietary basis will give place to trade on joint stock basis, where gains and losses will be shared by a few individuals. Again specialisation will be more fully carried out. As means of communications are developed, trade will come to be localised. Each locality will come to specialise in the

trade of commodities for which it has some natural advantages. These changes have already begun. We are actually in the midst of the transition and already some characteristics of a more developed and better organised trade system have made themselves manifest.

The transition is not easy and will take a long time, and might be accompanied by much suffering, it may be temporary, of particular classes of traders and middlemen. Again, the change will lead to permanent suffering of all classes of people if the specialisation in trade due to an efficient trade organisation is carried beyond proper limit. In an agricultural country, specialisation in agricultural trade industry should be limited by the character of the community's characteristic needs. Each locality must have the requisite supply of all the necessary food grains produced by its own agriculturists. Where this is not the case, trade becomes a means not of service but of exploitation.

Unfortunately in our country our internal trade guided by foreign merchants is gradually tending to exploit our agriculture in the interests of foreign countries. The exports of rice and wheat have been steadily increasing while their production has not extended in the same proportion. On the other hand, the increasing demand for raw materials for manufacture of jute and cotton, oil-seeds and dyeing stuffs has led the same tracts to the actual contraction of the areas under rice and wheat. In the eleven years ending 1911 the increase of exports of rice and wheat has been steady and continuous with but slight fluctuations even in famine years.

	1901	1902	1903	1904	1905	1906
Export of rice in	34	47.4	45	49.4	48	38.7
million cwt.	1907	1908	1909	1910	1911	
	38.2	30.2	29.2	48	52.4	
	1901	1902	1903	1904	1905	1906

Export of wheat in million cwt.	7.3	10.3	25.9	43	18.7	16.
	1907	1908	1909	1910	1911	
	17.6	2.1	21	25.3	27.2.	

But the areas under rice and wheat have not increased in the same proportion.

	1901	1902	1903	1904	1905	1906
Area under rice in million acres.	70	71.6	69.6	73.5	73.4	73.5
	1907	1908	1909	1910	1911	
	75.9	72.8	78.7	78.5		
Area under wheat in million acres.	18.6	19.6	23.6	23.5	22.4	25.1.
	18.4	21.2	22.7	24.4		

On the other hand the area under non-food products is steadily increasing.

	1901	1902	1903	1904	1905	1906
Area under jute in million acres.	2.2	2.1	2.5	2.9	3.1	3.5
	1907	1908	1909	1910	1911	
	3.9	2.85	2.87	2.98	3.1	
Area under cotton in million acres.	10.8	11.1	11.9	13	13	13.7
	13.9	12.9	13.1	14.4		

The area under food-grains increased by 7.17 p. c. only, while that under cotton and jute together increased by 50 p. c. in the 10 years ending with 1906. The total increase in cropped areas during the 12 years since 1892-3 was 17.4 mill-acres—or about 8 p. c. It was thus distributed :—

Food crops—5.4, mill-acres or about 3 p. c.
Non-food crops—12.0 „ 29 p. c.

Thus more than $\frac{2}{3}$ of the added acreage during the period was for the cultivation of non-food crops and less than a third for food-grains. But the most alarming fact of the position is that the extensive growth of raw materials for foreign export is continued in the face of a stationary or falling range of prices and concurrently with it. The prices of raw materials shew an unmistakable ten-

dency to a fall. Jute is an exception, being our practical monopoly. The price of jute has increased by 100 to 150 p. c. But tea and indigo have declined and linseed and raw cotton have remained nearly the same.

	1873	1883	1903	1908	1912.
Jute, per bale	Rs.	Rs.	Rs.	Rs.	Rs.
of 400 lb.	18½	17½	37	45	55
Cotton, candy	255	200	192	267	261
of 784 lb.					
Tea, lb.	As. 8,	5½,	5,	6½,	7

Thus in spite of declining or stationary prices the Indian cultivator grows more and more raw materials for foreign export in preference to food stuffs ; and yet the home demand for food crops is continuously increasing on account of the steady growth of population, and their prices rising phenomenally.

Index numbers of prices of the principal food-grains, rice, wheat, *jawar*, *bajra*, *ragi*, gram and barley.

1873	1898	1899	1900	1901	1902	1903	1904	1905	1906
100	139	187	192	157	141	126	117	147	179
1907	1908	1909	1910						
180	231	195	168						

The reason of Indians peasant's preference for the production of non-food products for the foreign market is his growing dependence on the foreign trader for his cultivation. We have already described in the last section the system under which the foreign exporting firms and their local agencies supply the cultivator with cash advances. In tracts where the peasant is hopelessly poor and indebted and cannot even procure the money-lender's aid, he is forced to seek and accept advances from the agents of the European firms and grows raw materials for the European markets in preference of food-crops consumed in the country. The case of jute cultivation is exceptional, the cropping of

jute on the whole more profitable to the peasant than that of food stuff. The peasant gets ready money in his hands and feels that a bag of money is worth the same or even more than the granary of his yard, though he sometimes receives a rude shock when in a time of scarcity he has to realise painfully that money is not grain, and jute cannot satisfy hunger. But the exception in the case of jute cultivation does not mitigate the gravity of the general agricultural situation in the country, the growing subservience of our peasant to the foreign exporter and the consequent danger to the food supply of the people. Our agriculture is coming gradually under the direction and control of the foreign merchant, and if the process of exploitation of our agriculture in the interests of the foreign merchant continues for long, the whole nation will be reduced to the condition of serfs in its own soil.

It is remarkable that the net work of railways in the country helps this process of exploitation. The railways have, indeed, conferred some important boons on our society. The growth of passenger traffic shows the importance of railways to the people. Pilgrimages have now become easier, their cost has become trifling and the journey rapid, and thousands of pilgrims from remote distances can now attend religious festivals. The railways are bringing the people of India in different provinces into more close and intimate connection, the annihilation of distance thus contributing to the formation and development of an Indian nationality. Economically, the railways can carry food in time of need from prosperous districts to famine-stricken areas. Indeed, the function of railways as carriers limit their use. The railways are not producers, they cannot create agricultural wealth. Their function is to distribute the wealth already produced in the country. Where the distribution of wealth is carried on in a way injurious to the real interests of the people, railways do more harm than good. In India the effect of railways

very often becomes not equal distribution but the depletion of wealth. The railways guided and controlled by the European mercantile community have become agencies of a trade system which has been exploiting our agriculture in their own interests. So far as our industries are concerned, the railways have not given them any encouragement. The freight charges are often too high and these high rates prevent the development of our cottage as well as factory industries. In America and Europe, cheap freight charges have played a very important part in developing infant industries. In India the railways fail to utilise the industrial resources, while they are exploiting our agriculture in the interests of the European merchants. These men are powerful in India and in England and are pressing programme after programme of railway construction in the country. The Government should resist this pressure in view of the larger interests of the people. The railways, indeed, now rest on a sound commercial basis, and the Government might use loans raised by it for purposes of railway construction. But it is not proper that any surpluses left after public expenditure should be devoted to railway construction. Unfortunately the public opinion with regard to this question is not at all strong. What is wanted in our country is a clear knowledge of the comparative economic importance of railways and waterways. We have already pointed out that waterways ought to be looked upon as an essential and necessary supplement to railways in this country. Bulky goods, raw materials which are cheap and cannot bear costs of carriage, commodities which need not require rapid transit should be transported by waterways. It would be an economic loss if railways are used for their transport. Again, in India the rivers are the easiest and cheapest means of transport to the small peasant proprietors, and petty artisans and traders. Where trade has not been centralised, the commodities are generally small in bulk and amount, and the traders and producers can conveniently

hire small boats, consult their individual convenience during the journey and conduct the sale themselves. Further the facilities which waterways offer for irrigation and drainage purposes are most important to an agricultural community. Thus while railways have been mere carriers of wealth, waterways are carriers as well as producers of wealth in the country. The railways have been obstructing drainage in the country. The Indian Railway Act, indeed, requires railway administrations to provide waterways sufficient to enable the water to drain off the land near or affected by the railway as rapidly as before its construction, but it is open to question whether it is *physically possible to do so*, and there is no doubt that in areas liable to inundation, the embankment does frequently alter the drainage of the country. On one side the floods are deeper and last longer than before, and soil becomes water-logged; on the other, the land does not receive the same amount of moisture or the same fertilising deposit of silt.¹ This water-logging is no doubt one of important causes of malaria which has resulted in low vitality and diminished economic activity of the people. Waterways provide facilities for drainage and irrigation,—leading causes of the prosperity of an agricultural community. Our waterways, however, are now declining to an alarming extent. India is gradually losing her natural facilities for irrigation purposes. Even drainage is suffering. The river-beds have been heightened in some tracts to such an extent that the drainage is away from instead of towards the rivers.¹ Rivers are silting up at their mouth and become more and more useless for trade and irrigation purposes and make a whole district malarious. Thus the paramount importance of the improvement of our waterways is easily understood. Not only for the sake of trade and irrigation, not only for agricultural prosperity but for the very health and well-being of the agricultural community, systematic measures have to be adopted to improve the navigation of

¹ The Census Report, Vol. V, 1918.

our waterways. Instead of spending more and more on the extension of railways, the Government of India should begin to devote increased sums of money towards the improvement of the waterways. The Famine Commission recommended that 20,000 miles of railways would be practically sufficient, so far as protection from famine was concerned. That limit had long ago been reached. But we are still having more railway lines. More lines do not mean greater immunity from famines, they mean greater facilities for exploitation which is the cause of famines. More expenditure on waterways means greater facilities of trade and irrigation, better drainage and increased agricultural wealth and well-being of the people. But the railways are not solely responsible for this exploitation. The entire organisation of trade in which the peasant is helplessly subservient to the foreign exporter is responsible for this process. Such a system requires a thorough modification. Our trade is now guided by foreign merchants, financed and directed according to their interests. Our system of transport is made to suit their needs, and our agriculture, which is our national industry is now coming to be exploited for the markets of foreign countries. A more alarming situation in economic life can hardly be conceived! In order to prevent the system of foreign exploitation of our agriculture which makes us more and more dependent on the markets of the world and threatens to jeopardise the food-supply in our home market, the present system of agricultural credit has to be reorganised. The reorganisation of trade must be preceded by the reorganisation of credit. If the peasant becomes no longer dependent on the European merchants for the cultivation of his crops, he will not cultivate such crops which are not more profitable and which do not satisfy the hunger of his family, ever on the verge of starvation. How agricultural credit can be reorganised and the sale of agricultural crops made to serve the economic needs of the village are therefore two of the most important problems of

our economic life. There is, no doubt, that co-operative credit and co-operative sale of agricultural crops among villages will be important steps in this direction. These questions, however, cannot be discussed within the short compass of the present paper.

THE PLACE OF INDIAN ART IN INDIAN INDUSTRIES.

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Of the many questions that have a direct bearing upon the problems relating to the industrial possibilities of India the determination of the place of Indian art in Industrial products is one. There is an inseparable association between art and industry. They are interdependent and should not be treated as entirely different and distinct things. Every industrial commodity requires a certain amount of artistic understanding ; " industry without art is brutality."

All manufactures and industries, either domestic or artistic, have, as a matter of fact, come into being primarily to meet the requirements of civilised man. Some of these requirements are entirely essential from the standpoint of utility and material comfort ; others may be considered to have little pretension to utilitarianism. The former is identified with industry, the latter with art. Now it has to be determined whether there exists a mutual relationship between the two, and, if so, what ; whether industries have a place of their own entirely independent of art or whether art is essential to all conditions of industrial manufactures. The popular idea of to-day is that art is cultivated for the sake of art only, that it is seldom utilitarian and that it is scarcely associated with any object of our daily home life.

This is the reason why art is not given the benefit of serious consideration and is held at best, as something serving the ostensible purpose of a fashionable superfluity or decoration. But is this really the purpose and mission of art? Are its qualities matters of indifference to all conditions of industry or are they, on the other hand, of vital importance to the welfare and progress of all industrial pursuits? It has to be admitted that art as applied to industry has chiefly a decorative significance. But this function of decoration is not entirely sumptuary or superfluous; on the other hand, it is essential. Art has many possibilities but its chief end is use. Mere substance has no utility. It is the form of a substance that makes it an object of utility, and it is with the form of things, which are necessary for life, that art is concerned. A bundle of wool has no utility, till it is converted into some kind of cloth or fabric by means of industrial art.

The masses are heedless about art and the popular idea is that art is distinct and distant from life. But all healthy human nature is wedded to the ideals and sentiments of art. We may not be always conscious of it, just as we are not always conscious of the atmosphere in which we live and breathe. The artistic temperament, the emotion that appeals to our sense of decorum, is a part of our normal faculties, and we exercise it daily, as we live, much oftener than we are conscious of actually doing it. Every one of us has his likes and dislikes, admiration and repugnance for things both of utility and inutility. The faculty that prompts us to make this selection is present in us all and we always make use of it in the adjustment of things that we wish to have either as essentials or embellishments. The object of our desire is very frequently something which yields some kind of pleasure or satisfaction to us. One of the elements which actuate this sense of pleasure in us is beauty. Art is chiefly concerned with beauty, either physical or metaphysical, and thus art reflects on life and its utility is complete in life.

We all have the impulse of choice. Most of us have a standard of judgment, a standard of liking and disliking or in other words, taste. This taste is based not always on any instinct or prejudice but on gradual culture and familiarity. We generally like or dislike a thing when we are in a position to differentiate not always between good and bad, but between what we have been led to appreciate and what we have not. For instance, there has been a growing appreciation for some articles of foreign manufacture, such as silk and woollen cloths, carpets and even ornaments, jewels and various other things. They are not, however, better than similar articles of Indian manufacture. Imported silk or woollen goods are neither so genuine nor so durable as Indian ones. Imported carpets are positively bad and are very inferior stuff. Imported golden ornaments have little or no genuine gold or are at best an eight or ten carat alloy, having practically no intrinsic value. There has been a craze for foreign jewellery even! A few years ago counterfeit diamonds and pearls, emeralds and rubies, amethysts and moon stones set in guilt brass, were publicly sold by thousands in Calcutta and elsewhere. These were the so-called jewels imported from foreign countries which probably had no jewels of their own to sell but could only manufacture inferior imitations for the market.

From the above it will appear that some articles are endured and even liked not always because they have any qualitative excellence but because they have been introduced into the Indian market to such an extent that people in general cannot help becoming more familiar with them than with similar articles of much superior quality of Indian manufacture.

There can be no definite standard of either beauty or quality of anything for which there may be a universal liking or appreciation. It is therefore necessary to have a wide range in the quality and form of commodities. But all such discretion should be based on artistic lines as far

as possible. A good deal of the success of industrial products is ensured by the proper choice and selection of their forms. In every article there are two things on which depends its success or failure in the market. They are, first, form and second, quality. The appearance of a thing goes a very long way to determine its consumption. The very first thing that one invariably thinks about at the time of purchasing a thing is its appearance or form. The question of genuineness, quality or cheapness comes next. Very few people would like to use or have anything, even of very superior quality, having a repulsive appearance. But if the form or finish of the article is attractive, there is every likelihood of its consumption in spite of its qualitative poverty. Until recently almost all the mill-made *dhoties* and *sarees* used in Bengal and other places came from Manchester and other places. The local handloom industry was carried on on a very small scale. But the prosperity and extension of the foreign mill trade greatly depended upon the artistic productions of the domestic handlooms, for the mechanical industry merely copied and reproduced spurious and inferior imitations of the finer and more beautiful things manufactured by sensitive handlooms. This is one of the accomplishments of the handicraft which will never be either compensated for or substituted by mechanical industry. Craftsmanship has the advantage of being always creative, whereas machine industry has merely a reproductive significance. The borders of *dhoties* and *sarees* manufactured in handlooms in Dacca, Shantipur, Farasdanga (French Chandernagore) and other places in Bengal were traced on tracing cloth and painted and sent over to Europe to be copied on powerloom *dhoties* and *sarees*; and although they turned out articles inferior to the handloom made cloths, yet they had a very extensive sale, chiefly for the borders of the cloths. Cheapness is of course greatly responsible for the sale of an article. But cheapness too has no definite standard; it fluctuates according to the resources of the buyer. If one

has money enough to buy a thing for which he has a liking, he thinks it cheap, but if he does not happen to have sufficient money to afford to buy it, he is likely to think it dear. We may all want cheap things, but we seldom like them. It is our economic difficulty which makes us think of cheapness, and not because we have a likeness for cheap articles. No cheap or underpriced thing can be really good. The popular demand for cheapness necessarily introduces inferior and spurious articles in the market. Most of us like silk but very few of us can afford to have it. But the economic difficulty could not however keep the popular desire of having it, if possible, cheap. This naturally led to the introduction of fraudulent substitutes. Recently a new kind of summer wear, known as *kossi* silk, has appeared in the Indian market. This cloth has not a single fibre of silk. It is nothing but mercerised cotton imported either from Europe or America, but it has the *appearance* of silk. It is too cheap to be silk, and too dear for cotton. Every one who buys it knows full well that it is *not* silk and yet he buys it presumably because it *looks* like silk. In this case it is not the material but its appearance which attracts and satisfies the buyer.

Sometimes it is also found that if one gets a strong liking for a certain thing, he does not always mind paying a high price for it, even at the cost of some inconvenience. When mill-made Indian *dhoties* and *sarees* first appeared in the market, they were crude enough and had all the defects that first attempts are liable to have. They had then very little or no chance of success in competing with European cloth. But now they have gradually improved and their consumption is daily increasing and it is but a question of time only when they will gain the monopoly so long enjoyed by cloths of foreign manufacture. The prices of *dhoties* have gone up. In 1909 a pair of *swadeshi* mill-made *dhoti* in Bengal cost Rs. 2 or Rs. 2-2 but now it costs at least Rs. 2-8 or Rs. 2-10. (The quality of the cloth has of course improved considerably.) But people do not

mind it, for they are getting things after their liking. This is due not merely because the things are worthy of use only, but chiefly because a certain amount of artistic understanding has been employed in their manufacture.

A very similar thing may be said of woollen goods of Indian manufacture, particularly in the Funjab. Handloom made *puttoos* were the products of indigenous industry. Considering their excellent quality, they were cheaper than any other woollen cloth, either of Indian or of European manufacture. But they had little range in varieties and still less attention was paid to an artistic treatment in their production. The *puttoo* industry has practically collapsed now, for it was not given a fair chance of competing on proper lines with other warm cloths in the market. Its patterns were not improved and its manufacture was not run on lines that would have met with the approval and requirements of the public. But this very industry has now taken a new form and suggests possibilities of development beyond anything hoped for so long. The very materials of which *puttoos* were made, are now being utilised with considerable success, in the production of cloths of various kinds after the patterns of European tweeds. This success is entirely due to two main reasons. First because they are being manufactured after the forms and patterns for which there is a general liking, and secondly because they are, although dearer than the *puttoos* of old, cheaper and better in quality than similar European cloths.

It is not possible to multiply examples in the short compass of this paper, but I hope it has become clear that in every industry a certain amount of artistic understanding is essential for its existence and development. The selection of this artistic element and application should be based on proper lines, as far as possible. Mistakes in this direction would be fatal, both from the moral, material and industrial standpoint. In Indian industries the elements of Indian art should be largely, if not exclusively,

adopted. It is in the industrial arts that the utilitarian aspect of art is directly cultivated. If Indian art finds no expression in Indian industries, the former loses its ground of practical and direct utility, and the latter its fulness of development. Industries without artistic elements have no being. In every industry there must be some artistic elements, and if in Indian industries, Indian art is not given full play, the elements of foreign art are surely to creep in in the manufacture of Indian commodities. This would result, as has already been the case in some Indian indigenous industries, in the production of mongrel hybrids of art and industry, which are not at all actuated by a common impulse. The metal industry of Benares and Muradabad; the carpet industry of Kashmir, Mirzapur and Amritsar; the gold thread industry of Delhi, Agra and Lucknow; the wood work of Kashmir and the Punjab; the pottery of Multan; the cotton printing industry of Lahore, Amritsar and Delhi, and various other industries of different places have miserably deteriorated, simply for the lack of correct artistic understanding and application. This is not a question of mere physical deterioration; the moral deterioration is still greater, still more deplorable. It means a deliberate insult to art and the denial of the regard and respect due to art. I cannot express what I felt when I saw at Benares a brass image of Mahadeva forming the base of a candle stick; a statute of Kali forming the chief decoration of an ash tray; Brahma, Vishnu, Lakshmi, and Swaraswati and a number of other gods and goddesses of the Hindus, engraved, out of proportion and form, on tea trays, flower pots and kettles; a carpet woven in Kashmir after a European pattern; a hybrid wood carving in Lahore; an imitation of a European water jug in Multan, painted with all sorts of bilious colours; a *jhuta* (spurious) gold thread work in Delhi; a *namabali* (a piece of cloth having the name of either Rama, Krishna or Hari printed all over it) printed in Germany at Muttra; a German chromo-lithographic

representation of Jagannath in Puri (where original paintings of the same subject could be had for one or two pice !)

The wilful neglect of a thing is much more deplorable than its entire absence. Had we lacked in artistic resources, it would have been quite a different thing altogether ; but to overlook the vast and glorious treasures we possess, to wilfully prevent the possibility of their revival by application to industries, to corrupt the national ideals of art by immoral and spurious imitations, is almost criminal. Indian design is as rich as it is inexhaustible. No other country can boast of so many variations of inventive beauty. If we would utilise even only a few artistic resources in the manufacture of commodities of utility, if it could only wed Indian industries with Indian art, the proper artistic understanding will be gradually restored and bad and indiscreet taste will gradually vanish and will lead to a new vista of industrial and artistic promise and development. It will be a revelation of the stirring of a new life full of possibilities which now lie hidden in the gloom of uncertainty and stagnation. It will re-establish all our arts and industries on a surer and nobler basis, a basis that will endure and stand firm to hold and support its own.

It is very often said that art is not for all ; its utility is also questioned. Art of course is meant for the cultured and intelligent, to begin with. But we have to increase the number of these men, for the welfare and advancement of a nation depends entirely on this development. Art is one of the instruments that can accomplish this. Art is meant for all, only if all desire to have it. It is not an occult mystery ; it has no undecipherable enigmas. Its door is open—open to welcome all. But after all it depends on different individuals to pass through it. The entrance will have to be made by an effort. A stranger's foot may stumble over the doorway, but if he steps in, he will be led into a hall, spacious and grand, and full of comfort and joy and delight unknown to him.

Art is not futile. I repeat, it is meant for use and its complete utility is in life, either personal or national. Art is concerned with beauty. We love art, for we love beautiful things, beautiful emotions. Our love for the former is based upon the material objects around us. Industry produces these articles, and if it is actuated by an artistic feeling, it fulfils its mission. True industry has no escape from art, just as art has no escape from life. And the best industrial products are those which give expression to aesthetic sentiments, for their purpose is not merely to produce things of utility but also to embellish or otherwise decorate even the ordinary objects of life and make us feel some of the delights that art seeks to produce.

TANNING INDUSTRY, ITS DEVELOPMENT IN INDIA.

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Technically speaking a hide or a skin is made of animal fibres naturally interwoven. Thus tanning industry is one of the great fibre industries of the world. It is an industry of bye-products. Cotton and jute are cultivated for their own value. A farmer is interested in the yield of cotton per acre and takes great care to have the largest yield. The same may be said of the silk industry. The silkworms are bred and killed for the sake of the fibre. The wool fibre is no doubt obtained as bye-product of the animal but has a decided advantage in that it can be removed from the back of living animals. Animals are rarely slaughtered for the sake of their skin and wherever it happens the prices are surprisingly high. The fur skins are a conspicuous example of this nature. A hide or a skin is a waste product of the slaughter house. In the case of sheep skins

the wool is considered a far more valuable article than the skins. There is a regular industry in Europe where the wool of the sheep skins is removed by certain processes. It is called fellmongering. The sheep skins are usually bought from the fellmongers to whom it is a waste product.

Raw materials used in tanning are the bark of trees, such as Aval, Bubul, &c.

In India the majority of skins are obtained from the animals slaughtered for meat. Sheep, goats and cows are the animals which are usually slaughtered. Buffalo hides are generally flayed from the dead animals as they are never slaughtered for meat. It may be made clear for the general reader that skins of large animals such as cows and buffalos are called hides and the rest are called skins. Cow is considered a sacred animal by the Hindoos. Hence the meat of the animal is not largely consumed. This accounts for the comparatively low returns of the cow hides compared to skins. The animal seems to have been domesticated since ages. The Live Stock Journal writes :—The humped cattle of India were domesticated more than 4,000 years ago, as is proved by the sculpture on Egyptian monuments which date back to 2100 B.C. They have long been extinct in the wild state but some herds of cattle, descendants of animals which have broken away from men exist in the jungles of Southern India. A curious trait in these humped cattle is the indifference to shade which other horned animals eagerly seek in hot weather and they are never seen to go and stand knee deep in water as do European cattle. Being sacred to Hindoos no endeavour was ever made by native breeders to improve their beef qualities.

The goats are more or less wild and are specially kept for meat. They are fattened in a more or less systematic way. The natural wild habits of the animal allow it to be kept at a very low expense. Sheep are much less wild and

are valued for their meat as well as for the wool. The wool obtained is not of a high quality because of the hot climate of India.

There are very few tanning factories in India maintained on the European lines. The industry is distributed in villages and is owned by the untouchable castes in India. Every village has its own butcher and in some villages every one is his own butcher. The skin is flayed as carelessly as possible and is given over to the local chamar or tanner. There are usually one or two families who cure or tan skins according to their long established practice. It is the skill of this tanner which turns out the main bulk of the skins coming to market. He always follows the methods handed to him from generations and never troubles himself regarding improvements or copies of any other method. It is because of this habit that we find in the same province methods of tanning and curing hides which are vastly different from one another. In small towns where the bulk of skins is concentrated from various villages round about, there exist small tanneries. The religious prejudices have played an important part in the making of these tanneries. Very few of these tanneries are owned by the Hindoos. The result is that the trade is a monopoly of the Mahomedans. This situation has a far reaching effect. The religious prejudices of the Mahomedans have played an equally important part to set back the progress of the trade. In consequence of their prejudice towards pig skins, they are ruled out of the Indian tanning trade and every year we lose a tremendous amount by doing away with such a valuable commodity. The tanning industry is shunned to such an extent by the Hindoos that they would scarcely advance the capital for the industry. This takes away practically a large amount of the free capital in the market.

The use of leather is very much restricted in India. Hand-bags, portmanteaus and such other articles are not

generally used. There is a large demand for slippers and shoes. Besides shoes the only universal use of leather is in water-bags or motes. There is always a great demand for well tanned hides for these purposes. They are used for taking out water from wells, to water the fields and every farmer owns at least one or two such bags. The leather undergoes a very severe test. It alternately gets wet and dry and the vegetable tanned leather soon perishes under the rays of the Indian Sun. Even with such a necessity we have not produced a leather which may be waterproof but have pulled on with a very inferior article. Such a leather is now on the market. It is chrome leather. It has not been well-known or well advertised in India. Hence we still find the old type of water-bags in the country. The high price of the chrome leather compared to local tanned leather will be easily compensated by the long duration. There is another leather article which has so much entered into our every day life that we do not recognise it as an article of very great importance. It is the heavy belting for the machinery of various factories. With the industrial revival of India and the development of the agriculture on the plantation lines, there is bound to be a great demand for belting. We find that some attempts are made in a few provincial towns to meet the growing demands. The article produced is of a very bad quality. The main reason seems to be the unsuitability of the Indian hides for high class belting. In this particular branch of industry also there is a high demand for chrome belting.

India produces a large amount of hides and skins for which there is no local consumption. There is not enough skill available in the trade to finish the article in a way which would command a ready market. As long as our trade is regulated by the demand for raw materials of the European and American markets and as long as no demand is created for our finished goods there is a real danger to our trade. A review of the statistics will clearly show how

we are far losing our industry and more and more passing into the stage of a country which only exports unfinished raw articles.

Before reviewing the statistics it would be worth while to mention the tanning materials which play an equally important part in the tanning industry. India abounds in tanning materials but no attempt seems to have been made to export them. Perhaps the heavy freight on the article compared with the value may be the cause which prevents the export. The only tanning material sent out is myrabs. India has a monopoly in this article, and hence the trade is flourishing. There are very few materials which can replace the article and so long as there will be vegetable tannage there is no chance of the article ever going out of trade. There is another old industry in India which is still continued in the conservative way. It is the making of the tanning extract. Cutch or Katha is solid tanning extract obtained from the trees of an Acassia in India especially found in the forests of North-East India and Burma. Another product of equal importance is gambier which looks like a good quality Katha and serves as a tanning extract. For the last few years an English Company is manufacturing myrabs extract on modern lines at Raniganj. The returns for the cutch and gambier as exported to England are :—

1907.	1901.	1909.	1910.	1911.
Tons.	Tons.	Tons.	Tons.	Tons.
4,045	3,258	1,589	2,493	86,621

Below are given the export figures of raw and tanned hides. From the figures published in the Tanner's Year Book 1913, the following conclusions can be drawn :—

The average taken is of the last three years. India exports to England 25.6 per cent. of the total quantity of hides exported from the British Colonies and possessions. The total value realised is 25 per cent. showing a loss of 0.6 per cent. This loss if brought about more or less in the

wet hides. 1·5 per cent. of the total wet hides imported in England are exported from India. The price realised is 1·1 per cent. Some comparative values may be worked out from those figures.

Indian wet hide.	Australian wet hide.	Italian wet hide.
per 100 lbs.	per 100 lbs.	per 100 lbs.
£ s. d.	£ s. d.	£ s. d.
2-12-0	2-18-10	3-12-0
Dry Hides :		
3-40-0	3-10-0	...

From the figures published in a report by Mr. A. Guthrie about the tanning industry in the Bombay Presidency, the following conclusion is arrived at:—The value calculated is only of the Bombay export. The rates quoted below are for 1,000 skins:—

Year.	Tanned.	Raw.
	£ s. d.	£ s. d.
1905-06	103-6-8	80-0-0
1908-09	102-0-0	106-0-0

The figures given in Mr. Guthrie's Report are very significant. The first thing that strikes us is a tremendous fall in the export of tanned hides in the 1901-02: or to put it in another way the great export of hides in the 1899-1900. A similar result can be seen on the curve IV. The dip is not so great as the value of the skins is put in million sterling. This is accounted for by the terrible famine. The drought seems to affect the cattle much more than goat and sheep. A similar rise is seen in the year 1906-07 and clearly shows the presence of some cattle disease or drought. In no other way the export of the hides is affected.

As a rule we export more dry hides than could be gathered from the export figures. England does not seem to be a very good market for the Indian hides. The largest

quantity is exported to Germany, next comes U. S. A., then Austria and then England. The average of the last ten years is 10,394, 3,983, 3,433, 1,988 thousand sterling worth of hides in each country respectively.

Looking to the value realised, it is clear that our hides are of an inferior quality. On the whole the hides realised 0·6 per cent. less on the average value. This is a great loss when the magnitude of the trade is taken into consideration. The price realised for the dry hides is just the average. The reason is that the countries which compete with us in the trade are like China, East Indies, &c., who have no scientific way of curing hides and they export a large quantity of dry hides which go to keep up the prices of the Indian hides. The inferiority of the Indian dry hides will be clear on comparing it with that of the Australian hides, which are not the best quality of hides put on the market. South and Central America produce a far superior quality and the Indian hides are a long way off from competing with them.

The quantity of raw hides exported from India is always greater than the tanned hides and the trade does not seem to have been much affected by the coming in of the chrome leather. During the famine extra amount of hides generally obtained from dead animals is usually tanned on the spot, hence we find the returns of tanned hides going up.

The figures for the goat and the sheep skins tell quite a different tale. The famine years do not affect the export trade to a great extent and it seems that these animals survive the drought better than the cattle. So far as goat skins are concerned India has a great superiority. There are few skins which would match with the Indian goat skin. So far as sheep skins are concerned, India has a great rival in Australia. Not only are the Australian sheep skins bigger and possess the advantage of being easily split but the wool is of a far superior quality.

The export of the tanned skins during the last ten years is practically steady. But the export of raw skins has gone ahead tremendously. In the year 1900-01 the value of exported raw skins was half that of the tanned skins while in the year 1909-10, it actually doubled. Besides this, there was a rise in the price of the raw skins which were cheaper than tanned skins in 1905-06.

This change has been brought about by the increased demand of the raw skins in Europe and more specially in America. It seems that the only saving point which has kept up the demand for tanned skins is the semi-chrome process. But for it almost all the skins would have been demanded in the raw state. A Guthrie in his report writes:— The cause of this great increase in raw goat skins is undoubtedly the great demand in both Europe and America for the glacekid for boots and shoes. A few years ago many boot-makers believed that the demand for this class of leather was a temporary one, but it goes on steadily increasing instead of diminishing. Mr. A. Chatterton in his report on the decline of tanning industry also points out the cause. He says at present there are no indications of a shrinkage in the total number of skins exported and the change affected so far seems to be simply that the skins are exported in a raw instead of a tanned condition. The cause of the demand for the raw skins is entirely due to the popularity of a new kind of leather which is now largely produced in America and on the continent by one or the other of what are known as chrome processes. This has led to the export of the raw skins from Madras to the extent of 40 per cent. of the total exports that means that about $\frac{2}{5}$ th of the skin tanning capacity of the Presidency is not utilised. The result is certainly disastrous. By encouraging an industry we provide work for the working classes as well as a profitable outlet for the capital. Our trade returns show that we do not export any finished leather. On the contrary we import a lot in India to meet our demands.

Comments have often been made that tanneries started in India on a large scale in cities will fail. The supposition is baseless. A. Chatterton of Madras writes in the *Leather Trade Journals* that there is a large amount of literature upon the subject mostly written by persons without any very extensive knowledge of the subject, and I have been unable to discover any reasons why it should not be successfully carried out in India provided that the capital and skilled labour which are absolutely essential to its success are available.

Instead of making vague statements as to removing the prejudices or inviting the capital it would be better to systematically examine the various steps which can be taken to improve and enlarge the industry. Allowing the trade to be drifted to the export of raw hides and skins various measures can be taken to raise their value and to improve the quality. The first defect common with all countries is bad flaying. After the animal is slaughtered it is customary to take the skin off by means of sharp knives. This lowers the price because of the cuts. It has been a source of complaint in all countries and can be remedied in all slaughter houses, as in Bombay. Austria has taken a lead in this matter and the flaying of hides is done by mallets. Every year new machinery comes out to attain this object and recently a demonstration was given at Islington of the methods followed in Paris. Such a demonstration should be organised in public slaughter houses and the process should be made compulsory.

The next point is the marking or branding of hides. All must be familiar with the triangular marks so often found on cattle to identify them. These are always made on the butts which form the most valuable part of a hide. Besides branding, it is customary to causticise by burning various parts to cure the diseases of the animal. The branding of hides is a universal complaint as well as a nuisance. No remedy is still proposed to do away with this process.

Next come the diseases of the cattle. The most destructive disease in this respect is what is called tick and affects the goat as well as sheep. Owing to the breeding of some insects in the hair or wool of the animal small holes appear in the skin. They are distributed all over and always dye a different shade. Such a skin is useless for various classes of goods, such as meter leather and cannot be given a good finish in the case of boot leathers. The disease occurs regularly and millions of sterling are lost in every sale. This disease is very easily curable by what is known as the arsenic dip which kills all parasites.

Another disease common to the sheep is cockle. It is caused by heat. The fat of the sheep decomposes and leaves patches on the skin which refuses to take finish with the same evenness as other parts of the skin. The disease is more or less avoided by timely shearing of the wool. Fatty foods given to sheep accelerate this disease. The next point is to increase by systematic breeding the number of cattle as well as sheep. It is better to leave the goat in semi-wild condition. The advantage is that it could pick up any sort of grass and thus survive the recurring famines. But the case is different with regard to cattle and sheep. They require a systematic grazing. It is impossible to rear cattle for the sake of hides as it can never pay. It is surprising that there is no industry to export meat outside India. With the present arrangement of the refrigerators, it is possible to export meat. The directions which the new industry should take is to have centralised slaughter houses as well as meat extract factories on the lines of those of Bovril and Oxo. The next important question is with regard to the curing of hides. Generally wet hides realise a higher value than the dry ones because of the facility with which they are worked. Salt is usually used in curing these hides. Unadulterated salt is better and prevents the formation of salt stains to a certain extent. There are some substi-

tutes for salt. Round about Cawnpore deposits of saline earth are found which serve equally well in preserving the hides. This more or less accounts for the concentration of the industry in that district. Very little information can be had with regard to such or similar deposits and no experiments have been made as to their value in curing hides. To avoid the catching of anthrax it is necessary to use some disinfecting processes. If large houses make it a point to export goods after a thorough treatment of the hides, by such a process as formo-mercury, the custom will be universal and there will be less risk of infection. The systematic drying of hides is very important. Hides which have been flint dried by the Indian sun lose a good deal in price because it is not possible to give them the original suppleness of the raw hides. Some investigations as to the drying of hides have been carried out by Eitner in Austria. The hides must be dried slowly at a low temperature not exceeding 90 °F.

Coming to the tanned hides and skins we see a large scope for their improvement. The method of tanning is certainly very good and the leather produced on the whole can stand any test, but the carelessness and negligence of the labour is quite conspicuous. Rarely we meet with hides or skins which are not more or less damaged by bad workmanship. Whether it is the result of lower wages or indifference, it is hardly possible to say. It goes without saying that a little more care of the hides and skins would fetch millions to India. The process of tanning has undergone a great revolution in the quickness of tannage. The methods are specially suitable for Indian skins. The use of tanning extracts and of the drum tannage will greatly accelerate the rate of tanning and a greater turn over of the capital. The method generally followed at present is the bag tannage process which takes in all three months. The period can be easily cut down to less than a fortnight.

Very serious charges have often been made that the Indian leather is adulterated to a large extent especially

with sesame oil. The charge is not true. In a recent article in the *Tanner's Year Book*, 1912, M. C. Lamb publishes various analyses of leather which go to prove that the percentage of grease in the leather is not higher than is expected from all tanned leathers. He writes :—
 “ It would appear from the above analyses that adulteration of Indian tannages by the use of mineral weighing matter or an excess of tanning matter is not so common as we have been led to believe. The analyses compares very favourably indeed in the great majority of cases with home tanned calf and dressing hides and prove that adulteration is not general amongst this class of leather.”

Turning to the possibility of producing good chrome leather we come to a very great problem. If ever chrome goods have to be turned out in India, it is only possible from centralised tanneries built on modern lines. Perhaps the best kind of goods may not be turned out at present in India, but it is possible to turn out an average quality of goods which would command the cheap markets of the world. The first step in developing the chrome industry is to manufacture semi-chrome leather. This is prepared by chroming tanned skins and finishing them in black and colours. The leather is more durable than the ordinary vegetable tanned leather and takes a better finish.

Out of the demand for untanned skins there is bound to grow up another industry. It is the manufacture of pickled skins in India. After the hair of the skins is removed instead of tanning the same with bark it may be treated with sulphuric acid and salt or alum and salt. The latter process is most costly and a little experience will make the first process so easy as to be applied by an ignorant village tanner. The process is very easy and it has a peculiar advantage that the solution used can never change or decompose as does the tannin solution.

Passing to the industry of tanning materials much remains still to be done. A great change has come over

this industry in Europe and America. The tanning materials are now demanded in the form of extracts which allow the process of tanning to be greatly accelerated. There is a great scope for the development of a tanning extract factory in India. The only industry of its kind is the manufacture Katha. The methods followed in its manufacture are crude which can be easily improved. The pine forests of Himalaya are valuable assets and it has been often questioned whether it would pay to prepare wood pulp for paper on the spot. All the former calculations were based on the fact that the solution obtained after bleaching wood pulp was a waste product. Since a few years it has been discovered that this waste product has a tanning property and can be utilized to tan leather if properly blended. With all the opposition given to it the material has come to the market and is used in various tanneries in America and the Continent. It remains to be seen then whether a wood pulp extract factory in the Himalaya forests will ultimately pay. If it does there is a chance of three new industries being opened out: the manufacture of wood pulp, the wood pulp extract and the tanning industry.

A marvelous change has recently come over in the direction of a substitute for natural tanning materials. It was only during the last two years that German chemists have succeeded in manufacturing synthetic or artificial tannin. There has been a still greater progress in another direction. Prof. Strasny of Leeds has succeeded in synthesising a material which is not a tannin in the strict sense of the world but has all its properties. The article is named *nerodol* and is manufactured on a large scale by a German firm. The researches are very startling and in a few years to come, it will not be a surprise if every one is using the coal tar tannins with as much zeal as the coal tar dyes. The natural effect will be a tremendous loss to India. The export of the myrabs which at present swell, the returns a good deal will soon be a matter of the pasts,

Not only that, but we shall have to import these synthetic tannins into India. The history of the coal tar dyes and destruction of the Indigo and Alizarin Industries will repeat itself. To one who carefully reviews the progress of the tanning industry it would appear that it is being rapidly controlled by the chemist. In the manufacture and finishing of leather various materials are used which are laboratory products. The process of chrome tanning has come out of the laboratory, and it will not be long before a chemist will be quite indispensable to a tanner.

HIDES AND SKINS INDUSTRY IN BERAR,

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It would not be out of place to take a historical retrospect of this industry and to trace the causes which have contributed to its present state. Out of the few occupations in which Indians may profitably take a prominent part, Hides and Skin Industry is one which has a double interest, *viz.*—commercial and artistic. The scope of this paper being, however, industrial, the commercial aspect alone will be dealt with. In Berar, so far as Indian enterprise is concerned this industry is confined to the manufacture of country shoes, water-bags (pakhals), well-bags (motes), &c. These are the chief articles produced after the tanning of the hides and are used by the common people. This industry has been in vogue for very many centuries, but of late owing to the foreign competition, the trade has slackened considerably. Tanning and curing of hides according to old methods is still going on in the villages and deserves a careful study.

TANNING.

The description of the native or crude tanning is as follows :—Barring the monsoon months, *viz.*, June to Sep-

tember, tanning work is carried on satisfactorily all the year round. Tanners receive hides and skins in various conditions but they undergo a simple process of washing before unhairing. In whatever condition the skins are received, the simple process to which they are subjected is that fresh skins are rinsed to remove the adhering blood, dirt, &c., wet or dry salted hides are soaked in fresh water to remove salt, while dried hides are left in water till they are thoroughly softened in a "khada" or "kund" in the ground. As the water in it is never changed and becomes putrid it softens the hides rapidly but decomposes them badly in places causing holes, &c. This process requires much care and takes 1 to 3 days according to the nature of the hide or skin.

Hides and skins are unhaird in the following manner :—

(1) The tanners (Dhors, Chambhars) put the hides into fresh lime and water and in some cases a thick lime milk is spread on the flesh side of skins and the skins rolled up till the wool or hair comes off. When it is removed, the skin is put into lime liquor. This process lasts for from a few days to 3 or 4 weeks according to the nature of hides and skins.

(2) To unhair hides and skins Akada milk (*Calatropis gigantea*) is used but it is very difficult to get it in sufficient quantity in Berar.

(3) Jawar or Bajra flour paste is used alone to unhair hides or skins but it takes much longer time. Bajra is sold dear and hence it is very rarely used.

When unhairing is carried out with tools, it is done generally either on the ground or on a wooden board laid on the ground ; the description of tools used will be given later on under a separate heading.

After unhairing hides or skins are again put into fresh water for a few days to loosen flesh if still left after the first simple process. The flesh is removed with Rapiya tool and the hides or skins are again washed with fresh water.

After this treatment the skins are thrown into water with tanning materials, *i.e.*, Babul bark myrabolans, &c., and left in this state in a Vat Kund or Nand &c., from one to eight or more days being moved every day. Hides are then sewn into bags which are partially filled with tanning agents referred to above and water and hung up on poles by the neck. As this water extracts Tannin from the material it percolates through the hides in the big earthen Nand kept under and again and again it is poured back into the bag for four to five days when the bag is reversed, the opening through which water (liquor) has been added being sewn up and an opening made at the butt end from which it is hung and the same process is repeated. After this the leather is considered a good one but it is again thrown into the liquor from 1 to 5 or 6 days to take out the hair stains and this process generally brightens its colour. Finally, it is dried out and grained down on the ground and covered with the used material to keep it from damage.

Before hides are finally dried up, they are taken out from this bath of Babul bark, myrabolans, &c., oiled with Til oil, &c., and first a light red lac dye is applied. After this they are partially dried and stretched out by brass sleeker on a wooden board and hung up till dry. When dry, dark red dye is brushed on twice and the hides then are softened and the flesh surface is made smooth and clean by thin shaving with a sleeker.

The skin oiled with Til oil is dyed in the raw state with the red dye formed from lack as above.

Thorough Babul tannage and myrabolan tannage without salt is the best of all for leather and it is cheap.

CURING.

Salt (Natrium chloride) is used as for curing, drying, &c. Hides are generally spread out on the ground with the flesh side up and powdered salt is rubbed in. They are dried after being salted by spreading them flesh side up on

the ground, &c., for export. In Berar salty earth is also used with salt for rubbing purposes.

Skins are also sometimes rubbed with salt and salty earth and they are then dried for export.

At Madras, Cawnpore, Calcutta, Bombay and other places tanners have established their shops and have their agents in several important places in Berar to buy hides and skins. The dealers are generally Mahomedans. They buy the hides and skins when fresh, salt and dry them and then despatch them in bundles. When the animals die, their body becomes the property of Mahars or Mangs. They take the body to skin it off outside the town, village, &c., and sell the hides to these agents.

TANNING MATERIALS.

Babul (acasia arabica).—This is the only material which is used throughout Berar. It can be found in abundance on the black cotton soil, because Babul firewood is much used in gins and presses. Its pods are also used. There are three kinds of Babul trees, *viz.*, telia ordinary and deo Babul. The first two are very useful for tanning. The price of bark varies according to the local demand from Annas 8 to Re. 1-4-0 per maund of 40-seers.

Tarwad (cassiu euriculata).—It is found in Berar but it requires much trouble to collect it. Its bark is very good for skins. It can be collected from November to May. The leather tanned with Tarwad turns dark when it is exposed to the sun but if this leather has a final bath of myrabolan, the dark colour is reduced a great deal. Therefore demand for it is less. It is not much used in Berar.

Myrabolans, Hirada and Behada fruits.—It is the chief and very important tanning material, &c. It is locally very much used with other articles. The leather tanned with this does not become red if exposed to light. This must be mixed with other materials while tanning as it alone does not give good results. Behada is used for skins more than Hirada.

Avala leaves (*Phylantus Emblica*).—The leaves contain tannin about 10 per cent. It is also used.

Ain, Khair, Dhavada, Rohani, Jambul bark, &c., is used for tanning purposes.

Lime is used for this purpose. Oil, especially Tili oil, Saffron oil, &c., is used.

The tools used generally for the tanning are :—

- Rapa.* For cleaning. It is of a semi-circular shape and made of iron having a thin broad edge and fixed in a wooden handle.
- Rapi.* For cutting. It is also made of iron (or brass) similar to Rapa but it has a sharp edge.
- Suttari.* For trimming. It is made of iron having a sharp edge. It resembles "Rapi" but it is of smaller size.
- Shear.* For removing hair on hides and skins.
- Nand.* Earthen vessel which holds nearly 6 to 10 gallons of water in which hides and skins are immersed for soaking.
- Big needle :* For sewing. It is similar to a borer having a wooden handle. It is used to make holes in the leather so as to enable a small needle with thread to pass through.
- Salcha or Kabud :* For fitting. It is made of wood.
- Hashti.* The instrument to beat out leather. It is made of iron and is about 9 inches in length.

METHOD OF COLOURING.

Before colouring hides and skins, generally sweet Tili or Saffron oil and water are used in the proportion of one or five for hides and one to eight for skins. There are mainly three sorts of colouring, viz.—

- (1) Red, (2) Dusky and (3) Light brown.

Lac is obtained from the following trees, which gives red colour :—

<i>Bori.</i>	(<i>Zezyphas Jujaba</i>).
<i>Wad Banian.</i>	(<i>Ficus Bengalleosis</i>).
<i>Pipal.</i>	(<i>Ficus Relegiosa</i>).
<i>Palasa.</i>	(<i>Butya Frondrosa</i>).

The method of colouring leather in past years was different from that prevailing now.

RED COLOUR.

Cleaned cotton used to be saturated and made into cakes and dried. Thus the cakes prepared were ready for export and sale. They were prepared at Nandura Malkapur, Basein and other places. Cakes cost from As. 8 per seer or more according to the weight and demand. The process of colouring has been described under "Method."

DUSKY COLOUR.

To obtain this 2 seers of awali leaves with equal quantity of dry Babul pods are put into one chatty full of water. This solution is used fresh daily for three days.

LIGHT BROWN.

Leaves of Dhawada and Behda fruits together with water in the same quantity as in the second colouring are used.

The last two of these colours are still in vogue and are generally prepared by Dhors and Chambhars.

The first red colouring process was the old one and has been entirely supplanted by the imported colour powders for more than 15 years past. The chief colours used in dyeing leather are : red, yellow, brown, green, white and black. Any colour worth one or two annas when mixed with five ounces of water is sufficient for one skin.

In Berar, butchers (Khatiks Chambhars) generally colour skins while Dhors, Mochies also carry on the business on a very small scale owing to foreign competition.

Colouring can be done in a satisfactory manner in two seasons, *viz.*, the cold and hot weather. The rainy days are not, owing to dampness, favourable.

ARTICLES.

Motes for wells, pakhals, country shoes are the chief articles made in Berar. The tendency of people is to use shoes of European style either of local make or imported. The cheaper qualities of those are manufactured of locally, tanned leather. Punjabi, Mundali, Deccani, Brahmani Joda, having single curled tip, Pooneri or Sholapuri, double tipped Joda called Nagari, Chapals used by women and vahans by Bhoi and other people are all imported. In Berar, double tipped joda is made by local Chambhars but now-a-days Sholapuri, Pooneri, Nagari, Punjabi, Gujarathi Chaduns, Chapals, &c., are made here as the outsiders have established themselves in Berar.

These Jodas have got their names from the localities of their original manufacture.

In the cotton growing and pressing factories and weaving mills tanned leather is used for rollers, wheels, belts, &c., in large quantities.

CENTRES.

The following are the centres where tanning of leather is carried on :—Nandura was formerly the only place in Berar where tanning was done in a systematic manner, *i.e.*, on the refined principles but it is now closed. In the same way some attempts were made at Akola forty years ago but met with failures owing to want of knowledge essential to this working.

The places from which raw hides and skins are exported are :—

Ellichpur, Amraoti, Yeotmal *via* Dhamangaon, Karinja *via* Murtizapur, Basin *via* Akola, Khamgaon, Nandura, Malkapur, &c. Agencies have been opened in all these places for the export of hides from Berar.

WORKERS.

The manufacture of leather is one of the oldest and most essential industries of the world, but it is left to the ignorant and unskilful classes of people. The classes engaged in this work are :—

Low class Cunbis, Mahomadans, Kachhis, Khojas, Dhors, Mochis, Chāmars, Mahars, Mangs, &c., &c.

There are two classes of Butchers. Those who slaughter sheep and goats are called “Baker-kasais” and those who slaughter cows, &c., are called “Gai-kasai.”

In villages the local tanners are the servants of the cultivators and they supply and keep in order the motes and Pakkals for which they receive payment in kind, while in the cities and towns they get money payment for the work they do. But the village tanners have now to work as labourers.

The following workers in the leather industry prepare the various articles as shown below :—

Gujarathi Mochis	Boot, shoe in the European and Indian styles, &c.
Chambhars	Joda, Chapal, Wahan.
Mochis from Upper India	} Chadan, Punjabi Juta, &c.
Dhors		Tanners, Makers of motes, Pakkals, &c.

RAW HIDES AND SKINS.

The raw materials for leather manufactures are chiefly the hides of bullocks, cows, buffaloes, skins of sheep, and goats. Besides these, small quantity of other skins, such as sambhar, deer and buck skins, &c., are used.

There are two kinds of hides and skins :—

- (1) Hides and skins from animals slaughtered.
- (2) Do from animals which die a natural death, from accidents, &c.

More advanced tanners use both sorts of hides and skins and buy them for export while the local tanners use those from animals slaughtered but the old caste prejudice

is becoming less intense as the hides and skins from the animals slaughtered (former) fetch higher prices than the latter. The former, *i.e.*, hides and skins from animals slaughtered is called "Halali" while the latter, *i.e.*, hides and skins from animals who die a natural death are called "Murdari."

EXPORTS.

The export trade in raw hides and skins has now-a-days becoming the main industry as their prices have gradually risen within the last few years and especially this year.

The American import tax on raw hides and skins was removed in 1910-11. This has encouraged the export trade of hides from India.

Raw hides and skins as at present available would have been quite sufficient for the local demand and would have checked the rise in prices but their export trade which offers good prices has increased by leaps and bounds. The following figures will show the state of the trade :—

PRICES OF HIDES AND SKINS.

IMPORTS (IN CWTS.) EXPORTS.

Year.	Hides Raw.	Hides tanned.	Hides Raw	Hides tanned.
1902-3	3,251	61	60,674	2,568
1903-4	3,068	61	62,805	1,174
1904-5	3,762	24	61,303	159
1905-6	3,997	70	77,465	651
1906-7	4,058	10	76,388	1,600
1907-8	4,897	8	56,140	291
1908-09	4,377	3	103,763	7,704
1909-10	3,523	83	57,674	495
1910-11	6,014	...	50,567	815
1911-12	472	180	21,349	4,461

IMPORT

EXPORT

Year.	Unwrought Leather.	Wrought Leather.	Unwrought Leather.	Wrought Leather.
1902-3	179	5,454	564	1,428
1903-4	219	6,002	593	1,054
1904-5	482	4,900	2,274	233
1905-6	506	5,953	849	120
1906-7	1,015	5,172	349	121
1907-8	728	3,445	1,263	216
1908-9	684	3,857	2,223	401
1909-10	544	4,728	1,039	382
1910-11	913	4,287	1,193	572
1911-12				

...	Imports of Skins of sheep and goats.		Export of Skins of sheep and goats.	
Year.	Raw.	Dressed or tanned.	Raw.	Dressed or tanned.
1902-3	17,434	35	40,594	227
1903-4	9,397	27	31,967	39
1904-5	7,725	82	26,122	1,835
1905-6	7,190	22	30,478	4,590
1906-7	10,238	6	39,242	5,594
1907-8	5,350	1	37,169	1,827
1908-9	7,527	...	42,551	1,166
1909-10	17,229	6	52,691	1,175
1910-11	4,446	119	35,253	5
1911-12	...	...	...	189

MYROBALANS.

(IN HUNDRED-WEIGHTS.)

IMPORTS		EXPORTS	
Cwt.		Cwt.	
1902-3	27,979	...	461,444
1903-4	8835	...	431,330
1904-5	9350	...	532,257
1905-6	2246	...	580,937
1906-7	1033	...	382,443
1907-8	7410	...	574,535
1908-9	3334	...	559,847
1909-10	1257	...	506,091
1910-11	6,589	...	479,777

ALIZARINE AND ANILINE DYES.

1902-3	6,315	..	...	9
1903-4	7,057	...	...	19
1904-5	7,792	...	...	17
1905-6	8,157	...	...	15
1906-7	7,699	...	...	37
1907-8	8,032	...	...	26
1908-9	8,260	...	...	59
1909-10	10,419	...	...	865
1910-11	9,367	...	...	57

The prices per maund of 40 seers which prevailed in Berar are tabulated in the following statements :—

	1890-91.		1895-96.		1899-1900.	
	Rs.	A.	Rs.	A.	Rs.	A.
Tanned hides	24	4	23	11	28	11
Raw hides	12	0	16	12	13	12
Tanned skins	30	10	32	10	33	0
Raw skins	18	0	17	9	19	0
Leather	80	0	66	4	80	0

Prices for each quarter are given below :—

	30th June.	30th Sep.	31st Dec.	31st March.
	1907	1907	1907	1908
	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Tanned hides ...	50 8	48 0	48 8	50 0
Raw do. ...	37 8	35 4	33 12	34 10
Tanned skins ...	53 4	53 0	53 0	51 8
Raw do. ...	25 0	25 0	25 6	23 14
	1908	1908	1908	1909
Tanned hides ...	49 8	46 10	46 0	45 4
Raw do. ...	31 0	29 0	32 4	27 4
Tanned skins ...	49 12	46 2	52 0	45 4
Raw do. ...	22 0	20 12	23 10	20 8
	1909	1909	1909	1910
Tanned hides ...	46 6	46 2	44 0	51 0
Raw do. ...	29 14	31 4	34 4	35 8
Tanned skins ...	44 4	47 4	40 14	50 4
Raw do. ...	21 8	23 8	24 2	27 4
	1910	1910	1910	1911
Tanned hides ...	52 0	51 6	52 8	52 8
Raw do. ...	35 0	23 12	35 8	23 10
Tanned skins ...	55 4	53 0	55 4	53 4
Raw do. ...	25 4	23 4	23 8	23 8
	1911	1911	1911	1912
Tanned hides ...	50 0	51 1	50 10	56 8
Raw do. ...	23 0	35 10	33 14	36 10
Tanned skins ...	50 0	50 0	55 0	57 8
Raw do. ...	23 14	24 14	26 12	25 8

CONCLUSION.

The noticeable feature of this industry is the recent rise in the export of raw hides and skins, the figures of which can be found in the foregoing statements. The demand for hides and goat skins, &c., for boots, shoes, &c., is still continuing. Want of practical experience and scientific training, the absence of intelligent labour for this industry will still have to be overcome.

Hides and skins tanned in Berar and in India are suitable only for some classes of work and therefore their demand is limited in other countries.

Book-binding leather from the raw skins of sheep and goats which was formerly considered to be the best has now become deteriorated but modern scientific knowledge will improve this state of things. It is noteworthy that the Agricultural Department in Central Provinces is trying their best to impart instruction in this subject at Nagpur.

Myrabolan which is the tanning material is also exported.

Madras, Bombay, Calcutta, Cawnpore tanners have kept their agents throughout Berar to purchase hides locally and advance money to the local Mahars, Mangs or Dheds, Khatiks, Kasais promising to purchase all the hides of animals skinned off by them during the year. The local Chambhars have to buy hides and skins from the dealers at a higher price on credit.

The Co-operative Credit Societies may in course of time improve the status of the tanners, mochis, chambhars if the societies will pay attention to this subject.

RECOMMENDATIONS.

The tanning factories may be gradually established in Berar with the aid of experts first obtained for training young men in this business. Capital should be collected for this work. By-product industries on a small scale may also be set up to be worked by different societies and companies in co-operation with the main industries.

SOME ECONOMIC ASPECTS OF THE SWADESHI MOVEMENT.

BY S. SATYAMURTI, ESQ., B.A., B.L.,

High Court Pleader, Madras.

For the purposes of this paper, the Swadeshi movement may be described as an economic one having, for its object, the regeneration of the industries and the commerce of India, by two means, *viz.*, (i) inducing the consumers to pass and observe a self-denying ordinance that they will consume only Indian-made goods, and (ii) giving all legitimate encouragement to the protection of the goods required in India. The object is one with which every true-hearted Indian must sympathise but certainly there is no room to doubt the efficacy of the means suggested for attaining the end in view. If, in the course of this paper, the difficulties in the course suggested by enthusiastic Swadeshi preachers are pointed out, it is not with the view of throwing any undeserved contempt on the movement. The present writer recognises thankfully that the Swadeshi movement has done at least this much good—that it has turned our attention to the industrial needs of our country. And if it has done nothing more than this, it will have deserved well of us. But I am of opinion that more results should not be expected of the movement than it can possibly yield, so that we may direct our energies to discovering other means which will effectively bring about the consummation which we all so devoutly wish for.

Like all movements, in their inception, the Swadeshi movement has been exploited by unscrupulous men who had a sole eye only to what they could make out of it. On the one hand, misguided politicians sought to make political capital out of it by

allowing it to develop into an unreasonable and fruitless boycott which only ended in unduly restricting the scope of the Swadeshi movement. On the other hand, unscrupulous traders took advantage of the opportunity to profit themselves out of this enthusiasm for Swadeshi—by palming off on the public foreign goods with a Swadeshi label and by putting in the market unfinished goods in the hope that since they were Swadeshi, they would find a ready sale. Then, unfortunately, for a time they did find a sale. I say unfortunately, advisedly, for as a brilliant friend of mine, expressed it the other day, the Swadeshi movement has only succeeded in enabling people to produce candles that won't burn, soaps that won't wash, matches that won't light, and pencils that won't write. Whether this feeling is a justifiable one or not, it is undoubted that such a feeling exists among the large body of consumers who are the people to be convinced of the utility of these goods. Such a feeling does not find as frequent and emphatic an expression as it ought to, since our people are unwilling to translate this feeling into words in public, for fear of being dubbed unpatriotic. I shall feel myself amply rewarded if my expression of this state of feeling among the consumers serves as a warning to those who have got the direction of the industries of our country.

One strong argument which must be urged against this unbounded confidence in the ultimate triumph of the Swadeshi movement is that the movement is really based on sentiment and as such cannot be expected to survive the shocks of time. Sentiment has its place, and an important place in man's life for, otherwise it would be a miserable thing. But each has its place and surely he is building his house on a foundation of sand who counts on sentiment governing the pecuniary transactions of men. In spite of the ridicule poured upon the conception, I still believe and venture to express my belief in the existence of Ricardo's "economic man," not indeed with all the implications which that word connotes.

But certainly, I believe that men are governed in their business transactions by what they consider best for their self-interest. They may be mistaken but that is another matter. The pity of it is that they rarely, if ever, err on the side of charity. Hence I strongly urge that to expect that the people of India will gradually evolve a love for their country's goods, so much so that they will go in for them even if they are costlier and less useful than the other available foreign goods, is midsummer madness. And I appeal to the history of the Swadeshi movement within the last few years to illustrate the truth of my proposition.

I go further and find fault with those who urge the poor people of this country to spend more money than they need on their requirements. God knows that they have not enough even for their requirements. And every attempt on our part ought to be to make this poor man's rupee go as far as it can so that he may approximate nearest to a minimum standard of comfort. And to say that he should sacrifice some portion of his hard-earned money for a benefit to his country which is at least doubtful, seems to me to be an ill-advised step. I am stating all this on the assumption that the poor man's sacrifice will be of some benefit to his country. I hope to show in the sequel, that that is highly doubtful.

But I may state at once that the arguments derived from the success of the Protectionist movement in other countries such as they are, cannot hold good in the case of the Swadeshi movement in India, for there is a capital difference between the two, *viz.*, that while in the one case, duties for the purpose of protecting the country's manufactures are imposed by the authority of Government, in the other, the whole basis of the movement is a voluntary one. If it be known, however, that the so-called success of the Protectionist movement in countries like Germany and the United States of America is due less to the protection which those countries enjoy than to other circumstances and that the success, such as it is,

has been accompanied with many evil results, then my case is stronger against the usefulness of any form of protection to India in her industrial development.

I do not propose to, nor is it necessary that I should do so, deal in this article with the time-honoured arguments for and against protection. I may take it that all the readers of my paper are familiar with them. I propose briefly to refer only to a few arguments which have a peculiar application to the conditions of India.

I will deal first with the famous "infant industry" argument. The argument is based on the statement of the great political economist Mill who, albeit a free trader, made an exception in favour of the industries of a country which were in the making. He granted that they might be protected for a time until they were able to compete on equal terms with the products of other more advanced countries. For one thing, the theory is not stated in any very absolute form by Mill. Then the next difficult is how to define the phrase "infant industries." I am not thinking now so much of the academic difficulty of defining the meaning as of the practical difficulty involved in it, since every industry which stands to gain by it will claim that it is "infant." And amid the din of interested partisans, the decisions of the powers that be are bound to be unpopular and sometimes even wrong. Again the infancy of industries unlike human infancy tends to grow longer with time. Once an industry is dubbed infant and granted protection, it is unwilling that it should be called adult and thus deprived of the clutches of Government aid, to which it has trained itself to think it is entitled. Almost always, therefore, protection for infant industries is only the thin end of the wedge. Even beyond all this, there is the argument against, this, as against every other protectionist device, that it cannot achieve the object in view, or if it does, it can only do so, at too dispassionate a cost.

Of course the running idea behind all the familiar arguments in favour of protection is this. A market is to

be found for home-made goods. For more reasons than one, a home market is better than a foreign one. For the demand is easily ascertainable, definite and close at hand, so that the supply can be easily adjusted. That market is now, in India, to a considerable extent, in the hands non-Indians who are able to offer better goods at cheaper rates in many cases and goods which cannot at all be had in this country in some cases. They must be driven out of the country and the home market reserved for the home producers who will produce the first class articles and try to produce the second class. If people, however, want to buy foreign goods, they must pay a tax to the Government for the luxury of acting in consonance with the normal economic laws of supply and demand. For, I hope, the day is long past when it can be seriously contended that the tax on foreign made goods will be paid by the foreign producers. Then, if there is an increasing demand for the artificially cheaper goods of the country, gradually the producers of the country will try and produce the goods cheaper and also goods which they could not manufacture before. Then the home-made products can compete on equal terms with foreign-made goods. Perhaps, then, protective duties may be abolished. This, in brief, is the argument of the Protectionist in any country. And if we substitute the voluntary for the Government agency, that is also the argument of the Swadeshist in India.

Now, let us examine it dispassionately. We may grant the premises more or less. But the conclusions do not by any means follow. First as to the goods which are produced in this country, what is the guarantee that, once protection in some form is granted to them, the producers will rise equal to their opportunities and try to reduce the cost of production and improve the quality of their products? Whatever may be the case with regard to the countries, I have no hopes that the Indian producer will do anything of the kind. He is generally supine, un-

enterprising and unintelligent. And if only he is able to sell his wares with some profit he is not the man to strike out new ways of development. The entrepreneur is conspicuous by his absence in India. And while I fondly hope that in the free, albeit unequal, competition with other countries in India, that man may evolve himself. Nothing is so calculated to prevent any such happening than the preference which is likely to be given to home-made goods *in any case*. And hence, the old world methods of production will continue except in rare instances until at any rate, the people have raised themselves to a higher status by demanding and consuming even the highly priced foreign goods and thus putting the needed economic pressure upon the producers of the country.

As regards the second class of goods which are not produced in this country now, the case is even worse. For some of them, admittedly cannot be produced in the country, at any rate not so cheaply as they are in other countries which are more happily situated with respect to the production of those particular commodities. And while it is easy to indicate the idea of each country producing what it can, in the best and cheapest manner, it cannot be denied that the waste of human energy is indeed great when every country attempts to be a self-contained economic organism and supply all its wants. At the same time, I do not forget the fact that for any country to advance on progressive lines, diversity of occupation is a desideratum. But some attention must be paid as to the adaptability of a country for producing certain kinds of articles. I am not competent to lay down here what articles India cannot produce or at least what she cannot as efficiently as other countries. But this, I know, that there must be and there are articles which India is not fitted to produce. And it will be the height of economic and industrial folly to force India to produce those goods.

Even with regard to goods, which India is now producing, I have already shown that they too stand in need of

improvements which will come only if there is healthy foreign competition. It cannot be denied that if only the quality of the home-made products compared favourably with that of the foreign-made goods, the former will have nothing to fear from the competition of the latter. And is this very desirable end going to be achieved by allowing our home-made goods to grow like hot-house plants under protectionist restrictions ?

If then, any form of protection cannot be justified on this argument, resort is not unusually had to another *viz.*, that protectionist duties will bring in revenue. Apart from the indisputable economic fact that this revenue will have ultimately to come from the pocket of the people of this country, I do not know if Swadeshism has anything to do with protectionist duties except in the way of influencing the Government to impose such duties. Nor do the Swadeshists advocate this reform on the ground of any possible addition to the coffers of the state.

Then, of course, there is the difficulty which other protectionist countries have always felt, *viz.*, how to distinguish between raw products and manufactured goods. Every country is anxious to get its raw products free. But the difficulty lies in drawing the distinction. And in India especially where the manufactures, such as they are, are so dependent on the products of other countries, it is difficult to conceive how the Swadeshists are going to distinguish between the two. And we must also expect retaliatory measures from other countries. And, for aught one knows, our manufactures may be seriously handicapped by want of machinery and other goods which may be necessary.

Then there is the stock argument that capital in India is very shy and will not come out, unless the industries are protected. That capital is shy in India is a regrettable fact which is well known. But whether this unwillingness of capitalists to invest their money in industrial concerns is due to the unprotected nature of our industries

is very doubtful. There must be some means suggested and carried out by which the capital of the country may be made available for its industrial undertakings. And I am not one of those pessimistic people who believe that no progress is being made towards the industrial development of the country. For there are distinct signs abroad that people are more and more willing to come forward and invest their money in enterprises provided they are reasonably satisfied of their soundness. But there again, Swadeshi has done more harm than good by making it possible for all sorts of concerns to be floated which had no chance at all. Thus the movement, to the extent of its influence, has made capital shy by the failure of industrial concerns. But things are improving in this direction also. And ere long we may see capitalists anxious to invest their money in industrial undertakings.

I do not propose to deal with the other arguments for protection. But I shall briefly advert to the evil effects of protection in any form. (I am speaking of protection and Swadeshim as if there were no difference between them. For the arguments for or against protection apply *mutatis mutandis* to Swadeshim.) I have already referred to the higher cost of living which is bound to follow in the wake of any form of protection. I need not refer to it again here. The next evil of the system is that once it is introduced it comes to stay. Once protection in some form is introduced, it is difficult to oust it from the country. And there is a reason for it. The industry which has learnt to lean on the crutches of state aid can ill-afford to stand on its own legs. Again, a number of small industries grow around the big one, which are all in the same plight. Thus it is found almost impossible for any country to get rid of the self-imposed protectionist chains.

Another form which this tendency takes is the creation of vested interests. Such a phenomenon is a very unhealthy one and tends to demoralize the public life of the

country. More need not be said on this point here than cite the example of the United States of America.

Another curious and regrettable result of any form of protection in a country is that when the producers of the protected goods find that, owing to the high prices prevailing, they cannot dispose of their goods as rapidly as they like, they resort to the device of "dumping" the goods in other countries, *i.e.*, sell them cheaper in other countries than in the country of their production. The injustice of this is apparent. Finally when Swadeshi like any other form of protection, takes an aggressive form as it has and may again, it will produce strained relations with other countries. Whether this strain is worth undergoing is very doubtful.

Having now discussed the arguments for and against protection in any form in the abstract and satisfied, at least myself, that the movement cannot be expected to achieve any striking results, I now go on to discuss the agricultural and industrial conditions of India to show how much less efficacious and useful any form of protection will be to this country.

"From two-thirds to three-fourths of the population of India are engaged in agriculture. Of the remainder a large number are weavers, carpenters, blacksmiths and other village artisans." These people are dependent directly or indirectly, on the chances of the season for their livelihood. And the Famine Commissioners have, as early as 1880, laid it down, "No remedy for present evils can be complete which does not include the introduction of a diversity of occupations through which the surplus population may be drawn from agricultural pursuits, and led to find the means of subsistence in manufactures, or in some such employments." So far protectionists and freetraders in India are in agreement. The difference comes only as to the means to be adopted.

.. A very brief examination of the special difficulties which confront India in her efforts to build up her manufactures must precede any pronouncement of solutions of them. Coal is admittedly a supreme necessity for the manufactures of any country. Fortunately for us, "for a considerable period in the future, India can rely upon the supreme advantage of indigenous coal." Next and only next in importance are iron and steel. At the present moment there is nothing but the beginning of an iron industry. The Ta'a Iron and Steel Works may modify the chances of the industry to a great extent. But it will be seen that at present India derives from her own soil only a very small part of the minerals that she needs. Hence it is evident that if her industries are to progress as we want them to, we cannot impose a protective duty on the import of iron and steel, at any rate for a considerable time to come. The petroleum industry, especially in Burma, has a great future before it, which is assured to it, if only the sources of the supply hold good. The production of manganese is another industry in which India has great possibilities. In the production of mica, India is first among nations, and is responsible for more than half the world's supply. The future of this industry depends largely upon the enterprise of those who control it. Though the manufacture of saltpetre still employs about 30,000 men, the production and exports of it show a tendency to diminish. Its prospects depend largely upon the possibility of turning it to its natural use as a fertiliser. Between a fourth and a third of the quantity of salt consumed in India is imported. The expansion of the production of copper can be rendered possible only when the by-products of smelting it can be largely used. The remaining minerals of India are tin, graphite, rubies, jade and gold. "Our review will have made it clear that comparing the mineral wealth of India with the vast area over which it is distributed, she has not been as richly endowed as Great Britain. It is difficult to believe that she can ever become a great manu

facturing nation in the British sense of the term. This conclusion, however, is not a depressing one. She can secure a reasonable diversity of industries and a large enough manufacturing population to form a fertile soil for new ideas without becoming so entirely urbanised as Great Britain."

Of the minerals above named, coal is one which does not need protection. For India has obvious advantages on her side which she can use to make the industry prosperous. Again, coal is one of the articles which are used for manufactures in India as in other countries; and hence called raw products. And no sane economist will advocate the imposition of any duties for protective or revenue purposes on the importation of such a necessity as coal. The more we have of cheaper coal in India, the better are her prospects of industrial regeneration. The same holds good more or less of iron and steel. The largest imports of iron and steel are, I believe, in the form of machinery. And, for two reasons, *viz.*, that there must be the best and cheapest machinery available in India for her manufactures and that we must not wantonly deprive ourselves of the results of inventions of machinery in other countries, any restriction on such importation is an ill-advised step. The other minerals form but comparatively minor industries to protect which is certainly not very useful. Further they have all, if only they are worked with the requisite capital and skill, a fairly assured future before them.

In cotton weaving, "India is still witnessing the struggle between the factory system and the system by which artisan works in his own house. There is one very serious obstacle to the rapid development of a factory system. Labour is very difficult to secure. The Indian labourer does not readily adapt himself to the new methods." In the report of the Factory Commission of 1908 it was calculated that one hand in Lancashire would produce more than two and a half times the output of a hand

in India. A new competitor, the hand-loom factory, is now entering the field, for which, I hope, there is a great future. "In India, the cheapness of labour gives it a much greater chance of holding its own in the conflict with steam than it has in England." "There is a large home market to be captured, as the Indian output amounts to only about a quarter of the imports. The chief weakness is in the production of the higher counts of yarn." "The future of the industry largely depends upon whether it is possible to introduce a high class raw cotton into India." This is perhaps the one industry about which Swadeshi preachers have harangued their hoarsest advocating the use of Indian made goods and boycotting Lancashire products. I may say at once that I recognise gratefully that some work has been done in the way of opening our eyes to the great future which lies before the industry, if only we devote proper attention to it. But in this, as in other industries, Swadeshists have confined their attention only to the consumers and not to the producers. If only the products of Indian mills can reasonably compare with those of foreign mills, I have no doubt that people will go in for them. And I am optimistic enough to believe that the current has set in strongly that way already.

I do not propose to deal with the other industries of India in particular here. The above I have given only as illustrative of my argument, *viz.*, that the industrial development of India does not demand any form of protection,

I should like to take each industry in turn and show in detail how any form of protection is not likely to help it but that it may retard its progress. But it is not possible to do so in this paper which is already too long. I may, however, state that I have examined the position and prospects of the important industries and am in a position to observe that whatever else they may or may not want they certainly do not want any form of protection for their development.

Having now discussed the futility of the steps which are usually suggested for the industrial advancement of our country, I may, in conclusion, state a few of the things which, in my opinion ought to be done for the end in view.

Industrial and commercial education of the requisite kind must be provided in various places in the country so that it may be available for those who are most likely to benefit by it. The education must be of a practical kind which must take account of the particular conditions of the part of the country where the school or the college is situated. These are but commonplace remarks. But what I am most anxious about is that the capital and the intelligence of the country must not stand so absolutely divorced from each other as they do now. I will make my meaning clearer. Those who have the brains to conceive and the hands to execute big industrial undertakings have not the required capital. And those who have idle capital have neither the energy nor the inclination to utilise the money to the best advantage. If some means can be devised by which the intelligent youth of the country who is well trained in the theory and practice of industry and commerce is put in charge of well-financed industrial concerns, the industrial future of India is assured.

Then again the Government must continue on a larger scale and more vigorously to point out to the people the industrial possibilities which lie before them in the various parts of the country. At the same time, I do not want that the Government should, as such, pioneer any new industries on *commercial* lines, while they may and ought to conduct experiments.

As was said in a previous part of this paper, Swadeshi as a feeling that every Indian ought to do something for the industrial welfare of his country ought to be cultivated in its intensity. I am only anxious that it ought not to take forms which, while they do not have any chance of enabling us to achieve the end we have in view, only tend

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to divert our attention from the really effective forms which the sentiment ought to take. For we are likely to imagine that, if we occasionally or even usually buy Swadeshi-made goods. "Even at some sacrifice," the industrial millenium of India is at hand.

Finally I grant that as against the products of countries in which protection takes the most aggressive forms of bounties, &c., it may be desirable to retaliate temporarily. The example of foreign bountyfed sugar will occur to every one. But I am only anxious that protection or Swadeshi, as a principle, ought not to be accepted by the Government or by the people.

I have done. But I should like to add that, in this paper, I have dealt with only one side of a big question and that in a very cursory fashion. Hence statements are likely to have been exaggerated. But my point is that the protectionist principle if given effect to in India will result in harm and certainly not in good.

NOTES ON INDUSTRIAL ORGANIZATION IN INDIA.

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It would be a mere platitude to assert, that the holding of industrial conferences in a country which is just developing into a full-fledged industrial nation is an event, which ought to evoke general interest. It is unfortunately the case, however, that such conferences have not appealed to the class whom they should particularly interest. The reasons for this lack of sympathy might be various, but I believe a continued interest in the activities of the conference can be created only by making them continu-

ous throughout the year. It would be a sound idea, therefore, if the conference considers the question of opening industrial bureaus in various important Indian centres, where questions of industrial organization can be systematically treated.

I propose in the following pages to offer a few suggestions regarding the various points of view from which such questions can be approached. The industrial organization of a country is bound to depend in modern times mainly on the relations of the capitalists and the employers of labour to the labouring classes. It will of course depend also upon the mobility of capital and on its easy access for those who are in need of it on a large scale. I mention these two factors especially, because they appear to me to be the most important ones in the present industrial development of India.

As regards the first of these issues, *viz.*, the relations between capital and labour it is high time that the Indian capitalist should take steps to secure a continuous supply of skilled labour. Indian labour, it is often asserted, is mainly unskilled, very mobile and fairly unsteady in its output of work. In the mills and factories, this feature of the Indian labour problem has to be taken into account, as it seriously interferes with regular production. There is another defect which will grow more serious unless steps are taken to remove or to lessen it, in the ordinary Indian labour, that is available in Indian cities. It is noticeable that the average Indian workman has deteriorated in physique and the hard conditions of city life, the insufficient dwelling accommodation and the insanitary environment have been sapping his vitality.

It is just these very points in the solution of which we might expect the capitalist to come and help to improve the quality of Indian labour. In giving such help he will be really helping himself. It is by no means desirable that there should be created as is now the case in industrial centres all over Europe and America a class of unhealthy

citizens with no permanent employment and perhaps with no desire to obtain permanent employment. This is called the proletariat class. Such a class becomes a danger to every industrial community because it soon becomes steeped in the vices of city life and comes to have a distaste for any regularity of employment. The slums are full of them and they are chiefly responsible for the hooliganism of modern cities. If we notice the conditions of life of the ordinary mill hands in the chief centres of production in India it will strike us that they will not fail to produce in our midst such a class unless we take preventive measures for the good of the community and for securing in the interest of Indian industry a better class of workers.

Efforts have been made by some capitalists to provide better housing for their men, to establish schools for their children and improve their lot generally, but such efforts have been spasmodic, and there has been no attention paid towards improving the general conditions of industrial workers and to make them conscious of the importance of continuing in their work and of learning the technical skill necessary if they hope to obtain better wages. We have not as yet amongst us, that class of mill-hands, which have been in the mill line for generations as in England and other European countries. The English mill-hand can be trusted to give his work undivided attention without coming under the lash of the overseer. He does not while away his time when asked "to tend his machine." he does not sneak away a moment here and a moment there for a chat or a smoke as the Indian mill-hand does. He is therefore a far more valuable asset to his employer than is the Indian mill-hand. He has far more general information and is better able to understand his rights and his duties. We have to make the Indian mill-hand understand these things and we must try and give him the rudiments at least of an education which will make him more wide awake. When he understands that his interest lies in learning

technical skill and becoming more steady the Indian capitalist can depend upon him with more certainty.

We are talking now-a-days a good deal about interesting the mill-hands in the co-operative movement. Very often it is the case that unless there is the tangible fact before them that they can obtain money at less interest with the introduction of co-operative credit, they do not care either way about the movement. Just as co-operative work among the villagers is looked upon as another fad of the revenue officers by a good many of them so is the introduction of co-operative ideas looked upon by the illiterate mill-hands. We have, therefore, to teach them first to understand these things and a surer way to approaching them will be by bettering their environment. The first step towards such betterment must lie in improving the housing accommodation of the mill-hand. This means of course a good deal of generous help from the capitalist or the mill-owner. It must be made practically impossible for slums to exist in Indian cities and what is possible for us now will become fairly impossible after the lapse of another twenty years.

We should strongly recommend, therefore, the building of improved tenements on the part of mill-owners for their own men. Such tenements can be let out to the men on a graded scale in proportion to the amount of wages they obtain. There should be an annual reduction in rent for a workman who keeps his rooms cleaner than those of others, and the inhabitants of such tenements should be encouraged to organise some co-operative work among themselves, such as the institution of a small bank from which they can withdraw money in times of emergency. The bank will have to be started with a good deal of help primarily from the mill-owners but they should have the choice of giving out help at a very low rate of interest to deserving persons.

We must watch the efforts of the Social Service League in Bombay in trying to popularise ideas of co-operation among the mill-hands. Some members of the Servants of India Society are now actively engaged also in studying the conditions under which mill-hands live at close quarters by occupying rooms amongst their midst. The details of such a study will be valuable in affording us help in the formation of schemes for raising the standard of general education among the mill-hands. We must particularly welcome the spirit of better interest in their lot on the part of the middle classes, as it is only by securing the confidence of the labouring and artisan classes that we can induce them to improve their general condition, and to make them more efficient workers. We must point out in this connection the efforts in Bombay of some gentlemen who are interesting themselves in the depressed classes and in the mill-hands by taking steps to provide schools for the former and by forming associations for the benefit of the latter. Such Associations can be developed into a kind of *trade union* for the working classes.

With the increase in number of the mill operatives in our big cities the establishment of such trade unions will be very welcome. But care must be taken that they must not create that spirit of animus against the capitalist which similar movements in the West seem to inspire. It will be as well, if our Indian employers of labour take the lead in forming such unions and inspire a belief in the union officials that the legitimate demands of the workmen as voiced through them will be sympathetically considered by the masters. Such Trade unions will then serve to promote a spirit of solidarity among the operatives without at the same time dividing the employed and the employers into two distinctly antagonistic classes.

A further step in a similar direction would be the establishment of some system of providing work for those who flock into the larger cities in search of employment. We can

establish with the help of the capitalist but mainly through the medium of the trade unions *Labour exchange offices*, where those in want of work can register their names and obtain information as to where work can be had. Care must be taken that those in charge of such exchange offices should be thoroughly familiar with the ways and wants of the labouring classes. At first such a scheme of establishing labour bureaus might appear in the present condition of Indian industry rather too ambitious, but there can be no doubt that a small beginning is possible in the direction.

So far we have dealt with the condition and the possible methods of improvement in the lot of the ordinary labourer. A good deal can be done to improve Indian industry by providing or at least by securing better methods of providing indirectly trained labour. During the last decade a good many factories under Indian auspices have been started and we are afraid quite a fair number of them have been unsuccessful owing to the want of the services of technically trained men. Very often the directors of such factories are retired Government officials or pleaders, and doctors with large practices, who by their training and their occupation in life, cannot be expected to know details of the business or the principles on which it should be started; though they have a very wholesome desire to finance it. The result is that they either find themselves completely in the hands of the so-called expert manager who robs the company at every point from the buying of machinery to the delivery of goods to their wholesale buyers, or that they get untrained or badly trained inefficient men from the very beginning.

What the Indian capitalist is in need of in this case is a kind of agency which will serve as a medium between the capitalist on the one hand and trained labour on the other. For high class trained Indians there is often a good deal of demand but when Indian students come back home after technical instruction abroad they often find themselves in

want of work because there is no meeting ground for the sources of supply and demand. The establishment of such an agency will therefore make the demand known to those who wish to supply it.

We should welcome therefore in connection with the industrial information bureaus about which mention has been made earlier in this paper, the establishment of a registration agency, at which Indian students who return after technical instruction abroad as well as those technically trained here, can report themselves when seeking employment. This list can be classified from time to time according to the various industries for which the men are available, and it can be sent on to mill-owners and other employers of labour. With properly trained staff at the agency there is no doubt that such work will be very useful in placing the right man in the right berth and thus helping on the progress of Indian industries. A small fee could be charged to those who are anxious to have the privilege of enrolment.

Mention must be made in this connection of another defect in the present system of securing good trained Indians for starting new factories. A fair number of young men who have been able to go abroad have done so at the expense of some charitable fund or other. The fund has spent on each one of them perhaps a sum amounting to 8 to 10 thousand rupees and yet it does not seem to be in the interest of the trustees of the fund, that the persons whom they send out at the fund's expense should be made to yield for the good of the country in the shape of effective work what they have learnt at other peoples' cost. When a young man returns and begins the not always pleasant work of job hunting, the trustees who are of course influential men in their own localities can help him only indirectly by furnishing him with notes of introduction. In several cases the young man is left stranded. He has of course no money of his own to float a big concern by himself, and

those who can finance him do not feel enough confidence in him to do so, as they know hardly anything of his antecedents, but are aware that he has nothing to lose financially, if the concern he is employed in, goes to ruin and what is worse, being very often uneducated men, they have but a vague idea of his technical qualifications.

We would suggest in this case that funds started with the special idea of sending young men abroad should make it a point of spending less in merely foreign education by limiting the number of students to be sent out and should invest more on those, whom they have already given a chance abroad by offering them what may be called "maintenance scholarships." A special part of the fund should be set aside for being utilised by foreign trained young men in showing practically to the satisfaction of the capitalists interested in the fund what they have learnt abroad. A contract should be previously made with them before they proceed abroad that they will (1) consent to remain as working with the maintenance scholarship allowance under the direction of the board of advisers appointed by the fund and (2) that they will agree to serve if the emolument is satisfactory in any concern started under the auspices of the fund.

Objection will perhaps be taken to such a proposal on the ground that it will not be possible to tie down any young man to a particular kind of employment and that they will always refuse the service offered them on the plea that the prospects are not satisfactory. The proposal however is well worth being put into practice in that it will give some young men the chance of avoiding the trouble of hunting out without success some likely capitalist and also the chance of showing to interested employers of labour what practical knowledge they have.

Such agencies for securing employment exist in the Universities of Oxford and Cambridge and they have been found there to be very useful. They do not necessarily

degenerate into an ordinary employment bureau as their object is not to make any profit out of the business. They serve rather to show the passed graduate the way to work, when he has to leave the University, and being under University supervision, they enjoy the confidence of the public. There is no reason why industrial bureaux started under the auspices of the Industrial Conference Committee should not enjoy a similar confidence.

Side by side, with an agency for bringing capital and labour into touch with one another we should have another department of the bureau for the scientific treatment of questions relating to the growth or decline of Indian industries. Such statistical branches should inquire into the more flourishing industries of the district in which the bureau is situated and University men should be encouraged to work out the statistics relating to such industries. We have to note with regret that many of our University men have no desire as yet for informing themselves about the industrial possibilities of the locality in which they live, and the utility of developing such a taste can be most practically brought home to them by the presence of an industrial bureau in their very midst.

Of course, this work will be at first, extremely difficult as it is not always possible to interest the right sort of men in collecting useful statistical information regarding any particular industry. How very uphill the work is has been shown by the efforts in that direction of some members of a society called "The Indian Guild of Science and Technology." This society was started in 1909 by Indian Technical Students in the United Kingdom with the active help of several distinguished men of science in British Universities. It has several branches in the United Kingdom, correspondents in France, America and Germany and has been successful in founding branches at Bombay, Calcutta, Madras and Rangoon. A great majority of foreign trained Indians are members of this body which

aims at collecting statistical information about Indian industries and hopes to increase scientific knowledge in India by various means, such as the publication of research work, and the holding of lantern lectures, &c.

Its efforts go to show that it is still hard to persuade small factory owners to come forward and make public, partly of course for their own advertisement, the results of their successful efforts. The development of any particular industry in any specified locality can be accurately studied, only when such help is forthcoming. An attempt can then be made to give in pamphlet form a short account of the possibilities of starting the industry with a specified amount of capital, a description can be given of a model working factory, and the causes of previous failures can be analysed and commented upon.

The putting together of such pamphlets will be, however, an impossibility unless the proprietors of the many new concerns belonging to the so-called small industrial class come forward with the knowledge of their experience. It is in their own interest also, to do so as they are likely to be furnished at easier rates of interest with more capital when the public finds by means of such pamphlets that their concerns stand on a solid footing.

We have considered in brief some remedies for the better organization of the supply of trained men and have suggested some methods to secure some steadiness in unskilled Indian labour. It remains for us to deal shortly with the question of the provision of capital for the many new small concerns recently started in India. The great cry at present is for the development of small industries, but although many Indians with an individually small supply of capital in their hands are anxious to invest in such small concerns their first hopes wither away when they come to realize that a factory on a small scale even eats up a bigger amount of capital than is originally estimated for its purposes.

The result is that several small concerns, particularly those in the Deccan, are found to be in temporary monetary difficulties. If they cannot secure funds to tide over such emergencies, the concern ultimately goes to ruin. There must be some organised agency at hand to give financial help to such of these concerns as can give good security for the help offered. They cannot borrow in the open market because of the absurdly high rate of interest. If they can obtain monetary help from some financing body at a lower rate of interest for example at a rate not exceeding 6 per cent., they will be far better off, while they are making a brave effort to produce commodities only available until now in India as foreign products.

We should welcome therefore a proposal which has recently been made by some members of the Indian Guild of Science, who are themselves manufacturers that locally, industrial syndicates should be formed for the purpose of obtaining through gentlemen of means in the particular locality some substantial loans at a rate of interest not exceeding four per cent. which sums the syndicate should lend out to deserving concerns at a higher rate of interest. The difference between the two rates should be utilised for helping some movement for technical instruction. As such syndicates are to be formed only within a particular locality they will have the advantage of being composed of men who are either directly interested in the industries started in the locality by the fact of their being manufacturers, or who are indirectly interested in industrial development and are willing to finance the local industries when their capital can be guaranteed. If the latter class of men join the syndicate they can persuade other influential gentlemen in the locality to lend their quota when the syndicate agrees to guarantee to them their interest, just in the same way as interest on Government promissory notes is considered to be guaranteed.

There can be no doubt that such a scheme if taken up by the capitalist classes in each particular locality will soon

make quite a good deal of capital available for the many small concerns in need of it. The various bureaus for industrial information, the establishment of which this paper advocates should make it a point to draw up a list of the various industries in the districts which they are meant to serve and they should invite the owners of factories in want of assistance to furnish them details as regards the securities they can offer, &c. The bureau can then approach either the Industrial Syndicate, if any such has been already formed, and invite the capitalist class to offer help to the various concerns. If some at least of the foregoing proposals can be found to be workable in practice we shall have advanced a great way in the better organization of Indian industry.

PROGRESSIONAL RURALIZATION OF THE PUNJAB.

BY PROFESSOR BAL KRISHNA, M.A., F.R.S.S.,
F.R.E.S., M.A.E.A., M.S.A.A.

'In a country devoted to mere raw agriculture, dullness of mind, awkwardness of body, obstinate adherence to old notions, customs, methods, and processes, want of culture, of prosperity, and of liberty, prevail. The spirit of striving for a steady increase in mental and bodily acquirements, of emulation, and of liberty, characterise, on the contrary, a State devoted to manufactures and commerce,' *Friedrich List*.

In such words of pregnant truth the defects of an exclusive pursuit of agriculture and the merits of manufactures have been pointed out by one of the greatest economists of Germany. My study of the Census Reports of the Punjab has forced upon me some important conclusions such as these—

- (i) that the Land of the Five Rivers is becoming more and more agricultural under the British administration,
- (ii) that the indigenous industries are being constantly killed by the stress of unrestricted foreign competition,

(iii) that low paid workers and tribes of menials are increasing by hundreds and thousands,

(iv) that we are becoming a nation of petty shopkeepers in the sense of distributors of foreign articles alone,

(v) that in short, during the last thirty years, we have been more and more subjected to the dangers pointed out by List. Instead of progressing we are being crippled, our arm of manufacture is being cut from us and we are thus on the way to become a purely agricultural state instead of the agricultural and manufacturing state in the pre-British period. These points will be proved by facts and figures quoted from Blue-books and I shall be much obliged if any gentleman would take the trouble to contradict them after studying this matter.

I have extracted from the Funjab Census Reports the following figures relating to the percentage of increase in population as well as in agriculture :—

PROGRESS OF POPULATION AND AGRICULTURE COMPARED.
TABLE I.

1881—1891.		1891—1901.		1901—1911.	
Per cent. Increase in population.	Per cent. Increase in agriculture.	Per cent. Increase in population.	Per cent. Increase in agriculture.	Per cent. Decrease in population.	Per cent. Increase in agriculture.
1	2	3	4	5	6
10·7	12	7·26	Apparently 6·4 Really 10·8	—1·7	2·5

The foregoing figures prove that there is a proportionally greater increase in the agricultural classes than in the total population, that while the rate of increase in the population of the province was 10·7, 7·26 and 2 per cent. the cultivating classes increased by 12, 10·8 and 2·5 per cent. at each succeeding Census, or decade, that is, the people goaded by some extreme necessity have migrated more and more to agriculture during the thirty years under review. In column 4 we see that the rate of increase in agricultural population is 8·4 but the virtual rate was 10 per cent. as seen from the following words of the Census Report, 1901, Part 1—page 360 :

“Agriculture alone shows a slightly higher increase of 6·4 per cent., but the increase would have been *greater* had not ‘agricultural labourers’ decreased considerably, for taking land-owners and tenants alone, we have now 14,770,000 souls, including dependants, as against 13,330,000 in 1891, *an increase of 10·8 per cent. in these two occupations.* This increase is significant of the development of canal and the colonization of uncultivated tracts in the past decades.”

PROPORTIONALLY PROGRESSIVE INCREASE IN AGRICULTURAL POPULATION.

In the Decennial Report on the Material Progress of the Punjab, 1881-1891, on page 1, we read “The proportion borne by agricultural and pastoral classes to the total population according to the Census of 1880-1881 was 53·6 per cent. In the Census of 1891 the figures for these classes are 54·1 per cent.” Then in the Census Report, 1901, Part I, page 814, we see that 58·05 per cent. of the total population were engaged in pasture and agriculture, but in the next decade again tells the same sorry tale of the constantly increasing ruralization of the Province, for pasture and agriculture claim 60 per cent. of the people in their folds. In brief, the last four censuses reveal an inevitable tendency for migration to land subject to the law

of diminishing returns and the desertion of native handicrafts and indigenous industries, arts and handicrafts which were handed down from father to son, from times immemorial, 53·6, 54·1, 58·05, 60 per cent. was the proportion of the agricultural classes to the then total population of the respective censuses of 1881, 1891, 1901 and 1911. Such is the prosperity, progress and economic development of the Punjab !

The same aspect is emphasized by the following table of the Functional Distribution of population during the last three decades :—

TABLE II.

Serial No.	Occupations.	1891.	1901.	1911.
1	Government	2·4	2·1	1·7
2	Professions	3·2	2·21	2·5
3	Agriculture	58·5 ? really 54·1	58·05	60·1
4	Artizans	217	19·87	20·4
5	Commerce	3·8	4·54	9·5
6	Personal	6·4	6·88	6·56
7	Unskilled	4·6	3·56	
8	Independent }		3·29	·24
		100	100	100

Indigenous industries have constantly been pushed out and cruelly ruined by the relentless competition of cheap and showy foreign goods and many more industries are every day becoming decadent. while their place is not being taken up by the mechanical industries. It is evident, therefore that the Punjabis like their brethren in other Provinces are fast becoming a nation of agriculturists and of distributors or suppliers of Western commodities and that they are losing their position in professions, liberal arts and State service.

It appears from the Census figures for 1891 and 1901 that *two million people or ten per cent. of the total population of the Punjab were turned within one decade into lower grades of labour* and some of them must have unfortunately joined the tribes of menials and servants. Professor Nicholson speaking on the criteria of the progress of a nation says :—

“One of the decisive marks of economic progress is found in the increase of the numbers of the classes with higher earnings relatively to those with lower incomes.” But alas ! in the Punjab ; within one decade alone, there has been an enormous decrease in the numbers of the classes with higher incomes, while full two million persons have been undeservedly doomed to lower grades of labour and some to perpetual starvation ! Such is the evidence of the Economic Retrogression or the Progressional Ruralization of the Province during the last decade of the 19th century!

Proofs in support of my statement can be multiplied to an indefinite extent but the constant deterioration of the old industries of the Punjab and slow increase of the new mechanical industries would be still more visible from the following interesting table :—

TABLE III.
DISTRIBUTION OF THE PROVINCIAL POPULATION
BETWEEN TOWNS AND VILLAGES.

British Territory	...	1881	1891	1901	1911
Rural Population	...	87.06	88.43	88.44	89
Urban Population	...	12.94	11.57	11.56	11

The foregoing figures prove beyond doubt that the proportion which the Rural Population bears to the whole has remained remarkably constant but with greater truth it may be said that it has rather been slightly increasing. On a careful examination the extent of the evil within the last

30 years under review would be prominently visible; because while in 1881, 13 per cent. of the people lived in towns, in 1911, only 11 per cent. was the proportion of the Urban population. It is still in the face of these figures, clearly proclaimed in official statistics that the Punjab is regarded as fast progressing. Can there be any more preposterously erroneous view of the real situation of the Province ?

But compare the next table which shows the increasing predominance of Urban as compared with the Rural element in England and Wales. It will be observed that in 1881, 68 per cent. of the population were dwellers in towns ; the proportion rose to 73 per cent. in 1891, to 77 per cent. in 1901, and to 78 per cent. in 1911.

TABLE IV.

Items.	Proportion per cent. of Population of England and Wales.			
	1881	1891	1901	1911
Urban population at each census ...	67.9	72.0	77.0	78.1
Rural population at each census ...	32.1	28.0	23.0	21.9
England and Wales ...	100.0	100.0	100.0	100.0

The preceding facts and figures are sufficiently eloquent but they grow doubly so when statistics of other countries are placed before the reader for comparison.

INDUSTRIAL ADVANCEMENT OF THE U. S. A.

During the 19th century the striking phenomena of the U. S. A. are the decline in the relative number of persons engaged in agricultural pursuits and the increase in the number of persons employed in trade and transportation. Yet, owing to the opening up of old American Indian reservations for settlement, the constant alienation of the public domain, the breaking up of southern plantations and farms, the number of agriculturists ought to have immensely increased.

TABLE V.

Reduction of Agricultural People in U. S. A.

1790	...	...	...	...	87·5%
1840	...	...	...	...	77·5%
1870	...	...	...	...	47·6%
1880	...	...	...	...	44·3%
1890	...	...	...	...	39·2%
1900	...	...	...	...	35·7%
1912	...	...	...	...	30%

TABLE VI.

DISTRIBUTION OF POPULATION ACCORDING TO OCCUPATION
IN THE U. S. A.

	1880	1890	1900
Agricultural pursuits ...	44·3	39·2	35·7
Professional service ...	3·5	4·0	4·3
Domestic and personal service ...	19·6	18·1	19·2
Trade and transportation ...	10·8	14·3	16·4
Manufacturing pursuits ...	21·8	24·4	24·4
	100	100	100

Let us now compare India with England. The Royal Commission of 1897 on Agriculture in England shows that since 1875 to 1895 upwards of 2,137,000 acres of

arable land had gone out of cultivation 1,900,000 acres of which had been under wheat, that there had been a diminution of 399,000 cattle and 2,941,000 sheep and a decrease of 13,250,000 in the annual value of lands in Great Britain.

This decline of British agriculture has not been stopped even up to this time, because progressive England is fast increasing the output of her manufactured products. Hence we see that in the last twenty years (1891—1911) the land devoted to agriculture has decreased by more than three-quarters of a million acres, while the land under the plough has gone down by more than 10 per cent. Thus England even, now when she is old in her manufacturing capacity, is becoming more and more industrial, while young India which ought to have improved her industrial and manufacturing capacities has virtually declined in industry and manufactures.

Now a comparative table of the Functional Distribution of the Population of the three most progressive countries of the West would definitely but remarkably reveal the Economic Retrogression of the Punjab. *The Agricultural produce of every kind has been fast increasing in those countries and yet men occupied in Agriculture have been constantly diminishing in numbers.* But such good luck is not reserved for this unlucky province. Its peoples are more and more migrating to land which, be it remembered is always subject to the law of diminishing Returns.

The proportions of the total population of the United Kingdom, Germany, and the United States engaged in the main classes of industry in those countries at three successive censuses were as follows :—

TABLE VII.

	Proportion occupied per 10,000 Total Population.								
	United Kingdom.			Germany.			United States.		
	1881	1891	1901	1875	1882	1895	1880	1890	1900
Agriculture ...	711	601	495	1,783 (a)	1,783	1 554	1,517	13,338	1,348
Building ...	289	222	278	209 (a)	209	262	138	187	164
Mining ...	158	187	202	66	71	83	50	62	77
Principal textile industries ...	313	297	243	178	141	134	62	67	72
Iron and steel, and manufactures thereof (including ship building) ...	239	257	301	171	179	215	91	127	152
Leather, paper, glass, pottery, and chemical trades ...	160	163	166	178	204	218	79	93	96
Total population in thousands ...	34,885	37,733	41,459	42,727	45,222	51,770	50,156	62,622	75,569

Thus it is clear that all the three countries show a marked decline in the population engaged in agriculture.

The comparative percentages of persons engaged in the chief occupations in *Germany* are still more remarkable : whereas in 1882, 43·4 per cent. of the total number of occupied persons in Germany were engaged in agriculture, forestry, and fishing, the proportion in 1907 had fallen to 32·7 per cent. The total number of persons dependent on agriculture for a living had fallen from 42·5 per cent. of the total population to 28·7 per cent.

Thus the relative strength of the agricultural population has fallen by 12 per cent. in Germany. But unfortunately, in the Punjab this healthy process has been reversed for while in 1881, 54 per cent. of the people were engaged in agriculture, the proportion in 1911 had risen to 60 per cent. We cannot compare ourselves even with such countries as Belgium and Austria.

If the reader has carefully studied the census tables of the last two decades, wonderful things might have been revealed to him. Since 1881 and in fact long long before that year there has been a strong tendency towards the transformation of industrial Punjab into a purely agricultural country but that tendency was *mightily visible* in the last decade of 1901-11 because in spite of a positive decline of 1·7 per cent. in the population of the Punjab during that decennium, agriculture, pasture and farmstock-breeding claimed more people in 1911 than in 1901. On the whole, there were 349,502 agriculturists more after the lapse of ten years though the actual reduction in population amounted to 566,985 souls. If the population of the Province had increased there would have been no misgivings, but now that we had lost nearly 2 per cent in numbers, the addition of 349,502 hands to the already crowded agriculture is virtually the most disastrous event of the decade.

DISAPPEARANCE OF 8,300,000 LANDLORDS AND THEIR DEPENDENTS.

Things have grown worse not only to the extent indicated above, but they have really adopted incredibly hideous forms. The very first fact of tremendous importance is that during the last ten years 8,289,800 men who were receivers of income from rent of agricultural land, have disappeared. Where? nobody knows. In the year 1901 the number of these landlords was 8,915,669, but in 1911, it was only 625,869; there were in 1911 only seven Landlords instead of 100 in 1901. It is well to remember that the numbers 625,869 and 8,915,669 represent actual workers as well as their dependents. If we were to exclude the direct dependents of the landlords, then there were, in 1911, 239,772 landlords of both sexes. These rent-receiving landlords belonged to many and varied classes. They comprised the agriculturists, Government employees of all kinds, money-lenders, grain-dealers, other traders of all kinds, priests, clerks, school masters, lawyers, estate agents and managers, medical practitioners, artisans of all kind and men of many other sundry occupations.

I have looked in vain throughout the Census Report for some explanation of this uncommon phenomenon, of this extraordinary, and almost sudden change in the functional distribution of the Punjab population. The silence of the Census Commissioner on this momentous problem when he has enlightened us on many other points of far less importance is very remarkable. Some explanation of this violent change may be offered by saying that rent-receivers have become peasant proprietors—men who have been called ordinary cultivators in the Census Report. In the last decennium, there has been a net addition of 7,650,711 persons to this class of peasant proprietors, while the net decrease in the class of landlords was 8,289,800.

The following important questions occur to me :—

(a) What has become of the people who have been dispossessed of their landlordship, *i.e.*, what main occupations have been adopted by them ?

(b) What classes have been ousted from the ownership of land ?

(c) Men of what classes and religions have come to possess that ownership ?

(d) What was the approximate income of 8,915,669 landlords and their direct dependents and how is that income now distributed ?

DECAY OF INDIGO INDUSTRY IN THE PUNJAB.

Indigo plantation must have decreased a good deal, because in 1911 there were only 11·3 men supported by this industry in place of 100 in 1901. The production of Indigo was a very lucrative industry. From times immemorial India has been renowned for this product. The very word *indigo* (English and German) comes from *L. Indicum*, that which is Indian (*L. Indicus*) or that which has been imported from India. The Greek word for indigo is *Indikon*. The indigo colour was largely used by the ancient Phœnicians, Egyptians, Assyrians, Greeks and Romans but now like many other things we have lost our market even for this article in the world.

DECAYING SUGAR INDUSTRY.

Such is the enormous reduction in the production of indigo, but the same lamentable fate is reserved for our sugar industry, because makers of sugar, molasses and *gur* have decreased by 39·6 per cent. (group 23, Schedule II, Table X). Sugar from Java, Mauritius and Germany is ousting the native product from Indian market on account of its cheapness. Its import increased from £3,938,481 in 1901-02 to £8,777,310 in 1910-11, that is, within one decade there has been an increase of 123 per cent in the importation of sugar. Foreign countries are and will be

dumping our markets with their cheaply produced or bounty-fed sugar only on account of the Open-door policy of our Rulers. Not only our lucrative industries and handicrafts but even the production of profitable agricultural commodities, such as indigo and sugar are being wrested from this preponderantly agricultural India. We do not know whether there would be an end to this disastrous replacement, it is rather to be feared that this replacement would be ever increasing with the progress of chemical science in the West. Our cotton plantation is soon to be threatened on account of a remarkable recent discovery of a German chemist who has succeeded in reducing the cost of the production of cotton to half of what it was before in Germany. We can still save the situation, avoid the decay of our industries and the deterioration of our agriculture and the perilous debasement of the whole people of this great Empire, only if we build a strong tariff wall against foreign imports and introduce free compulsory education in this land.

GROWTH OF HEWERS OF WOOD AND DRAWERS OF WATER.

It would be no exaggeration to say that the tendency of present day economic forces in India is to convert the self-supporting man and woman into a labourer or at least to push him and her to lower grades of labour. During the ten years in question, the number of low paid farm servants and field labourers has gone up from 438,653 to 1,192,187 thus showing an increase of 174.9 per cent. Similarly there is a rise of 165.1 per cent. in the number of the wood-cutters, firewood, lac, catechu, rubber, etc., collectors and charcoal burners. Again, shepherds, herdsmen, goat-herds have increased by 124.8 per cent. actually adding 178,875 persons to their number. But then, breeders of valuable animals like the horses, mules, camels, asses, sheep, goats, pigs, etc., have *decreased* by 144.4 per cent.

It should be distinctly understood that all the woeful industrial decadence has resulted from the unchecked, free, keen and open competition between primitive industries of India and the highly organized factory industries of the West. And hence the future of those industries which are now struggling for existence against the mighty in-roads of the West, appears to become highly dark and gloomy.

Manufactures of glass and crystal-ware, dyes, paints and inks, sugar, wines and liquors, carts, carriages and palkis, boats and ships, musical instruments, *nay even bangles, rosaries, beads, necklaces, spangles and sacred threads* too, have much dwindled. Persons supported by these arts and industries could not pick up even a precarious living. The proverbially cheap though industrious, frugal and thrifty, low paid though skilful labour could not compete with the Western articles produced in giant factories owned and conducted by giant syndicates, cartells and trusts.

CONCENTRATION OF WEALTH IN SIX TOWNS.

If the reader would take a walk in any one of the big cities, like Lahore, the capital of the Province, he would see wonderful things if he has eyes to see and a heart to feel. From one end of the Anarkali and Upper Mall to the other end he would see shops of various kinds. Tailors, milliners, dress-makers, darners, embroiders on linen, hair-dressers and wig-makers with their gaudy show cases, attractive sign boards, and hundred and one devices to catch the fancy of the passersby would meet his eye. A few steps more and he comes upon some highly embellished curio shops. His heart leaps up with joy at their splendid sight and he thanks his stars for having seen without payment the curiosities of this wide wide world. Scarcely he comes out of the shop, when the dealer in the opposite row winks his eyes at him and invites him to see his beautiful goods—hats, umbrellas, socks, perfumes, carpets, curtains fans, toys, paper-flowers, etc. Let him go onward still and he

would see enamellers, gilders, imitation jewellery sellers sitting in highly decorated shops, whose showy and profuse ornamentation enslaves his heart and be he a European or an Indian—at the sight of that dazzling brilliance he readily jumps up to the conclusion that India has made wonderful progress, that India is fast growing rich. This erroneous idea is strengthened at the sight of dozens of booksellers, publishers, stationers, photographers, engravers, watch-makers, dealers in pictures, optical, surgical, or musical instruments. The idea becomes a conviction at the sight of banks, insurance companies, hotels, liquor and aerated waters—shops !

Reader, this is what you see at the surface and therefore have your heart so much captivated that it beats high with joy at the prospects of progressive India. *But stop and think for a moment whether you saw any among those hundreds of thousands of articles, of Indian make?* That dazzling brilliance, that captivating ornamentation and embellishment, that profusion of decoration, that exuberance of adornment and beautification, that fairy enchantment so lovely to see, that graceful charm of tawdry, handsome, comely or showy curiosities is not Indian but Western !!

It will thus be seen that we are only distributors of commodities received from the West. Our towns have become centres of distribution and all the display of Western wealth, civilization and culture is highly concentrated in them. When these few cities are the standard of the measurement of our wealth, it is but necessary that extravagant calculations should ever be made of the wealth of India. But a Westerner does not know that our hand industries have been so much stifled, and killed by him outright, that our villageman unlike olden days cannot get even ordinary things of Indian make in his own village and he has therefore to go to towns for shopping.

The Globe trotters, other travellers in India, the Anglo-Indian community here move in these cities and hence they carry away exaggerated and really false ideas of the wealth and progress of this country. They forget that all this concentrated wealth has been received from the West in exchange for the raw materials which the Western manufacturer is impatiently anxious to get from this land, that the sons of the soil have taken no share in manufacturing it, that their handicrafts and industries are being fast killed by Western giants, that people are being forcibly pushed to unremunerative, primitive, wasteful and unadvancing agriculture where no machinery, no new-manures, no new seeds or plants and no new and cheaper methods are employed, in short, they do not grasp the most important fact that we are fast becoming a nation of agriculturists and petty shopkeepers on account of the open-door or Free Trade policy of our Rulers. Unless this stern, solid and irrefutable fact is comprehended in all its bearings, no impartial and correct estimate of the economic situation of this country can ever be made. Unless it is fully grasped that only on account of the Free-trade of England every decennium has thrown hundreds of thousands of men and women from their hereditary professions to die of starvation or seek employment anywhere as best they can, unless it is honestly recognized that by reason of the absence of capital, captains of industry, efficient labour, organizing skill, mobility of labour, free compulsory education, technical, mechanical, electrical, commercial, industrial, in one word, practical education—the Indians cannot adopt the new methods of production, India would ever suffer the consequences of a huge misunderstanding. Indians as well as Europeans should clearly comprehend the situation—the trend of past events and the tendency of the future in trade, industry and agriculture. Those of us who have the welfare of our mother country at heart and especially the Government of this Great Empire will do well to ponder over the real situation in India in the light

of preceding facts and figures and adopt means for the betterment of this economically backward country.

It must be distinctly said that the absence of a strong tariff-wall has led to the gradual extinction of our handicrafts and the snail-like progress of our mechanical industries, because the one from senility and the other from infantile frailty could never compete with the giant and long established industries of the West.

To counteract the effect of the present economical disabilities, let the people themselves awaken to their sense of duty. It should be fully recognised that the silent industrial revolution, the disintegration of old institutions and the extinction of our handicrafts have necessitated an entire change in our economic and social life. We ought not to be wedded to our old systems of production. In the absence of state assistance, we should learn to stand upon our own legs. *Had a people with the ambition, enterprise, perseverance and freedom of the west possessed such a wealth of natural resources, as we do, they would certainly have made this land a veritable paradise.* It is we who are lacking the desirable qualities of self-sacrifice, activity, courage, enterprise, originality, industry, prudence, tenacity and perseverance, the study of economic, commercial and industrial questions. Let us, therefore, educate ourselves in economic technical and commercial matters and persuade the Government to co-operate with us in building magnificent and numerous technical academies, institutions, schools, stations for testing, well-stocked laboratories and in creating a technical literature, statistical bureaus and research institutes which should drive away the nightmare of harrowing sorrow from this sacred land. Then only shall we enter upon a higher form of life and fulfil our mission, then only industrial regeneration of India, the economic emancipation of the submerged millions and the pulling up of India out of the nauseating mire of dehumanizing poverty, will come within the range of possibility.

Let us have a firm faith in the destiny of our Mother land, let all the uplifting influences be brought to bear upon to-day's India and let Education and Protection be our watch words, then alone we can check this unhealthy ruralization of the country, then alone our dreams of economic regeneration will soon be realized. Let us hope that the haphazard and wreckless policy of drift pursued by our Rulers in India will give place to one of effective control over our economic development, that India will be governed in the interest of India and not in the interest of Lancashire, and Birmingham, that England would soon rise above selfish motives and that this cradle of humanity be raised in the scale of a civilization which is

“Sweet to the world and grateful to the skies.”

ALUMINIUM INDUSTRY IN INDIA.

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It reflects credit on India, and to the pioneers of this industry here that she has been able to take part however insignificant and humble in the revolution in the metallurgical industries of the world even though rather late. The discovery of the metal aluminium, its isolation, and its use on industrial scale may well be said to mark an epoch in the use of metals by man. Though the metal was isolated by Wohler in 1827, and attempts were made in 1854 by Deville to obtain it in larger quantities, the industry had no footing till 1886 when Heroult and Hall invented and patented their processes almost simultaneously. Since 1889, there has been a remarkable increase in the use of Aluminium in the arts and industries. This was the result of the fall in the cost of production : in 1887 the cost of aluminium was £18 per lb., in 1891 it was about

Early years of
the Aluminium in-
dustry in the West.

10*d.* per lb. ; in 1909 it was reported that the cost varied from £61 to £80 per ton ; in 1911-12 the price was at about £75, *i.e.*, at about 8*d.* per lb.

The large variety of uses to which the metal has been put in other countries will give an idea of the vast changes that are bound to follow with the increasing use of aluminium. The metal is at present used in all forms and dimensions, from papers, visiting cards, thimbles which weigh but fractions of a tola to objects of several maunds in weight such as shippropellers and the like. In the

In small industries. pure state aluminium serves for the manufacture of electric conductors, of surgical apparatus, precision instruments, of artistic objects like letter cases, picture frames, cigar cases, &c., and of cooking utensils, cups, dishes, pots, &c. For articles of small or moderate dimensions where no special strength is required this metal competes successfully with copper, nickel, germansilver, and brass since volume for volume it is cheaper. In the larger industries also aluminium is making rapid progress. It has been adopted for

Military uses, military uses, *e.g.*, field equipment utensils, where on account of its lightness a saving of about 50 per cent. in weight is effected ; again, the gun carriages used in France are made of this metal which weigh only 78 kilograms instead of the usual weight of 285 kilograms.

use in steamers, Yachts and steamers have been made of this metal with considerable saving in weight. Aluminium permits of being worked into tubes which are preferred in the chemical industries, in optical instruments, and in the making of cycles, cycles, motor cars, motor cars, &c. It need not be pointed out that the science, of aeronautics and the making of aeroplanes, aeroplanes, have been facilitated by the use of aluminium and its lighter alloys.

Aluminium has a bright future before it as a conductor for

electric works,
 lightness, with equal conductivity it weighs and costs less than copper. As such it is already in large use for overhead electric transmission. In the mining industry there has been considerable saving in time, cost and energy by the use of aluminium cars and cages. In Medical Science, the surgical instruments have been made lighter and more handy, while its use in the dental plates has reduced both the cost and weight of artificial teeth. In the manufacture of scientific instruments of precision like the Balance, the Sextant, &c., lightness as well as resistance to atmospheric oxidation have been secured. It has been found useful for the manufacture of ordinary chemical apparatus like ovens, baths, tripods, etc. ; while in chemical industries it has been a great boon as it is fairly stable towards common chemical agents. The recent developments in the art of soldering aluminium has made this metal more easily available for the larger plants required in the chemical industries. Aluminium is a good chemical agent for reducing the oxides of many metals and these reactions are utilised in various ways. The use of aluminium in flash light powder is likely to change the old methods of lighting entirely. For printing purposes it is found useful, lithographic plates made out of the metal being very valuable. On account of its lightness and stability in air, it has been proposed for coinage in place of copper and brass.

Aluminium is very slowly acted upon by acids, though alkalis and salts have greater action. Aluminium has

A semi-noble metal. been styled for this reason a semi-noble metal being intermediate between the noble metals—silver, gold and platinum, and the base metals—iron, copper, zinc, lead, &c. As such,

"This semi-noble metal has immense future before it ; because, silver gold and platinum have extremely small prospects of being noticeably cheaper, yet the time is not probably far distant when we shall have this metal at the price of the base metals. It can replace platinum and gold because of its lightness ; it already replaces silver, specially because of its resistance to sulphur, as well as for its lightness, besides being cheaper. At its present price it can replace the common metals for uses where its lightness is an extraordinary advantage. But when its price is down to that of these baser metals, it will replace them by virtue of its own intrinsic chemical and physical superiority, aside from its lightness. According to the calculations made in 1895, four metals, iron, zinc, lead and copper were cheaper than aluminium bulk for bulk."

its future.

replace them by virtue of its own intrinsic chemical and physical superiority, aside from its lightness. According to the calculations made in 1895, four metals, iron, zinc, lead and copper were cheaper than aluminium bulk for bulk."

"The ultimate goal of aluminium industry will be reached when it outstrips any of these metals and stands next, in importance and value of annual production, to iron."

In the light of these uses and possibilities of the metal it is no exaggeration to say that the discovery and the cheapening of aluminium is one of the greatest achievements of the nineteenth century ; in other words,

Importance of the discovery of aluminium.

it is no exaggeration to say that the discovery and the cheapening of aluminium is one of the greatest achievements of

"Nineteenth century will live in History as that century which gave to the world, the railway, the telegraph, the telephone, the dynamo, the Bessemer steel and aluminium."

Out of the several uses of the metal enumerated above, we are not concerned with any in India except the use as cooking materials. It will take perhaps a long time in India for the application of aluminium to other purposes, as the workmen are not yet quite familiar with the methods of working the metal.

As a material for making cooking utensils and the like, the superiority of aluminium is established, as the most useful and least attacked of the ordinary metals, by means of experiments conducted ever since the metal was familiarised in the fifties of the last century. These are admirably summed up by Mr. Richards* and it is worth while to quote the same in extenso.

Suitability of Aluminium for Culinary purposes.

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means of experiments conducted ever since the metal was familiarised in the fifties of the last century. These are admirably summed up by Mr. Richards* and it is worth while to quote the same in extenso.

* Richards, J. W., *Aluminium*, P. 98, &c.

Henry St. Claire Deville's Experiments. Henry St. Claire Deville, the great chemist, who was the first to cheapen the production of aluminium (1854) with prophetic insight looked forward to the times when aluminium would be used for culinary vessels. After trying a series of experiments he wrote : I have observed that the tin which is so often used and put in contact with common salt and vinegar is attacked much more rapidly than aluminium under the same circumstances. Although the salts of tin are very poisonous and their action being far from negligible, the presence of tin in our food passes unperceived because of its minute quantity. Under the same circumstances aluminium dissolves in less quantity ; the acetate of aluminium that is formed resolves itself on boiling into insoluble alumina or an insoluble subacetate having no more taste or action on the body than clay itself. It is for this reason and because it is known that the salts of the metal have no appreciable action on the body that aluminium may be considered an absolutely harmless metal."

Ballard's experiments. Ballard (1892) conducted the tests for several months and found that air, water, wine, beer, cider, coffee, milk, oil, butter, fat, urine, saliva and damp earth have less action on aluminium than on iron, copper, lead, zinc or tin. Vinegar and salt together attack it but so slightly as not to prevent its use for cooking purposes. A sheet lost only 1.8 per cent. of its weight in vinegar and 2 per cent. of its weight in a five per cent. salt solution after four months' immersion.

Lunge and Schmidt's Results. Lunge and Schmidt (of Zurich) conclude from a series of experiments with ordinary commercial aluminium, that the action of tea, coffee and beer is practically zero that of acids and acid liquids is more pronounced but in the worst case too slight to cause any alarm whatever. Nor is there the slightest danger of any injurious action on the human body by such traces of aluminium compounds, seeing that our food contains very much more than these ; in fact they could not act injuriously unless quantities hundreds of times larger were regularly entering the stomach."

Besides the stability of the metal in general, there are many other advantages which make aluminium the best metal for culinary purposes. Out of these the following are well established:—

Advantages of the use of Aluminium vessels.

1. It is non-poisonous. The same could not be said of any metallic utensils ; procelain and glassware are too fragile to be used for heating purposes. Enamelled ware

was considered to be non-poisonous till recently when it has been shown that the lead present in the enamel dissolves and produces injurious effects to an appreciable extent.

2. It is easily cleaned. It is very seldom that anything burns fast or sticks to an aluminium vessel. If such a thing does at all happen, a soaking in water removes it entirely.

3. It does not allow the food to be scorched. It is a singular fact, that it is almost impossible to scorch even the most delicate foods in an aluminium vessel. This is a well attested fact and is due to the great heat conductivity of aluminium preventing a high local temperature on any one spot. On this account, the metal is not well suited for frying pans or skillets, in which the object is to superficially scorch the food.

4. It is not corroded. None of the acids found in foods have any perceptible corrosive action on aluminium. Daily use for three years, in every way, had left in one case no signs of corrosion* on a utensil; in weight the utensil lost $\frac{1}{4}$ oz. which would point to about 100 years as the probable time it would take to wear out.

5. Aluminium vessels cook quickly, because of the great facility with which heat is conducted by the metal.

6. It is only one-third as heavy as other metals.

7. Vessels made of the metal are very durable. They do not corrode from inside, and show little wear outside; besides, there is nothing to crack off as in enamel ware, no coating to wear through as in tinned ware. The utensils if properly treated are almost indestructible and will wear almost indefinitely.

* The above observation of Mr. Richards cannot be upheld by the present writer. Perhaps the utensils he had chance to observe were of much lower quality.

8. In comparison with brass vessels used in India, aluminium vessels are superior in all the above points and moreover save the expenses of tinning which is necessary in the first case.

It need not be pointed out that these observations apply to the pure metal only. It is very necessary that, as we in India use the metal mainly for culinary purposes, it should be of great purity. If the metal were used for mechanical purposes, where it is not exposed to the action of organic acids or salts, it is a matter of indifference what kind of metal is used. Pure aluminium is much stronger and capable of greater resistance to acids and so should be used for cooking purposes in preference to cheaper and impure metal.

Besides being slowly eaten up, the metal has another disadvantage, *viz.*, that it loses its polish quickly and cannot be easily brought back. However, this is a trivial point in the case of culinary vessels though this property works, against the use of this metal for artistic and ornamental work requiring a permanent glittering polish but in all cases the good metal takes and maintains the polish much more easily than impure metal.

With the increased number of aluminium factories in different towns it will be possible to sell back or exchange old vessels for new ones as is done in the case of copper and brass vessels. However old aluminium vessels bring a low return compared with the new—the corresponding rates being As. 5 to 8 per lb. and Re. 1 to Rs. 1-8 per lb. respectively.

The metallurgy of Aluminium.

Though the element was isolated in 1827 by Wohler and though his method was simplified by Deville in 1854, it was not till 1887 that aluminium was prepared properly on a commercial

Early History.

Purity of the metal a factor in the resistance of the metal.

Loss of polish on the metal.

Value of old aluminium ware.

scale. The first two processes consisted of the reduction of the salts of aluminium by potassium or sodium. The production by these methods in 1885 amounted only to 2 tons in France and 2½ cwt. in America; and the price of aluminium was £18 per lb.* The year 1886 saw the development of electrical methods of Heroult and Hall who independently devised the present method of manufacture of the metal. The principle involved in Hall's process is the electric decomposition of alumina, dissolved in a fused bath of the fluoride of

Hall's process.

aluminium and other bases, the current reducing the alumina (the oxide of the metal) in preference to the solvent. This method was essentially different from any of the methods previously followed and was the source of a revolution in the aluminium industry. As a result the price of aluminium went down suddenly, as the cost of production was at once reduced to about 10d. per lb. (19 cents.) while the price in 1887 was £18 per lb. Since 1890, the progress of the aluminium industry has been steady and sure. The sodium processes have dropped altogether from the race, and electrical processes occupy the field. Among these again the processes producing

the alloys only have also dropped out. The two requisites for the aluminium factories. Among those that remain, only those that are favourably situated near *abundant water power* with *cheap supplies of alumina* have flourished. The industry has already reached a strictly commercial basis in which every item of expense has to be reduced to a minimum. It is hoped that the uncertainty as to prices that prevailed in the world's market after 1902 will be removed under the steady influence of the syndicate formed last year.

The immense progress of the Aluminium industry within the last 10 or 12 years can be realised from the fact that the production and prices.

* For further details see Dictionary of Applied Chemistry by Sir E. Thorpe, 1912 Edition, pp. 105, &c.

tion has almost trebled within a period of 5 years. The following figures show the production and prices of the metal within the last 20 years :—*

Year.	Production.	Price.
1891	300 tons	27s. per kilogram
1900	8,000 ,,	2s. per lb.
1905	11,500,,	s3-3 to 3-9 ,,
1909	24,200,,	s1- 1-6 ,,
1910	34,200,,	s1-8 to 1-7 ,,

The following figures from Minets' "Aluminium and its Uses" are also interesting though not very reliable :—

Price of Aluminium.

Year.	cents. per lb.	Year.	cents. per lb.
1854	259·20	1884	8·36
1855	108·00	1890	2·98
1859	17·38	1895	·32
1864	17·38	1898	·24
1874	17·38	1901	·22

Total Production of Aluminium.

	U.S.A.	Switzerland	France.	England.	Germany.
1885	1	0	2	1	10
1890	28	41	37	70	0
1895	417	650	360	0	0
1900	1650	1232	800	500	500

With reference to the metallurgy of Aluminium it must be pointed out that no great reduction in the prices† of the metal could be expected as long the present methods

Concentration in large factories. are being followed. All that could be done in the matter of organisation and production on a large scale has been done. The recent

* Indian Trade Journal, Vol, xxii, p. 811.

† On the contrary during 1911 the prices have gone up. In 1910 the wholesale price was £68 per ton : in 1911 it was £75, and is further expected to rise till a limit of about £90 per ton reached. If this last price is maintained India may hope to manufacture aluminium in spite of the competition of the more advanced countries.

statistics of production show that the world's output of aluminium is practically confined to *five* factories which contribute 9/10 of the total output ; the rest being made up of other *seven* factories. The two requisites of the industry are (1) cheap electric power, (2) cheap supply of alumina. It is not possible to cheapen the first item below what it already is in the places where the metal is produced ; attempts made to cheapen the second are reported to be successful and if carried on in a commercial scale are likely to make another revolution in the aluminium industry. According to the specifications of a patent taken in 1908, the formation of alumina becomes

A new method of alumina. a byproduct in the preparation of silicon from kaolin or clay. The clay is mixed with carbon and heated in electric furnace, the silica is reduced, and the oxide of aluminium easily isolated. This tendency to utilise cheaper sources of aluminium is likely to cheapen the alumina, and is expected to help the future rise of the industry.

As it has been already indicated the material used for the manufacture is alumina or the oxide of the aluminium. This oxide is manufactured from the naturally occurring bauxite in the following way. The mineral bauxite is used with carbonate of soda in a reverberatory furnace. The fused mass is washed with water which retain all the aluminium as the aluminate of soda. The solution is freed from all suspended solids and decomposed by carbonic acid gas which precipitates the metal as hydrated alumina. The precipitate is repeatedly washed and then dried at red heat, when all the water goes away leaving a hydrous alumina.

This alumina together with some fluoride salts is transferred to carbonlined iron pots which form negative poles, and into which dip carbon rods which complete the circuit by connection with the positive pole of the

dynamo. When current is passed through this circuit the fluoride salts melt and there is no decomposition till alumina is added. The alumina is decomposed into the metal aluminium which is taken out in the molten form, and oxygen which is taken up by the carbon rods. More of alumina is added, the process being continuous as the metal can be easily removed from the bottom. The cost of the fluoride bath is nominal ; the alumina required is about twice the amount of the metal produced, while the consumption of the carbon is equal to the weight of the metal produced.

Properties of pure Aluminium.

The atomic weight of aluminium is 27·80 ; and corresponding to this it has a low density, *viz.*, 2·6 ; it is therefore about two and half times as heavy as water and about one-third as light as copper, iron, or tin.

The melting point of this metal is 657°
 Low Melting C—a temperature much below the melt-
 point. ing-point of copper (1065°C) or gold (1063°C), or iron (1800°C) ; it can be boiled at 1400°C. This shows that working in aluminium requires far less heat than any of these metals. The heat conductivity of aluminium is 3,435, though less than that of copper, is greater than that of brass, german-silver, iron or zinc : so it is more suitable for cooking purposes than the last three.

Aluminium is not such a good conductor of electricity as silver or copper ; their electrical resistance (for a wire 1 metre long and 1 m. in thickness) is in the ratio of 37 : 19 : 20. However looking at the current prices of the metals and their density, we find that for like conductivity copper is one and half times as costly as aluminium. Thus though aluminium is already cheaper than copper, it might be further pointed out that there is considerable chance for it to be a better conductor when the

Cheapness of aluminium for the same conductivity.

purity of the metal is increased. Some of the samples of pure aluminium have shown the resistance of 29 compared to 20 of copper and with further purification a nearer approach may be expected. If the same kind and amount of impurity were introduced into the present good copper, its conductivity would surely be lowered more than ten or fifteen per cent. Again just as copper is used instead of silver though the latter is a better conductor, copper will be displaced by the cheaper aluminium. Already, the latter metal has found a favourable use in the overhead electrical transmission, where this metal has to be preferred on account of its intrinsic merit.

Aluminium has a bluish white colour and has a beautiful lustre specially on freshly cut or polished surfaces. It does not change in air appreciably if free from silicon. If the silicon is between 5 to 1 per cent., the silicon goes to the surface, is oxidised and forms a layer of silica which can be rubbed off easily. Its stability in air is accounted for by the formation of a thin and coherent coating of the oxide which prevents it from further oxidation. Water and dilute organic acids scarcely affect aluminium at boiling heat; it is true it is acted upon by strong solutions of organic acids and salts but only very gradually. It has been already shown that this does not interfere with the use of the metal for culinary purposes. Among the mineral acids nitric acid has no action; by sulphuric acid it is dissolved gradually; by hydrochloric acid and alkalis rapidly and easily.

Aluminium is able to reduce almost all oxides even those of iron, silicon. Interesting applications of this reaction are made specially in the preparation of the metals like iron,

Cobalt, nickel, or chromium when required in small amounts without the use of costly and elaborate furnaces.

Thermit welding. The process is named after Goldschmidt and consists in mixing together the oxide and aluminium powder and starting the reaction by means of magnesium ribbon surrounded by potassium chlorate powder. The mixture is generally heated in a funnel-shaped crucible with a hole at the bottom which lets out the metal when the reaction is complete. The reaction is generally very vigorous and the metal as well as the crucible become red hot. The molten metal is utilised in welding together two pieces of iron (*e.g.*, the iron rails, etc.), which are slightly heated previously and which are surrounded by a mould to hold the molten metal at the joint. This is called "Thermit welding."

Besides being used in the pure form, aluminium has found important applications in the form of alloys when combined with other metals. Among the most useful alloys are those with copper and with magnesium. The addition of a small proportion of aluminium increases the hardness of copper, does not injure its malleability, makes it susceptible of a

Golden. beautiful polish and varies in colour from golden red to pale yellow. The quality of brass is also improved by the addition of small quantities of aluminium; an alloy containing 70 per cent. of copper, 27.5 per cent. of zinc and 2 per cent. of aluminium is said to show nearly double the tenacity and more than double the elongation of ordinary cast brass. The most interesting alloy of aluminium is, perhaps, the one with magne-

and white. sium; it is, white in colour, has the workability and strength of brass, but can resist the action of many chemicals and is much lighter. This alloy is named Magnalium and contains 2 to 12 parts of magnesium to 100 parts of aluminium. It has been used for various purposes where lightness and

resistivity to chemical action are aimed at, e.g., in many scientific instruments, etc.

*The working in Aluminium.**

Aluminium working is not much different from working with copper ; as a consequence Indian copper-smiths can work well with the new metal after a few trials. The tools required are almost the same but the working is a little more difficult.

Aluminium is melted dry, that is to say, without any flux, in clay or graphite crucibles, and during the melt the metal is constantly added. When the mass is completely molten it is brought to a red glow and the crucible is removed from the fire. The metal is now violently stirred by means of an iron rod which ends in a small round ladle at right angles to the rod and perforated ; the surface of the metal is skimmed and the layer of the oxide formed is removed whereupon the true operation of casting commences. The stirring rod is removed from the melt as soon as it is so hot that the metal does not adhere to it.

Since aluminium shrinks on solidifying quite perceptibly—by about 1·8 per cent.—the molten metal should be cautiously added, in as small quantities as possible, in order to keep the mould well filled. For the casting mould, metal vessels may be used, but for complicated objects it is advisable to cast in sand.

Pure aluminium as well as that of commerce with 98·5 per cent. purity may be forged, drawn, and rolled cold on wooden hammer and anvil without being necessarily annealed beforehand : annealing is necessary if the purity is above 97 per cent., in which case the metal may be heated up to

* The information in this section is mainly derived from Er. Minet's book on Aluminium, p. 172, &c.

2008C. ; while with 95 per cent., aluminium both annealing and heating are quite unnecessary. The metal preserves the shape once given to it without deformation ; for pieces with sharp curves and bulgings it is better to take aluminium that is slightly alloyed.

Boring. Aluminium is soft like copper and may be bored without difficulty ; it is however desirable to use tools as sharp as possible and to oil them before use with petroleum or turpentine. Nor is there any difficulty in rivetting ; the plates may receive hard hammering without being split, they do not burn, stay straight, and do not hollow out at the rivet holes, so that the rivets hold well even in the millings. At most since it is very malleable, the metal occasionally shows a tendency to bulge out a trifle when the rivets come too near the edge.

Turning. Aluminium may be *grooved* and *filed* like copper to which in fact it is so similar. When alloyed and hammered, it may be perfectly well turned and planed, if the instruments are sufficiently sharp and work at sufficient speed. The instruments need to be lubricated with turpentine or petroleum or better still with suds but never with oil. The work of milling proceeds smoothly ; but in case the cutters are clogged they must be cleansed with oil and brush.

Aluminium takes a high polish ; but the lustre is not white, like silver or nickel, but is bluish, somewhat like tin. For polishing, the pieces are first scoured with pumice stone, and then rubbed by brushes with a paste of half-powdered emery and tallow ; the polishing is finally completed with polishing soap and turpentine oil. Another way is to clean the metal with a fine powder of fine sand, clay and wood ashes and to polish by means of polishing leather, or with chamois skin and brass rouge.

Soldering. The soldering of aluminium is a matter of great difficulty and presents a problem which is not yet solved quite satisfactorily. "There

has been great difficulty in finding a wholly satisfactory solder for the metal and one that shall resist corrosion. Dagger (Journal of Society of Chemical Industry 1891, p. 486) quotes as useful for heavy soldering a mixture of—

Aluminium	12 pts.	}	and a mixture of the three metals in
Copper	8 pts.		
Zinc	80 pts.		

the ratio of 6: 4, and 90 for light soldering. Joints however can be made by autogenous welding with an oxyhydrogen or oxy-acetylene flame and also electrically. Butt and other joints may be effected by various mechanical devices with the aid of fusion at the surface or by a casting of the metal around the junctions.”*

In the absence of a good solder the method adopted for patching and joining two pieces is the autogenous welding just mentioned. The connecting surfaces are heated by oxyhydrogen flame and joined together when melted. It is for this reason that the repairing of old aluminium articles is not easily done by ordinary workers in the absence of the hot flame required for the purpose.

Possibilities of Aluminium manufacture in India.

It was already pointed out that the most essential conditions of the success of the metal-lurgy of aluminium have been up to now a cheap electric current and a cheap supply of alumina (the oxide of the metal). The many projects † for electrical power now being worked or proposed leave aside one of the requirements of the industry as being ready for immediate service when required. The other requisite, *viz.*,

* Thorpe " Dictionary of Applied Chemistry," Vol. I. New Edition 1912, p. 106, &c.

† For example, see proposals for utilising water power in Southern India by Mr. A. Chatterton, Madras, 1892, where he proposed to manufacture aluminium at Periyar waterfalls, near Ammayanayakanur on S.I.R.

alumina, is still, so to say, in the prospecting stage. Large deposits of a mineral approaching the bauxites of France and Ireland have been discovered, but it will take much time before they are utilised for this industry. The Laterite which is so abundant in Southern India and which has been unsuccessfully used as a source of iron (like the French Bauxite in its early days) contains a very high percentage of Alumina in many cases. In the opinion of Sir Thomas Holland,* the utilisation of these deposits of alumina would completely swamp the market of bauxite.

There are three possible ways in which the Indian bauxites could be utilised. The first would be the simple export of the richer bauxites in the raw or calcined state to the alumina factories of Europe or America. This however is not practicable on account of the low price of the mineral in European market which does not pay more than 22 to 23 shillings per ton.

Another way would be to extract alumina from the mineral on the spot, and export the same to European or American factories or to utilise the same in India for the manufacture of aluminium salts, which are useful as astringents, as mordant in dyeing, and in the sizing and finishing of paper. This scheme does not require any heavy outlay or involve any large risk, as the process of the manufacture of alumina is simple and practicable in India. The process consists in boiling the powdered bauxite with a caustic soda solution, which can be filtered off. The solution could be decomposed by passing carbon dioxide but the most recent Baeyer's method is to boil the solution with alumina; by both of these methods† aluminium is com-

* Sir T. H. Holland, Sketch of the Mineral Resources of India.

† See also Rec. Geol. Ind., Vol. XXXV, p. 29.

pletely separated as solid aluminium while the solution contains caustic soda which could be recovered and used again. The hydrated alumina thus separated requires to be purified by calcination, when it can be obtained as fine white flour, containing 99 per cent. of aluminium oxide, suitable for export to any distance. In this form,

Exportation of alumina is at present exported on a large scale from Europe to America for reduction to the metal, and fetches a price varying, from £12 to £38 per ton. The only difficulty in this mode of utilising the Indian bauxites is the absence of cheap alkali in India, which has to be imported. However, this does not count much as the alkali could be recovered after the separation of alumina and could be used over again.

The third way would be to begin the manufacture of aluminium after getting the alumina rather than export it. By itself this is the best method,* but there are tremendous difficulties in the way. It requires preliminary investigations on an elaborate scale for the selection of a site near cheap water and electric supply; and needs the risky outlay of heavy capital in entirely untried conditions in an industry which has already passed to the stage of the keenest competition. However this does not mean that India can never hope to manufacture the metal; we have simply to wait till the manufacture of alumina is put on a sufficiently sound basis, and then the next step will be the utilisation of cheap supplies of power for the manufacture of the metal.

In this connection, it might be pointed out that there is a tendency on the part of the metallurgical engineers to depart from the production of the metal from its oxide: and experiments are conducted to manu-

* Specially because the second scheme may not be successful in the event of a fall in the price of aluminium in Europe.

facture it from the aluminous clays ; bauxite is limited in quantity and for any large production the question of freights as well as the sufficiency of supply are the controlling factors. An example of the change of method has been already given in the manufacture of alumina as a byproduct from clay. " The presence of large bodies of excellent clays, and the very high efficiency recently attained in the modern types of large unit gas-engines promise in the not too distant future to completely change the sources and the methods of production of metallic aluminium."

The aluminous deposits of India are very rich and varied. By comparison of analysis it has been shown that the Balaghat and Jubbulpore (Katni) bauxites are of very high value compared with the Irish, French and American Bauxites. The following are the most important places * in which aluminous bauxites or laterites are observed :—

Bengal.—Neturhat, Palamau district ; Sarguja State, Chota Nagpur ; Korlapet in the Kalahandi State.

Bombay.—Mahabaleshwar.

Central Provinces.—Katni and Bijeeragogarh in the Jubbulpore district : various hills near Rupjar, and Samnapur in the Baihur Tahsil (the richest ores) of Balaghat district, Bhopal.

Madras.—On the Palni hills small deposits of almost pure gibbsite occur.

Rajputana.—Near Modh in the Bikanir State ; also in the Gwalior State.

According to the report in the Records of the Geological Survey for 1910, " the Katni bauxites (at Tikari) have been successfully prospected and proved to be workable by the

*For details the following may be consulted :—Records of Geol. Sur India, Vol. XXXII, p. 125 ; Vol. XXXV, p. 29 ; Vol. XXXVII, pp. 216-7 Vol. XXXIV, p. 210.

Bombay Mining and Prospecting Syndicate, Managing Agents, Messrs. C. Macdonald and Co. ; and a joint stock company is to be floated for working these deposits." But there is no further mention of the progress of this venture, and in 1910.

the report published in 1911 mentioning only the following :—" The Bauxite deposits of India still remain undeveloped but the Katni quarries again produced a small quantity of 66 tons valued at £25." In August 1912, Messrs. Macdonald & Co, floated a joint stock company for the manufacture of cement at Katni and also for the utilisation of other deposits like bauxites.

Necessity of further expansion of the market of the metal.

It is a question only of time and opportunity for the manufacture of the metal in India. Perhaps it will take some years, before the market for aluminium ware has reached a sufficiently large volume to pay the expenses of the production of the metal on large scale, and before sufficiently cheap electric power stations are installed in the country. In the meanwhile it is suggested that experimental work should be done in the manufacture of alumina from bauxite, and attempts should be made to purify it and make it free from impurities like iron and silica which are detrimental to

Suggestion for the extraction and purification of alumina.

the use of the metal. If this problem is solved, and if by that time electric power is made available, the success of the aluminium industry is assured. "If it pays the British Aluminium Company to transport French and Italian bauxites to Ireland for the extraction of alumina, and to Scotland for electrolysis," there is no reason why it should not pay the Indian capitalists to extract alumina, on the spot, from the highly aluminous and easily quarried laterites of the Central Provinces and rail it for further treatment to centres of cheap electric power in the southern or the northern part of the country.

The present state and the possibilities of the Aluminium Industry in India.

It is very difficult to obtain reliable statistics showing the present condition of the aluminium industry in India and its progress during the last few years. No official returns as to the imports of this metal in India are available—this metal being enumerated among “other unenumerated” metals in the trade returns of the Indian ports. Similarly there is nothing to show the number of the factories working in aluminium.

By the courtesy of the Director of Commercial Intelligence Department a few statistics of the imports * of aluminium in the Bombay and Madras presidencies are given in the appendix—similar returns for other parts being not available. In the statement showing the aluminium factories in India sent by the same department mention is made of only the Indian Aluminium Company of Madras. Of course, the number of aluminium factories is very large comparatively, nearly 40 being estimated.

However from what one can see about Aluminium around one's self, it is easy to notice that the number of factories and the sale in the market are both increasing every year, and the metal is getting more and more popular,

If ever a single man be given the credit of introducing a new industry in the country, the name of Hon'ble Mr. Alfred Chatterton, C.I.E., must be pointed out in connection with the aluminium industry. It was he, who by importing the metal and by working privately on a small scale laid its foundation. Shortly after the start Government took over the factory and ran it for five years and a half, during which time a net profit of

* See Tables (A) & (B).

Rs. 60,000 was accumulated. It was gradually taken up by private individuals, and the Government business sold to the Indian Aluminium Company who are still carrying it on. The success of this procedure of starting new industries should leave no doubt as to the feasibility of State Protection without any bad effects. Mr. Chatterton started the industry on his own behalf, and through Government help was able in successfully inducing the capitalists to take it up after he had demonstrated to them the profitable and practical character of the work. It was in 1898 that he brought out the first of the largest lot of aluminium metal into India, which amounted to about one hundred tons. The progress in the industry can be judged by the fact that the imports in 1911-12 reached the figure of nearly 1,200 tons, as can be seen from the tables at the end. The following figures of the imports for the last few years (from the South Indian Trade Journal for June 24, 1913, p. 160), are very instructive :—

First imports of the metal ; imports in 1911-12.

Years.	Imports of Aluminium in cwt.	Value in lakh Rs.
1904-05	890	1.05
1905-06	1,803	2.06
1906-07	1,964	2.89
1907-08	2,696	3.62
1908-09	3,734	3.21
1909-10	11,740	9.02
1910-11	11,784	9.21
1911-12	21,512	15.21
1912-13	35,809	25.51

The number of factories making Aluminium vessels in India is nearly 40 or more, though no official statistics are available. The profits of the industry are fairly large, specially when big factories are worked. All the letters, written to various aluminium companies with a view to find the present state

of the industry, were unreplied except one. The Indian

The Indian Aluminium Company Madras. Aluminium Company of Madras was the only one that replied to the queries.

They employ a capital of nearly 5½ lakhs of rupees ; their net profit is reported to be about Rs, 70,000, *i.e.*, nearly 15 per cent. on the capital outlay. It is calculated that, taking into consideration all the factories of India, the total capital employed in this industry is nearly a crore of rupees, while fifteen years ago, the metal was not at all a commercial commodity.

Out of the factories that turn out Aluminium vessels, a great portion is situated in Madras and Bombay. The Madras and Bombay factories compete for the markets in many cases ; the Bombay ware is generally cheap, but the metal used being of a cheaper type the utensils do not last so long as those

that are made at Madras out of better metal. The import figures in the appendix reveal the fact that while Bombay imports the largest amount of the metal from Germany 6·38 lakhs of rupees' worth out of a total of 8·9 lakhs, the Madras Factories use British aluminium to the value of 4 lakhs of rupees out of a total of 6·32 lakhs. The use of better quality metal in Madras is necessitated by the fact that the people in Southern India use a lot of tamarind water which as an acid liquid has considerable solvent action on the metal. However, this is a

step in the right direction, for if at all aluminium is to be popular in India, it should be in the best form. The use of metal of bad quality is detrimental to the increased sale of the metal and to the expansion of the market. It has to be noted that the many advantages aluminium is reported to have refer to the pure metal. The statements that the metal is non-poisonous, is lighter, is easier for cleaning, cooks quickly, does not burn into holes, &c., apply to a fairly pure kind of the metal. The weakest point in the use of aluminium for culinary purposes is that it is acted

upon by some acids and the organic salts formed in cooking. These could be minimised by the use of metal free from iron and silicon; the use of purer metal cannot be too strongly insisted for the commercial success of the present and future aluminium industry of India.

Judging from the wholesale price of Aluminium Profits of the which varies from £60 to £80 per ton aluminium factories we can safely expect the aluminium in India. sheets to cost to the factories not more than 8 to 9 annas. per lb. The price of the finished product varies from 14 annas per lb. to Re. 1-8 per lb. This shows the large scope there is for the manufacture of the article from imported metal, and the amount of the profits that may be derived from the industry. The factories, however, do not pay unless started on a sufficiently large scale to pay for the cost of running very costly machinery under expert management.

As to the expansion of the market for Aluminium there is no doubt that it is progressing very rapidly. Though the industry was introduced in 1898, when the price of the metal was very high £192 per ton, the number of workers and sellers of aluminium was considerable, as judged by the census return of 1901. Within less than three years of the working of the industry as many as 254 persons were supported in Madras and Mysore only. The number has considerably increased now, a single factory employing over 200 men; and the returns for 1911 census when published will throw much light on the progress of this industry.

The aluminium ware is slowly progressing northwards and its use in the north is not so great as in the south, because of the high railway freights and because it requires time before the ware is popularised. The markets in the Punjab have begun to show this ware only recently; but

Progress of aluminium vessels in the markets of India.

Census Returns of 1901.

in that short period the progress has been steady. The metal is valued both by the Hindus and Mahommedans as the vessels are much cheaper than those of the same size made of copper and brass, and besides possessing the advantages already mentioned, save the botheration of tinning which is quite necessary for the former class of goods.

Thus the popularity of the metal is increasing steadily, but there may soon ensue a reaction against it, if a high standard of purity of the metal is not maintained. Besides being slightly corroded by certain organic acids and salts, aluminium possesses another disadvantage *viz.*, vessels made of the metal cannot be easily repaired * locally,

whereas a hole or crack in a copper or
Difficulties of re-
 pairing. brass vessel could be easily set right

by the local coppersmith. However, there is no great necessity to get the vessels repaired, as they do not cost so much as the heavy handmade articles of brass or cooper, and last for a fairly long time if care is taken. Moreover old aluminium vessels are taken back by the factories at the rate of 5 to 8 annas per lb. Thus there should not be much difficulty in the expansion of the market on this score. Difficulties about the durability of the vessels and of the polish would be minimised by the use of better quality of the metal.

As to the future of the industry, there is not the least
Future of the In-
 dustry, more fac-
 tories by hand or
 machinery. doubt that it is a bright one. The

making of aluminium vessels would be started in large factories or on a small scale by the ordinary coppersmiths, as it has been already pointed out aluminium can be worked easily with almost the same tools that are required for copper. The only difficulty is about soldering which is not quite easily done. The best substitute for soldering

* See *supra* for the methods of repairing.

Oxyhydrogen
blowpipe.

is the joining of the two portions of the metal by means of a hot flame from an oxyhydrogen or oxyacetylene blowpipe or by electrical heating. If a small oxyhydrogen blowpipe—such as is used for Drummond's Limelight in Magic lanterns—be obtained and worked properly, the difficulties of production on a small scale and of repairing old vessels can be removed to a certain extent at least.

However, the goal of the Indian aluminium industry should not be only the manufacture of the utensils from imported metal. As Mr. Chatterton has suggested, the ultimate aim should be to manufacture the metal in India. Unlike the copper and brass industries, for which the ores are poor in quality, the aluminium ores of India are, some of them at least, as rich as the French and Irish bauxites. Electric power is getting cheaper in India; and in the presence of both these requisites it is a question of time when the people and the market will be ready for the manufacture of the metal itself. According to the letter of the Indian Aluminium Co. of Madras already quoted, "the manufacture of aluminium from bauxite at present would not be profitable, our main reasons being that the present consumption is not sufficient and that there are very great difficulties in the way of obtaining services of fully qualified experts."

Necessity of the
expansion of the
market for the
metal.

It has already been noticed that the production of aluminium in the world has already reached such a stage, that it will not pay unless manufactured on a very large scale. The present market for Aluminium in India is not able to accommodate more than 1,800 tons (the imports during 1912-13) and is barely capable of supporting a good size factory for the metal which would produce at least about two or three thousand tons. Therefore the process of the popularisation of the

metal is to be more thoroughly put into practice if the goal is to be attained sooner.

TABLE (A).

Imports of Aluminium in various forms into the Bombay Presidency during 1911-12.

—	United Kingdom.		Germany.		Belgium.		U. S. A.	
	cwt.	1,000 Rs.	cwt.	1,000 Rs.	cwt.	1,000Rs.	cwt.	1,000Rs.
Circles ...	2175	173.8	9085	688.9	230	17.8	58	4.2
Sheets ...	17	1.7	893	29.4	...	...	9	6
Sheets and circles ...	200	20.6	...	...	...	...	...	...
Ware ...	1.7	.2	28.5	4.2	...	...	...	...
Total ...	2712	196.3	9206.5	672.5	280	17.3	67	4.8
Grand Total.	...	...	cwt. 12219.5 Rs. 8,90,900		...	...	...	...

TABLE (B).

Imports of Aluminium in Various forms in Madras Presidency during 1911-12.

—	United Kingdom.		Germany.		Belgium.		U. S. A.	
	cwt.	1,000 Rs.	cwt.	1,000 Rs.	cwt.	1,000 Rs.	cwt.	1,000 Rs.
Circles and Sheets ...	4068	309·5	1371		161	11·1	1110	79·6
Ingots and Blocks ...	223	11·2	146	100·3	100	4·6	220	11·2
Bars and Notched Bars ...	1772	85·6	154	7·1	60	2·6	...	...
Pyramids ...	$\frac{1}{2}$	155	...	8·2	...	...	...	...
Wire ...	2	190	11 lbs.	...	...	...	...	...
Rivets ...	5	725	...	15	...	...	...	...
Leaves ...	3 lbs.	69	...	...	...	...	...	...
Aluminium Tubing ...	64 lbs.	130	...	...	...	...	...	...
Ferro-aluminium ...	2	60	...	...	...	...	...	...
TOTAL ...	6072	4,07,7	1671	115·8	321	18·6	1133	90·8
GRAND TOTAL ...	... Rs, 6,32 000							

The writer is grateful to the Director of Commercial Intelligence for these figures : returns for other provinces are not available.

INDUSTRIES SUITABLE FOR THE BLIND.

BY DR. NILKNATHRAI DAYABHAI, L.M.&S.

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Blind, Bombay.*

It is with great diffidence that I undertake at your call to write a paper on this subject. For the last hundred years or more, European countries have been making efforts to impart not only general education but side by side with it technical education to the blind with a view to ameliorate their condition and make their lives bearable and enjoyable by making them bread-winners either fully or partially. In this noble work, now the blind and the sighted stand shoulder to shoulder, the latter helping the former with practical sympathy in the shape of advice, money and close association and the former proving to the latter that in spite of disabilities, which blindness has inflicted on them, they can work for their bread and serve the society in which they are born. The experience of the European countries goes to show that blindness though it inflicts a severe disability, does not render a human being completely afflicted and helpless, provided he is desirous of working for himself and willing to take help from others. Some examples of brave blind souls could be cited even from our own country, where no effort had hitherto been made to make the life of a blind man practically useful to himself and society. The blind Gujarati poet Kavi Dalpatram wrote poems, and gave lectures after losing sight for more than a score of years. Pandit Gatooolajee blind from infancy, composed extempore poems, using given words, gave lectures on religious and philosophical subjects and was a Sanskrit scholar of eminence, a pillar of strength to the Acharyas of Vaishnav faith, and was before the Bombay public for more than 50 years. Surdas, the blind poet of

Northern India immortalised himself by composing "Puds" and "Kirtans" preaching morality and religion. The printed collection of his poems is called the "Sursagar." A blind man of Poona, Mr. Nana Bhore passed the Vakil's examination notwithstanding blindness and was also a practising pleader.

One blind Punjabi of Jallandar is also a pleader. A blind Daxni carries on work as a carpenter, building houses at Pandharpur. A blind Mussulman at Ahmedabad earned his bread and supported a small family by preparing Khas Tatties. A potter near Ahmedabad works on the wheel preparing tiles for the roofs of houses and earthen utensils for household use.

Mansook, a blind tailor of Limbdi, stuck on to his profession after losing sight. cutting dress, sewing and hemming both on the machine and with the hand, and composed small poems. Magan, a tailor of the Pinjari gully, Bombay, prepares bed-curtains and rajais himself, sewing with his own hand and maintains a staff of sighted tailors numbering about 6. I had heard of a worker on the lathe, working somewhere in Kathiawar, preparing wooden bangles. I would not multiply examples. The above examples of blind persons of this country belonging to a time when the systematic education of the blind was not even dreamt of, go to show that the blind persons of the above type cannot be considered as burdens to society but on the contrary, some of them were an honour to it and others helped themselves unaided. Now in these days of education for the blind, if their sighted friends show practical sympathy by giving them education and helping them with materials for different handicrafts, and securing to them work, surely a large number of the blind will not only cease to be a burden, but be respectful citizens, helping themselves and other blind people and making their own lives and those of their friends, happy and contented. I now here quote a passage from "Light on Dark Paths" which shows what a tremendously large number is afflicted with blind-

ness, and to this huge figure, a large quota is contributed by India. "Such is the condition of more than one million persons in the world. Of these nearly 84,000 are living in the United Kingdom and 600,000 are His Majesty's subjects in India. To this vast number the inestimable blessing of sight is denied. Yet how cheerfully, how bravely the blind meet their lot." The census of 1911 for the Bombay Presidency shows that the number of blind in this Presidency alone is 39,058.

Musicians.—The blind as a rule take to music well. Even in bygone days when schooling for the blind was never dreamt of, the blind took to music and did it nicely. One Abdul Rohman *alias* Jairam, earned his bread in Bombay and was considered a good musician earning about Rs. 70 per month without school education.

Coming to the days of schooling for the blind, one Motilal Hiralal, a pupil of the Victoria Memorial School for the blind goes about Bombay, teaching music in Parsee and Hindu families, but chiefly among Parsees earning Rs. 75 per month. Another lad Manilal Nanalal, who left this school only in June of this year (1913) has begun as a teacher of music in Parsee families, earning Rs. 40 per month with a good future before him. These two examples of school-taught music teachers go to show that at least in the City of Bombay there is a field for blind musicians. Hindu temples, families of Indians of all races and creeds and occasions of festivities are the fields for people so trained. Besides these, the blind knowing music may take to the profession of "Kirtankars" and preachers. This branch is not only best suited to the blind but affords them the largest field for earning a respectable living. This statement is supported by an opinion of the blind Principal, Sir Francis Campbell of the Norwood Royal College for the blind, well-known in Great Britain for its efficient teaching of music, who says "That eighty-eight per cent. of their pupils are earning their own living." To secure such a good result, Institutions for the

"After-Care of the Blind" should come into existence in India. The blind take to "Dilruba," "Sitar" "Sarangi," "Harmonium" and "Tabla" and Flute" nicely in this country.

As a manufacturer of musical instruments, Philip Layton's name stands pre-eminently forward. He entered Montreal, Canada, with a good character, coupled with a practical and proficient knowledge of his business without a farthing in his pocket. He started Piano and Harmonium Manufactory and some years later opened shops on the main roads of Montreal, the value of which together with the cost of the musical instruments contained therein amounted to 90,000 dollars. Later on he and his sighted wife organized an attack on Montreal with the aid of 20,000 women soldiers collecting a lac and fifty thousand dollars for the starting of a Progressive Blind School for the Protestant children in that City.

Preachers and Teachers of Religion :—

In Great Britain and Ireland many blind people after a course of general education and graduation at Oxford or elsewhere take to the study of religion and become churchmen with the degrees of B. D. and D. D. Some of them in addition to church duties act as preachers outside the church. The blind Pandit Guttoolajee mentioned above worked in this direction for about 2 scores of years in Bombay. At present a young blind lad of Bhulia Keshav Shirvalkar, Brahmin by caste, having learnt Sanskrit at his place and after obtaining Braille alphabet adapted to Marathi from the Victoria Memorial School for the blind, learnt the Marathi alphabet which is the same as the Sanskrit alphabet, and with this aid he has copied out "Bhagvat-gita" in Sanskrit. Being a Brahmin and having studied the "Gita" he now goes about Khandesh and Central Provinces as a preacher and earns his bread. He also knows Marathi and English, which latter he learnt because of the large heartedness and personal exertion of Mr. Dayaram

Gidumal and with the aid of the English Books supplied by me. He is now engaged on Rs. 15 per month by a Dakshni Brahmin gentleman at Nagpore as a teacher of general elementary education for his young blind son.

Blind as Teachers of the Blind.

In a large number of schools in Great Britain and Ireland, blind people act either as Head or assistant teachers in conjunction with the sighted teachers. Here in India too, I, the present Principal of the Victoria Memoria School for the blind, am sightless. I adapted Braille English alphabet to Sanskrit to suit the Indian vernaculars, thus showing that the blind can help the blind.

Blind as lawyers and Magistrates.

In England the blind Dr. Ranger's name is well-known among the blind as a Solicitor. He is Solicitor to the British and Foreign Blind Association and had just now a large hand in the drafting of a Bill for the general pensioning of the blind which is likely to go before the Parliament, as well as in securing to the blind a right of admission to the assurance, Sick-Benefit and such other Societies. I have already cited the instances of Mr. Nana Bhoré of Poona, and another blind pleader of Jullandar. A blind man in England whose name I do not remember just now, was a member of a County Council and a Magistrate in that district. The late Sir Henry Fawcett became Postmaster-General after he lost his sight. While blind he gave lectures on Political Economy and as Post-Master-General introduced money-order and Postal Savings Bank systems. These examples show conclusively that if the blind be given opportunities, they will take their share, humble or large in the different walks of life according to their merits, and will create openings for themselves.

Commerce.

As yet no commercial education is given to the blind in the United Kingdom, but in the United States of America

there is an Institution for imparting instruction in the branch of education. In our country as the necessity for education in commerce for the sighted has only recently been thought of, and as the general education of the blind is of recent growth, it is not possible to expect this class of education here for the blind so soon. Nevertheless, there are even now in the Bombay Presidency a blind person at Navsari trading in cotton and another trading in oil-seed in the Kalol District of His Highness the Gaekwar of Baroda. A blind Borah gentleman, Tyabali Hakimjee by name, deals largely in all kinds of cane at Katha Bazar Bombay, helped by his sons. Another a Bagdadi Jew by name Menase, blind from infancy, deals in clothes with the aid of his wife. He was in this school for some time Councillor Clayton having lost his sight at 19 learnt basket-making at the Birmingham Blind School and carried on a large basket-making business, preparing in a month from 15,000 to 26000 baskets, engaging blind and sighted basket-makers and supplying baskets to the postal, army and navy departments of the United Kingdom and even of distant Canada. "Progress" of December 1912, says that basket-makers in England can earn about £1-10-0 per week.

Blind as Carpenters.

Many a people would think that the blind cannot take to carpentry, for the practice of that profession requires handling of sharp-edged tools, but experience shows otherwise. All the chairs, tables, cupboards &c., at the British and Foreign Blind Association, London, have been manufactured by the blind carpenters of England and one of the "Progress" numbers, a monthly Magazine for the Blind, says that a blind carpenter earns on an average per week £1-9-2. In our own country too, a blind carpenter works as a builder of houses at Pandharpur, thus proving that with primary education becoming wide-spread and the blind resorting to the blind institutions for training, such a result will follow in the not very distant future.

Blind as Cane and Bamboo Workmen.

This class of work is very promising for the blind in our own country especially in large towns where cane-seat chairs, commodes, stools, teapoys, waste paper baskets, etc., are largely in use. The generous public of Bombay gives the Victoria Memorial School for the blind work of this sort with twofold good results, *viz.*—

(a) It helps the Institution by affording opportunities for teaching this art to the blind, and (b) by assuring the public that the blind can work satisfactorily in this direction. This kind of work also helps this Institution in making some profit out of it, notwithstanding waste and damage done to materials by the beginners.

One blind man Vala Hari, trained at this Institution was sent to the Sangli State Jail, as teacher of cane-work to the sighted prisoners there on a salary of Rs. 15 per month. He worked there for 3 months both to the entire satisfaction of the prisoners and the Superintendent of the Jail, as will be seen from the following remarks of the Superintendent :—

“Himself being a good hand in preparing cane articles, such as chairs, trunks, baskets, etc., he has a very good knack of teaching the art. Though blind of both the eyes, his tact of work is admirable. He is a very useful hand, and has given me entire satisfaction by his conduct and work. He is well deserving of patronage.” Another blind boy Nanalal Lalubhai worked at Ahmedabad as a cane-worker to the satisfaction of his employers, earning Rs. 8 or so per month, and secured a good name for himself and the school. Unfortunately for the cause of the blind, he died of plague in 1907. Another blind boy of this school, Reva Durghajee, now at the Ahmedabad Mahipatram Anath Ashram, does cane-work to the satisfaction of the public, and a gentleman was so much pleased with his work that he got him photographed while caning a chair, telling him that this would help him. I

am just now in receipt of a card from a blind boy of this Institution, Bhailal Mathur, who says that three rupees worth of cane has secured to him Rs. 7-8-0 by weaving the seats of 10 chairs, but as his native place Nadiad does not supply enough of cane-work, he has bought a packet of yarn at a cost of Rs. 4 for weaving tapes for cots which work he wishes to do side by side with the cane-work for the reason mentioned above, and he thinks that this work will prove fairly remunerative.

Weavers.

In the Victoria Memorial School for the blind at Bombay, tape-weaving is taught, and at present one blind boy Bhailal Mathur referred to above works in this direction side by side with cane-work at Nadiad as already stated above. In 1896, during my visit to the Amritsar Blind School under the Church of England Zenana Mission, I saw blind Mussalman women converts weaving tapes for cots.

Tailors.

This school teaches tailoring, both with the hand and on the machine. The needles for hand-sewing used here are ordinary ones and the machine used is Singer's, but I think a machine of any make will do, provided the blind worker is taught to use it. The blind can sew and hem both with the hand and on the machine independently of sighted help. They can also cut, arrange and sew together the different part of a dress. They can also cut articles of dress with the aid of paper or thick cloth specimens. Two boys Shakalchand Chakubhai and Jaga Jesung of this school are now working as tailors at Ahmedabad using Singer's machines and earning about Rs. 5 per month. I have referred above to Manshook, a tailor of Limbdi, who became blind at 86 and went on earning his bread though blind. Another man, Magan of the Pinjara Gully, Bombay, referred to above though blind from early age, works as a tailor and is at the head of a tailoring esta-

blishment maintaining half a dozen sighted tailors. The Aberdeen Asylum prepares mattresses, feather beddings, and pillows, and an issue of "progress" says that blind mattress makers earn about £1-5-0 per week each.

Knitting work.

Some English schools teach knitting and the blind children at these schools knit socks, stockings, etc., with the aid of knitting machines, and the pupils so taught earn a decent living. When the thread breaks, sighted assistance is, I suspect, required. People at Glasgow prepare fishing nets and I think these, lawn-tennis and cricket nets can be knitted by the blind in this country, if they are taught this art. The Aberdeen Asylum for the blind prepares lawn-tennis, cricket, fishing and fruit-tree netting.

Brush-making.

Some schools for the blind in the United Kingdom teach brush-making, and it appears from the "Progress" that brush-makers there earn about £1-14-10 per week.

Broom and Mat-making.

Ordinary brooms for sweeping houses and mats for the floors and fans are made in our country from the leaves of the date palm trees. The same articles are also made from the different kinds of grasses all over the country. These like "Khas" or "Vala" (scented grass) tatties can easily be made by the blind. Experience in the preparation of bamboo chicks goes to show that the work of mat-making, Khas-tatties etc., can be learnt and done by the blind of all ages, where materials for work and a market for their sale are easily available.

A blind Mussalman near the three gates at Ahmedabad used to prepare Khas-tatties and fans and maintain himself and a small family out of his earnings. The Aberdeen Asylum for the blind prepares mats from hair, wool, and straw, and this work is also suitable for the blind of this country.

Door-Entrance Rugs.

These are made at the Amritsar Blind School by the blind pupils there from grass called "Sarkat" in Gujarati. The same can be done in other parts of India where this material or fibres of the cocoanut are available.

Wire-work.

A blind pupil, Soni by caste, prepared wire slings, wire rat-traps, etc., at this school. The slings are similar to those to be had from the bazaar, and fetch good prices. The rat-traps, though to all appearances similar and nice compared to the bazaar traps, are faulty in their arrangement of the entrance door for the rats, and hence the rats enter and leave them instead of being locked up there. Wire-door mattresses for brushing shoes on entering the house or a parlour can also be made by the blind. Some English schools for the blind work in this direction.

Oil Mills.

A blind Borah youth, Guffoor by name of Adas near Wasad on the B. B. and C. I. Ry. line, though blind from infancy, works at a complicated and risky country oil-mill driven by a bullock, when some sighted people have not the courage to work such a mill. He is paid by his employer. He takes care of the bullock, yokes and unyokes him and fits up and disconnects the different parts of the mill.

Potters.

I am told that in a village some miles away from Ahmedabad, a blind potter prepares pots of different sizes for holding water, grain, etc. I am sure it is easier to prepare tiles for the roof of houses on a wheel as well as bricks with the aid of wood or iron frames than prepare water pots with the aid of tools and hands. A blind lad in this school says that he can prepare earthen toys, such as cows, etc., horses, camels, etc., etc. He is, however, not tested yet in this direction.

Gardening.

The blind cottagers in England attend to flower and fruit gardens and do all the work in connection therewith. I heard of a cultivator at Maudha in the Kaira Zilla looking after a water-lift worked by the bullocks. This is a risky work even for a sighted man.

Egg-hatching and Hen-farming.

This has been taken up as a bread-winning pursuit by some blind people in England, and Captain Webber, himself blind and an authority on this subject, moves about in the United Kingdom giving lectures on this subject.

Biddee and Snuff-making.

Powdered tobacco rolled up in leaves also affords a fairly bread-winning work for the blind, and a blind lad Hajee Nathu prepares biddees at Rajkote. He was a promising lad while at this school and if his health had permitted, he would have taken to some better work. Another promising though unlucky lad, Mathur Vithal by name would have earned his bread by music or tailoring if he had continued at them ; but he is now earning about Rs. 4 to 5 per month by preparing snuff at Anand in the Kheda Zilla.

Shoe-making.

I had under me in the Victoria Memorial School for the blind a shoe-maker's lad, Jumna by name. I asked his father who followed the shoe-maker's profession to train him up in this line, but on the ground of the boy being blind the father could not be made to even think of it. This lad is now earning Rs. 5 to 6 per month by turning the wheel of a silk-reeling machine at Ahmedabad. Upto very recently no blind boy took to the profession of shoe-making. A brave English blind-man went to Sweden and learnt there from a fellow-sufferer this art, and is now practising it in England and has in his turn taught the same to others. He contributed a series of articles on this subject for the adoption of this trade by his blind brethren,

A blind deaf-mute authoress.

A blind deaf-mute authoress, Hellan Kellar by name, (now only blind and deaf) of the United States of America is a prominent figure in that country as one fighting against odds and attaining success. She is a philanthropist and is the authoress of the works on "Optimism" and "The world I live in." Both these works are drimming with instructive and interesting truths, full of real optimistic ideas showing the buoyancy of her nature and proving to the world that even double difficulties are nowhere before a heart willing to work for her own salvation.

I wish this paper proves instrumental in showing to the young and adult blind of both sexes that though their life is an afflicted one, it ought not to be a burden, either to themselves or to their friends, and families provided they have the courage to make efforts in directions suggested above. The iriends of the blind associating with them should encourage them to begin work again, if they have given it up, that charity, real charity, consists in making the blind take to some work, howsoever humble, than in feeding and pampering them. It is only the very old and infirm blind persons who ought to be fed and lodged while they live. As the curse of ignorance grips the blind more tightly than blindness itself, I would respectfully urge that the information of the nature given here be distributed broadcast in villages and cities of his country, in the Vernaculars of the different districts.

A NOTE ON INDUSTRIES OF HYDERABAD

(SIND), PAST AND PRESENT.

RAI BAHADUR DIWAN BULCHAND DAYARAM, HYDERABAD.

Speaking generally it may be said the old industries of the City of Hyderabad are in a languishing state, and the modern industries have not yet assumed any large proportions, except a few of a very inferior sort. The industries

that first gave rise to that well known class of Hyderabad merchants called the Sind Workmen, who have now shops in all parts of the world, both old and new, and who number now 8,000 men, was the gold and silver thread embroidery of Hyderabad. This class has become very wealthy and prosperous and the City of Hyderabad owes a great deal of its wealth to their trade with foreign countries. They now deal in all varieties of gold and silver work made in India, Japan and China, and Indian silk, carpets, jewellery, art-ware, etc., etc. The Hyderabad industry that enabled them to make a start in business is now on its last legs, being ousted by the cheaper and more flashy Madras gold and silver thread work. In the seventies and eighties the number of workers in gold and silver and silk-thread work, called "Chikamdozi" in the vernacular language, was over a hundred and embroidered pieces of cloth worth perhaps a lakh of rupees, were turned out, every year giving employment to numerous families, whose deft fingers worked the rich and delicate patterns on a black ground of satin or velvet. Their number has now dwindled to a dozen or so and their wages declined by 100 per cent. Hyderabad table-covers, teapoy-covers, handkerchiefs, wall-dados of cloth and other drawing room decorations, curtains and wall-hangings, worked in gold, silver and silk thread were eagerly bought in Europe, America and the English Colonies. These are all at a discount now, Chinese, Japanese, Madras, Surat, Benares and Bombay embroideries having driven them out of the foreign markets. The Sind workmen, with their clever adaptability, have taken to trade in the latter class of embroidery and thread work and discarded the Hyderabad products.

Another industry that flourished in Hyderabad and is declining now is the wood lacquered work. Large quantities of this were manufactured and exported in eighties to foreign countries by the same class of merchants and commanded a large and ready sale. There was a large class of artisans turning out these articles and a regular guild of

them. The number that found employment in this industry was over a hundred men. They made many fancy articles, generally in red, green and gold colors with beautiful designs and figures of birds and animals in gold. A very favourite article was a 'nest' of 7 or 12 spheres or globes one enclosed within the other. A good specimen of this class cost about Rs. 20. Besides this, cradles, cots, flower-vases, cups, mugs, trays, card-cases, etc., were made. This industry is now dying out in Hyderabad, the workmen migrating to other places and taking to other occupations, mainly agriculture. Cheap cot-legs and small knick-knacks are still manufactured, but there is nothing artistic about them. The number of workmen has decreased to about a dozen or less and the total work turned out is only worth a few hundred rupees a year. Of this too a large part is not done by the indigenous craftsman but by artizans from the Punjab who have settled in the city.

A third industry that flourished greatly before but is now in a falling state is enamelwork. Beautiful blue, red or green enamel was put on gold and silver ornaments, there was a large local demand for it and a great deal of it was sent out to all parts of Sind. There were about twenty shops for it owned by both Hindus and Mahomedans. The feet ornaments of all Hindu women consisted of enamelled silver, and Mahomedan women wore enamelled ornaments over different parts of their body. Also the Mahomedan aristocracy and the landed gentry such as Mirs, Jagirdars, Zamindars, greatly indulged in their taste for swords, knives, daggers enamelled in gold and silver and scabbards with enamel work and the workmen found ample and lucrative employment. The saddlery and trappings of their animals, horses, camels, &c., had also enamel painted on a black ground of silver, gold or brass.

Tastes have now changed and even the Mahomedan aristocracy and gentry is getting modernized and prefer English saddlery or the cheaper and plainer but more

polished workmanship of the modern gold or silversmiths over these articles, and so the Hyderabad enamel industry is dying out. The number of shops is reduced to five or six.

Two other industries that thrived before were leather and ivory. Before the taste for English shoes and boots had assumed large dimensions, the indigenous workers in leather made dainty and elegant native slippers and shoes in large numbers, specially for well-to-do Mahomedans and Amils. The leather was beautifully soft and most prettily colored and the top portion was often worked with silk or gold thread with flowered borders to enhance its beauty. There was a large demand for these shoes and this trade gave employment to numerous Mahomedan families. The shoes were sent out to all parts of Sind. These leather workers also made other articles of leather such as saddlery 'nuts' for camels, &c., with silk and gold thread embroidery on them. Excellent 'nuts' worked in silk or gold leather continue to be made to this day on a pretty large scale, but the other leather manufactures have largely disappeared. Rough thick native-shoes used by the lower classes are still made in large quantities by a class of shoemakers that came from Marwar. But there is not much skill or art in their work. Similarly the ivory industry has dwindled or rather deteriorated, nothing but plain ivory bangles which are worn by native women being now manufactured. Formerly a variety of articles, plain and fancy, were made of ivory in Hyderabad, such as dice, spinning tops, spoons, antimony and scent bottles, paper knives, playing cards and a number of other fancy articles and knickknacks. A very dainty article which was made of ivory cubes or spheres which was a typical oriental produce and which Tennyson in the "Princess" has described as "Laborious Orient ivory sphere in sphere." The superior and cheaper ivory work of Amritsar has ousted them from the market and the number of artisans is greatly reduced.

A pair of other gold industries, that deserve special mention and that greatly flourished in the days of the

Amirs of Sind and the early British period in Hyderabad were wall-painting by local painters and plaster of Paris ("Cheroli" work. The local painters or "Kamangers" who painted in water colors, which were of a permanent character, ceilings, walls, arches, domes, niches, etc., were in great request in the houses of the wealthy Zamindars and Bania merchants or Sahukars, as well as among the Mirs. They painted invariably flowers, birds and animals. In Hindu houses they also painted scenes from holy or religious tales and plays in addition. The Sindhi painter has now disappeared from Hyderabad. His drawing was rather crude and lacking in symmetry and perspective, but the coloring and setting were vivid and bold.

The Cheroli, gypsum or plaster of Paris worker was a very skilful artizan. He worked either with his finger nails or one or two small wooden or iron instruments, drawing and moulding beautiful figures in plastic gypsum and giving them a lovely shape. The best room of the houses of the rich often had a thick coating of this plaster on the walls, and in the niches, window recesses, wall shelves, etc. and the artizan or rather the artist did exquisite moulding in it. The plaster of Paris worker too has almost disappeared from the city now.

Besides these industries there were other industries such as those of the manufacture of swords and sword blades, daggers, musket barrels, knives, which have now ceased to exist, but except in the days of the Mahomedan rule, the number of the artizans, which were engaged in them was never very large. The stone-cutter or lapidary who polished or cut into shape precious stones also found much greater employment before than he finds now.

Briefly it may be said that the industries whose great distinctive feature was their elegant and artistic character are now greatly on the decline in Hyderabad and the industries which flourish have nothing artistic or æsthetic to commend them.

These are the boot and shoe industry for native and European boots which gives employment to about five or six hundred people in the city, mostly foreigners, such as Kutchies, Marwaries and Bengalees.

(2) Wood-work of the plainer sort which is found in almost every city of any size giving employment to a large number of carpenters.

(3) Iron work also of the coarser kind is carried on now mostly by people from the Punjab. The only article which requires some superior skill made by the smiths in the city is iron-safes for which a large demand is springing up, the safes of European manufacture being driven out of the market by them.

(4) Pottery of a plain and coarse character such as jars, chatties, water bottles or "koojas" 'chilams" or hook as, baking pots, drinking pots, tiles, bricks, native lamps, etc., is largely made. None of these are glazed or colored and there is nothing handsome about them. This industry is indispensable for every native city and flourishes everywhere.

(5) Tin smithing or tinker's work. A large number of cheap lamps, lanterns and pots are made which command a large scale. The number of tin shops is between 25 to 30.

(6) Brass industry. Brass vessels such as cooking utensils are still made in large numbers. This industry has existed since a long time and is expanding, but the workmanship is of an inferior kind. The number of workmen employed in it is about 150. They make and sell vessels of brass, copper pewter or "kangha."

(7) Printing cloth. There are about a dozen shops for this. The printing is chiefly on cotton. The dye is permanent and washes well, but the figures except the flower patterns are rather crude, the higher class of native women wear the printed cotton gowns (which are so extensively in use) imported from Khyrpur State.

(8) Dyeing—This industry exists in every Indian town. The dyers in Hyderabad are mostly Mahomedans. The Hindus prefer the red or yellow saffron color, while the Mahomedans wear indigo colored trousers for which cloth is very extensively dyed. The number of dyers though much smaller than before, is still large. The dyes used are mostly vegetable. Dyeing is cheap and a dyer earns about 12 annas a day only.

(9) Gold and Silversmith's work. The native women, specially of the better classes, wear gold ornaments in great profusion and the native goldsmith has flourished from time immemorial. The number of Sindhi goldsmiths in Hyderabad, mostly Hindus will be about 50. These men are experts in inlaying work, setting precious stones in gold very deftly and firmly. The setting is of a very permanent character and the foils selected are often of excellent color and quantity. The artistic element is however not very marked in them, the cutting of the stones being defective. Their wages are high, the average daily wages of a good goldsmith in Hyderabad being between Rs. 1-4-0 and Re. 1-8-0. Besides the Sindhi goldsmiths, there are now Cutchi and Marwari goldsmiths who are also making a good living. The Cutchi goldsmith's work is of a plainer but more polished and elegant kind and is finding much favour. Gold buttons, rings, bangles and silver utensils such as plates, cups, "lotas" glasses, etc., are being largely made by these goldsmiths and find a ready sale.

(10) Silk-thread weaving or "Patolis" work is another industry which though not so flourishing as before, still exists in a fair condition. The neck, breast, wrist, shoulder and other ornaments worn by native women are generally tied by a silken band which is closely and firmly woven. This industry is therefore in a way supplemental to the goldsmith's work. The number of patolis or silk-thread weavers and knitters is still about 25. Besides these silk bands they make trousers' strings or "aghats" of silk, tassels, fringes, borders, tapes, etc. They earn between 8 to 12 annas per day.

(11) **Leather.**—Curing of leather is carried on, on a very large scale in villages near the Fuleli giving employment to several thousands of people mostly low-caste Hindus from Marwar. The dressing or tanning is also done on a pretty large scale, mostly under the supervision of Khoja merchants from Karachi who employ a number of Madrassi and other workmen. Fairly good leather is now manufactured suitable for shoes and boots of the English pattern and only slightly inferior to Cawnpore leather. These Khoja merchants are thriving very well.

(12) **Tailoring.**—With the modern desire to dress as finely as possible, the tailor flourishes splendidly in Hyderabad, as he does in all other Indian cities and the tailoring shops in the city count by scores. The number of tailors will come up to about 400, a good tailor earning on an average between Re. 1 to Re. 1-8 per day. English and French styles of dress are imitated in all habiliments, except perhaps the head-dress, French-cut trousers and English cut frock-coats being the rage with young men.

Besides these industries there are numerous other small ones such as the manufacture of fireworks, of ghee and oil jars of leather, crude soap-making, sweetmeat making, aerted water manufacturers, oil-pressing, etc., etc., but they need no description. Many of these are common to all Indian towns.

To conclude, the Hyderabad industries of the old distinctive type peculiarly Indian, with the artistic elements largely predominant in them, are pining for want of a stimulus owing to a change of tastes and fashions, but the vulgar and plainer ones with the elements of art and beauty greatly lacking in them, but suiting modern tastes and requirements are flourishing and expanding. The oriental designs and patterns and eastern art forms and colors with their beautifully soft and subdued shades and tints are giving way to glossy, tawdry ware with its bright flashy colors and cheap modern art of the west,

THE LACQUER INDUSTRY OF KHANOTH.

BY

BULCHAND KARAMCHAND, ESQ., B.A., HYDERABAD (SIND.)

Lacquered work appears to be one of the most ancient of Sind industries. Kashmore in Upper Sind Frontier District and Khanoth in Hyderabad District are the two places in Sind where this industry is localised. The Turfery of the Upper Sind Frontier is of a very rough and primitive kind, and has not that gloss and variety of colour so peculiar to the Khanoth work. The best lacquered work is undoubtedly produced in Khanoth ; and so famous is this small village for its lacquerware that "Khanoth work" and "Lacquer work" are almost synonymous expressions in Sindhi.

It is interesting to enquire why the lacquer work industry got localised in an out of the way place like Khanoth. The enquiry leads us to the midæval history of Sind. Khanoth is situated about a mile to the south of Old Hala—a place about 3 miles to the west of New Hala. About 2 miles to the Northwest of New Hala, and almost in the same line with old Hala and Khanoth, may still be seen the ruins of the old historic town of Khudabad. The tombs of Mir Bijar, Mir Sohrab, and Mir Fatehalikhan are still in a tolerable state of preservation. The dome over the tomb of Mir Bijar, I am told, is one of the best in Sind, certainly better than any over the Mirs' tombs in Hyderabad. It appears at one time, the present ruins of Khudabad, the present Old Hala, and the Village of Khanoth all formed one large town extending over 6 miles in length and about two and a half in breadth. Situated about 8 miles from the Indus, this ancient town of Khudabad—or Hala—must have enjoyed a considerable reputation for its arts and industries; for it was here that the two most famous art industries of

Sind—the Lacquer ware and the Hala Pottery—flourished. It must at the same time have been a rich and prosperous town to have supported two such splendid arts, and to have produced such rare and splendid specimens of stone carvings as may still be seen on the walls of the dome over the tomb of Mir Bijar, standing majestically amid the neglected ruins of Khudabad. Apart from its being part of the large town, Khanoth enjoyed peculiar advantages and special facilities for carrying on the industry. The forest situated only half a mile from Khanoth supplies it with ample material for work—namely, the *Bahin* wood. Round about are forests of *Babul* trees, from which is obtained lac. Both these materials were very cheap and easily procurable. These circumstances made the industry permanently localised in Khanoth; and though Khudabad has disappeared, and Old Hala has shrunk into insignificance, Khanoth remains, and still maintains, that old industry of which Sind is justly proud.

The small Village of Khanoth has about 2,000 inhabitants, nearly half of whom are Hindus. Of the Mahomedan population a large portion is connected directly or indirectly with the Turnery industry. The *Vighams* are a class of people whose hereditary profession is Turnery. It is sad to say they are, many of them, a set of lazy, dishonest, and most unbusinesslike people. If you go and order a cradle, the *vigham* is all politeness and glib tongue; he will promise to do the very best work and give it to you within a week, or at the most, a fortnight. Only he wants a little money in advance,—just to buy materials. He is ready to sign a bond, or give security. You go away satisfied, but you should consider yourself fortunate if after knocking at his door about twenty times, and threatening him with a warrant of arrest, you get your cradle after six months.

The Banyas know how to deal with these people, but even they are fleeced by the too clever *vigham*. The usual

method is that a *vigham* will prepare a cot leg or a cradle stand, and pawn it with the Banya who advances to him a sum of money in proportion to his credit ; and in course of time he ultimately acquires the complete cot or cradle and sells it. So long as the *vigham* has money in his pocket, he will never set himself to work. Their shops and their houses are very shabby in appearance, and they hardly possess the bare necessities of the trade.

The character of the *vighams* has seriously affected their trade. Many people will not order a cradle simply because of the unbusiness-like habits of these people. Partly because of this and partly owing to strict regulations enforced by the Forest Department, the industry is in a bad way, and I was told some of the *vighams* have left their trade and are taking to agriculture which offers far better prospects. People do not like to pay higher prices, and the *vighams* produce bad and inferior work and resort to dishonest practices.

At present there are about 8 workshop all told. It is hard to know the exact daily or monthly earnings of the *vighams*. They will never tell you that, suspecting you to be a Government official or an Income Tax Assessor. It however appears that an expert earns about 12 annas a day, while an indifferent workman gets about 4 to 6 annas daily.

When I visited their village in March 1907, most of the Turners were in a bad plight and bitter in their complaints. They said they were starving, though I found plenty of work on their hands. Some of them, they said, had left Khanoth and settled in Hyderabad, and they would, one and all, emigrate to Hyderabad, if they could be afforded facilities for carrying on their work there. It appeared to me that a local magnate of the place had troubled them very much. In the whole village I could not get a single ready made fancy article. There

Why the industry is languishign.

Their earnings.

Their present condition.

are two or three shops in New Hala where lacquer ware may be purchased. But these shopkeepers were, one and all, loud and bitter in their complaints against the deceitful *vigham* of Khanoth. They would reduce their prices by 10 to 15 per cent. if only the *vighams* dealt with them in a businesslike way.

What is the future of the lacquered work Industry in Sind ? Unless the *vighams* change their idle habits, the industry is doomed. The rise in the price of lac will tell somewhat unfavourably upon the industry, but lac plays only a minor part in the production of the lacquered article. The chief difficulty is lack of capital. The *Banya* will not lend them money because of their dishonest ways. An Urban Co-operative Bank will be a blessing in Khanoth.

It is, however, possible that an organized body or Guild might take up the work, and by prudent and businesslike methods exact work from them. Or perhaps an enterprising man, with business capacity, may bring them over to Hyderabad and pay them in proportion to the work they turn out. They said they will be most willing to come over to Hyderabad, if they could be guaranteed sufficient work. There should be no difficulty in finding work for them if they would come here.

The cradles (*Pinghas*) of Khanoth are quite the fashion in Sind, and almost every well-to-do house has a Khanoth cradle in it. If the industry were worked on business lines, and if the centre of this industry, is shifted from Khanoth to Hyderabad, the demand for *Pinghas* is bound to increase and will in itself be sufficient to keep all the hands engaged.

Then there is a constant and steady demand for fancy lacquer articles from the *Sind Workis* of Hyderabad (Sind) and also from the Europeans and Tourists in Hyderabad and Karachi. The "Curio," dealers of Hyderabad some-time ago carried on an extensive trade with foreign coun-

tries in Sind lacquer work, but of late the demand has fallen off, because of the difficulty in securing the right things they want. If the *vighams* settled in Hyderabad they will have the advantage of coming personally in touch with the *Sind Workis* who could make useful suggestions from time to time, and would, besides, secure them a constant demand.

Apart from the fancy-work, the *vighams* could make articles of everyday utility, which ought to assure a steady market in and out of Sind. Here is a list of everyday utilities to which our *vighams* might turn their attention.

Inkstands, Mirrorstands, Toilet-sets, Ball frames for Schools, Pen-holders, Pen-racks, Chess-men, Sodawater openers, Pipes for Hubble Bubbles, Rattles, Humming Tops, Buttons, Stethoscopes, Ornamental Trays, Jars, Vases, Toys, etc.

The present is a critical time for the industry. Considering the fact that the demand for men in agriculture is day by day increasing, and the poor circumstances of the present day *vighams* it is likely they will be tempted to run off to agriculture. There are 8 or 9 good workers still in Khanoth whose services may be secured for the Technical Schools in Sind. Unlike the potter of Hala, the *vighams* have no secrets of their trade, and are willing and anxious to teach any one who cares to learn.

The Technical School at Kharpur turns out some good specimens of lacquer work, but it looks like *Punjabi* rather than *Sindhi*, because the Turners there have been imported from the Panjab. The work turned out by Technical Schools at Jacobabad and Khairpur Mirs looks more attractive on the outside, but it has not the permanency, gloss, and the variety of colour so peculiar to the Khanoth work. The Khanoth workman has much to learn in point of artistic design. He has old and stereotyped methods and notions. He has not kept in touch with the modern advances in the trade. A course of drawing will do him a lot of good. A

visit to some of the chief centres of lacquered work industry in the Punjab and Sawantwadi, will give new ideas to him. If he can be taken over to some Industrial Exhibitions it will also do him some good by suggesting new ideas to him.

Coming, then, to practical suggestions for preserving this ancient Industry, an Industrial Association or a Syndicate might advance a sum of money—between two to three thousand rupees—and place it in the hands of a person with business capacity. On the whole it will be safer to look for such a man among the merchant classes. The man might work under the guidance of a committee of men—composed chiefly of the *Sind Workis* of Hyderabad who should have some pecuniary interest in the scheme. The scheme should be worked not on mere philanthropic lines but on sound business principles. A meeting of the leading *Sind Workis*, called specially for the purpose, may perhaps make very useful suggestions.

If the centre of the industry could be shifted to Hyderabad, the Association might profitably lay aside a part of its funds, for purchasing specimens of lacquered ware of other parts of India, or from Exhibitions and thus build up a small museum to serve as an object lesson to the workers in the industry.

At the same time a small collection of the best specimens may be kept always ready for sending to Exhibitions—Indian or Foreign—to secure orders from abroad.

These few suggestions might do something for the industry, which I fear is rather in a bad state at present.

RESOLUTIONS.

The Resolutions were next taken up, each being properly discussed by persons who by their qualifications and expert knowledge of the subjects discussed were thoroughly capable of dealing with them. As no shorthand writer was engaged by the local Reception Committee to report the speeches on the Resolutions, several of them are wanting. However those that are available are quite sufficient for all practical purposes. The first Resolution runs thus :—

FIRST RESOLUTION

Indian Banks.

With reference to the questions raised by the Government of India on which opinions are invited as to whether there should be restrictions about the use of the terms " Banks " and " Bankers " and as to whether there should be any legislation in regard to Banking, this Conference is of opinion.—

(a) That the use of the term " Bank " should be restricted only to companies registered under the Joint Stock Companies' Act.

(b) That all Banks not registered in British India having an Office or Branch in British India should be registered under the Indian Companies Act, save and except the Banks which are created by a Statute.

(c) That there need be no subscribed minimum capital, but that the paid up capital should be one-third of the subscribed capital and that it should be paid up within six months of registration.

(d) That the Registrar of the Joint Stock Companies be authorized to refuse to register as Banks such companies whose Memoranda of Association provide for and warrant business other than Banking business in the ordinary sense of the term and that an appeal against the Registrar's decision should be allowed to the highest Judicial authorities of the place where the Registrar's Office is situated.

(e) That no Bank shall be allowed to use the terms " Saving's Bank " for a department, or a concern except the Presidency Banks and Government Postal Department, unless the said Department or the said concern is made to invest two-thirds of deposits in securities sanctioned by the Indian Trust Act and are ear-marked for that purpose.

(f) No Banks shall be allowed to advance monies against their own shares unless they are fully paid up.

Mr. Dinshaw Eduljée Wacha in proposing the above resolution said :—

I am not going to try your patience, gentlemen, and I hope you will forgive me, if I only take a very small portion of your time. I am an oldman, grey-haired and hoary and am toothless and eyeless. You will remember the words of Sir Walter Scott in the " Lay of the last minstrel."

" The way was long, the wind was cold,
The minstrel was infirm and old."

The way of this Conference, Gentlemen, is very long and I therefore will not say more except that I have great pleasure in moving the resolution.

Rao Bahadur Dewan Hiranand Khemsing seconded the Resolution in suitable words.

Rao Bahadur R. N. Mudholkar in supporting the Resolution said :—

I shall have to qualify the President's remarks, gentlemen, in connection with this first resolution dealing with Banking Legislation. I do not oppose the several clauses in the resolution as they are worded now, but I must mention that during the discussion in the committee, I felt it my duty to oppose the original proposals strongly. I contended that the existing law in India provided sufficient safeguards to allow us to go on with Banking without any special new banking legislation, for I consider that there is no need for it in India. We have had failures, just as every other country has had similar failures and though the experience is no doubt costing us dear, we must not waste our time in vain lamentations but profit by it, and I had therefore, asked the members of the subjects committee to consider well before they took the step which they proposed and which you see before you in the form of a resolution which has already been read to you.

The reason why I have so strongly opposed this motion is that there is no definite assertion that it is

needed. You find the British Chambers of Commerce expressing doubt about the need of such a proceeding, there are different opinions being expressed, and each view has a great deal in its favour. There is also difference of opinion as to the circumstances under which this crisis has come about and therefore, gentlemen, since on these fundamental points doubt is expressed, how can we pass definite resolutions outlining the policy to be adopted towards banks. It is not safe for us to commit ourselves. But my friends who possess a better capacity than I have and whose opinions are weighty have thought otherwise.

These rules are going to affect, if adopted a number of concerns which carry on the work of bankers along with their other business. Examples of these are Cox & Co., King, King & Co., Grindlay & Co. These are private bankers and I do not see how their cases are to be dealt with, as they are not bankers in the sense that we wish it to be adopted and would not come under the Legislation the Government of India proposes. There are besides hundreds of people in India, the shroffs, for instance, who are doing banking business but are not bankers. How would the Government Legislation affect these people? There was to be brought forward in this resolution a clause dealing with the question of shroffs but my friends, at my suggestion have dropped the matter out of the resolution, in deference to my opinions. I quite agree with my colleagues, in thinking that Joint Stock Banks should be registered and that their business should be defined for them to a certain extent, the rules being framed so as not to prevent them from entering on profitable, though slightly hazardous fields but to act as checks on those, who are led away by the desire for big profits and for the opportunity of being able to give bigger dividends and to show a great increase in their business than their competitors and rival institutions. This spirit, gentlemen, is to be discouraged and if we had instilled these principles into our

bankers before this crisis, there would have been no banking failures to worry ourselves about. Another point in connection with these banks, is that they should be well advertised and their audits made public through the medium of the newspapers. In the case of a partnership, it is not necessary for the bank or concern to advertise as it is presumed. If the partners are active, they are sufficiently familiar with the state of their own affairs without calling in any outsider to review their business to make it public. It is different, however, gentlemen, in the case of a bank where deposits are to be made by outsiders, who are practically ignorant of the workings of the bank at the present time, but, if the banks were properly advertised as is done by all the leading European banks of to-day, it would give to the depositors a feeling of security which will not only satisfy them but will indirectly bring to these concerns more numerous depositors, and that is, gentlemen, the aim of all managers. On this point, gentlemen, the committee came to compromise. The question which every body must ask is, "what is the business of a bank?" The defining of legitimate business for a bank is a very important matter, one which I do not think can be set down on paper without being harmful to many institutions, which at present are very sound. The Government of India have themselves acknowledged the difficulty in legislating on this matter.

Government banks for instance carry on a commission business; by Government banks, I refer to the Presidency Banks. The Presidency Banks also on certain occasions advance money to shroffs, whom they recognise and thus these banks to a certain extent, though indirectly carry on a trading business. Therefore the subjects committee after discussion decided that the propositions put forward regarding what should be considered as legitimate work for a bank to carry on, should be deleted.

All the propositions that now find a place in this Resolution have been so carefully worded, gentlemen, that

all difficulties in connection with them have been eliminated and I have therefore no hesitation in asking for their adoption in the present form.

Mr. Parsram Detaram Shamdasami, Manager of the late Specie Bank (Hyderabad Branch) said :—

It has fallen to my lot to support the resolution before this Conference. The previous speakers have so ably and lucidly explained the objects that demand the passing of this bill that there is little for me to add. I have been connected with banks myself for ten years and I may say a great deal from my personal experience of the corruption and fraud that can be practiced by those responsible for the honest and efficient management of banks. But it will serve no useful purpose now, as the disclosures of some of the failed banks have already shown the dark side of the picture though not the darkest. Many must have been the tears shed by those who rallied round the brigands of finance with the enormous frauds committed by them in the open daylight. Don't you think that many of these frauds would not have been committed, if the laws governing the company had provided a safeguard for the prevention of frauds. The Company's Act as you must be aware is of 1882 and remained unaltered for over 25 years. The said Act has since been amended and is to come into force next April. But the Amended Act not providing the necessary safeguards, the Government have wisely invited public opinion on it. This attempt was made before the present commercial crisis came to pass. In view of the present crisis, I hope all will agree with me that there is the urgency and necessity of providing strict, vigilant safeguards before disasters occur, as delays are of the greatest danger. I therefore appeal to you all to carry the resolution unanimously. After the speech of Mr. C. P. Ramasawmy Iyer, the resolution was put to the vote and carried.

SECOND RESOLUTION.

Congress of Commerce.

Mr. Jehangir Bomanjee Petit proposed the following Resolution :—

This Conference welcomes the Scheme of the proposed All India Commercial Congress, formula'ed by the Hon. Sir Fazulbhoj Currimbhoj Ebrahim as affording unmistakable proof that the leaders of the Commercial and Industrial Community are awakening to the need of organising their interests so as to develop greater solidarity of influence and opinion and to be better able to represent with weight and authority the Indian point of view in the Counsels of the Commercial World of India and the Empire. It appoints a committee consisting of the following gentlemen to consider and report as to how this Conference can best co-operate with the proposed All India Commercial Congress in advancing the objects, which it is intended to promote :—

Mr. D. E. Wacha.
Rao Bahadur R. N. Mudholkar.
Hon'ble Mr. Lalubhai Samaldas.
Hon'ble Sir. Fazulbhoj Currimbhoj.
Sir R. N. Mookerji.
Mr. J. Chaudhari
Hon'ble Babu Ganga Prasad Varma.
Mr. C. Y. Chintamani.
Mr. N. Subba Rau.
Dewan Bahadur P. Rajaratnam Mudaliyar.
Mr. Gulam Hussain G. Chagla.
Mr. Usufali
Lala Lajpatrai.
Hon'ble Rai Bahadur Lala Sultan Singh (Delhi).

In proposing the Resolution Mr. J. B. Petit pointed out in an eloquent and impressive speech the importance of the scheme proposed by Sir Fazulbhoj, which he said would go a long way in improving the position of Indian Trade and Commerce by creating in the land sound and influential opinion on matters affecting the vital economical interests.

Indian Commercial Congress.

NOT A RIVAL OF THE INDIAN INDUSTRIAL CONFERENCE.

Explanation by the Author of the Scheme,

In seconding this Resolution an interesting and important speech was made by Sir Fazulbhoy Currimbhoy Ibrahim, the author and promoter of the idea of a permanent Commercial Congress for India, in order to counteract the idea of antagonism which has somehow grown up in many minds between the proposed Commercial Congress and the existing Indian Industrial Conference. Sir Fazulbhoy Currimbhoy said :—

“ I am extremely grateful to you, Mr. President, for the very kind and sympathetic reference you have been pleased to make at more than one part of your able presidential address, to which we have all listened with so much interest and pleasure, to the scheme of an Indian Commercial Congress which I have put forward for the consideration of all those who are interested in the industrial and commercial well-being of our motherland. You have said that one of your reasons for accepting the presidential chair at this session of the Industrial Conference, was the consideration that you would be in a position to remove misunderstandings and to assist in bringing about a complete understanding between the existing and proposed institutions, and perhaps the amalgamation of the two. Again, in the concluding part of your address you have been good enough to assure the conference on my behalf that I have no idea of strangling this conference, and that I would be the first to welcome any proposal for either amalgamating both the movements or of co-operation with each other in a spirit of amity and friendliness. I beg to endorse your assurances on my behalf most heartily.

Good Work of the Industrial Conference.

"Gentlemen, the Hon'ble Mr. Lalubhai Samaldas is intimately acquainted with every stage in the inception of my scheme, and if with that knowledge he has come here to preside over this important conference and to assure you that the scheme of a Commercial Congress is in no way antagonistic to it, I feel that it is almost superfluous on my part to adduce any further arguments in support of that position. Nevertheless, let me assure you that when the idea of an Indian Commercial Congress suggested itself to me, or at any time afterwards, no thought of rivalry with or antagonism to this movement ever crossed my mind. How should it? I yield to no one in my appreciation of the service which the Indian Industrial Conference has rendered to the country, and is still rendering, in creating, encouraging and promoting industrial and commercial aspirations in the public mind, and in representing to Government the necessity for adopting measures to promote the economic well-being of the country. Some of the ideas put forward by this conference, have already produced good results. Others are receiving the serious attention of Government and the public and will, I have no doubt, yield fruit in time. The conference has stimulated interest in industrial matters, and it has been one of the principal agencies in bringing about the change of sentiment which is visible everywhere in respect of the relative importance in the minds of our young men of a clerical post in a Government office and a commercial career. This is a valuable record of good work accomplished in a comparatively short time, and I am certainly not so ungrateful as to seek to undermine the institution which is responsible for it.

"Gentlemen, it is really surprising to me how the idea that the aim of the Commercial Congress was to undo the Industrial Conference could have originated. If you look at the constitution proposed for the Commercial Con-

gress, you will see that it is to be more in the nature of such organisations as the associated Chambers of Commerce having for their object the presentation of the collective views of the Commercial Community of India. Well-known public bodies such as Chambers of Commerce, Leagues, Associations, and so forth, actively interested in Indian commerce and manufactures are to be recognised as electorates entitled to send delegates to the congress. This Industrial Conference is a body consisting of enlightened men from all walks of life, who are anxious to promote industrial and economic progress. The proposed congress will consist only of merchants and manufacturers, in other words of men who are actively engaged in conducting industries and in operations of trade, and it will be the mouth-piece of these classes in representing to Government their wants and wishes.

Aims of the Commercial Congress.

“ It is evident, gentlemen, that the bodies which are intended to be represented in the Commercial Congress, are not directly or considerably represented here in this conference. Nor is it likely that they will be in the near future, because while all commercial men would be glad to join a movement entirely and especially devoted to their interests, only some of them can be expected to take an interest in the large problems of policy which this conference is called upon to consider. Moreover, it is impossible to discuss in a conference like this, the details of intricate commercial questions which arise from time to time, and in which the trading and commercial classes are vitally interested. In my humble opinion, a general gathering like this conference, with large national objects in view, is not in the least likely to be affected by an institution specially designed to be the mouth-piece of the Commercial Community.

“ It may be asked and it has been asked, why start a new institution instead of joining the one already

existing ? The answer is that the proposed congress will be formed on the basis of existing commercial bodies which are in no way connected with this conference. While it would be comparatively easy to persuade local commercial organisations to organise a common gathering of their own delegates it would be far more difficult to induce them to join a general conference of this kind. Every trade and profession has its own genius and special requirements, which can be adequately satisfied only in a body of its own members. Mr. President, you have referred to the possibility of the amalgamation of the proposed congress and this conference. I certainly hope that this will become possible in course of time, but for myself, I believe that there is ample room and work at present for two such bodies as the congress and conference to work side by side in this country. The one cannot but help the other. I am sure that, so far as the proposed congress is concerned, it will be the means of creating and stimulating interest in the work of this conference among classes who have not hitherto come within its influence.

“Mr. President and gentlemen, I have confined myself in the few remarks I have made to answering the criticism that the proposed congress will come in the way of the conference. One more criticism I have to refute and I have done. An idea seems to prevail that there is a ‘deliberate, though indirect, intention disclosed in the draft rules of the congress to exclude European organisations, probably on the ground that the interests of the two communities are irreconcilable.’ You have the draft rules before you and I am sure that you do not see any such suggestion even hinted at in them. Such at any rate is not our intention and, as the congress is for the commercial welfare of the country, and as the commercial interests of Europeans and Indians are interwoven we will do our best to secure the co-operation of European organisations, and I appeal to the leaders of the different chambers to help us in this movement. Moreover, the Indian Merchants’ Chamber and

Bureau have already addressed the European Chambers on the subject. If they desire any modifications in the constitution we shall be glad if they will indicate at the preliminary meeting of the committee the direction in which they deem them necessary.

“The objects and purpose of the proposed Commercial Congress are set forth in the printed papers distributed among you along with the draft constitution suggested for the Congress by the Indian Merchants’ Chamber and Bureau of Bombay.”

After the speech of Sir Fazalbhoy, Lala Goverdandas of Lahore spoke in Hindustani :—He pointed out the great needs of Indian traders, how traders coming from abroad carried off the trade of this country because the people here did not see what was wanted, did not work properly. England, Germany, Japan and other countries were making millions out of India annually. The people were inexpert and had no influential organisations. Europeans sent their agents into all districts and towns and found out what the requirements of the country or district were and straightway proceeded to manufacture what was wanted and in nearly every place where the European trader had come, he had succeeded in ousting the indigenous manufactures. This was the fault of the Indian people themselves and could be remedied by their sending out their agents to all parts of India. It was the duty of the proposed congress to see that this was carried out, otherwise India as a trading country would fall behind the rest of the world.

It was the duty of Swadeshi manufacturers to send out agents to all parts of the world and to study the requirements of the various provinces and countries, as there was no time like the present and foreign trade had not taken so great a hold in India that it would be impossible to compete with it.”

The Resolution was then unanimously carried.

THIRD RESOLUTION.

Co-operation among Indian Chambers of Commerce.

This conference calls upon all persons taking genuine interest in the advancement of Indian industries—

(1) To bring about co-operation and co-ordination between the existing Indian Chambers of Commerce, Trades Associations, Mercantile Unions and Industrial Associations.

(2) To establish such Chambers and Associations at important commercial and industrial centres, where none such are in existence and for this purpose to widen the scope and enlarge the working of the Industrial Conference.

In proposing the third Resolution, Mr. C. Y. Chintamani said that Indian trade was entirely managed by outsiders. The exploitation of the country was in the hands of a few foreign commercial bodies who jealously guarded their rights and Indians were unable to make that headway which was so necessary for the country's progress.

India is a rich country. Her resources are immense and what we want is that these resources should be exploited and utilized by Indian Capital and by Indian labour. This is to some extent being done to-day but it is not sufficient. To accomplish this, there have now sprung up in various parts of India, Chambers of Commerce; these chambers, gentlemen, are doing a great deal of good and should be encouraged by all possible means. Even among these chambers there is apt to spring up conflicting opinions and if jealousy and strife enters into these chambers and they do not assist one another, Indian trade must suffer. We hope, gentlemen, that this will not occur and we have every reason that there ought to be unity among all Indian Chambers to ensure permanent and lasting results.

There were yet many places where at present no chambers existed and it was the duty of the merchants to see that this deficiency was supplied.

Mr. C. Gopal Menon of Madras seconded the resolution eloquently in the following words :—

“ I wish very briefly to point out to you what your duty is as regards the progress of trade in India. Only by being

in a position of unity so that your united demands will be heard can you hope for any degree of success. To do this, there ought to be at your disposal a body which exists solely to guard your interests. That body is the Chamber of Commerce and it is the duty of every merchant to become a member of it.

“ The uses of the chamber are manifold. Through it not only can unnecessary restrictions be removed from trade but merchants can gather information for the carrying on, extending or making of new business. It is a body of gentlemen that is now absolutely essential, if we are to develop our trade on proper and profitable lines.

“ The meetings of this congress annually will not only be a means of comparing notes of the past but here we can form new plans for the future, plans that will lead to success and prosperity to our motherland.

“ I must again ask all merchants to join these Chambers of Commerce and then only can the Industries of India progress as they ought to.”

The Resolution was unanimously carried.

FOURTH RESOLUTION

Weights and Measures.

This conference notes with satisfaction the appointment by the Government of India of a Committee to enquire into the question of weights and measures and expresses the hope that as a result of the enquiries of the committee, suitable action will be taken for securing uniformity of weights and measures.

In proposing the resolution Mr. J. Chowdhuri, Bar-at-Law, Calcutta, made the following speech :—

The resolution which I have to up hold is one which all will, I feel sure, second me in. It is relative to the weights and measures. Government has realised how difficult it is for traders at the present time to trade effectively when they find that a maund of goods from one province is either more than or less than a maund in another province.

Government has I say realised this difficulty which is a very serious one for traders and has therefore appointed a weights and measures commission which is at present in Madras. We cannot say what decision they will come to or what standard they will adopt, but we may take it that what is adopted will be in the eyes of the commission the best possible standard and will no doubt be equally suitable to all Indian traders.

Mr. Gopaldas Jhamatmal in seconding the Resolution said:—

This lack of a uniform standard in weights and measures in India has seriously handicapped trade in this country and it is hoped that the Government of India will realise this and take active steps and measures to rectify it. The differences of the weights did not extend only in various provinces, that in itself is bad enough but when it comes to such a state that even in various districts there is a difference in weights measures it can be realised how difficult it is for Indian traders to carry on their trade.

In this important question the Government is at one with the people and the resolution which I ask you support, gentlemen, is really a commendation of the Government's determination to give at no late date a uniform system of weights and measures to India.

The Resolution was then unanimously passed.

FIFTH RESOLUTION.

Apprentices.

This conference brings to the notice of Government that in order to encourage enlistment of apprentices by factories carrying on new industries, it is desirable to amend Section 27 of the Indian Contract Act so as to permit agreements laying down reasonable limitations and conditions under which an apprentice, may after the expiry of his period of apprenticeship, establish, carry on or perform work in or for another factory.

In proposing the Resolution, the Hon'ble Mr. Gokuldas K. Parekh of Bombay said :—

The question that I have to deal with, gentlemen, is a purely legal question and being a lawyer myself, it has been therefore put into my hands.

It is very necessary for the advancement of our young men that they should be thoroughly drilled in their work. The trades of to-day require competent skilled labour, if they are to compete with the trades of foreign countries. We want to be able to produce articles not only cheaper than those which are imported but also articles that will be as good, if not better in quality. To do this, our young men must be thoroughly trained in institutions where such a training may be secured and as many of our young men cannot go to foreign countries to study they must perforce have institutions in this country where the necessary training may be secured. I therefore think that the amendment of the bill as put forward by the Conference should receive your unanimous support.

The Hon'ble Mr. T. V. Sheshagiri Aiyar in seconding the Resolution said :—

I regard the abolition of the existing rule as essential or at least that it be amended on these two grounds :—

(1) It aims at liberty of contract and is therefore not wanted in this country.

(2) It is particularly hard in the case of men of my profession.

It is impossible that managers of concerns in this country will take in young men for training in the business they themselves are working at, if no guarantee is given that when these young men have finished their apprenticeship, they will not be allowed to carry on a similar business within a given area, at any rate until a certain number of years have elapsed. This is not a new idea but is one at present in force all over Europe where an apprentice is bound not only during his apprenticeship but also for a long while after. That is why the amendment of the present rules in a matter of immediate importance for unless

they are amended manufacturers will not take in apprentices and thus the developing of suitable young men to spread our industries cannot be brought about and I therefore ask you, gentlemen, who, I feel sure are all in favour of the growth of our industries to give your whole support to this measure which aims at supporting the big manufacturer, training the apprentice and directly giving an impetus to our trade.

Mr. Shri Kishendas made a few suitable remarks in support of the Resolution which was then put to the vote and carried unanimously.

SIXTH OMNIBUS RESOLUTION.

This conference while recording its appreciation of the provision which Government have been making for agricultural and commercial education and for technical education generally, deems it necessary to re-affirm resolutions II, IV, VI, X and XIII, of the last conference in regard to the measures which have to be adopted for making such Provision adequate to the requirements of the country. This conference re-affirms the resolutions passed at the last conference and at previous conferences in regard to (a) Handloom Weaving (b) Provincial Departments of Industry (c) Co-operative Banks (d) Co-operative Credit Societies and (e) Railway Rates.

(From the Chair.)

SEVENTH RESOLUTION.

Gift of Dr. Rash Behari Ghosh.

This conference places on record its grateful appreciation of the munificent gift made by Dr. Rash Behari Ghosh to the Calcutta University and appeals to other wealthy gentlemen in the country to follow his example.

Mr. G. K. Deodhar in moving the resolution said :—

In no part of the world has a country ever progressed in which the advancement in higher education and commerce has not been brought in. To accomplish this, as to accomplish most other things, money is needed for the endowing of chairs in universities in these branches. As a prominent Indian philanthropist, the name of Dr. Ghosh has become a household word all over India

not only by his kindly personality but by his public spirit. He has served his country not only by speech but by more tangible methods. I refer to his generous grant of Rs. 10 lakhs to Calcutta University for the spread of Higher Education and Science, upon the development of which our industries are now dependent. We would be failing in our duty, if we did not place on record our appreciation of the generous gift which is an example that all Indians should endeavour to follow. Not only must the present generation be grateful to him but posterity must also be thankful to him, for his gift is one that is lasting in its effects.

This example ought to be followed all over India. Those who have the means, will do so, if not on so magnificent a scale yet on a scale sufficiently in proportion to their means.

Among others who spoke on the resolution dealing with the generous gift of Dr. Rash Behari Ghosh to the Calcutta University for the formation of a chair of Science was Mir. Ayub Khan of Lasbela a local Muhammadan gentleman. He addressed the audience in one of the vernaculars (Sindi). He congratulated Dr. Rash Behari Ghosh on his munificent gift, all the more munificent and generous in that Dr. Ghosh was already an old man and not likely to reap much from his gift in the way of honours. The Mir Sahib then exhorted all others to show a like generous spirit on India's behalf. He said that there were many who were ready to spend hundreds of rupees on trifling affairs, giving as much as Rs. 100 for a single visit to Maud Allan and a few words with her, while others were equally ready to go and pay heavily to see some impecunious European conjuror perform. This money instead of being spent to swell the incomes of outsiders should be utilised for the bettering of India's people. He then concluded by saying that the appointment of a chair of science in the University of Calcutta, the gift of a generous Indian gentleman, should be filled by an Indian and under no consideration by a European.

The Resolution was unanimously carried.

EIGHTH RESOLUTION.

Office Bearers.

This conference resolves that Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference for the next year, and Mr. M. B. Sant, Assistant Secretary, and this Conference appeals to the public for a sum of Rs. 8,000 to carry on the work of the Industrial Conference.

This conference deems it desirable that there should be a Standing Committee appointed for each year to co-operate with the General Secretary in carrying on the work of the conference during the year and to advise him on all such matters as he may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1914 :—

Sir R. N. Mookerjee (Bengal)
 Mr. J. Chowdhary (")
 Hon'ble Mr. Lalubhai Samaldas, (Bombay).
 Sir Vithaldas D. Thakersey, *Kt.* (")
 Mr. D. E. Wacha (")
 Dr. Satish Chandra Bauerjee (U. P. & Oudh)
 Mr. C. Y. Chintamani " "
 Dewan Bahadur P. Rajaratnam Mudaliar (Madras).
 Lala Harkishen Lal (Punjab).
 Hon'ble Rai Purnendu Narain Singh Bahadur (Bihar).
 " " Bahadur Krishna Sahay (")
 Rao Bahadur Dewan Hiranand Khemsing (Sind).
 Mr. M. B. Dadabhoy (C. P.)
 Rao Bahadur R. N. Mudholkar (*Ex-Officio*).

Hon'ble Dewan Bahadur L. A. Govindaraghava Iyer spoke highly of the work done by Rao Bahadur Mudholkar, the General Secretary and his assistant, and proposed the adoption of the Resolution recommending that a Standing Committee be formed for co-operating with the Office of the General Secretary in carrying on the conference work.

Dr. Nilratan Sarcar in an eloquent speech supported the Resolution which was unanimously passed.

With a hearty vote of thanks to the chair, the proceedings terminated.

APPENDIX I.
RESOLUTIONS PASSED AT THE FIRST
INDIAN INDUSTRIAL CONFERENCE.

Held at Benares on the 30th December, 1905.

Resolved that this Conference urges the Government of India and all Provincial Governments and administrations, as also the people of India according to their powers and opportunities,—

- (1) To found Technical Schools in all large centres for the Industrial education, on an adequate scale, of the Indian people,
- (2) To encourage and help Indian manufactures,
- (3) And to foster and extend the use of such manufactures in India in preference to foreign goods.

Proposed by the Honourable Munshi Madho Lal (Benares).

Seconded by Mr. A. Chowdhri (Calcutta).

Supported by Mr. N. Subba Rao (Rajahmundry).

II

Resolved that this Conference urges all Provincial Governments and Administrations as well as the proprietors and managers of private schools and colleges to add commercial classes, and industrial classes like those of weaving, dyeing, carpentry, &c., to the existing educational institutions where practicable.

Proposed by Mr. G. Subramania Iyer (Madras).

Seconded by Mr. Ali Mahomed Bhimji (Bombay).

III

Resolved that this Conference specially invites the attention of Indian capitalists to the great importance of introducing the use of improved hand-loom among the weavers of India, and recommends the establishment of weaving schools where boys may learn the use of such looms, with a view to their more extended use among the towns and villages of all Provinces in India.

Proposed by Mr. Prabhas C. Mitra (Calcutta).

Seconded by Mr. Babulal Govika (Aligarh).

Supported by Mr. Fazlal Hassain (Aligarh).

IV

Resolved that this Conference urges Indian capitalists to establish at their own cost schools for spinning, dyeing, pottery, carpentry and the manufacture of ironware and brassware, in order to afford facilities to boys of all castes and classes to learn such useful industries as a means of their livelihood.

Proposed by Rai Bahadur Lala Baij Nath (Allahabad).

Seconded by Pandit Rambhaji Dutt Chowdhri (Lahore).

Supported by Mr. L. R. Das (Calcutta).

V

Resolved that where it is possible to raise large funds for Industrial education, this Conference recommends the placing of such funds in the hands of trustees with a view to the establishment of Technological Colleges on the most modern methods adopted in Europe, America and Japan for the training of large numbers of students in the various industries which are profitable in India.

Proposed by Sir Bhalchandra Krishna, *Kt.* (Bombay).

Seconded by Rai Saheb Lala Girdhari Lal (Delhi).

Supported by Mr. Lakhbir Singh (Muzaffarnagar).

Resolved that Provincial Committees be established in Bengal, Bombay, Madras, the United Provinces, the Punjab, and the Central Provinces and Berar consisting of the members named below for giving effect to the above recommendations generally encouraging industries and making an industrial survey in their several provinces and compiling useful facts and suggestions for submission to the next Industrial Conference in December 1906. In order to carry out these views each Committee is requested to raise suitable funds, appoint trustees, frame rules for the conduct of business and lay their accounts before the next Industrial Conference.

Resolved that the following gentlemen be members of the Provincial Committees for the year 1906, with power to add to their number :—

BENGAL.

T. Palit, Esq.

The Honourable Mr. J. Chawdhari.

R. N. Mookerji, Esq.

BOMBAY.

D. E. Wacha, Esq.

The Honourable Mr. Vithaldas D. Thackersey.

Lallubhai Samaldas, Esq.

MADRAS.

N. Subba Rao, Esq.

The Hon'ble Mr. L. A. Govindaraghava Iyer.

V. Krishnaswami Iyer, Esq.

UNITED PROVINCES.

Rai Bahadur Lala Baij Nath.

The Honourable Pandit Madan Mohan Malaviya.

Munshi Ganga Prasad Varma.

THE PUNJAB.

Rai Bahadur Lala Ganga Ram, C. I. E.

Shaikh Umar Baksh.

Lala Harkishenlal.

Lala Lajpat Rai.

Lala Mulkaraj.

CENTRAL PROVINCES AND BERAR.

Rao Bahadur R. N. Mudholkar.

G. S. Khaparde, Esq.

M. V. Joshi, Esq.

Proposed by Lala Lajpat Rai (Lahore).

Seconded by Rai Bahadur Ganga Ram (Lahore).

Supported by the Honourable Mr. L. A. Govindaragbava
Iyer (Madras).

VII

Resolved that this Conference appoints Rao Bahadur R. N. Mudholkar as General Secretary, empowers the President to appoint a permanent Assistant Secretary and establishment on suitable pay and allots a sum of Rs. 5,000 for meeting the expenses of the next twelve months.

Proposed by the Honourable Pandit Madan Mohan Malaviya (Allahabad).

Second by Mr. C. Vijayaraghavachariar (Salem).

BENARES, The 30th December, 1905.	R. C. DUTT, <i>President.</i> R. N. MUDHOLKAR, <i>General Secretary.</i>
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RESOLUTIONS PASSED AT THE SECOND INDIAN INDUSTRIAL CONFERENCE.

Held at Calcutta on the 29th and 31st December, 1906.

I. Technical and Commercial Education.

RESOLVED—That this Conference re-affirms the Resolution passed at the Conference of last year on the subject of Technical and Commercial Education, and requests the Government to establish a sufficient number of Secondary Technical and Commercial School, a superior Technical College for each Province, and one fully equipped first class College of Technology for all India. And that a Committee consisting of the President, the General Secretary, Messrs. R. C. Dutt, D. E. Wacha, G. V. Joshi, G. Subramania Iyer, Lajpat Rai, P. N. Bose, A. C. Sen, Deva Prasad Sarvadhikari, and Dr. Nil Ratan Sircar, be appointed to prepare a Memorial on the above lines for submission to Government by the President and the General Secretary.

Proposed by V. Krishnaswamy Iyer, Esq. (Madras).

Seconded by Deva Prasad Sarvadhikari, Esq. (Calcutta).

Supported by Babu Ambica Charan Maitra. (Pabna).

,, G. A. Natasen, Esq. (Madras) and carried
unanimously.

. II. The Indian Stores Committee.

RESOLVED—That this Conference conveys its thanks to the Government of India for appointing a Committee for making recommendations for the use by Government department of indigenous articles in preference to foreign goods, and requests that they be pleased to direct the early publication of the Report of the Committee, so that the public and the trades in India may have an opportunity of considering it before final orders are passed on the subject.

Proposed by Sir Bhalchandra Krishna (Bombay).

Seconded by K. Natarajan Esq. (Bombay).

Supported by Moulvie Mahommad Nizambuddin Hassan (Lucknow) and carried unanimously.

III. Industrial Survey.

RESOLVED—That in view of the importance of having an Industrial Survey of India made by Government, and having regard to the recommendation made by the Committee on Industrial Education to that effect, this Conference requests Government to make such a survey and empowers the President and the General Secretary to submit a memorial on the subject.

Proposed by Rao Bahadur R. N. Mudholkar (Amraoti).

Seconded by Bibrodas Pal Chowdhuri, Esq. (Calcutta).

Supported by S. C. Mookerjee, Esq. (Calcutta), and carried unanimously.

IV. Suggestions to the Public.

RESOLVED—That this Conference specially invites the attention of the public to the great importance of introducing the use of improved hand-loom among the weavers of India, of promoting technical education by the establishment of schools and classes, and of starting laboratories for the purpose of determining the industrial value of Indian products.

Proposed by Dewan Bahadur Ambalal S. (Ahmedabad).

Seconded by Viswanath P. Vaidya, Esq. (Bombay).

Supported by Dr. Nil Ratan Sircar, (Calcutta).

Supported by Shet Damodardas Khivraj (Beawar) and carried unanimously.

V. The Conference Provincial Committees.

RESOLVED—That the Provincial Committees already established be asked besides taking steps to promote industries in their several provinces, to compile usefull facts and suggestions

for submission to the next Industrial Conference, and to raise suitable funds for carrying on their work.

Proposed by Dewan Bahadur L. A. Govindaraghava Iyer (Madras).

Seconded by Babu Ambica Charan Ukil (Calcutta).

Supported by A. Ramanna, Esq. (Mysore) and carried unanimously.

VI. Appointment of Office-Bearers and Provision of Funds for the Year 1907.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary, and empowers the President and the General Secretary to appoint an additional Assistant Secretary and an establishment on suitable pay, so that the Assistant Secretary may be free to visit the different provinces and help the Provincial Committees in all matters in which they may require assistance. And this Conference allots a sum of Rs. 10,000 for meeting the expenses for the next twelve months, and also for issuing a quarterly bulletin of industrial information under suitable management.

Proposed by R. C. Dutt, Esq., C. I. E., (Baroda).

Seconded by Rai Bahadur P. Ananda Charlu, C. I. E.,

(Madras) and carried unanimously.

VITHALDAS D. THACKERSEY.

President.

R. N. MUDHOLKAR,

General Secretary.

**RESOLUTIONS PASSED AT THE THIRD INDIAN
INDUSTRIAL CONFERENCE.**

Held at Surat on the 30th December, 1907.

I. Industrial Survey

RESOLVED—That this Conference expresses its sense of satisfaction that an Industrial Survey has been carried out in the United Provinces and is being carried out in the Central Provinces and Berar, and in the Baroda State ; and it would urge other Provincial Governments in British India and the Governments of other Indian States to carry out at an early date Industrial Surveys of the territories within their jurisdiction as exact and detailed information would afford facilities for the introduction of a sound system of technical education and the well-ordered development of indigenous industries.

(Proposed by Sir Bhalchandra Krishna, *Kt.*, of Bombay, seconded by K. Natarajan, *Esq.*, of Bombay, and carried unanimously.)

II. Technical and Commercial Education.

Resolved—(a) That this Conference re-affirms the Resolution on Technical and Commercial Education passed at the last Conference.

(b) That this Conference thanks the Government of the United Provinces for the action taken by them with a view to introduce a fairly comprehensive system of Technical Education in those Provinces and would express the hope that other Provincial Governments will be pleased to convene representative conferences such as the recent Naini Tal Conference to devise measures for the spread of Technical Education in their respective provinces. And this Conference further expresses the hope that the Government of India would provide adequate funds for giving effect to the recommendations of the Naini Tal Conference and carrying out similar schemes in other provinces.

(c) That this Conference, while appreciating the action taken by the Governments of some Indian States to encourage

Technical Education, urges that further steps should be taken in the same direction in all Indian States.

(d) That this Conference welcomes the growth of public interest in Technical Education as shown by the action taken by certain local and municipal boards and private associations in promoting it, and it strongly urges on the leaders of the people the necessity of taking practical steps for providing increased facilities for it by starting institutions and founding scholarships to encourage technical studies in India and abroad.

(Proposed by R. C. Whitenack, Esq., of Baroda, seconded by D. G. Dalvi, Esq., of Bombay, supported by Ishwar Das Varshini, Esq., of Aligarh and Professor Ruchi Ram Sahni of Lahore, and carried unanimously).

III. Agricultural Education.

RESOLVED—That this Conference records its sense of appreciation of the action taken and contemplated by the Government in regard to the establishment of Agricultural Colleges in the several provinces, and would urge that in view of the importance of a wider spread among the cultivating and land-holding classes of a practical knowledge of the principles of scientific agriculture and modern methods, Government would be pleased to establish Experimental and Demonstration Farms as widely as possible, and to start vernacular schools in connection with them one at least in every district.

(Proposed by G. Subramania Iyer, Esq., of Madras, seconded by Rao Bahadur Khandubhai Desai of Surat, and carried unanimously).

IV. Agricultural Banks.

RESOLVED—That this Conference begs to call the attention of Government to the urgent need of promoting the establishment of Agricultural Banks to help co-operative credit societies and to advance loans directly to agriculturists at reasonable

rates of interest, and further begs to suggest that the advice and co-operation of representative members of the Indian community may be enlisted in devising a suitable scheme to secure this object.

(Proposed by Rao Bahadur Lalshankar Umiashankar of Ahmedabad, seconded by Thakorram Kapilram, Esq., of Surat, and carried unanimously.)

V. The Mining Industry.

RESOLVED—(a) That this Conference expresses its sense of satisfaction at the successful formation of the Tata Iron and Steel Company, Limited, with the help entirely of capital raised in India.

(b) That this Conference invites the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and trusts that in view of the ultimately lucrative character of the industry they will make organised efforts in that direction.

(c) That this Conference is of opinion that special consideration should be shown to Indian enterprise and intiation by the Government and preferential treatment given to it.

(Proposed by Rao Bahadur R. N. Mudholkar of Amraoti, seconded by the Honourable Mr. Gokuldas K. Parekh of Bombay, and carried unanimously.)

VI. Cotton Spinning and Weaving.

RESOLVED—(a) That this Conference records its sense of satisfaction at the stimulus the Spinning and Weaving industries have received from the Swadesi movement and it urges the bestowal of increased attention on cotton cultivation, the erection of Spinning and Weaving Mills at suitable centres, and the revival of the Hand-loom Weaving Industry on a commercial basis, as essential to the success of the movement,

(b) That this Conference urges the Government to remove the restrictions retarding the expansion of the industry and to provide facilities for affording practical instruction in weaving by the establishment of Weaving Schools at every important weaving centre.

(Proposed by L. K. Tulasiram, Esq., of Madura, seconded by S. B. Sankaram, Esq., of Ellore, and carried unanimously.)

VII. The Sugar Industry.

RESOLVED—(a) That this Conference notices with concern the increase in the imports of foreign sugar, and is of opinion that to arrest the steady decline of the indigenous industry, it is absolutely necessary to encourage the cultivation of healthier and more prolific varieties of cane, to employ greater care in cultivation, to use more economical processes for extracting the juice, and, above all, to adopt the most modern and efficient methods of refining.

(b) That this Conference urges the Government to provide more extensive irrigational facilities, to allow the utilisation of bye-products and, further, to consider the desirability of imposing a duty upon imported sugar in order to protect the indigenous industry.

(Proposed by the Honourable Pandit Madan Mohan Malaviya, of Allahabad, seconded by Manubhai Nandshankar, Esq., of Baroda, supported by Lala Dharamdas Suri of Lahore and Chunilal Vrijbhukandas, Esq., of Bombay, and carried unanimously.)

VIII. Appointment of Office-Bearers and Provision of Funds for the Year 1908.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary, and it appeals to the public for a sum of Rs. 10,000 for meeting the expenses for the next twelve months.

(Proposed by Sir Bhalchandra Krishna, *Kt.*, of Bombay, seconded by the Honourable Pandit Madan Mohan Malaviya of Allahabad, and carried unanimously.)

SURAT,
The 30th December,
1907.

} AMBALALSAKERLAL DESAI,
President:
R. N. MUDHOLKAR,
General Secretary.

**RESOLUTIONS PASSED AT THE FOURTH INDIAN
INDUSTRIAL CONFERENCE.**

Held at Madras on the 26th and the 27th December 1908.

I. Departments of Industry.

Resolved—(a) That this Conference is of opinion that there should be in every province of British India a Department of Industry under a Director of Industries to deal with industrial questions and to be in charge of technical and commercial education as well as industrial instruction ; and that there should be an Advisory Board of qualified persons, not less than one-half of whom should be non-official Indians, who should be consulted on all matters of importance.

(b) that the functions of this Department should include (1) the supply of advice in regard to new industries, (2) the introduction of new or improved methods and processes, (3) the carrying out of investigation and experiments, (4) the development of selected industries, and (5) the organization of industrial and commercial exhibitions ;

(c) that there should be an industrial museum and a bureau of information under the Department of Industry for supply of information to the public on industrial and commercial matters.

(Proposed by D. E. Wacha, Esq., (Bombay), seconded by Rao Bahadur G. Srinivasa Rao, (Madura), supported by R. V. Mahajani Esq., (Akola), and carried unanimously.)

II. Technical and Industrial Education.

RESOLVED—That this Conference re-affirms the Resolution of the previous Conferences on Technical and Industrial Education, and urges (1) that the Victoria Jubilee Technical Institute, Bombay, and the College of Science, Poona, be enlarged so that they may between them supply for the Presidency of Bombay technological instruction in all the branches of mechanical and chemical industries ; (2) that the Government of India may sanction the proposal of the Government of Bengal to add classes in industrial Chemistry to the Sibpur Engineering College ; (3) that Government of Madras will be pleased to give effect to the recommendation of the Ootacamund Industrial Conference that the Madras College of Engineering should be expanded into an Institute of Technology ; (4) that the Secretary of State might accord early sanction to the proposal of the Government of the United Provinces that a (College of Technology should be opened at Cawnpore ; and (5) that similar institutions should be established in the Punjab, Burma and Eastern Bengal and Assam.

(Proposed by the Hon'ble Pandit Madan Mohan Malaviya, (Allahabad) seconded by the Hon'ble Mr. Gokuldas K. Parekh, Bombay), supported by T. Rangachariar, Esq. (Madras), and Lalla Dharam Das Suri, (Lahore) and carried unanimously).

III. Commercial Education.

RESOLVED—(a) That in the opinion of this Conference the time has come for the Indian Universities to create faculties of Commerce and institute Degrees in Commerce, and to affiliate Commercial Colleges that will prepare candidates for University Degrees in Commerce ;

(b) that there should be established one College of Commerce at each Provincial capital and that it should include provision for the training of teachers for Commercial Schools in the mofussil.

(Proposed by K. Subramani Aiyer, Esq. (Bombay), seconded by D. G. Dalvi, Esq. (Bombay), and carried unanimously.)

IV. Agricultural Banks.

RESOLVED—That this Conference again invites the attention of the Supreme and the Provincial Governments to the urgent need for Agricultural Banks both to assist Co-operative Credit Societies and, in cases where Co-operative Credit Societies cannot or will not serve, to advance loans directly to agriculturists on easy terms, and urges them to take early action in the desired direction in conjunction with Indian capitalists who, the Conference feels confident, would be ready to co-operate with Government in any such scheme.

(Proposed by Lalubhai Samaldas, Esq. (Bombay), seconded by Rao Bahadur Khandubhai G. Desai, (Surat), supported by Rao Bahadur V. K. Ramanujachariar, (Kumbhakonam), and carried unanimously.)

V. Cotton Excise Duty.

RESOLVED—That this Conference records its emphatic protest against the continuance of the Excise Duty on Indian mill-made cloth as an unjust and unnecessary impost and urges that it should be removed without delay.

(Proposed by Uttamlal K. Trivedi, Esq. (Bombay), seconded by Pandit Rambhuj Dutt Chowdhuri, (Lahore), and carried unanimously.)

VI. Railway Rates on Goods.

RESOLVED—That this Conference calls the attention of the Government to the prevailing complaints about existing railway rates, and suggests that an enquiry should be instituted into their effect on indigenous industries especially in their competition with imported goods, and further submits that the rates should be reduced where their effect may be proved to be injurious.

(Proposed by Dewan Bahadur Ambalal S. Desai, (Ahmedabad), seconded by Rao Bahadur Doorao Vinayak, (Akola), and carried unanimously.)

VII. Mining, Weaving and Sugar Industries.

RESOLVED—That while expressing its satisfaction at the steady progress of the Swadeshi movement, this Conference, concurring with the last Conference, calls the particular attention of capitalists and the general public to the necessity of developing the Mining, Weaving and Sugar industries, and urges the formation of Joint-Stock Companies for working mines and erecting mills and factories.

(Proposed by the Hon'ble Sir Vithaldas D. Thackersey Kt. (Bombay), seconded by G. Subramania Iyer, Esq. (Madras), supported by the Hon'ble Mr. H. S. Dikshit (Bombay), and carried unanimously.)

Office Bearers and Funds For Next Year.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and Mr. C. Y. Chintamani as Assistant Secretary for the year 1909, and appeals to the public for a sum of Rs. 5,000 to meet the expenses of the next twelve months.

(Proposed by N. Subba Rao Pantulu, Esq. (Rajahmundry), seconded by Babu Gunga Prasad Varma (Lucknow), and carried manimously.)

MADRAS, The 27th December, 1908, }	R. N. MUDHOLKAR. President.
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RESOLUTIONS OF THE FIFTH INDIAN INDUSTRIAL CONFERENCE.

Held at Lahore on the 30th December 1909.

I. Death of Mr. R. C. Dutt.

RESOLVED—That this Conference places on record its profound sorrow for the sad death of its first President, the late Mr. Romesh Chandra Dutt, C. I. E. The Industrial movement has lost in him one of its ablest and most zealous champions, and the country, one of her most accomplished, earnest and patriotic sons. That this Conference authorizes the General Secretary to convey the above Resolution to the widow and son of Mr. Dutt.

II. Purchase of Stores by Government Departments.

RESOLVED—That this Conference thanks the Secretary of State and the Government of India, for the orders, which have been recently issued, in regard to the purchase by Government Departments of articles, made in India, in preference to those of foreign manufacture. The Conference, while recognising the fact that these orders mark a distinct advance in the policy of Government towards the encouragement of indigenous industries and manufactures, is of opinion that the report of the Committee be published for general information and guidance in the future.

III. Technical and Industrial Education.

RESOLVED—That this Conference regrets that the proposal of the United Provinces Government for the establishment of a Technological College at Cawnpore, which was supported by the Government of India, has not been sanctioned by the Secretary of State. In view of this fact this Conference reaffirms the Resolutions of the previous Conference on Technical and Industrial Education and again urges:—

(1) that the Victoria Jubilee Technical Institute of Bombay, and the College of Science at Poona, be enlarged so that they may between them supply for the Presidency of Bombay technological instruction in all the branches of mechanical and chemical industries ;

(2) that the Government of India may sanction the proposal of the Government of Bengal to add classes in Industrial Chemistry to the Sibpore Engineering College ;

(3) that the Government of Madras will be pleased to give effect to the recommendation of the Ootacamund Industrial Conference that the Madras College of Engineering should be expanded into an Institute of Technology ;

(4) that the Secretary of State might accord early sanction to the proposal of the Government of the United Provinces that a College of Technology should be opened at Cawnpore ; and

(5) that similar Institutions should be established in the Punjab, Burma, Eastern Bengal and Assam.

IV. Commercial Education.

RESOLVED—(a) That in the opinion of this Conference the time has come for the Indian Universities to create Faculties of Commerce and institute degrees in Commerce and to affiliate Commercial Colleges that will prepare candidates for University degrees in commerce ;

(b) that there should be established one College of Commerce in each provincial capital and that it should include provision, for the training of teachers for Commercial Schools in the mofussil.

V. Agricultural Banks.

RESOLVED—That the Conference again invites the attention of the Supreme and Provincial Governments to the urgent need of establishing Agricultural Banks for assisting the existing Co-operative Credit Societies and for advancing loans direct to agriculturists on easy terms wherever such societies do not exist, with the view of ameliorating the economic condition of the Indian peasantry.

VI. Cotton Excise Duty.

RESOLVED— that the Conference records again its emphatic protest against the continuance of the Excise duty on Indian mill-made cloth as an unjust and unnecessary impost which presses heavily on the industry, and prays that it should be abolished at the earliest opportunity.

VII. Weights and Measures.

RESOLVED—That this Conference invites the attention of the Government of India to the desirability of introducing uniform weights and measures to facilitate trade among the different towns and provinces of India, to prevent fraudulent practices of traders and remove the present inconveniences arising from a multiplicity of weights and measures and from a want of uniform system and standard.

VIII. Office-Bearers and Funds for Next Year.

RESOLVED—That this Conference re-appoints Rao Bahadur R. N. Mudholkar as General Secretary and authorizes him to appoint an Assistant Secretary with suitable establishment and appeals to the public for a sum of Rs. 5,000 to meet the expenses of the next twelve months.

RAMESHWAR SINGH,
President.

30th December 1909. } **R. N. MU DHOLKAR.**
General Secretary.

**RESOLUTIONS OF THE SIXTH INDIAN
INDUSTRIAL CONFERENCE.**

Held at Allahabad on the 30th December 1909.

**I. Vote of sorrow for the Death of His Late
Majesty, King-Emperor, Edward VII.**

RESOLVED—That this Conference places on record its profound sorrow at the death of His Late Majesty King-Emperor, Edward VII, in whom the people of India have lost a most sympathetic and warm hearted well-wisher and supporter, the Empire a wise and benevolent sovereign and the world a powerful promoter of peace and general amity, and respectfully tenders its condolence to Her Majesty Queen-Empress Alexandra and the members of the Royal Family.

(Put from the Chair in solemn silence, the whole audience standing, and carried unanimously.)

II. Homage to His Majesty, King-Emperor, George V.

RESOLVED—That this Conference begs to offer its respectful and loyal homage to His Majesty King-Emperor, George V, on his accession to the throne of the British Empire and expresses the hope that His Majesty's gracious sympathy for the people of this country and interest in their well-being will effectively promote their prosperity and advancement.

(Moved from the Chair and carried unanimously and by acclamation.)

III. Technical Education.

RESOLVED—(a) While gratefully acknowledging the grants to technical and industrial education made by Government in recent years, this Conference places on record its firm conviction that, for effectively promoting the industrial progress of this country, it is essential that the Government should establish here at least one fully equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts, and further urges that the visit of His Majesty, King-Emperor George V and Her Majesty, Queen-Empress Mary should be commemorated by the foundation of such an institution.

(b) This Conference also invites business, scientific and technical experts to form themselves into a working organization for the creation of a scientific, technological and commercial literature in the Indian Vernaculars for the dissemination of information on industrial and commercial subjects amongst the people of India.

(Proposed by Sir Bhalohandra Krishna, Kt., of Bombay, seconded by Pandit Gokarnanath Misra of Lucknow, supported by Babus Laxmi Chand and Thakur Prasad and carried unanimously.)

IV. Commercial Education.

RESOLVED—(a) In the opinion of this Conference the time has come for the Indian Universities to create Faculties of Commerce to institute Degrees in Commerce, and to affiliate Commercial Colleges which will prepare candidates for such Degrees.

(b) That there should be established one College of Commerce in each provincial capital and that it should include provision for the training of teachers for commercial schools in the mofassil.

(Proposed by Mr. C. Gopal Menon of Madras, seconded by Mr. Gulabchand Javeri and carried unanimously.)

V. Excise duty on Cotton Goods.

RESOLVED—This Conference again records its emphatic protest against the continuance of the Excise Duty on Indian mill-made cloth as an unjust and unnecessary impost which presses heavily on the industry and prays that it should be abolished at the earliest opportunity.

(Proposed by the Honourable Mr. Gokuldas K. Parekh of Bombay, seconded by Mr. Muthuradas Ram Chand Javeri of Sind, supported by Mr. Mawjee Govindjee Sheth of Bombay and carried unanimously.)

VI. The Indian Factories Bill.

RESOLVED—This Conference is of opinion that the provisions of the Indian Factories Bill of 1909 involve a serious, unnecessary and uncalled for interference with the rights of adult male labour and urges that the sections of the Bill which involve such restriction be dropped.

(Proposed by the Honourable Sir Vithaldas D. Thackersey, seconded by Mr. D. E. Wacha, supported by the Honourable Rao Bahadur R. N. Mudholkar and carried unanimously. Two amendments were proposed but they were lost.)

VII. Merchandise Marks Act.

RESOLVED—This Conference draws the attention of Government to the use, on several articles manufactured outside India, of misleading descriptions, impressions, or marks calculated to cause the belief among purchasers and consumers that the same were made in India and urges that steps be taken, by legislation, if necessary, to prevent such and similar fraudulent practices by requiring in every case the indication of the country of origin.

(Proposed by Mr. M. B. Sant, of Amraoti, seconded by Mr. J. P. Kotilingam of Madras, and carried unanimously.)

VIII. Weights and Measures.

RESOLVED—This Conference re-affirms Resolution No. VII of last year's Conference and again invites the attention of the Government of India to the desirability of introducing uniform

weights and measures to facilitate trade among the different towns and provinces of India, and remove the present inconveniences arising from a multiplicity of weights and measures and from want of a uniform system and standard.

(Proposed by the Honourable Rao Bahadur R. N. Mudholkar, seconded by Mr. Goswami Brijnath and carried unanimously.)

IX. Agricultural Banks.

RESOLVED—This Conference notes with regret that the Secretary of State has not sanctioned the scheme drawn up by some of the leading financiers of Bombay of an Agricultural and Industrial Bank, though the same had received the support of the Government of Bombay and the Government of India, and again urges upon Government its conviction that for securing an amelioration of the economic condition of the peasantry and the land-owning classes, it is necessary to establish agricultural banks for assisting the existing Co-operative Credit Societies and for advancing loans direct to agriculturists wherever such societies do not exist.

(Proposed by Mr. G. K. Devadhar of Poona, seconded by Mr. Mahesh Charan Sinha. Babu Ambica Charan Ookil moved an amendment which the President ruled out of order. The original resolution was carried unanimously.)

X. Joint Stock Companies.

RESOLVED—This Conference considers that it is desirable to bring the law regulating Joint Stock Companies in India in a line with the law in England, as laid down in the recent Companies Consolidation Act, with such modifications as will suit the circumstances of this country.

(Proposed by Mr. J. K. Mehta of Bombay, seconded by Mr. B. F. Karbhari and carried unanimously.)

XI. Abolition of the Department of Industries.

RESOLVED—This Conference records its sense of deep regret at the action of the Secretary of State in directing

abolition of the Department of Industries in Madras and lodges a protest against the policy laid down by him that the State should not pioneer new enterprises, as unduly limiting State help in industrial development.

[Proposed by Mr. C. Y. Chintamani, of Allahabad, seconded by the Honourable Sir Vithaldas D. Thackersey, and carried unanimously.]

XII. Duty on Sugar.

RESOLVED.—This Conference is strongly of opinion that it is essential that the Government should impose an adequate import duty on foreign sugar in order to enable the indigenous industry to hold its own.

(Proposed by the Honourable Rai Bahadur Ramanuj Dyal, seconded by Mr. J. P. Kotilingam and carried unanimously.)

A resolution on Octroi duty levied in some parts of India was moved but its consideration was postponed owing to a difference of opinion.

XIII. Appointment of Office-bearers and Appeal for Funds.

RESOLVED.—That the Conference re-appoints the Honourable Rao Bahadur R. N. Mudholkar as General Secretary and authorises him to appoint an Assistant Secretary with suitable establishment and appeals to the public for a sum of Rs. 5,000 to meet the expenses of the Industrial Conference Office for the next twelve months.

[Proposed by the Honourable Pandit Madan Mohan Malaviya, seconded by Babu Ganga Prasad Varma and carried unanimously.]

R. N. MOOKERJEE,
President.

ALLAHABAD,
The 30th December 1909.

R. N. MU DHOLKAR,
General Secretary.

RESOLUTIONS.

PASSED AT

**The Seventh Indian Industrial Conference,
Held at Calcutta on the 29th December, 1911.**

RESOLUTION I.

Homage to Their Imperial Majesties.

The Indian Industrial Conference assembled in its seventh Session humbly and respectfully tenders its most dutiful and loyal homage to Their Imperial Majesties King-Emperor George V and Queen-Empress Mary on the occasion of Their visit to India to graciously announce in person the solemnities of Their coronation to Their faithful and loving subjects in this country. The Conference begs to express its grateful rejoicings at the benign assurances of sympathy and regard given in the Royal Proclamation and the boons bestowed upon the people to promote their happiness and prosperity and secure their contentment and attachment.

Moved from the Chair.

RESOLUTION II.

The late Honourable Mr. V. Krishnaswamy Iyer.

The Conference expresses its profound sorrow at the sad and untimely death of the Honourable Mr. V. Krishnaswamy Iyer, C. S. I., Member of the Executive Council of His Excellency the Governor of Madras, in whom it has lost one of its most zealous and active supporters, the country one of her best and noblest sons and the British Empire a most loyal and devoted citizen. The Conference authorizes the General Secretary to convey its sincere and heartfelt condolence to the son and relations of the deceased gentleman.

Moved from the Chair.

RESOLUTION III.

Technical Education.

While expressing its appreciation and thankfulness to the Government for the liberal action taken and contemplated, in regard to Technical Education, this Conference once more records its firm conviction that for placing the cause of industrial progress on a firm basis, it is most necessary that the Government should establish in the country at least one fully-equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts and further urges that the visit of Their Imperial Majesties the King-Emperor and the Queen-Empress should be commemorated by the foundation of such an institution bearing Their names.

Proposed by—MR. A. CHOWDHARI, (Bengal).

Seconded by—MR. S. K. Nair, (Madras).

Supported by—MR. L. V. KAIKINI, (Berar).

RESOLUTION IV.

Failure of Industrial Enterprises.

This Conference notes with regret and concern the failure of several industrial enterprises started for carrying on new industries and the effect these failures have produced in damping the ardour of the people in the development of the resources of the country. The Conference calls upon the leaders of the people in the different Provinces and Districts to institute inquiries into the causes of these failures and authorises the General Secretary to depute one or more persons for securing this investigation.

Proposed by—The Hon'ble Mr. R. P. Karandikar,
(Bombay).

Seconded by—Rao Bahadur V. R. Pandit, (C. P.)

Supported by—Mr. K. S. Narain Rao (Madras).

RESOLUTION V.**Railway Rates.**

This Conference calls the attention of the Government to the prevailing complaints about the anomalous character of the existing Railway rates on goods and their unfairly heavy incidence on interprovincial trade and urges the necessity of laying down for interprovincial consignments the same scales of rates as those for consignments to and from important ports.

Proposed by—Mr. N. A. Dravid, (Berar).

Seconded by—Mr. L. V. Kaikini (Berar).

RESOLUTION VI.**Purchase of Government Stores.**

This Conference urges upon the leaders of the different Provinces the necessity of vigilance to secure the effectual and complete carrying out of the orders of the Government issued in 1909 for the purchase of Government Stores in this country as far as practicable, and appoints a committee consisting of the following gentlemen to watch the operation of the rules and to report thereon to the next Conference :—

Sir R. N. Mookerjee

Mr. D. E. Wacha

Honourable Sir Vitaldas D. Thackersey

Honourable Mr. La'ubhai Samaldas

Dewan Bahadur P. Rajaratnam Madaliyar

Lala Harkishen Lal

The Honourable Rao Bahadur R. N. Mudholkar.

Proposed by—The Honourable Rao Bahadur R. N. Mudholkar, (Berar).

Seconded by—Prof. R. K. Mookerjee (Bengal).

RESOLUTION VII.

Director of Industries.

This Conference once more urges that there should be in every Province of British India, a department of industry under a Director of Industries to deal with industrial questions and to be in charge of Technical and Commercial education as well as Industrial instruction ; and that there should be an advisory board of qualified persons not less than one half of whom should be non-official Indians, who should be consulted on all matters of importance ; that the functions of this department should include (1) the supply of advice in regard to new industries, (2) the introduction of new or improved methods and processes, (3) the carrying out of investigation and experiments, (4) the development of selected industries, (5) the organisation of industrial and commercial exhibitions.

(6) That there should be an Industrial Museum and a bureau of information under the Department of Industry for supply of information to the public on Industrial and Commercial matters.

Proposed by—Mr. C. Y. Chintamani, (U. P.).

Seconded by—Mr. Kalooram Gangrade, (Central India).

RESOLUTION VIII.

Co-operative Banks.

This Conference welcomes the establishment in the Bombay Presidency of a Central Co-operative Bank and urges upon the Government and the people the desirability of establishing similar Banks in the other Provinces to help Co-operative Credit Societies and to advance loans directly to agriculturists at reasonable rates of interest.

Proposed by—The Hon'ble Sir Gangadhar Rao Chitnavis, (Berar).

Seconded by—Rao Bahadur G. Shrinivasa Rao, (Madras).

RESOLUTION IX.**Indentured Labour.**

This Conference is of opinion that in the highest interests of the country, the system of Indian indentured labour is undesirable and should be abolished and urges the Government of India to take early steps to prohibit the recruitment of Indian labour under contract of indenture, whether for service at home or abroad.

Proposed by—Honourable Mr. N. Subba Rau, (Madras).

Seconded by—Mr. Polak, (South Africa).

Supported by—Mr. Paul Peter Pillai, (Madras).

RESOLUTION X.**Duty on Alcohol.**

In view of promoting and facilitating the work of Scientific and Technical Instruction in India this Conference urges upon Government the desirability of exempting, in conformity with the practice of other civilized countries, from payment of duty all alcohol purchased by public educational institutions in this country for strictly educational purposes.

Proposed by—Mr. Manindra Nath Banerjee, (Bengal).

Seconded by—Dr. A. Chattopadhyay, (Bengal).

RESOLUTION XI.**Appointment of Committee**

This Conference appoints a Committee of the following gentlemen to submit opinions on and offer suggestions in regard to the Co-operative Credit Societies' Bill, the Life Assurance Companies' Bill and the Provident Societies' Bill, now pending in the Imperial Legislative Council :—

The Honourable Mr. G. K. Gokhale.

The Honourable Sir Vitthalidas D. Thackersey.

The Honourable Mr. M. B. Dadabhoj.

Sir G. M. Chitnavis.

Babu Surendranath Thakur.

The Honourable Rao Bahadur R. N. Mudholkar.

Proposed by—MR. J. CHOWDHARI, (Bengal)

Seconded by—PANDIT GOKARNA NATH MISRA, (U. P.).

Supported by—MR. A. C. UKIL, (Bengal).

RESOLUTION XII.

Previous Resolutions.

This Conference confirms the resolutions passed in previous Conferences :—

(1) calling upon the Government and the people (a) to encourage and help Indian manufacturers and (b) to foster and encourage the use of such manufactures ;

(2) inviting the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and asking them to make organised efforts in that direction ;

(3) urging the special claims to consideration of the Textile and Sugar Industries ; and praying for the repeal of the excise duty on Cotton goods ;

(4) urging the desirability of the standardisation and unification of weights and measures so as to remove the serious inconveniences caused to trade by their multiplicity ;

(5) urging the Indian Universities to create faculties of Commerce, to institute degrees in Commerce and to affiliate Commercial Colleges which will prepare candidates for such degrees, and recommending the establishment of a College of Commerce in each Provincial Capital, which should also provide for the training of teachers for Commercial Schools in the mofussil.

Proposed by—Mr. R. C. Bonnerjee, (Bengal).

Seconded by—Mr. V. V. Jogiah, (Madras).

RESOLUTION XIII.

Office Bearers.

The Hon'ble Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Industrial Conference for the next year, Mr. N. A. Dravid, Honorary Assistant Secretary and Mr. M. B. Sant, Assistant Secretary, and this Conference appeals to the public for a sum of Rs. 5,000 to carry on the work of the Industrial Conference.

This Conference deems it desirable that there should be a Standing Committee of the Conference appointed for each year to co-operate with the General Secretary in carrying on the work of the Conference during the year and to advise on all such matters as the General Secretary may submit to them and that the following gentleman do constitute the Standing Committee for the year 1912 :—

Sir R. N. Mukerji

Mr. J. Chandhari

Sir Vithaldas D. Thackersey

Mr. D. E. Wacha

Hon'ble Mr. Lalubhai Samaldas

Dewan Bahadur P. Rajaratnam Mudaliyar

Lala Harkishen Lal

Dr. Satish Chandra Banerjee

Mr. C. Y. Chintamani

Mr. Hasan Imam

Rai Parendu Narayen Sinha

The Hon'ble Mr. M. B. Dadabhoy

Hon'ble Rao Bahadur R. N. Mudholkar, General
Secretary (Ex-officio).

Proposed by—The Hon'ble Pandit Madan
M. Malaviya.

Seconded by—Rao Bahadur R. G. Mundle,

M. B. DADABHOY,

President,

Seventh Indian Industrial Conference.

R. N. MUDEHOLKAR,

General Secretary,

Indian Industrial Conference.

RESOLUTIONS

PASSED AT THE

Eighth Indian Industrial Conference

HELD AT BANKIPORE

On Monday the 30th December 1912.

RESOLUTION I.

The Delhi Outrage.

The Indian industrial Conference expresses its indignation and abhorrence at the dastardly outrage committed upon the life of His Excellency the Viceroy and begs to offer its respectful sympathies to Their Excellencies Lord and Lady Hardinge and the Conference fervently prays that His Excellency will have a speedy recovery and restoration to health.

Moved from the Chair.

RESOLUTION II.

Agriculture and Commerce.

In view of the great importance of properly developing Agriculture and Indian Commerce, this Conference urges upon Government and the people the urgent necessity of establishing Chairs of Agriculture and Commerce for spreading knowledge of the general principles of these subjects among persons who do not wish to specialise in them; and for the suitable advancement of Technical Education, the Conference strongly advocates the creation of Boards constituted on lines similar to the Senates of Universities for directing and regulating instruction therein.

Proposer—Hon'ble Rao Bahadur R. N. Mudholkar.

Seconder—Hon'ble Babu Krishna Sahay.

RESOLUTION III.

Indian Chambers of Commerce.

This Conference draws the attention of the commercial and other business classes

- (a) to the great necessity of establishing Indian Chambers of Commerce and Associations of the Industrial and Financial interests, wherever favourable circumstances exist and
- (b) to the importance to themselves and to the country of their engaging to a greater extent than hitherto, in the foreign trade of the country.

Proposer—Mr. L. V. Kaikini.

Secunder—Dr. S. V. Ketkar.

RESOLUTION IV.

The Atkinson-Dawson Inquiry.

This Conference expresses its disappointment at the recommendations made by Lieutenant-Colonel Atkinson and Mr. Dawson in regard to higher Technical Education and expresses its disagreement with the recommendation in regard to the State Technical Scholarships, as these recommendations are not calculated to secure that higher type of knowledge of principles and practice which is required for organisation, direction and management of industries.

Proposer—Mr. N. A. Dravid.

Secunder—Mr. M. B. Sant.

RESOLUTION V.

Polytechnic College.

While expressing its appreciation and thankfulness to the Government for the liberal action taken and contemplated, in regard to Technical education, this Conference once more records its firm conviction that for placing the cause of industrial progress on a firm basis, it is most necessary that the Government

should establish in the country at least one fully-equipped Polytechnic College for imparting the highest kind of instruction in the applied sciences and industrial arts.

Proposer—Honourable Babu Dwarkanath.

Secunder—Mr. Mithila Saran Sinha.

RESOLUTION VI.

Technical Education.

This Conference urges all Provincial Governments and administrations, Rulers of Indian States, as well as Principals and Superintendents of Private or Aided Schools and Colleges, to add Commercial, Technical and Industrial classes for instruction in commercial subjects as well as in weaving, dyeing, sheet-metal working, smithy, carpentry etc., to the existing courses of instruction, wherever practicable.

Proposer—Mr. Moulvi Mahamad Hussain.

Secunder—Mr. Chandrabhan Sahay.

Supporter—Mr. G. N. Kane.

“ Mr. G. K. Harkare.

RESOLUTION VII.

Failure of Industrial Enterprises

This Conference notes with regret and concern the failure of several industrial enterprises started for carrying on new industries and the effect these failures have produced in damping the ardour of the people in the development of the resources of the country. The Conference calls upon the leaders of the people in the different Provinces and Districts to institute inquiries into the causes of these failures and to communicate to the General Secretary the results of their inquiries, and authorises the General Secretary to depute one or more persons for conducting this investigation, if the funds at his disposal permit.

Proposer—Professor Jadunath Sarcar.

Seconder—Rai Narayan Prasad Sahib.

Supporter—Mr. K. P. Sen Sinha.

“ “ Rao Sahab Ganesh Nagesh.

RESOLUTION VIII.

Hand-loom Weaving.

This Conference specially invites the attention of the capitalists to the great and urgent necessity of improving the existing condition of the weaving industry by the introduction of labour-saving hand-loom and other devices of approved patterns, in important centres of the Hand-loom weaving industry, with the co-operation of the weaving classes.

Moved from the Chair.

RESOLUTION IX.

Railway Rates.

This Conference once more calls the attention of the Government to the prevailing complaints about the anomalous character of the existing Railway rates on goods and their prejudicial effect on interprovincial trade ; and urges the necessity of laying down, for interprovincial consignments, the same scales of rates as those for consignments to and from important ports.

Moved from the Chair.

RESOLUTION X.

Faculty of Commerce.

This Conference records its sense of gratitude to the Government of Bombay for having created a Faculty of Commerce and urges the other local Governments and Universities in India to follow the example of the Bombay University in establishing Faculties of Commerce for giving an impetus to Commercial Education,

Moved from the Chair.

RESOLUTION XI.

Provincial Departments of Industry.

This Conference once more urges that :

- (a) There should be in every province of British India, a Department of Industry under a Director of Industries to deal with purely industrial questions and to be in charge of Technical, Commercial as well as Industrial Education in the Province; and that there should be an advisory board of qualified persons, not less than one half of whom should be non-official Indians, who should be consulted on economic questions of importance; that the functions of this department should include (1) the introduction of new or improved methods and processes, (2) the carrying out of investigations and experiments, (3) the development of selected industries, and (4) the organisation of industrial and commercial Exhibitions.
- (b) That there should be an Industrial Museum and bureau of information under the Department of Industry for supply of information and advice to the public on all Industrial and Commercial matters within the province.

Proposer—Honourable Mr. Gokuldas K. Parekh.

Seconder—Babu Ram Gopal Choudhary.

RESOLUTION XII.

Co-operative Banks.

This Conference once more welcomes the establishment in the Bombay Presidency of a Central Co-operative Bank and urges upon the Government and the people of other Provinces, the need of establishing similar Banks to help the existing Co-operative Credit Societies for advancing loans at reasonable rates and on easy terms to the agriculturists.

Proposer—Rai Purnendu Narayan Sinha Babadur.

Secunder—Mr. L. V. Kaikini.

RESOLUTION XIII.

Miscellaneous.

This Conference confirms the resolutions passed in previous years :—

- (1) Calling upon the Government and the people (a) to encourage and help Indian manufactures and (b) to foster and encourage the use of such manufactures ;
- (2) Recommending to the people the desirability of starting Funds for the promotion of Technical and Industrial Education ;
- (3) Inviting the attention of capitalists in India to the urgent need of developing and fully utilising the mineral resources of the country and asking them to make organised efforts in that direction ;
- (4) Urging upon the attention of the Imperial Government the special claim to consideration of the Textile and Sugar Industries ; and praying for the repeal of the excise duty on Cotton goods ;
- (5) Urging upon Government the desirability of the standardisation and unification of Weights and Measures so as to remove the serious inconveniences caused to trade by their multiplicity.

Proposer—Mr. Mathura Nath Sinha.

Secunder—Mr. S. V. Lalit.

RESOLUTION XIV.

Co-operative Credit Societies.

This Conference expresses its great satisfaction at the progress which Co-operative Credit has made in this country since the passing of the Co-operative Credit Societies' Act of 1904,

and earnestly hopes that with the wider application of the principle of Co-operation under the Co-operative Societies' Act of 1912, Government will give larger financial and administrative facilities which are needed to secure a surer growth of Co-operation and exhorts the educated public to strenuously extend its operations to various branches of agriculture and small industries which are bound to prosper with the help of the Co-operative movement.

Proposer—Mr. G. K. Devadhar.

Secunder—Mr. R. V. Mahajani.

RESOLUTION. XV.

Sir T. Palit's Gift.

This Conference places on record its sense of gratitude to Sir T. Palit of Calcutta for his munificent gift to the Calcutta University and expresses the hope that his example would be followed by others.

Moved from the Chair.

RESOLUTION XVI.

Office Bearers.

The Honourable Rao Bahadur R. N. Mudholkar be appointed General Secretary of the Indian Industrial Conference for the next year, Mr. N. A. Dravid, Honorary Assistant Secretary and Mr. M. B. Sant, Assistant Secretary and this Conference appeals to the public for a sum of Rs. 8000 to carry on the work of the Industrial Conference.

This Conference deems it desirable that there should be a Standing Committee appointed for each year to co-operate with the General Secretary in carrying on the work of the Conference during the year and to advise him on all such matters as he may submit to them and that the following gentlemen do constitute the Standing Committee for the year 1913 :—

Sir R. N. Mookerji.

Lala Harkishen Lal.

Mr. J. Chaudhari.

Sir. Vithaldas D. Thackersey.

Mr. D. E. Wacha.

Hon'ble Mr. Lalubhai Samaldas.

Dewan Bahadur P. Rajaratnam Mudaliyar.

Dr. Satish Chandra Banerjee.

Mr. C. Y. Chintamani.

Rai Purnendu Narayan Sinha Bahadur.

Hon'ble Mr. M. B. Dadabhoy.

Hon'ble Babu Krishna Sahay.

Hon'ble Rao Bahadur R. N. Mudholkar (*Ex-officio*).

Proposer—Hon'ble Mr. Krishna Sahay.

Seconder—Professor Jogindra Nath Samaddar.

HARKISHEN LAL,

President,

Eighth Indian Industrial Conference.

R. N. MU DHOLKAR,

General Secretary,

Indian Industrial Conference.



APPENDIX II.

LIST OF DELEGATES TO THE

Ninth Indian Industrial Conference.

Held at Karachi on 25th December 1913.

- (1) Elected by the District Congress Committee, Khandwa :—
 1. Rai Bahadur H. Mitra, Bar-at-Law.
 2. D. N. Fadnis Esq., Pleader.
 3. S. S. Dikshit Esq., B.A., LL.B., Pleader.
 4. Kulu Ram Gangrade " " "
 5. Manak Chand Jaini " " "
- (2) By Chamber of Commerce, Karachi :—
 1. Hon'ble Mr. W. N. Nicholas, the Vice Chairman.
 2. Mr. H. F. Pfister.
 3. Mr. G. W. Wilson.
- (3) By Indian Merchants Chamber and Bureau, Bombay :—
 1. Hon. Sir Fazulbhoy Karimbhoy.
 2. Hon. Mr. Lallubhai Samaldas.
 3. Mr. D. E. Wachha.
 4. Mr. J. K. Mehta, M.A.
- (4) By National Fund and Industrial Association, Madras :—
 1. Hon. Nawab Syed Muhd. Saheb Bahadur.
 2. Dewan Bahadur M. Andinarayaniah.
 3. Dewan Bahadur L.A. Govindaraghava Aiyar B.A., B.L.
 4. C. P. Ramaswami Iyer, B.A., B.L.
 5. Hon. T. V. Seshagiri Aiyar, B.A., B.L.
 6. C. Gopal Menon.
 7. V. V. Gopalswamy Mudaliar, B.A., B.L.
 8. S. Srinivasa Iyengar, B.A., B.L.
 9. G. Venkataranga Rao, M.A.
 10. Pandit D. Gopala Charlu, A.V.S.

11. N. Subba Raw Pantulu, B.A., B.L.
12. A. O. Parthasarudhi Naidu.
13. K. R. Subramania Sastriar, B.A., B.L.
14. C. Srinivasa Charlar.
15. Dr. U. Rama Row.
16. A. Rangaswami Iyengar, B.A., B.L.
17. S. Kasturi Ranga Aiyengar, B.A., B.L.
18. K. B. Ramanatha Iyer, M.A., B.L., L.T.
19. Hon. H. M. Abdul Khadar Badsha Sahib.
20. T. Ranga Chariar, B.A., B.L.,
21. T. S. Viswanatha Iyer, B.A.

(5) By the Millowners Association Bombay :—

1. Hon'ble, Sir Fazulbhoy Karimbhoy.
2. Sir Vithaldas D. Thackersey.
3. Mr. J. B. Petit.
4. Mr. D. E. Wacha.

(6) By the C. P. P. Congress Committee, Nagpore :—

1. Hon. R. B. V. R. Pandit, Bar-at-law, Nagpore.
2. Govindrao Subhedar, Honry. Magistrate, Nagpore.
3. V. R. Dixit Esq., Bar-at-law, Nagpore.
4. N. A. Dravid Esq., Servant of India Society, Nagpore.
5. V. M. Jakatdar Esq., Pleader, Bhandara.
6. Rai Bahadur H. Mitra, Bar-at-law, Khandwa.
7. Damoder Narayen Fadnavis Esq., Pleader, Khandwa.
8. S. S. Dikshit Esq., B.A., L.L.B., Pleader, Khandwa.
9. Kalaram Gangrade Esq., B.A., L.L.B., Pleader, Khandwa.
10. Manakehand Jaini Esq., B.A., L.L.B., Pleader, Khandwa.

(7) By the South Indian Association Madras :—

1. Hon'ble. Mr. T. V. Seshagiri Aiyar.
2. Dewan Bahadur L. A. Govindaraghava Aiyar.
3. Hon'ble Rao Bahadur B. N. Sarma.
4. Hon'ble Mr. V. S. Srinivasa Sastriyar.
5. Mr. C. P. Ramaswami Aiyar.
6. Mr. S. Srinivasa Aiyengar.
7. Mr. C. Gopal Menon.
8. Mr. A. Rangaswami Aiyengar.
9. Mr. G. C. Loganatha Moodular,

REPORT
ON
INDIAN INDUSTRIAL CONFERENCE WORK
AND RECORD OF
**General Industrial activity in the Country in the
twelve months ending with November 1913.**

PART I.
INDUSTRIAL CONFERENCE WORK.

December 1912.

The report submitted to the eighth Indian Industrial Conference which met at Bankipore in December 1912, referred to the period of twelve months from December 1911 to November 1912. During the months of November and December 1912 the Conference office was mainly engaged in connection with the arrangements for the last Session of the Conference, in communication with the office of the Reception Committee at Bankipore.

The Conference was held under the Presidentship of Lala Harkishen Lal, B.A., Bar-at-Law, Lahore, on Monday, the 30th December 1912, in the spacious pavilion erected for the Indian National Congress. Full account of the proceedings of the Conference including resolutions passed at its Session, the texts of the papers laid on the table, the speech of the Chairman of the Local Reception Committee, the Presidential address and the speeches delivered during the discussion on these Resolutions are given in the Report.

January to November 1918.

Resolution No. XVI passed at the Bankipore Conference appointed Rao Bahadur R. N. Mudholkar as the General Secretary, Mr. N. A. Dravid, Honorary Assistant Secretary, and Mr. M. B. Sant, Assistant Secretary and authorized the General Secretary to appeal to the public for raising Rs. 8,000 to carry on the work of the Industrial Conference during the year 1913. To give effect to the financial portion of this resolution, about 250 appeals for funds were issued to leading Zamindars, prominent industrialists and noted gentlemen all over the country. But it is our painful duty to have to state that the response this year was even more discouraging than that of last year. Out of Rs. 8,000 which the General Secretary was authorized to raise, Rs. 2,115 only have been recovered so far. Several gentlemen occupying high positions, who put down their subscriptions with their own hands have failed to pay, although several reminders by letters as well as by telegrams were sent. They did not even show the courtesy of acknowledging these letters and reminders. Several others, who are looked upon generally as the leaders of their respective provinces, have given no response to the appeal made to them. Under these discouraging circumstances, the task of carrying on the work of the Conference is becoming more difficult every year. The General Secretary was very desirous that either the Honorary Assistant Secretary Mr. Dravid or the paid Assistant Secretary Mr. Sant should be sent out to some important centres for reviving interest in the Industrial Conference movement and to conduct in part the enquiries about the failures of new Industrial enterprises in so many places. But very soon after the last session, Mr. Dravid took up certain new responsibilities which rendered him, he said, powerless to work for the Industrial Conference and the General Secretary's health demanded Mr. Sant's continuous presence at headquarters. The want of funds made it impossible to give effect to the proposal to send

out an assistant to promote the establishment of Chambers of Commerce and Associations of Industrial and financial interests in these provinces and sub-provinces where none such exist. So disappointing has been the response of the leaders of the people to the call for assistance made by the General Secretary and so egregious has been the failure of committees and persons from whom a fuller and livelier recognition of duties was expected that it has become a serious question how the interest in industrial development has to be kept up.

The local Reception Committee of the Industrial Conference at Bankipore failed to supply the funds needed for expenditure in connection with the Session held there, though it had solemnly promised to do so. In this it followed the example of Calcutta and Allahabad. In the case of the first of these two cities, however, the generous contributions of the late Maharaja of Mayurbhanj and Sir R. N. Mukerjee served as a partial compensation of a sort. The failure of the reception committees throws the burden of expenditure which ought to be supplied by the local men on the general funds of the Conference and renders well-nigh impossible the great work of keeping public interest and zeal in the material advancement of the country. It is conceded on all hands that to familiarize the country with the aims and objects of the Industrial Conference and to create interest in industrial matters, it is necessary to send out qualified speakers and organizers. Provincial and District Committees have to be formed in places where none exist and the old committees which as usual have sunk into lethargy have to be roused; above all effect has to be given to Resolution VII of the Session of the last Conference to depute one or more persons for conducting a thorough and searching investigation into the causes of the failures of industrial and financial enterprises all over the country. But extreme inadequacy of funds placed at the disposal of the General Secretary left him little power to carry out any of the objects mentioned above.

In the opinion of some supporters and wellwishers of the organization as well as some outside critics, the Indian Industrial Conference has now reached a stage, when it should introduce in the programme of its work, more practical features than the collection and dissemination of information on economical, commercial, industrial and educational topics, and the mere passing of resolutions and the making of recommendations to the Government and the people. Since the commencement of its work, the Conference office has issued reports of the eight Conferences which have been held and three other publications, covering in all about 5,800 pages of closely printed matter. The Directory of Indian goods and industry has been revised and recompiled four times. The fifth edition issued at the end of 1912 has been sold out nearly half. It is more than doubtful, if it can be said that the mass of information compiled and collected so far is quite sufficient for all practical purposes and that there is no further need of obtaining and printing the papers contributed by qualified experts and writers on industrial and economic subjects. The importance and value of many of these papers and the utility of the information compiled, to the country generally, can not be lightly regarded and we can ill-spare the stimulating influences set in motion by the Conference organisation. Several matters are suggested as falling within the purview of the duties of the Industrial Conference and it is even called upon to direct its attention to these in preference to the work, it has been carrying on. Some of these are :—

- (1) To furnish free of cost schemes, estimates and prospectuses for starting different industries.
- (2) To start a public fund for sending promising students to high class industrial or educational institutions in foreign countries or in India for the study of the arts and industries needed in the country.

- (3) To start on an experimental basis some useful industries and after conducting them successfully for a time to hand the same over to public bodies or individuals wishing to take advantage of the experience acquired.
- (4) That the office of the Industrial Conference should serve the purpose of a well organised intelligence bureau which should not only collect and maintain correct statistics of trade, commerce and industry of the different provinces in India as well as of foreign important trade or art centres, but should also collect and disseminate information regarding the names and addresses of experts and specialists in India as well as in foreign countries for conducting different industries or research work.
- (5) That the Conference should maintain a museum of artistic, industrial, commercial, mining and agricultural products and other resources of the country and should study the home and foreign markets for Indian goods.
- (6) The Conference office should issue an industrial bulletin or periodical devoted exclusively to the discussion and diffusion of industrial information.

Now the objects suggested are no doubt excellent and the desirability of securing them has for years been perceived by many of our chief workers in the country. But as things stand, some of them are simply beyond the power of the Industrial Conference. These suggestions presuppose the existence of resources which are not possessed or likely to be possessed now or for several years to come. It is no use disguising from oneself the grievous lack of public spirit under which India is still labouring. All our political, industrial, religious, moral, social movements are organised and maintained by men belonging to the middle classes. Very little is done by the old aristocracy of the Market and the Exchange. There is any amount of money for personal extravagances, for huge expenditures on trips to

Europe and sojourns there, for ruinous speculation and gambling, but none for the Congress, the Social Conference or the Industrial Conference.

The issue of an industrial bulletin was seriously considered in the very year following the establishment of the Conference Office. But even the comparatively small amount needed for that project was not forthcoming and it had to be abandoned.

Materials were collected during the year that is about to expire, for the revision of the First Edition of the Directory of Technical Institutions in India, which is now out of stock and for which there is a very encouraging and steady demand. It is also contemplated to bring out a Guide to the Universities, Polytechnic Institutes, technical, industrial, and agricultural schools, colleges and other institutions in all the important foreign countries, where technical education is imparted.

During the year under review several queries were addressed by private individuals and firms on a variety of subjects and the Conference office tried to furnish the information, it was in a position to do, from the sources available to it.

The Resolutions passed at the last Session were according to usual practice, submitted to the Government of India, the Provincial Governments and Administrations and also to the Governments of the principal Indian States for information and such action as may be deemed by them necessary.

During the current year industrial and agricultural exhibitions, cattle shows, industrial fairs, etc., were held in so many places in India that it is not possible to notice them all. Only such as called for mention owing to their importance are referred to in Part II section B, under the respective provinces in which they were held.

Part II Sections A and B of this report comprise a description of the general Industrial activity in the country including

the steps taken by the Imperial as well as the Provincial Governments in British India and the Darbars of Indian States to further the cause of technical education and the promotion of industries.

The lists of Indian Patentees and of new Companies registered during the year under review are appended to this report as annexures.

We beg to repeat our sincere acknowledgments to the Imperial and Provincial Governments, the Rulers of Indian States and the proprietors of different periodicals for the annual reports and other official publications and the daily or weekly papers and monthly magazines which they have been kindly supplying to the Conference office free of charge.

Statements showing the receipts and disbursements of the office of the General Secretary are hereto appended.

HARKISHEN LAL,

President.

Eighth Indian Industrial Conference.

R. N. MUDHOLKAR.

General Secretary,

Indian Industrial Conference,

Amroati, 30th November 1918.

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Eighth Indian Industrial Conference.

R. N. MUDHOLKAR.

General Secretary,

Indian Industrial Conference,

Amroati, 30th November 1913.

Summary of accounts of the office of the Indian Industrial Conference

Receipts.	Amounts.
Opening balance ...	Rs. A. P. 8,048 7 2
From sale proceeds of the Directory of Indian Goods and Industries ...	570 8 0
do Directory of Technical Institutions in India...	87 0 0
do Surat 3rd Industrial Conference Report ...	26 10 0
do Lahore 5th do do ...	81 8 0
do Allahabad 6th do do ...	92 18 0
do Calcutta 7th do do ...	1,022 15 0
do Guide to Modern Machinery ...	172 11 0
For advertisement in Bankipore Conference Report...	10 0 0
Interest on deposits in Banks ...	147 12 1
<i>Donations.</i>	
Lala Harkishen Lal, Lahore ...	300 0 0
Sir Dorab J. Tata, Kt., Bombay ...	250 0 0
Sir R. N. Mukerjee, K.C.I.E., Calcutta ...	200 0 0
Honourable Mr. G. K. Parek, Bombay ...	100 0 0
M. V. Joshi Esq., Amraoti ...	100 0 0
Hon'ble Rai Bahadur Purnendu N. Sinha, Bankipore	100 0 0
do Mr. Justice Sharufuddin, Calcutta ...	100 0 0
Sir Vithaldas D. Thackersey, Kt., Bombay ...	100 0 0
Messrs Morarjee Gokaldas and Co., Bombay ...	100 0 0
Hon'ble Rai Bahadur Krishna Sahay, Bankipore ...	100 0 0
Reo Bahadur R. N. Mudholkar, Amraoti ...	100 0 0

for the 12 months from December 1912 to November 1913.

Receipts.	Amount.		
	Rs.	A.	P.
Shriment Appa Saheb Patwardhan, Chief of Sangli...	75	0	0
Hon'ble Mr. P. S. Sivaswami Ayar, Madras ...	50	0	0
Rao Bahadur S. N. Pandit, Rajkote ...	50	0	0
Maharaja Saheb of Nashipore ...	50	0	0
Shet Hansraj Pragji Thackeray, Bombay ...	50	0	0
M. B. Dadabhoy Esq., C.I.E., Nagpore ...	50	0	0
Babu Narayen Prasad, Patna ...	25	0	0
Shet Gulabchand Devchand Javeri, Bombay ...	25	0	0
Rao Saheb G. M. Sahasrabudhe, Ellichpur ...	25	0	0
Rao Bahadur K. G. Desai, Surat ...	25	0	0
Sir Bezonjee Dadabhoy, Nagpore ...	25	0	0
N. Subba Rao Pantula, Esq., Rajahmundry ...	20	0	0
D. E. Wacha, Esq., Bombay ...	15	0	0
Rao Bahadur R. G. Mundle, Yeotmal ...	15	0	0
Rao Bahadur Vaman Rao Mahadeo Kolhatkar, Nagpore	15	0	0
R. V. Mahajani Esq., Akola ...	10	0	0
Professor Jadunath Sarkar, Patna ...	10	0	0
Rao Saheb Rama Rao, Travancore ...	10	0	0
Babu Sheo Prasad Gupta, Benares ...	10	0	0
Mobi Uddin Ahmed Esq., Bankipore ...	5	0	0
Dewan Bahadur K. Krishnaswami Rao, Madras ...	5	0	0
Total ...	7,274	15	8

*Summary of accounts of the office of the Indian Industrial Conference
for the 12 months from December 1912 to November 1913.*

Disbursements.	Amounts.
Pay of Assistant Secretary and other Establishments	1,411 4 0
On Directory of Indian Goods and Industries accounts	245 4 0
On Directory of Technical Institutions in India account	5 0 0
On Report of 3rd (Surat) Industrial Conference account	5 0 0
do 5th (Lahore) do ...	5 2 0
do 6th (Allahabad) do ...	15 2 0
do 7th (Calcutta) do... ...	256 15 0
On Guide to Modern Machinery account ...	25 0 0
Printing charges of the Report of the 7th Calcutta Conference of 1911. ...	925 1 4
do of the papers submitted at the Calcutta Conference ...	122 3 0
do of the papers submitted at the Bankipore Conference ...	202 11 8
do of the Report of the 8th Bankipore Indian Industrial Conference (part payment) ...	650 0 0
Travelling expenses of the Asst. Secretary and other office staff incurred in connection with Bankipore Conference ...	212 0 0
Printing (Miscellaneous) ...	122 4 0
Postage ...	120 6 0
Telegrams ...	84 2 0
Stationery ...	71 5 9
Books and Periodicals ...	81 7 0
Book binding ...	10 0 0
Railway Freight ...	50 5 0
Advertising Charges ...	10 2 0
Furniture ..	5 2 0
Sundries ...	15 2 8
Lighting Charges. ...	6 0 0
Typewriter repairs and other supplies ...	20 10 0
Expenditure ...	4,627 14 8
* Balance ...	2,647 1 0
Total Rs. ...	7,274 15 8
* Out of this amount, the following charges have to be paid:—	
Cost of printing the Report of the 8th (Bankipore) Conference (balance)	700 0 0
do The Directory of Indian Goods and In- dustries 5th Edition ...	750 0 0
Total Rs. ...	1,450 0 0

Amraoti
1st December 1913.

R. N. MUDHOLKAR,
General Secretary,
Indian Industrial Conference.

PART II.

A brief account of industrial activity in India during the twelve months, Dec. 1912 to November 1913.

Section A.

The Government of British India and Indian States and Industrial development.

GENERAL.

The Government of India have decided in communication with the local Governments to award three scholarships of Rs. 100 each per month to Indians to facilitate their training in the principles and practice of architecture with a view to their ultimate employment in the Archæological Department. This step has been taken to give effect to the recommendation of the Conference of Orientalists held at Simla in July 1911. The scholars will have to attend the Architectural classes at Sir J. J. School of Art, Bombay. The training will last for three years. The candidates will have to report themselves to the Consulting Architect to the Government of Bombay. The Bombay Government has also issued a separate Notification on this subject.

To encourage the spread of the co-operative movement the Government of India has been pleased to remit the stamp duty with which the instruments executed by or on behalf of any Co-operative Credit Society, or any of its officers or members are respectively chargeable.

The Government of India has this year sanctioned an award of ten state technical scholarships to the following candidates for a course of training in Europe in the subjects noted against each:

1. Mr. P. K. Rajamanikam, Leather Goods industry.
2. Mr. Chunilal Purshotamdas Shah, Pottery.
3. Mr. Ramesh Chandra Roy, at present at Manchester, Mechanical and Electrical Engineering, subject to the production of a Medical Certificate as to his physical fitness to undergo the course of study proposed.
4. Mr. Abdul Rahim Khan, Sugar Engineering.
5. Mr. Krishna Lal, Sugar Engineering.
6. Labouri Mal Khosla, Flour Milling.
7. Mr. Abdul Hakim, Chemistry as applied to minerals and metals.
8. Mr. Vidyvananda Dewara, Mechanical and Electrical Engineering.
9. Mr. C. C. J. Brandon, Architecture.
10. Mr. Row Lal, Mechanical and Electrical Engineering.

The Government of India has instituted a state scholarship for domiciled European or anglo-Indian girls or women to enable them to complete their studies abroad in teaching and medical profession. The course of instruction includes domestic science, music, training in arts and kindergarten methods. The rate of scholarship is £ 200 a year for three to five years, as may be decided on by them.

For controlling Life Assurance business, the Government of India passed an Act in July 1913, called the Indian Life Assurance Rules, 1913. It lays down the qualifications of actuaries, necessity of accuracy in the calculations showing the financial condition of a company and other rules.

The question of prescribing a uniform system of weights and measures for the whole of India which was under the consideration of Government since the passing of the Weights and Measures Act in 1871, has at last been taken up in right earnest. The Indian Industrial Conference has been agitating this question for the last five or six years and pointing out the serious inconveniences to interprovincial trade caused by the lack of uniformity in this matter. The Government of India has now appointed a Committee of four officials who are to submit a report in six months.

The rules issued by the Government of India in September 1912 for the supply of articles for the Public Service have been revised by an order dated 24th July 1913. The clauses relating to the purchase by Government Departments *by preference* of all articles produced in India in the form of raw materials or manufactured in India from materials produced in India and the purchase of articles manufactured in India from imported materials, remain almost intact.

The Rules for the grant by Local Governments of licenses to prospect for minerals and of mining leases in British India have also been revised by Government of India order dated 15th September 1913.

Mr. J. F. Gruning, I. C. S., Officiating Secretary to the Government of India, Department of Commerce and Industry, has addressed a letter to all the Local Governments and Administrations regarding the desirability of legislation in connection with the use of the term "Bank" in India with a view to impose certain restrictions on the use of that term as well as on the banking business generally.

From the Report submitted by the Indian Patents Office, Calcutta, it appears that out of 678 applications received in 1912, only 50 came from Indians, and all the rest from foreigners, which is a clear indication of the lack of inventive capacity

and disregard for the study of mechanical and other subjects, where this faculty can be put to the test.

The Government of India in the Railway Department have issued a new Resolution revising the terms of construction of branch lines by private enterprises which were originally promulgated in June 1910. The terms now offered are in certain respects more liberal. The Branch company will now receive a guarantee or rebate on their paid up share capital instead of over the capital actually spent.

According to a memorandum issued by the Bombay Agricultural Department 44 lakhs of acres were under cotton cultivation in 1913-14, 9 lakhs in British Districts of Gujerat and Larkana, 32 lakhs in Native States and 3 lakhs in Sind.

At the Mechanical Engineers Examination held in Bombay in September 1913, five students passed in 1st class, and 23 in 2nd class.

The Government of Bombay have appointed Hon'ble Sir P. M. Mehta K.C.I.E. and Mr. John Wallace, C.E., the well-known Editor of the Indian Textile Journal, to be members of the Committee of Direction for Technical Education in the Presidency.

It is proposed to amend the Smoke Nuisance Act of 1903 empowering the Commissioner to control the building of chimneys and flues: this would benefit the owners in the long run as it will avoid the expenses of subsequent alterations and the chance of erection of unsafe chimneys.

The Report on wages in the Bombay Presidency recently published, arrives at certain very interesting and useful conclusions. The authorities agree in holding that :—

(1) During the last 10 years the rates of unskilled labour have increased 25 per cent.

(2) This labour is more independent and hard to control and is very unpunctual.

(3) The hours of labour have decreased.

(4) The quality of work is much inferior in comparison to the work 10 years ago.

The Government of Bombay has issued orders to the Pottery Department of Sir J. J. School of Art, Bombay, that the services of the Superintendent should be made available outside Bombay to Native states and private firms or individuals anxious to develop the Pottery industry. The Superintendent will visit places outside Bombay for the examination of claybeds &c., and for the giving of advice on payment of his travelling allowance and other necessary charges.

In a press-note issued by the Government of Bombay in March last it was announced that Rs. 51,000 had been allotted for the promotion of Technical and Commercial Education in the Presidency. The following grants have been sanctioned:—

	Rs.
(1) Manual training classes in the Training Colleges for men at Poona, Ahmedabad, Dharwar and Hyderabad for buildings and equipment ...	8000
(2) Victoria Jubilee Technical Institute, Bombay, for Machinery and apparatus ...	6500
(3) Irish Presbyterian Mission Industrial School at Borsar for handlooms, Machinery and tools...	2000
(4) V. J. Technical Institute, Snkkar, for Oil Engine &c. ...	5000
(5) Muncioipal Technical Institute, Jacobabad ...	1200
(6) Ranchodlal Chotalal Institute, Ahmedabad, for Machinery ...	2000

	Rs.
(7) Fardunji Sorabji Parekh Technical Institute, Surat, for Machinery	2800
(8) Engineering College, Poona, for equipment, books &c.	8500
(9) College of Commerce, Bombay	15,000

At the instance of the Hon'ble Rao Bahadur Shrinivas Rodda, the Director of Public Instruction was asked to report on the practicability of establishing manual training classes at Bijapur and other Government High Schools. The Director in his report has expressed the opinion that it is both desirable and practicable to start such classes. The subject should be compulsory in the first year and optional during the rest of the course which should be based on the "Sloyd" system.

With a view to a thorough discussion of the question of the education of children employed in Factories, the Government has consulted the Bombay Mill Owners' Association and the Municipal Corporation of Bombay, and has decided to refer the matter to a Committee of the following gentlemen :—

- (1) The Director of Public Instruction.
- (2) The Collector of Bombay.
- (3) The Hon'ble Sir Sasson J. David, *Bart.*
- (4) The Hon'ble Sirdar Sir Chinubhai, Madhavlal, *Bt.*
- (5) The Hon'ble Sir Ibrahim Rahimtoola, *Kt.*
- (6) The Hon'ble Sir Fazulbloy Karimbhoy.
- (7) Mr. D. E. Wacha.
- (8) The Chief Inspector of Factories.

The Bombay Government are providing facilities for planting trees on fresh ground; "on economic as well æsthetic considerations the importance of adding to the tree growth in this country is obvious" and the Government are ready to give certain concessions to private individuals also for planting new trees.

It is very gratifying to learn that the scheme for the establishment of a College of Commerce in Bombay has been sanctioned. The College will for the present be accommodated in the Elphinstone College building and will prepare candidates for the Degree of Bachelor of Commerce of the Bombay University. The college commenced its work on 22nd October 1913 and, pending the arrival of the permanent principal from England, Mr. K. Subramani Aiyar, B.A., L.T. will act as Principal and will have four Assistants.

The Public Works Department of the Bombay Government has invited applications for one of the three architectural schools recently sanctioned by the Government of India.

Under orders from the Bombay Government, the Victoria Jubilee Technical Institute, Bombay, has been converted into a Central Technological Institute for the Bombay Presidency. The present Institute will be removed to a new site and a Committee of Directors of Technical Education has been appointed whose function will be:—

(1) To regulate the courses and standards of instruction at the several schools and classes in the Presidency under its control.

(2) To arrange for the periodical examination of these schools and classes.

(3) To recommend to Government grants-in-aid to such schools and classes.

(4) To arrange for the translation into the Vernacular of text books on technical subjects.

(5) To determine the conditions under which new schools and classes shall be established by the aid of Government.

The step taken by the Bombay Government for the translation of Text Books into our Vernaculars is a very important one and will lead to the diffusion of technical and commercial education among non-English knowing classes and ought to be followed by other Presidencies.

In addition to Mechanical and Electrical Engineering, Textile and Chemical branches, it is proposed to open a class for instruction in sanitation and plumbing.

Certain proposals of the Principal of the Sir J.J. School of Art, Bombay, have been approved by the Local Government and concurrently with the abolition of the 1st Grade Examination in Drawing, the scheme of instruction and examination will be expanded so as to include the following branches of artistic work.

(1) Advanced drawing.

(2) Painting.

(3) Design and composition.

(4) Modelling.

(5) Architecture.

(6) Minor industries like metal-working, cabinet-making, wood-carving, and inlaying, stone carving, weaving and needle work, pottery and house decoration.

In each of these subjects there would be three Grades of Examination, viz., Elementary, Intermediate and Advanced.

In their notification dated 15th July 1913, the Government of Bombay have laid down certain rules to regulate the grant of certificates of competency to Engineers of sea-going steamships and the method of conducting Examination of candidates for these certificates.

The Agriculturial Department, Bombay, has issued leaflet No. 2 giving a list of 22 implements recommended by the Department for use in the field with the price of each and its special advantages and use.

His Excellency the Governor of Bombay opened the Industrial Exhibition and Lingayat Hall of Sanskrit Academy at Dharwar on the 17th November 1913. Thousands of exhibits in claywork, carvedwork, leather goods, metal ware, textile fabrics &c. were received and the exhibition on the whole formed a very useful collection.

This year's session of the Deccan Agricultural Conference was held at Poona, under the Presidency of His Excellency Lord Willingdon, Governor of Bombay, in September 1913. A very valuable paper was presented by Dr. Mann, Principal of the Agricultural College, Poona.

MADRAS.

Orders have been issued by the Government of Madras on certain proposals of Mr. Chatterton and subsequently modified by Mr. Tressler in connection with the Technical Institute, Madura. The proposal of Dr. Marsden regarding the opening of a class for dyeing has been approved. Instruction in Mechanical Engineering is also included in the scheme of studies.

Dr. Marsden was deputed by Government to study the local conditions of this industry and to ascertain in what manner, Government can help the indigenous dyers for improving the methods followed by them. As a preliminary step he set up a small pictorial laboratory to carry out experiments, and to give

practical training to a few selected students. Dr. Marsden recommends the starting of a specially equipped dyeing school for their benefit.

The Report submitted by the Director of Agriculture in Madras Presidency, shows that much attention to cotton cultivation is being paid in the Tinnevely, Kurnool and Bellary Districts, where arrangements have been made for the distribution of selected seeds, the introduction of drill system and the maintenance of demonstration plots.

For the purpose of conducting a Botanical Survey in Southern India, Government had deputed Mr. Hooper and his Assistant Mr. Ramaswami. The expedition resulted in the acquisition of about 700 sheets. The Deputy Conservator of Forests has contributed about 600 specimens. The work is proceeding and, it is hoped, will yield valuable results.

BENGAL.

The Dacca University Committee has submitted its Report, which is a very interesting document, which emphasises the importance of a fuller life and organised co-operation of the residential and teaching University and holds that the multiplication of scattered colleges bound together by the loose tie of application to a common University—can no longer be recognised as the sole means of satisfying the ever-increasing number of students seeking higher education.

The Dacca University proposes to include the following departments.

- (1) Arts.
- (2) Science including Research.
- (3) Islamic studies.
- (4) Law.
- (5) Engineering.
- (6) Medicine.
- (7) Teaching.

The scheme will cost about 52 lakhs of Rupees according to the latest notification issued by the Civil Engineering College, Sibpur; provision has been made in the College for instruction in the following subjects :—

(1) The Engineer Department—a four years' course leading to the Bachelor of Engineering Degree in Civil Engineering.

(2) Apprentice Department—including Sub-overseer, and Overseer Classes.

(3) Practical Training in Mechanical and Electrical Engineering; on completion of training in this Department the following certificates are granted :

Civil Branch	{	Sub-Engineer.
Mechanical and		Upper Subordinate.
Electrical Branch		Full Course Certificate.

(4) Workshop contains industrial classes for

- | | |
|-----------------|--------------------------------|
| (1) Carpenters | (4) Turners. |
| (2) Blacksmiths | (5) Pattern-making. |
| (3) Fitters | (6) Foundry in Brass and Iron. |

On the recommendation of Mr. Tressler, Superintendent of Industrial Education, Calcutta, the Bengal Government has sanctioned the organization of a peripatetic instruction party to demonstrate to weavers the advantages of improved methods and appliances. The party will consist of a Superintendent, 3 maistries, 2 cooly weavers, a peon and a watchman and will carry a small stock of machinery for sale.

There is one central depot for seed and manure. A firm in Calcutta manufactures ploughs.

The Committee on the Technological Institute of Calcutta has influenced the Government to start the Institute on the following lines :—

(1) the inclusion of higher training in Electrical and Mechanical Engineering.

(2) opening of a higher Civil Engineering branch, and

(3) combination of different branches of higher Engineering in the same Institution.

A proposal has been for sometime under consideration of the Government for the establishment of an Institute of Mining and for the further expansion and development of the existing system of evening classes for mining at Asonool.

The Government of Bengal propose to start a Technological Institute in the centre of Calcutta, a committee has been formed to elaborate the details in communication with employers of all sorts of labour. The following subjects will be included in the scheme of the courses of instruction.

- (1) Mechanical and Electrical Engineering.
- (2) Weaving, spinning and other textile courses.
- (3) Chemistry applied to arts including dyeing and industrial research.
- (4) Printing and process work.
- (5) Commercial subjects.
- (6) Millinery and dress-making for women.

PUNJAB.

The Agricultural Department receives from the Government a permanent advance for introducing agricultural implements to cultivators viz., ploughs, chaffcutters, winnowers, bullock hoes and reapers.

It is interesting to note that in Punjab two shoe makers' societies and two promising societies of carpenters and blacksmiths have been started on co-operative basis. Artisans and

weavers are taking as much interest as the farmers in the co-operative movement.

The Seventh Conference of the Registrars of Co-operative Societies was held in Simla on the 16th, 17th and 18th of October 1913. The Honorable Sir Robert Carlyle, Member of Council in the Department of Revenue and Agriculture, attended the commencement of the Conference to meet the members and discussed the progress made in the different Provinces by the co-operative movement.

The Director of Agriculture and Industries, Punjab, has issued a leaflet in English and the vernaculars calling attention to the evils of damping cotton both before and after ginning.

Mr. J. W. William Raitt, Cellulose expert of the Forest Research Institute, Dehra Dun, now in Lahore, for developing the paper pulp industry in the Punjab, has issued a Report on the savannah grass. The effect of Mr. Raitt's investigation will be to give a prospective value to large tracts which were better to be looked upon as unproductive and to add to the paper pulp-making materials of the Country.

From a note recently published by the Director of Agriculture and Industries, Punjab, it appears that there are hundreds of acres of land near Lyallpur under cultivation of American cotton. The Department is expected to have sufficient seed to sow 10,000 acres in the spring.

THE CENTRAL PROVINCES AND BERAR.

The first Provincial Co-operative Conference for Central Provinces and Berar was held at Nagpur on 14th December 1912, under the presidentship of Mr. M. W. Fox Strangways, Financial Commissioner. Several important subjects were discussed in connection with the movement which is rapidly becoming popular.

The second conference of Co-operative Society for Central Provinces and Berar was held on 15th and 16th September at Jubbulpore. It is a very encouraging sign of the times that, like all other Provinces, the movement of co-operation is steadily increasing and its benefits are being appreciated by artisans and farmers.

An agricultural conference was held in Berar on the 21st, 22nd and 23rd November 1913, when much useful discussion took place on agricultural matters, together with demonstration of improved processes etc.

In the Central Provinces for the purpose of distributing agricultural implements, depots have been formed at Nagpur, Raipur, Hoshangabad and on a small scale at Ahola. The Agricultural Department stocks winnowers, ploughs, chain-pumps, sugarcane mills, maize-shellors, and bullock-carts.

During the year under review very important mining licenses for extracting coal, manganese, baxer, mica and other minerals have been granted to Indian merchants and syndicates. Messrs Olpherts and Company have secured a license for prospecting manganese, copper, gold and silver.

The Director of Public Instruction has awarded a Technical Scholarship of Rs. 25 per mensem tenable for 3 years for a course of technical training in Textile Industries at the Victoria Jubilee Technical Institute, Bombay, to A. V. Ramachandra Moodaliar with effect from January 1914.

ASSAM.

The State Technical Scholarship £ 150 a year was notified by the Government of Assam as eligible to a suitable candidate for the study of Mechanical and Electrical Engineering in some foreign country.

With the object of assisting the Tea-box Industry of Assam, the Hon'ble the Chief Commissioner was pleased to abolish in

August 1912 the royalty on tea-boxes or timber used for their manufacture. The concession will continue up to 1st September 1914, if found workable.

The total area of land under tea cultivation rose to 361,671 acres at the close of 1912, the new extension being about 10,000 acres. and permanent and temporary labour force increased by about 16,000 during the year.

At a conference held at Gaunati on 22nd September 1913, the Chief Commissioner discussed very freely with the representatives of the people the question of the Technical Education for the Province. . The meeting also recognised the necessity of appointing a Director of Industries. Many of the suggestions of the Director of Public Instruction regarding the establishment of technical schools in different places, were passed.

UNITED PROVINCES.

The Government of the United Provinces is prepared to receive applications for technical scholarships of £ 150 a year tenable for 2 years enabling the holders to proceed to England or other Western country for instruction in—

- (1) Sugar Engineering
- (3) Wood and grass pulp working.

A new industrial school has been opened at Gorakhpur and a school of design at Lucknow. The Government of the U. P. has recently sanctioned the establishment of a Faculty of Commerce. It is very gratifying that the example set by the Bombay University is being followed by other Provinces.

The Tirhut Educational Society has started an industrial school at Musaffarpore for teaching carpentry and blacksmithy and has secured for it the approval of the local Government with a grant of Rs. 184 per month.

The United Provinces Agricultural Department has a permanent advance of Rs. 30,000 for seed and implements, of which Rs. 25,000 are devoted to the purchase of agricultural implements. There are depots at Cawnpore and Pratapgarh. The principal implements sold are low lift chain pumps, ploughs and chaff-cutters, grain-crushers, and harrows, etc.

The appointment of a chemist with four assistants and the construction of a laboratory and other workshops have lately been sanctioned from the nucleus of a technological institute of Cawnpore.

BEHAR AND ORISSA.

A question of mining instruction in the Colliery Districts is under consideration of the Government who have consulted the Chief Inspector of Mines and owners of the Giridik and Jherria coalfields. A committee has been appointed to determine the scope, designation and location of a common institution for Bengal and Behar.

A meeting of the Board of Trustees of Sir Andrew Fraser Memorial Fund selected the following subjects for the award of scholarships :—

- (1) Civil Service.
- (2) Engineering.
- (3) Medicine.
- (4) Agriculture.

Since the formation of the new Province much activity is noticeable in the promotion of technical as well as general education. A representative committee has been formed to consider the question of the proposed Patna University and other committees have been organized for the discussion of other educational matters.

MYSORE.

Two Co-operative Unions were started during the year 1912-13 one at Hassan and the other at Tumkur. These unions consist of about 10 societies.

From the very able and exhaustive address delivered by Dewan Bahadur Vishweshwarayya we learn that the Government has approved of a scheme of elementary and advanced technical and commercial education. The scheme comprises the establishment of Chamarajendra Technical Institute at Mysore, and a Commercial and a Mechanical Engineering School at Bangalore. The Institute will consist of 5 Sections,—

- (1) Engineering Section.
- (2) Industries and Crafts.
- (3) Fine Arts.
- (4) Commercial School.
- (5) Workshop.

The Bank of Mysore is proposed to be started at Bangalore. The Mysore Government has promised certain concessions.

An Agricultural School has been recently opened at Bangalore for imparting practical instruction in agriculture.

The Government of Mysore have appointed Signor Washington Mari, a graduate of the Royal School of Sericulture, as their silk expert. He will be placed in charge of the silk industry and the silk filatures started at Chennapatna.

A new scheme is being projected to augment the power available at the Cauvery Falls during the dry months of the year and to render it thus secure from the interruptions owing to shortage of water. The scheme includes extensive Irrigation works.

The total value of the bullion produced in the Mysore Gold Mines during 1911, was worth over 2 million pounds, representing an increase of £ 23,740 over last year's figures.

The Mysore Dassera Industrial and Agricultural Exhibition was held this year also, and was a brilliant success owing to the enthusiasm and capacity of the official and non-official gentlemen who took part in organizing it.

Acting on the recommendations made by Mr. Alfred Chatterton, C. I. E., the Mysore Government has directed that a separate department of industries and commerce be continued under the State, this Department will perform the following functions :—

(1) Assisting private individuals by advice, loans or in any other manner for starting new industries, or business concerns, such as mills, presses, irrigation and pumping plants, oil presses, rice hulling machinery, &c.

(2) Furnishing as far as possible free of cost, estimates, schemes, prospectuses, articles of association, &c., to private capitalists.

(3) Experimental installations of sugar plant, lather for wood-turning, and silk-reeling.

(4) Collecting correct statistics of industries and commerce for the whole State; to undertake industrial surveys, formation of a central industrial depot, a museum of industrial machinery and commercial products and an information bureau and study of markets for Mysore products.

BARODA.

A very exhaustive and able report has been compiled by Mr. Manilal B. Nanavati, Director of Commerce and Industry, Baroda State, on agricultural indebtedness. The report covers

a very wide ground of investigation and deals with a variety of cognate matters. It furnishes very interesting and instructive reading and serves as a model for other Provincial Governments and Administrations for the purpose of conducting enquiries on similar lines.

The Baroda State has offered a scholarship to an art graduate with business instincts, for the higher study of industrial, economic and commercial questions in an American University.

GWALIOR.

It appears from the Jayajee Pratav of Gwalior that the research work in the Porcelian line lately undertaken by the Department of Commerce nearly five years ago has been concluded and that the Darbar of Gwalior has sanctioned a scheme with a view to place the industry on a commercial basis.

COCHIN.

Mr. Jackson of the Salvation Army Silk Farm was the recipient of a Gold medal from His Highness the Raja of Cochin for silk exhibited at the State Exhibition.

The State has announced that it is prepared to give special concessions to any private company or individual for making wood pulp by the grant of land for building the factory, supply of bamboo and other raw materials for the actual felling and transport charges, free supply of fuel, exemption from royalty for 5 years.

From the speech made by the Dewan of the State at the opening ceremony of the 5th Agricultural Industrial Exhibition, it would appear that the State authorities have become fully alive to the need of exploiting the abundant resources of the State and development of various industries.

BURMA,

From the latest Report on Public Instruction in Burma it appears that vigorous efforts are being made by that Department for the purpose of popularising agricultural instruction commencing with the elementary study of plant-life in primary schools, and making provision for the sons of landlords to acquire practical knowledge of improved methods of agriculture, fruit growing. It appears that coffee seeds continue to be supplied to farmers in Burma and experiments in growing coffee and superior varieties of tobacco are being conducted with varying success in different places.

KASHMIR:

The Kashmir State has also taken steps to advance its natural resources and established a hydro-electric scheme which bids fair to help materially the industrial progress of Kashmir.

Part II.

Section B.

INDUSTRIAL ACTIVITY OF THE PEOPLE.

GENERAL.

The Indian Guild of Science and Technology which has been organised by a group of Indian students in England is doing much to promote the knowledge and application of Pure and Technological Science, and to improve the methods of economic production. It has already secured about 216 members with seven distinguished patrons. At each annual meeting much useful discussion takes place and papers are contributed.

BOMBAY.

The Tata's Hydro Electric Works at Khandala are expected to be ready within a year or so. When completed, they will develop 98,000 h.p. or 73,000 kilowatts. The site of the dams and station is 50 miles away from a railway station; for the transport of structural material and other supplies a 56 mile line of standard gauge had to be specially constructed for this project.

Mr. Ardesir D. Wadia, the Manager of the firm of Messrs. A. D. Wadia & Co., has been honored from America with the distinction of Member of the A. M. Soc. M. E. He is probably the first Indian to receive this honor.

A Company has been started at Bombay for the transport of cotton, coal, iron, machinery and other heavy goods. The Company will maintain a fleet of 25 motor cars with a capacity of 3 to 10 tons each, and the total transporting capacity will be 1,000 tons per day.

The Simplex Waste Preventor for Carding Engines invented by Mr. S. M. Rutnagar is now working in several of the Bombay leading cotton mills.

The Ahmedabad Electric Co., has been registered at Bombay with a capital of $7\frac{1}{2}$ lakhs of rupees for the supply of electrical energy for lighting the city and supplying power to the mills.

The Karachi Electric Supply Corporation, Ltd., has been registered with a capital of 1 lakh of rupees for the supply of electricity for lighting, fans and other general purposes.

The Indian Industrial and Prudential Assurance Co., Ltd., is the name of a proposed concern for the insurance of artisans, factory, dock, railway and other workmen, casual labourers and domestic servants.

The profits of the Tata Iron and Steel Co., during the year ended June last, amounted to over 8 lakhs of Rupees, out of which $3\frac{1}{2}$ lakhs are set apart for a dividend due on preferences shares at Rs. $3\frac{1}{2}$ from January 1912 to June 1913.

The Directors of Jain Shri Ranjit Singji Mill at Sholapur are going to add a weaving shed with 300 looms.

The following two Navigation companies were registered at Bombay during the year :—

- (1) The Eastern Maritime, and
- (2) The Persian Gulf Steam Navigation Co.

The following New Mills were registered in the Bombay Presidency during the year.

The Assurva Mills Co., at Bombay

Kasturchand Mills Co.,

Simplex Mills Co.,

Rajpur Mills at Ahmedabad

People's Spinning and Weaving Mills, Bombay.

The Bundi Hydraulic Lime and Cement Co. Ltd., has been registered in Bombay to work the extensive deposits of Natural Cement and Limestone in Bundi State.

The Directors of the Advance Mills, Ahmedabad, have decided to put in 10,000 spindles and 300 looms, and the building work is progressing satisfactorily.

The Tata Mills Ltd., Bombay, has been started with a capital of 6½ lakhs of Rupees. At the start the Mill will work with 65,000 spindles and 2000 looms.

The Bombay Brick and Tile Company is the name of a new concern formed at Bombay for the production of brick-roofing and paving tiles and other material. The Government of Bombay has promised a concession covering a period of fifty years for the removal of sand from the seashore.

The Honourable Sir Fazlulbhoj Currimbhoj Kt., has suggested a scheme for the formation of the Indian Commercial Congress. This congress would direct public opinion on industrial and commercial topics in sound and useful channels, and would in course of time influence the commercial and fiscal policy of Government.

In connection with the proposed electrification of a small section of the B. B. & C. I. Ry., some alterations in the structure of the Bridges in Bombay have been proposed and the work undertaken.

The question regarding the education of children employed in the Factories, has been referred by the Government of Bombay to a select committee consisting of a few prominent official and non-official gentlemen and mill owners. The committee will report on the question and suggest as to who should bear the cost of their education.

MADRAS.

Indigo cultivation is gradually decreasing throughout the Madras Presidency.

New Malabar Timber Yards and Saw Mills, is the name of a concern registered at Madras.

BENGAL.

The Angus Jute Mill is the name of a new mill started at Bhadreswar, with a capital of 37½ lakhs raised in the United States. The products of the Mill are intended for the American market and will not be sold locally.

Four new jute mills were registered at Calcutta during the year.

Pioneer Sugar Company is the name of a new concern formed in Calcutta.

PUNJAB.

The construction of a wheat elevator at Lyallpur has begun. The total capacity of the elevator bins will be over a million maunds. The total cost will be about 2 lakhs.

The following two cotton mills were started in the Punjab during the year under review :—

- (1) Provident Cotton and Flour Mills Co., Kasur
- (2) Marwari Spinning and Weaving Mills, Lahore

CENTRAL PROVINCES.

The Directors of the Central India Mills, Nagpur, have added 120 looms to the new mill plant at a cost of Rs. 30,000.

The opening ceremony of the power house of the Nagpur Electric Light and Power Co. was performed on 12th November by the Honourable Sir Benjamin Robertson in the presence of a large gathering.

UNITED PROVINCES.

Mr. Henry James Newson, who received his early education at Allahabad, is one of the most successful Government of India scholars and has completed his practical training in mechanical and electrical engineering. He is likely to be of great use to his countrymen who should utilize the knowledge that he has gained abroad.

Mr. Jagannath Prasad Khanna, another student from Allahabad who spent two years in the Pittsburg University, returns from America after having obtained the degree of B. Sc.

The Baib and Wood Pulp Manufacturing Co., Ltd., has been registered with a capital of Rupees 12 lakhs.

Mr. Raj Kishore Mitra is the third successful student from the U. P., who has returned to his native country after creditably finishing the General Cotton Course at an American school.

ASSAM.

Indian Forests Economic Products Co., Ltd., has been registered at Chittagong for the exploitation of different forest products.

MYSORE.

Arrangements are being made for increasing the power available at the Canvery falls during the dry months of the year. The scheme will embrace extensive irrigation works.

The official reports indicate a good year in Mysore mining.

TRAVANCORE.

A company for the manufacture and sale of safety matches has been formed under the designation of the South Indian Match Factory, much help is promised by the State of Travancore and several important concessions have been given.

INDORE.

On the 10th of October, the foundation stone of a new Block of buildings for the dying and bleaching section of the Indore Malwa United Mills, Indore, was laid by Sir Fazulbhoj Carrimbhoj, Kt.,

COCHIN.

Mr. Jackson of the Salvation Army Silk Farm, was awarded a gold medal by H. H. the Raja of Cochin for samples of silk exhibited at the State Exhibition.

APPENDIX I.
INDIAN PATENTS.

APPLICATIONS FILED.

J. Khan for concrete floor construction.

Munshi Bansilal for the weaver's improved cottage beaming machine.

J. Ekambaraswamy and P. Murugachari for tube and disc water left with chain.

Jivanlal Kanji for churning machine for curdle milk.

J. Chiranjilal for hinged wooden sole boots and shoes.

K. R. Taraswami Naidu for a water lift.

Sheo Prasad Mehra for the two stand fly shuttle slay.

Shamchand Shet for an improved gold tester.

S. W. Das for a new baling press of toggled lever type worked by cranked pulley.

R. C. Bannerjee for an improved candle stand.

The Techno-Chemical Laboratories Ltd., for improvements in and relating to the carrying out of catalytic operations, &c.

C. Chitambarachari for manual labour water lift.

L. M. Mehta for utilising the movement of water.

C. K. Datta for a device for the suppression of smoke applicable to lamps without chimneys known as "Kupis."

H. Mandal for improvements in the toggle lever type jute press.

S. T. Krishnamacharya for a small and portable table which can be raised and lowered at will.

H. D. Adhikari for lever action husking and powdering machine of iron to be worked by hand or foot.

Amiruddin and Rahimuddin for the Faithful Padlock.

S. D. Canji for improvements in swinging chairs or sofas.

M. A. Rahimon Saheb for rolled silver lace.

K. K. Apte for piano wire grids.

J. S. Banajee for antiseptic paper.

N. B. Bhattacharjee for up to date Misquith flate.

C. R. Mudaliar for first aid snake bite outfit.

Gulam Hussain Nabi Baksh for improved cricket bat.

G. N. Sahasrabudhe for the folding Bharat Cooker.

K. R. Jasoomanina for improvements in Cotton Gins.

Md. Nizamuddin for combination detachable Railway sleeper.

Shah Din for sugarcane mill.

Lala Thakurdas and Malawa Ram for sugarcane press.

K. C. Das for universal pocket lamp.

Md. Isahak Badri for winding machine.

Sirdar Raja Babu for improvements in automatic chursahs.

A. B. Godrej for improvements in safes.

J. L. Dhar and G. C. Roy for improved and simplest form of gold tester.

S. K. Dey for automatic sawing machine fan.

Gulam Hoosain Saheb Mahomed for a cooker.

B. N. Banerjee for screw crane.

T. Kalianjee and A. B. Paranjpe for improvements in internal combustion engine.

B. Singh, K. Singh, S. Singh and L. Singh for improvement in the method of manufacturing chalk pencils.

Hamidulla for a lock.

Shri Krishna Joshi for a heated oil illuminator.

H. Gangadharachari for bangles.

K. C. Das for the easiest method of taking down a speech or a dictation verbatim in any language and at any speed.

S. S. Rao for the direct measure.

B. K. Bomanjee for the rapidly adjustable embroidery or needlework frame.

D. D. Pudumjee for improvements in cotton gins and cotton machinery.

E. T. D' Cunha for improvements in sleepers.

G. N. Barooah for improvements in and relating to tongueless buckles or the like.

Abdul Aziz and Mola Baksh for a lock.

J. Shanker, Kishanlal and Bankeylal for a lock.

J. F. Saldanha for system of raising water by air pressure.

M. A. Kawle for improvements in incandescent petroleum lamp.

S. N. Chaudry for Oil Engine Cooler.

N. Jagjiwandas for improvements in boots and shoes.

K. Baksh for machine for circumcision.

PATENTS SEALED.

524 Wadia ; 571 Jagannathan ; 104 Shuman ; 630 Bansilal ; 483 Swami Dyal ; 705 Ekambaraswamy and Murugachary ; 405 Subra ; 864 Adhikari ; 430 Techno Chemical laboratories Ltd. ; 841 Datta ; 806 Khan ; 949 Day ; 971 Jasomania.

APPLICATIONS ACCEPTED UNDER SECTION 6 OF THE NEW ACT.

N. P. Sen for mechanism for automatic supply of oil at a constant level in oil lamps.

J. Khan for concrete floor construction.

Imam-ud-din & sons and Fazul Ilahi for camp field bed furniture.

APPENDIX II.

LIST OF JOINT STOCK COMPANIES.

BANKING, LOAN AND INSURANCE.

(a) *Banking and Loan.*

Badarganji Loan Office, Rangpur Punjab and Kashmir,
Bank, Rawalpindi Sri Kadambadi Ammen Janasahaya Dhana-
sekara Saraswati Nedhi, Karukumbakam.

Khoksa Janipore Banking Corporation, Bengal.

Brahmanbaria Coranation Bank, „

Bharat Vyapar Bank, Gorakpur.

Agra Bank, Agra.

Cosmopolitan Bank, Bombay.

Sri Vibudha Virja Samvardan Bank, Morrispet.

Imperial Bank, Delhi.

(b) *Insurance.*

Jagajyoti Provident Fund Co., Bengal.

Bitagi Jivan, and Bibaba Sahajyu Bhandur, Bengal.

City of Calcutta Provident Co.,—Bengal.

People's Cooperative Insurance Society, Cattack.

Minerva Assurance Co., Calcutta.

Eagle Assurance Co., „

Atlas Assurance Co., Chandpur.

Eastern Provident Co., Chandpur.

Pioneer Assurance Co., Bombay.

Graduate Assurance Co., Calcutta.

City Insurance Society „

Punjab Provident Co., Amritsar.

Crown Insurance Co., Bombay.

Light of Asia Insurance Co., Calcutta.

II. TRADING.

(a) *Railways and Tramways.*

Upper Sind Light Railways (Jacobabad — Kushmore Feeder) Karachi.

Sara Sirajganj Railway Co., Calcutta.

(b) *Navigation.*

Eastern Maritime, Bombay.

Persian Gulf Steam Navigation Co., Bombay.

(c) *Others.*

Ahmedabad Electricity Co., Bombay.

Indian Forests Economic Products Co., Chitagong.

Bose Brothers (Cutlery) Mazaffarpur.

Ayurvedic Medical Co., Amritsar.

Bombay Scientific Steam and Electric Laundry.

Belgava Power Cultivation Association.

Bombay Brick and Belgaum Tile Manufacturing Co.,
Bombay.

Arcadian Tobacco Co., Calcutta.

Karachi Electric Supply Corporation, Karachi.

Bundi Hydraulic Lime and Cement Co., Bombay.

III. MILLS AND PRESSES.

(a) Cotton Mills.

Kasturchand Mills Co., Bombay.

Simplex Mills, Co., ,,

Rajpur Mills, Ahmedabad.

Tata Mills, Bombay.

Provident Cotton and flour Mills Co., Kasur (Punjab.

Marwari Spinning and Weaving Mills, Lahore.

People's Spinning and Weaving Mills, Bombay.

Sri Narasimha Cotton Press Co., Narasarowpet.

New Malabar Timber Yards and Saw Mills, Madras.

Assurva Cotton Mills Co., Bombay.

(b) Jute Mills.

Empire Jute Co., Calcutta.

Narcoldanga—do— ,,

Angus Jute Co., ,,

Hoogley Jute Mills Co., ,,

(c) Mills for Wool, Silk and hemp &c.,

United Silk and Cotton Mfg. Co., Bombay.

(d) Other Mills and Presses.

Cawnpore Ice Factory and General Mills Co., Cawnpore.

Argyll Oil Mills, Bombay.

Berar Oil Works, Akola.

Bombay Cotton Waste Cleaning, Bleaching and Manufacturing Co., Bombay.

Madras Premier Industries (for oil) Madras.

IV. TEA AND OTHER PLANTING COMPANIES.

Bengal Tea Co., Calcutta.

Friends Tea Co., Bengal.

Indian Tea Corporation „

Alipur Duar Tea Co., „

Gour Nitya Tea Co., „

Eastern Tea Co., Jalpaiguri.

Rampore Tea Estate Calcutta.

Bayley and Brack Kotagiri.

Gopalpur Tea Co., Bengal.

Kohincor Tea Co., „

Darjefeling Union Tea Co., Calcutta.

Indian National Trading and Planting Corporation, Bengal.

Sind Cotton Growing Syndicate. Bombay.

V. MINING AND QUARRYING.

Parscole Coal Co., Calcutta.

Benakuri Coal Co., Bengal.

Punjab Coal Co., Abbotabad.

Bombay Behar Stone Lime and Mining Co., Bombay.

Koderma Bissenpur Mica Syndicate, Sadarpet.

Singra Coal Co., Calcutta.

Eastern Minerals, Lahore.

Ambler's Slate and Stone Co., Bengal.

Dalbhoom Gold and Mineral Prospecting Co., Calcutta.

Karur Kurnool Diamond Mining and Prospecting Syndicate, Bombay.

VI. SUGAR MANUFACTURING COMPANY.

Pioneer Sugar Co., Calcutta.

C. P. Sugar Syndicate Co., Sawargaon.

INDEX.

A

- Agricultural Journal of India*, 45.
Agricultural News, 84, 93, 94, 96, 97, 100.
 Agricultural Schools, 23-24.
 Agriculture, Intro, xxxii-xxxiii, 168, 205-207; evils of an extensive pursuit of, 295.
 Akbar, Emperor, 120.
 Alagwadi, R. V., 132, 137.
 Alexander the Great, 195.
 Aluminium, uses of, 313-314; importance of, 315; advantages of, 316-318; production and prices of, 319-320; imports of, 339.
 Aluminium Industry in India, 312-339; early years of the industry in the West, 312-313; uses of aluminium, 313-314; a semi-noble metal, 314-315; importance of the discovery of the metal, 315; suitability for culinary purposes, 315-316; its advantages, 316-318, its purity, 318; value of old aluminium ware, *ib*; the metallurgy of aluminium, 318-319; statistics of production and prices, 319-320; concentration in factories, 320-321; properties of pure aluminium, 322-325; the working in aluminium, 325-327; possibilities of the manufacture in India, 327-332; present state of the industry in the country, 332-338; imports of aluminium, 339; Intro., xxix.
 American cotton, 71-75; advantages of, 74-75.
 Ammonium sulphate, 46.
 Aniline dyes, 268.
 Annual Report, 40.
 Apprentices, resolution on, 4, 378-380.
 Aristotle, 191.
 Arkwright, Sir R., 201, 202.
 Art, its relation to industry, 237-238; indifference of the masses to, 238; necessity of, 242-245.
 Asoka, Intro., xix, 193.

- Association for the Advancement of Scientific and Industrial Education, 33.
 Ayub Khan, Mir, 5, 7.

B

- Baib grass, 112-114.
 Bailey, L.H., 98, 99, 100.
 Bal Krishna, Prof., on Progressional Ruralisation of the Punjab 295-312; mentioned, Intro., xxviii, xxxiv.
 Ballard, M., 316.
 Banerjee, Dr S.C., 5, 382.
 Bank failures, 14.
Banking (Gilbert), Intro., iv, 17.
 Banks, Int o., ii-vi, xxi-xxiii.
 Bastow, A.H., 133.
 Beadle, C., 108.
 Behar Planters' Association, 26.
 Hessemer, 202.
 Bhargava, Rao Bahadur M.P.N., on Paper Pulp Industry in India from Baib Grass, 111-117; on capital, Intro., 1; mentioned, xv, xxviii.
 Bhoré, Nana, 341, 344.
 Bishambhar Nath, Pandit, on technical education, 210.
 Blind, occupations for the, 342-350.
 Bone meal, 51.
 Boot and shoe industry, 356.
 Boulton, M., 201.
 Brass industry, 366.
 Brindley, J., 201.
 Buddha, Gautama, 194.
 Bulchand, Rai Bahadur Dewan, Intro., xxxi.
 Bulloigh, 201.

C

- Calcium cyanamide, 46
 Calcium nitrate, 46.
 Campbell, Sir F., 342.
 Capital, Intro., i, xxxiv-xxxvi, 22, 23, 66-67, 207-208, 277.
 Capital and labour, 285.

INDEX.

Cartwright, E., 201, 202.
 Caste or communal system, 204-205.
 Cattle, improvement of, 60; diseases of, 254.
 Cattle Insurance Societies, 175-182.
 Cattle manure, 42-43; analysis of, 44-45.
 Central Provinces Sugar Syndicate, 50.
 Central Sugar Factory system, Intro., xiii.
 Chagla, Gulam, H. G., 3, 7, 370.
 Chairman's address, 8-11, importance of Karachi, 8-9; industrial pursuits, 9; lacquer work, 9-10; pottery, 10; printing of cloth, *ib*; flour mills, *ib*; sugar industry, *ib*; tanning industry, *ib*; Indian banks, 11.
 Charaka, 77.
 Chatterton, A., on the decline of the tanning industry, 252, mentioned, 253, 327, 332, 333, 387.
 Chaudhari, J., 3, 4, 5, 8, 370, 377, 382
 Chintamani, C. Y., 3, 5, 8, 39, 370, 376, 382.
 Chellaram, D., 7.
 Clement, 201.
 Clouston, D., on Manures tried in the C. P. and Berar, 42; mentioned, ix, xxxii.
 Coal, 280-281.
 Colbertism, 197.
 Columbus, 201.
 Commercial education, 283.
Commercial Products of India (Sir G. Watt), 78.
 Conti, Nicolo, 120.
 Co-operation, Intro., xvii-xviii, xxxiv-xxxviii, 63-64, 155, 157.
 Co-operative banks, 4.
 Co-operative Central Sugar Factories, 61-67; condition of the industry, 61; modern machinery, 61-62; scheme of a factory, 62-63; sugarcane estates, 63; principle of co-operation, 63-64; cost and management of a factory. 64-66; capital and how it should be raised, 66-67.
 Co-operative Credit Societies, 4; proposals for the formation of, 164-166, 216-217.
 Co-operative subjects, 167-190; famine and co-operation, 167-168; the industry of agriculture, 168; co-operative credit, 168-169;

Indian Famine Commission Report quoted, 169-170; M. Dupernex on the time to organise credit, 171-172; Congress of the International Co-operative Alliance, 172-173; Raiffeisen banks, 173-174; famine fund, 175; Indian Co-operative Act, 176; State aid and co-operation, 177-180; scope of State aid, 181-182; the various forms of State aid; 183-186; supervising agencies or unions, 187-190.
 Cotton, area under, 231; cultivation of, Intro. xiii-xiv.
 Cotton industry, 281-282.
 Cotton mills, 25-26.
 Cotton presses, 26.
 Cotton seed oil industry, Intro., vii, 31-32
 Credit, 215-216.
 Crompton, S., 201.
 Crosthwaite, H. R. 156.
 Currimbhoy, Sir F., Intro., iii, viii, 2, 3, 7, 13, 39, 163, 170, 375.
Cyclopaedia of American Horticulture, 85.

D

Dadabhoy, M. B., 6, 382.
 Dalpatram, Kavi, 340.
 Davar, Sorab R., on the Development of Banking in India, 214; mentioned, Intro., xx, xxi, xxxiv.
 David, Sir Sassoon, Intro., vi, 15, 23
 Davis, R. A., 88.
 Dayabhai, Dr. N., on Industries Suitable for the Blind, 340; mentioned, Intro., xxix, xlii.
 Dayaram, Rai Bahadur Diwan B., on the Industries of Hyderabad, 351.
 Deccan Agriculturist's Relief Act, 183.
 Devadhar, G. K., Note on Co-operation among the Mill Hands 155. on Co-operative subjects, 167-190; mentioned, Intro., xvii, xviii, xxxvii, 5, 7, 380.
 Development of Banking in India, 214-218; banking enterprises 214-215, credit, 215-216; co-operative credit banks, 216-217, failures of Indian banks, 217-218.
 Deville, H. St. C., 312, 318
Dictionary of Applied Chemistry (Thorpe), 319, 327,

Digambar, V., 8
 Disease, of fruit trees, 87.
 Dupernex, H., 169, 170, 171, 173,
 175.
 Dyeing, 857.

E

East India Company, Intro., xix,
 198-200.

Economic Conditions in India,
 191-208; science of economics,
 191-192; economic transition in
 India, 192-193; commercial de-
 velopment, 193-196; money
 economy, 196-198; joint stock
 companies, 198; the East India
 Company, 198-200; industrial
 conditions in Europe in nine-
 teenth century, 201-202; re-
 sources of India, 202-204; caste
 or communal system, 204-205;
 agriculture, 205-207; capital,
 207-208; banking, 208.

Economics, science of 191-192.

Education, Intro., xxxii-xxxiv.

Egyptian cotton, disadvantages
 of, 74.

Eitner, M., 255.

Elizabeth, Queen, 199.

Enamel work, 853.

Estates, sugarcane, 69.

Ewbank, R. B., 174.

F

Factory Commission, 281.

Famine vs Co-operation, 167-168.

Famine fund, 175.

Fawcett, Sir H., 844.

Fertilisers, artificial, 46-47.

Fiscal policy, Intro., xxvii.

Flour, banana, 93.

Food grains, prices of, 231.

Forbes, James, 199.

Foreign fruit, 94.

Foreign sugar, imports of, 68-70

Fruit, exports and imports of,
 92-93.

Fruit Cultivation and Fruit Indus-
 try, 76-101; history of fruits,
 77-78; practical hints on, 79; true
 plants, *ib*; proper soil for fruit
 plants, 79-80; soil 80-81; situa-
 tion, 81; preliminary operations
 of the field, *ib*; the distance, 81-
 82; planting, 82-83; sub-crops,
 83; watering, 83-84; manures,
 84-85; pruning, 85-86; thinning
 86-87; diseases, 87; harvest, 87-
 88; harvesting of oranges in
 South Africa, 88-90; grading for

size 90; wrapping the fruit, *ib*;
 packing, 90-91; area under fruit
 cultivation, *ib*; exports and im-
 ports, 92-93 banana flour, 93;
 Indian and foreign fruits, 94;
 the mango, 95-96; the lemon, 97;
 development of the foreign fruit
 industry, 98; suggestions, 100;
 conclusion, 100-101

Fruit industry, Intro., xiv-xv

Further Note on the Prospects
 of Establishing Match Facto-
 ries in Southern India, 132-137;
 samples of untested wood, 132-
 133; Travancore woods, 133-134;
 South Indian Match Factory,
 134; site for the factory, *ib*;
 timber for factory buildings,
 134-135; soft wood for matches
 and boxes, 135; firewood for
 consumption in the factory, 135;
 freedom from payment of ex-
 port duty, 135-136; M. Rossner
 on the factory, 136-137

G

Gaekwar, H. H. the, 345.

Gardener's Chronicle 85, 96.

Gatoolaljee, Pandit, 340, 343.

Ghosh, Dr. R. B. gift of, 5, 380-
 381; mentioned, 380, 381.

Gibbon, E., 120.

Gidumal, D., 343-344.

Gilbert, J. W., on joint stock com-
 panies, Intro., iv, 17, 18.

Giles, Prof. 117.

Gopal Menon, C., on Economic
 Conditions in India, 191, men-
 tioned, 3, 376; Intro. xviii.

Goschen, Lord, Intro., v, 19.

Goverdhan Das, Lala 3, 8, 375.

Govindaraghava Iyer, Dewan Ba-
 hadur L. A., 6, 8, 382.

Grass Pulp industry, 113.

Grasses, for paper making, 128-
 131, 112-115.

Greaves, H. R., 162.

Green soiling, 47.

Gupta, S. N., on the Place of
 Indian Art in Indian Industries,

237; mentioned, Intro., xxiv, xl.

Gupta, Shiva Prasad, 8.

Gupta, Sir K., 34.

Gur, 54.

Guthrie, A., on raw goat skins, 252

H

Hailey, H. R. C., Intro., x, xxviii,

Haldane, Lord, on success, 40.
 Handloom Weaving, 4, 32-33.
 Hand-made paper, 32.
 Harkishen Lal, Lala, 5, 221, 382.
 Hardinge, H. E. Lord, on bank failures, 14-15.
 Hargreaves, J. 201, 202.
 Henderson, G.S., on American Cotton in Sind, 71; mentioned Intro., xiii.
 Heroult, M., 319.
 Hides, exports of 249-252.
 Hides and skins, curing of, 260-261; colouring of, 262-263; raw, 265-266; exports and imports of, 266-267; prices of, 268-269.
 Hides and Skins Industry in Berar, 258-270; tanning, 258-260; curing, 260-261; tanning materials, 261-262; method of colouring, 262-263; red colour, 263; dusky colour, *ib*; light brown, 263-264; articles 264; centres, *ib*; workers, 265; raw hides and skins, 265-266; exports and imports of, 266-267; myrabolans, 268; aniline dyes, *ib*; prices, 268-269; conclusion, 269; recommendations, 270.
 Hoarding habit, 216.
 Hobbes, T., 200.
 Holland, Sir T. 4., 328.
 Hooper, D., on Indian Paper Making Materials, 101; mentioned, 93, Intro., xv.
 Hunter, Sir W., 203, 204.

I

Indian Agriculturist, 84.
 Indian art, 242-244, Intro., xxiv
 Indian banks, resolution on, 1-2-365-369; failure of, 217-218
 Indian Chambers of Commerce, resolution on, 3, 376-377.
 Indian Commercial Congress, resolution on, 2-3, 371-375; aims of, 373-375; mentioned, 39.
 Indian Companies Act, 1, 21, 220
 Indian Contract Act, 4
 Indian Co-operative Act, 176
 Indian Cotton Seed Oil Company, 31.
 Indian Famine Commission Report of, 169-170
Indian Forest Records, 129.
 Indian fruit, 94
 Indian Guild of Science and Technology, 36, 292.

Indian Merchants' Chamber and Bureau, 39.
 Indian Paper-Making Materials, 101-111; plants yielding them, 102-104; chief bamboos of India, 104-105; areas for manufacture of paper from bamboos, 105; grasses and other trees, 106-111
 Indian Sugar Tariff and the Indian Sugar Refining Industry, 67-70; resolutions, 67-68; imports of foreign sugar, 68-69; revision of the tariff, 69-70.

Indian trade, Intro., xxii-xxiv.
Indian Trade Journal, 320.
 Indian Trust Act, 2.
 Indigo Industry, Intro., vii.
 Industrial education, 283.
 Industrial finance, Intro., xix, xx.
 Industrial organisation, Intro., xxvi-xxvii.
 Industrial syndicates, 294-295.
 Industrialism, progress of, 33-37.
 Industries, miscellaneous, Intro., xxxix-xlii.
 Industries suitable for the Blind, 340-351; musicians, 342-343; preachers and teachers of religion, 343-344; the blind as teachers of the blind, 344; the blind as lawyers and magistrates, 344; commerce, 344, 345; the blind as carpenters, *ib*; the blind as cane and bamboo workmen, 346-347; weavers, 347; tailors, 347-348; knitting work, 348; brush making, *ib*; broom and mat-making, *ib*; door entrance rugs, 349; wire work, *ib*; oil mills, 349; potters, *ib*; gardening, 350; egg-hatching and hen farming; *ib*; siddee and ruff-making, *ib*; shoe-making, *ib*;
 Information bureaux, 290, 292.
 International Co-operative Alliance, Congress of, 172-173.
 Iron work, 356.
 Irrigation, Intro., xxxviii.

J

Jehangir Emperor, 77
 Jhamatmal, Gopaldas, 4, 378.
 Jinah,
 Joint Stock companies, failure of, Intro., vii
Journal of the Society of Chemical Industry, 327
 Jute, area under, 231.
 Jute mills, Intro., vi-vii,

INDEX.

Jute presses, 26.

K

- Karamchand, B., on the Lacquer Industry of Khanoth, 359; mentioned, Intro., ii, xxxi, xxxix.
 Karolyi, Count A., 179.
 Kay, J., 201.
 Kenbargimath, Rao Saheb S.G., 161.
 Khare, L. G., on Industrial Organisation in India, 284; mentioned, Intro., xxvi, xxvii, xxxii, xxxiii, xl.
 Khatan, Govardhandos 15.
 Khemsing, Rao Bahadur H., Intro., iii, 2, 6, 7, 8, 13, 366, 382.
 Kishendas, Shri, 4, 380.
 Konddeo, Dadaji, 78.
Krishi Karma Prakash (Phadke), 83, 84.
 Krishnasawmy Rao, Dewan Bahadur K., 134.
 Kulkarni, L. B., 76, Intro., xiv.

L

- Labour, ideas of, 209-210; combination of, 210-211; division of, 211.
 Labour exchange offices, 289.
 Labour supply, Intro., xxxiv.
 Labouring classes, 155-156.
 Lacquer Industry of Khanoth, 359-364; Khanoth history, 359-360; the Vighams, 360-361; why the industry is languishing, 361; their earnings, *ib*; their present condition, 361-362; the future of the industry, 362; suggestions, 362-364.
Laissez faire, 200.
 Lajpatrai, Lala, 3, 8, 370.
 Lamb, C., on leather, 266.
 Lassalle, M., 198.
 Layton, P., 343.
 Leather, uses of, 247-248; chrome, 256, 247-248.
 Leather industry, Intro., xxxviii.
 Lemon, the 97.
 Levinstein, M., 36.
 Lindley, Lord, 227, 228.
 List, F., 201, 295.
Live Stock Journal, on Indian cattle, 246.
 Locke, J., 200.
 Lunge, M., 816.
 Luzzatti, L., 179.

M

- Machinery, modern, 61-62.
 Madhavlal, Sir C., 168.
 Magelliad, 201.
 Mahomed, Nawab Sayed, 8.
 Maine, Sir H., on village tenure, 204.
 Mango, the, 95-96.
 Manu, 193, Intro., xix.
 Manures, for fruit trees, 84-85.
 Manures tired in the Central Provinces and Berar, 42-53; cattle manure, 42-43; silt, 43; sheep folding, 43-44; two classes of manures, 44; analysis of cattle dung, 44-45; soda, 45-46; saltpetre, *ib*; ammonium sulphate, 46; calcium cyanamide, *ib*; artificial fertilizers, 46-47; green soiling, 47; oil cake, 48-51; bone meal, 51; poudrette, *ib*; suggestions, 51-52; conclusion, 52-53.
 Marx, Karl, 198.
 Master, B. B., on the Present Downfall of Swadeshi Banks, 219; mentioned, Intro., xxi.
 Match Factories, estimates for, app. C., 151-154 b, Intro., xviii.
Materia Medica (Dutt), 77, 78.
 Mather, Sir W., 36.
 Mehd, P. V., on Tanning Industry, its Development in India, 245; Intro., xxiv.
 Mehta, C. V., 164.
 Milinda, 192.
 Mill, J. S., Intro., xx, on capital, 206; on Indian industrial progress, 210; on the manufacture of playing cards, 211; on infant industries, 274.
 Mills, paper, 128-126.
 Milner, Lord, 99.
 Mercantilism, 197, 200.
 Money, economy of, 196-198.
Moral and Material Progress, 32.
 Mookerjee, Prof. R., on the Transition in the Internal Trade of India, 229; mentioned, Intro., xxiii, xxxii, xxxviii.
 Mookerjee, Sir R.N., 3, 5, 370, 382.
 Moore, Sir T., 191.
 Morrison's Committee, Sir T., 33, 34, 35, 36, Intro., viii.
 Mudholkar, Rao Bahadur R. N., 2, 5, 6, 11, 13, 40, 866, 370, 382.
 Mulgund, B. D., 101.
 Mulgi, Amba Shankar, 161, 164.

Munsterberg, H., on vocations for young men, 35.
Myrabolans, 268.

N

Narain Singh, Rai P., 6, 382.
National Economy (List), 201.
Nichols, the Hon'ble Mr. 7.
Nicholson, Sir F., 170.
Nicholson, Prof. S., on the criteria of progress, 299.

Note on Co-operation among the Mill Hands, 155-166; co-operation as a remedy, 155; labouring classes, a fit object of co-operation, 155-156; a comparison, 156; difficulties in the way, 156-157; teachings of the history of co-operation, 157; information of 100 mill hands, 157-159; mill hands' societies in Bombay, 159-160; Tardeo Mill Hands' Society, 160-161; key to success, 161-162; mill-owners' initiative, 162-164; definite proposals, 164-166.

Notes on Industrial Organization in India, 284-295; relations between capital and labour, 285; provision of better houses for labourers, 286-287; Social Service League, 288; trade unions, *ib*; labour exchange offices, 289; improvement of the Indian industries, 289; industrial information bureaus, 290; funds for sending young men abroad, 291; bureau of scientific information-292; industrial syndicates 294, 295

Note on Industries of Hyderabad, 351-358; gold, silver and silk-thread work, 352, 357; wood lacquered work, 352-353, 356; enamel work, 353; leather and ivory, 354, 358; wall-painting, 355; manufacture of swords, &c., *ib*; boot and shoe industry, 356; iron work, *ib*; pottery, *ib*; tin smithing, *ib*; brass industry, *ib*; printing cloth, *ib*; dyeing, 357; tailoring, *ib*.

O

Office bearers' resolution on, 5-6, 882.
Oil cake, 48-51.
Omnibus resolution, 4, 880.

Optimism (H. Kellar), 351.
Oriental Memoirs (Forbes), 199.
Our Industrial Future, 209-213; altitude towards labour, 209-210; Pandit Bishambar Nath on technical education 210; combination of labour, 210-211; division of labour, 211; village industries, 211-212; possibilities of a technological college, 212-213

P

Paper, hand-made and machine-made, 127-128.
Paper, imports of, 111-112.
Paper industry, Intro., vii-viii-xv-xvii, xxxviii.
Paper Makers' Monthly, 114.
Paper Making Industry in India, 117-131; history of paper making 117-123; paper mills in the country, 123-126; hand-made paper, 126-127; machine-made paper, 127-128; treatment of the raw material, 128; woods and grasses for making paper, 128-131.
Paper Pulp Industry in India from Baib grass, 111-117; imports of paper, 111-112; foreign competition, 112; baib grass, 112-114; Nepal grass, 116; possibilities of the grass pulp industry, 116; conclusion, 116-117.
Parekh, G. K., 4, 7, 378.
Paterson, W., 228 B.
Pearson, R. S., 102, 104, 105.
Peoples' Banks for Northern India (Dupernex), 169.
Petit, Jehangir B., 8, 7, 164, 370.
Phillips, Sir Owen, 99.
Pitcher, Captain, 84.
Pitke, H. R., on Hides and Skins
P Industry in Berar, 258, Intro, xxv, xxxviii.
Place of Indian Art in Indian Industries, 237-249, relation between art and industry, 237-238; indifference of the masses to the former, 238; taste, 239; form of commodities, 239-241; mill made articles, 241-242; necessity of artistic element, 242-244; art and national progress, 244-245.
Planting, of fruit trees, 82-83.
Plants, true, 79.
Plato, 191.
Polytechnic college, 37-38.
Ponnall, G. H., on the circulation of money, 215-216.

Pottery, 356.
 Poudrette, 51.
 Present Downfall of Swadeshi Banks, 219-228 B; starting of banks, 219-222; break-up of Swadeshi banks, 222-227; stock-taking, 227-228; points for directors to note, 228-228 A; origin of banking 228 A 228 B.
 Presidency Banks, 15, 16, 368.
 Presidential address, 18-40; bank failures, 14; banking movement, in India, 15-21; winding up of a company, 21; the investing public, 22; working capital, 22-23; industries of the country, 23; agricultural schools, 23-24; sugar industry, 24-25; cotton mills, 25-26; jute and cotton presses, 26; Tata Iron and Steel Company, 26-28; causes of bank failures, 28-31; Tata Hydro-Electric Works, 31; cotton seed oil industry, 31-32; hand made paper, 32; handloom industry, 32-33; progress of industrialism, 33-37 polytechnic college, 37-38; progress made by the Conference, 38-39; conclusion, 39-40.
Progress, 345, 348.
 Progressional Ruralisation of the Punjab, 295-312; progress of population and agriculture compared, 296-297; increase in agricultural population 297-299; distribution of the provincial population, 299-300; industrial advancement of the U.S.A. 301; distribution of population according to occupation in the U. S. A., Germany and the United Kingdom, 301-304; disappearance of landholders and their dependents, 305-306; decaying sugar industry, 306-307; growth of brewers of wood and drawers of water, 307-308; concentration of wealth, 308-311; education and protection, 311-312.
 Proposals and Suggestions, Summary of, Intro., xxxii-xlii.
 Protection, reasons for and against, 278-279, 311-312.
 Pruning, 85-86.
 Ptolemy, 194-195.

Q

Quesnay, M., 200.

R

Raiffeisen banks, 173.
 Railways, rates of 4; benefits of, 233-234.
 Raitt, W., 102, 104, 110, 111, 113, 129.
 Rajaratna Mudaliyar, Dewan Bahadur P., 3, 5, 370-382.
 Rama Rao, Rao Saheb, on the Prospects of Establishing Match Factories in Southern India, 132 mentioned, Intro, xvii.
 Ramasawmy Iyer, C. P., 2, 8, 369.
 Ranade, M. G., 78.
 Reed, Dr. S., on the co-operative movement, 163
 Resolutions, 1-6, 365-382
 Ricardo, D., 272
 Rice, export of, 230; area under, 231.
 Richards, J. W., 315, 317.
 Rocquigny, Count de, 178, 182, 186.
 Roller, A., 133.
 Rossner, A. G., 133, 136, 137.
 Rousseau, J. 200.
 Routledge, T., 104, 105, 129.
 Ruskin, John, 212.

S

Sahasrabudhe, G. N., on Co-operative Central Sugar Factories, 61; on the Indian Sugar Tariff and the Indian Sugar Refining Industry, 67; mentioned, Intro, x, xi, xii, xxxiv, xxxvii.
 Sahay, Rai Bahadur K., 6, 382.
 Saltpetre, 45-46.
 Samaldas, Lalubhai, on progress, Intro., i; mentioned, Intro., ii, iv, vi, viii, xxxii, xxxiii, xxxiv, xxxix, 2, 5, 6, 7, 11, 13, 163, 370, 382.
 Sant, M. B., Intro., ii, 5, 382
 Satemurty, S., on some Economic Aspects of the Swadeshi Movement, 271; mentioned, Intro., xxv, xxvi, xxxix.
 Schmidt, M., 316.
 Scott, Sir W., quoted 366.
 Selbourne, Lord, 228 A.
 Seshagiri Iyer, T. V., 4, 8, 379.
 Shah, Prof. P. G., on Aluminium Industry in India, 312; mentioned, Intro., xxix, xxxix.
 Sheep, diseases of, 254-255.
 Sheep folding, 43-44.

- Shamdasani, P. D., 2, 369.
 Short Note on American Cotton in Sind; 71-76; statement of the crop, 72; improvement of the cotton, 73; disadvantages of the Egyptian cotton, 74; advantages of the American cotton, 74-75.
 Silt, 43.
 Silver, A. H., on the revival of industry, Intro, i, xix, xx, xxxiii, on our Industrial Future, 209.
 Sindal, R. W., 102, 104, 129.
 Sindhi cotton, improvement of, 73
 Sircar, Dr. N. R., 6, 8, 382.
Sketch of the Mineral Resources of India (Holland), 328.
 Skins, 245-247.
 Smeaton, J., 201.
 Smith, A., 201, 228 B.
 Social Service League, 288.
 Soda, 45-46.
 Soil, for fruits plants, 79.
 Some Economic Aspects of the Swadeshi Movement, 271-284; the inception of the Swadeshi moment, 271-272; based on sentiment, 272-273; protectionist movement, 278-279 the argument of 'infant industry, 274; industrial and agricultural condition of India, 279-280; coal, 280-281; Cotton weaving, 281-282; industrial and commercial education, 288.
 South Indian Association, 88.
 State aid and co-operation, 177-180; its various forms, 183-186.
 Stephenson, G., 201.
 Stevens, H. P., 108.
 Strasny, Prof., 257.
 Subba Rau, N., 3, 8, 370.
 Sugar Industry in the United Provinces, 53-60; Java croppage, 58-54; gur, 54; prices of sugar, 55; canes in Java, 56-57; Rosa Factory, and Raja Lalita Pershad factory, 57-58; the hygienic system, 58; waste in the indigenous system, 58-59, improvement of cattle, 60, Intro., vi, ix-xiii, xxxviii, 24-25, 306-307.
 Sugar tariff, Intro., xi, xii, resolutions on, 67-68, revision of, 69-70.
 Sugarcanes in Java, 56-57
 Sultan Sing, Rai Bahadur Lala, 3, 370.
 Sumanas, D., on Paper Making Industry in India, 117; mentioned, Intro., xvi.
 Sundaram Iyer, K., 8.
 Susruta, 77.
 Swadeshi banks, starting of, 219-222; break up of, 222-227.
 Swadeshi movement, Intro, xxv-xxvi; 271-272; based on sentiment, 272-273.
 Swords, manufacture of, 355.
 Sydenham, Lord, 38.
 Sykes, Prof. on cheques and bills, 215.
 Symington, W. W., 100, 201.
- T
- Tailoring, 357.
 Tanning factories, 247.
 Tanning Industry, its Development in India, 245-258; how skins are obtained, 245-247; tanning factories, 247; use of leather, 247-248; tanning materials, 249; exports of raw and tanned hides, 249-252; improvements of the industry, 253; branding of hides, *ib*; disease of the cattle, 254; disease of the sheep, 254-255; Indian leather, 255-256; chrome leather, 256; substitute for naturals, tanning materials, 257; Intro., xxiv-xxv.
 Tanning materials, 249, 261-262.
 Taste, 239.
 Tata, J. N., 27.
 Tata Hydro-Electric Works, Intro. vii, 31, 30.
 Tata Iron and Steel Company, Intro, vii, 26-28, 29, 30, 280.
 Tata Research Institute, 37.
 Technical education, 36; Pandit Bishambar Nath on, 210.
 Technological College, possibilities of, 212-218.
 Thakersey, Sir V. D., 5, 159, 163-382.
 Thakersey, H. P., 164.
 Thakordas, P., 164.
 Thinning, 86-87.
 Thorpe, Sir E., 319
Times of India, 89, 75, 123, 155.
 Tin smiting, 356.
 Trade change in the methods of, 229-230.
 Trade unions, 288.
 Transition in the Internal Trade of India, 229-237; change in the methods of trade, 229-230; export of rice, 230; export of wheat, 231; area under rice, *ib*; area under wheat, *ib*; area under

jute, *ib*; area under cotton, *ib*;
prices of food grains, 232; benefits
of railways, 233-234; water-
ways, 234-237.

Travancore, H. H. the Maharajah
of, 134.

Tropical Agriculture (Nicholl) 82,
85.

U

Unsub Alli, 3, 370.

V

Varma, Ganga Prasad, 3, 370.

Vighams, 360-363.

Village Industries, 211-212.

Vishindas, H., 7

W

Wacha, D. E., 2, 5, 7, 366, 370,
382.

Wall painting, 355.

Watering, 83-84.

Waterways, Intro., xxxviii, 234-237

Watt, Sir G., 201.

Wealth of Nations (Smith), 201.

Webber, Captain, 350.

Weights and Measures, resolution
on, 3-4, 377-378.

Wheat, export of, 231; area under,
231.

Wiesner, Prof., 117, 119.

Wohler M., 312, 318.

Wolf, M., 171, 172, 178, 181.

Wood, for matches, 182, 183, 185.

app. A, 138-147; app. B, 148-160

Wood work, 352-353, 357.

World I Live in (H. Kellar), 351.

A

Accounts; summary of, 48, 50.

Agra Bank, 80.

Agricultural Banks, 9, 15, 17, 21.

Agricultural education, 9.

Agriculture and Commerce, 31.

Ahmedabad Electric Co., 72, 81.

Alipur Duar Tea Co., 83.

Ambler's Slate and Stone Co., 84.

Arcadian Tobacco Co., 82.

Argus Jute Mill, 74, 82.

Argyll Oil Mills, 83.

Assurva Mills Co., 73, 82.

Atkinson-Dawson Inquiry, 32.

Atlas Assurance Co., 80.

Ayurvedic Medical Co., 81.

B

Baib and Wood Pulp Manufactur-
ing Co., 75.

Bayley & Brack, 83.

Belgava Power Cultivation Associ-
ation, 81.

Bengal Tea Co., 83.

Benakuri Coal Co., 84.

Berar Oil Works, 83.

Bharat Vyapar Bank, 80.

Bitaji Jivan, Bibaha Sahatyu
Bhandar, 80.

Bombay Brick and Tile Co., 73, 82

Bombay Behar Stone Lime and
Mining Co., 84.

Bombay Cotton Waste Cleaning,
Bleaching and Manufacturing
Co., 83.

Bombay Scientific Steam and
Electric Laundry, 81.

Bose Brothers, 81.

Brahmanbaria Coronation Bank,
80

Bundi Hydraulic Lime and Cemen-
Co., Ltd., 73, 82.

C

C. P. Sugar Syndicate Co., 84.

Cawnpore Ice Factory & General
Mills Co., 83.

Central India Mills, 74.

City Insurance Society, 81.

City of Calcutta Provident Co., 80.

College of Science (Poona), 13.

Commercial education, 8, 19, 13, 17,
5, 24.

Conference Provincial Commit-
tees, 6

Co-operative banks, 26, 35.

Co-operative Credit Societies, 14,
36-37.

Cotton Excise Duty, 14, 17, 20.

Cotton Spinning and Weaving, 10.

Crown Insurance Co., 81.

Cosmopolitan Bank, 80.

D

Darjeeling Union Tea Co., 83.

Delegates, List of, 39-40.

Department of Industries, 12, 21, 35.

Duty on alcohol, 27.

Duty on Sugar, 22.

E

Eagle Assurance Co., 80.

Eastern Maritime, 72, 81.

INDEX.

Eastern Minerals, 84
 Eastern Provident Co., 81.
 Eastern Tea Co., 89.
 Empire Jute Co., 82.

F

Faculty of Commerce, 84.
 Friends Tea Co., 83.

G

Gopalpore Tea Co., 83.
 Gour Nitya Tea Co., 83.
 Graduate Assurance Co., 81.

H

Hand-loom, 2.
 Handloom weaving, 84.
 Hoogley Jute Mills Co., 82.

I

Imperial Bank, 80.
 Indentured labour, 27.
 Indian Chambers of Commerce, 32.
 Indian Commercial Congress, 73.
 Indian Factories Bill, 20.
 Indian Forests Economic Products Co., Ld., 75, 81.
 Indian Industrial and Prudential Assurance Co. Ld., 72.
 Indian manufactures, 1.
 Indian National Trading and Planting Corporation, 83.
 Indian Patents, 77-79.
 Indian Stones Committee, 5.
 Indian Tea Corporation, 83.
 Indore Malwa United Mills, 76.
 Industrial Activity :-

Bombay	71-78.
Madras	74.
Bengal	74.
Punjab	74.
Central Prof	74.
United Pro.	77.
Assam	75.
Mysore	75.
Travancore	75.
Indore	76.
Cochin	76.

Industrial Conference Work 41-47.

Industrial Development :-

(5) Bombay	54-59.
(11) Madras	59-60.
(4) Bengal	60-62.
(13) Punjab	62-63.
(7) Central Fro. & Berar	63-64.
(1) Assam	64-66.

(14) United Pro.	65-66.
(8) Behar and Orissa	66.
(12) Mysore	67-68.
(2) Baroda	68-69.
(9) Gwalior	89.
(8) Cochin	69.
(6) Burma	70.
(10) Kashmir	70.

Industrial education, 13, 16.
 Industrial enterprises, Failure of, 24, 33.

Industrial Survey, 6, 8

J

Jagajyote Provident Fund C., 80
 Jain Shri Ranjit Singhji Mill, 72
 Joint-Stock Companies, 21, 80-84

K

Karachi Electric Supply Corporation, Ld., 72-82.
 Karnr Kurnool Diamond Mining and Prospecting Syndicate, 84.
 Kasturchand Mills & Co., 72-82.
 Khoksa Janipore Banking Corporation, 80.
 Koderma Bissenpur Mica Syndicate, 84
 Kohinoor Tea Co., 83

L

Light of Asia Insurance Co., 81

M

Madras Premier Industries, 83.
 Marwari Spinning and Weaving Mills, 74, 82.
 Merchandise Marks Act, 20.
 Mining industry, 10, 15.
 Minerva Assurance Co., 80.
 Nagpur Electric Light and Power Co., 74.

N

Narcoldanga Jute Co., 82.
 New Malabar Timber Yards and Saw Mills, 74, 82.

O

Office bearers, 7, 29, 11, 37, 15, 18, 22

P

Parscole Coal Co., 84

INDEX.

Peoples Co-operative Indian Insurance Society, 80.
Peoples Spinning and Weaving Mills, 72, 82
Persian Gulf Steam Navigation Co., 72, 81.
Pioneer Assurance Co., 81.
Pioneer Sugar Company, 74, 84.
Polytechnic College, 82-83.
Provident Cotton and Flour Mills Co., 74-82.
Provision of Funds, 7, 11, 15, 18, 22.
Punjab Coal Co., 84.
Punjab Provident Co., 181
Purchase of Stores, 16, 25

R

Railway rates, 14, 25, 34,
Rajpur Mills, 72, 82.
Rampur Tea Estate, 83.
Resolutions, of the Previous Conferences, 1-88.

S

Salvation Army Silk Farm, 76.
Sara Sirajganj Railway Co., 81.
Sibpur Engineering College, 13, 16.
Sind Cotton Growing Syndicate, 83.
Singra Coal Co., 84.
Simplex Mills Co., 72, 82.

Simplex Waste Preventer, 72.
South Indian Match Factory, 76.
Sri Narasimha Cotton Press Co 82.
Sri Vibudha Virja Samvardha Bank, 80.
Sugar industry, 11, 15.
Suggestions to the Public, 6.

T

Tata's Hydro Electric Works, 71.
Tata Iron and Steel Co., 72.
Tata Mills, Ltd., 73, 82.
Technical education, 5, 13, 8, 16, 3:
Technical Schools, 1.
Technological College, 2.

U

United Silk and Cotton Mfg.
Upper Sind Light Railways,

V

Victoria Jubilee Technical Institut
(Bombay), 13.

W

Wadia, A. D. & Co., 71.
Weaving industry, 15.
Weaving Schools, 2.
Weights and Measures, 17, 20.