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THE FIRST
**Indian Industrial
Conference**

HELD AT LAHORE

ON THE

30th December, 1909

PUBLISHED BY THE GENERAL SECRETARY
THE INDIAN INDUSTRIAL CONFERENCE, AMRAOTI

1910

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REPORT
-OF
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INTRODUCTION

'Rome was not built in a day, and nation-building, to be of a permanent order, is necessarily a very slow evolutionary process. We are sometimes apt to get impatient and to hurry forward to reach a goal without going through the intermediate disciplinary stages which are necessary. But the more haste the worse speed. We must be content to do the work that lies before us in our life time; to carry on the torch in our own day, and pass it with undimmed lustre to our successors in the race.

The work of nation-building requires the co-operation of all sections of the community. And it is gratifying to find that this feeling of good-fellowship and co-operation is beginning to manifest itself largely amongst the Mahomedan and Hindu communities everywhere in India. And why should it not be so? Why should not all the separate sections come closer together in furthering the common interests of the country? We can be—

" distinct as the billows,
yet one as the sea."

Differences in religions, creeds and rituals there will always be amongst us, but these need not interfere with entire community of feeling and co-operative unity of spirit in promoting the material, social, intellectual, political and moral progress of India'.—(Presidential address of Maharaja Sir Rameshwar Singh Bahadur, p 15 of the Report)

'I wish the conditions in India would change, that the rulers will carry the collected will of the people with them, and thereby secure 'the co-operation of the growing Patriotism in the country.' (Lala Harkishen Lal, p. 10)

'Indian conditions call for combination both in the conduct of manufactures and in the procuring and producing of raw materials.' (Mr. Frederick Noel Paton, pp. 35 & 40)

'No one will deny that India has produced in the past, and is still able to produce, men whose intellects are as acute as any that are to be found in the western world.' (Dr. T. H. D. La Touche, p. 81)

'Are you content merely to receive such a share of the profits as is derived from investments in mining and manufacturing concerns, a poor way of making money at best, looking on while your country is being depleted of the raw material with which Nature has so bountifully supplied you, and compelled to pay highly for the metals which might be supplied very largely from your own mines, and for the articles manufactured from them?' (*Ibid*, p. 82)

As a permanent and useful co-worker with the Indian National Congress, the Indian Industrial Conference is holding its Sessions year after year during the Congress week. In consonance with this practice, the Fifth Indian Industrial Conference was held at Lahore in the Bradlaugh Hall, on Thursday, the 30th December 1909.

The severity of the Lahore winter, coupled with the fact that the Session of the Industrial Conference had to be held after the close of the Congress, affected its attendance and marred to some extent its success. The number which was between 6 and 7 hundred was in itself not unsatisfactory. What was noticeable and regrettable, was that the majority of the Congress leaders, who were in Lahore the day before had either gone away or did not care to attend. The gathering though not so large as most previous ones however, included several leading men of the Punjab and the N.-W. P., frontier provinces and influential representatives from Kashmir and other parts of India. The assembly consisted of men who take real interest in Industrial matters. And so far as the transaction of solid work is concerned, the Session can bear favourable comparison with any of its predecessors. The programme of the Indian Social Conference also, which was held on the same day, at about 3 P.M., interfered not a little with the work of the Industrial Conference, which had, on account of the crowding of functions to get through a mass of business within the short space of about 4 hours. The experience of the Madras Conference clearly points to the necessity of reserving at least two days for the work of this Conference and holding its Sessions before the close of the Congress Session. Otherwise, the Conference has to rush its programme through and the time required for the proper discussion and deliberation of important subjects is not obtained. The Industrial Conference, cannot rest content with merely passing a few formal or academic resolutions. Its work is eminently of a practical nature. Industrial questions are occupying in recent

years an increasing share of public attention, all over the country throughout the year. Economic and Industrial questions demand such thorough and informed discussion that adoption of measures to give a practical shape to any one of them may well claim the whole time of a Session of the Conference. For instance, in considering a question like the Sugar industry, a number of facts and circumstances, local, provincial, agricultural, chemical and financial have to be taken into account. This means that each aspect must be properly dealt with by experts before laying down definite lines of action, to guide persons wishing to embark upon those industries. Though it is not practicable to impose such a high standard on the Conference, it cannot indulge in a mere rhetorical display or vague declamation, and the hurrying through a number of Resolutions, is of absolutely no value except where they are intended to emphasize a position laid down after sufficient consideration and discussion. While, therefore, the value of the Papers laid before the Lahore Conference must be acknowledged and the contribution made by the addressès of the President and the Chairman of the Reception Committee and by the speech of His Honor the Lieutenant-Governor to the general treatment of industrial questions is of first class importance, the absence of all discussion of the subjects dealt with by the resolutions has caused great disappointment to all friends of industrial progress. For this regrettable deficiency, the Reception Committee cannot well be blamed. A notable event in connection with this Session of the Industrial Conference was the part which the ruler of the Province, His Honor Sir Louis Dane, the Lieutenant-Governor took in its proceedings. His Honor not only graced the occasion with his presence, but also made a weighty, luminous and sympathetic speech which will be noticed in detail hereafter. The Imperial and Local Governments have often given undeniable proof of their sympathy with the Industrial Conference from the day of its birth and this is the second

time, in the history of that movement, when the head of the Local Government honored it by his visit. But His Honor Sir Louis Dane has made a further advance and given to this organisation his open support and thus added to its weight and strength. The promotion of the Industrial Exhibition, personal interest taken in it, the munificent grants made for it and then the participation in the proceedings of the Industrial Conference, place beyond doubt His Honor's genuine sympathy for the people of this country.

The preliminary arrangements for the Conference were made by a Reception Committee which had for its Chairman, the leading industrialist of the province, Lala Harkishen Lal. He was assisted by a band of zealous and enthusiastic workers, as Secretaries from among whom might be specially mentioned Pandit Balakram Pandya, Prof. S. N. Das Gupta, Prof. Behari Lall Bhatia, Prof. Ruchiram and Mr. Narain Das.

The proceedings were opened by Lala Harkishen Lal, the Chairman of the Reception Committee who in welcoming the delegates delivered an able and inspiring speech. The selection of Mr. Harkishen Lal to the position of Chairman was eminently judicious. He was the right man in the right place. He is the acknowledged pioneer of Joint-stock enterprise in his province. A Cambridge graduate in Mathematics and a practical student of economics, he gave up his practice at the Bar and took up commerce and industrialism as more beneficial to his people. Possessing peculiar fitness for business life, he controls at present no fewer than 19 different companies and associations, among which are the Bharat Insurance Co., Ltd. the People's Bank of India, the Amritsar Bank, the Lahore Spinning and Weaving Mills Co., Ltd. The Bharat Buildings, which accommodated the Congress delegates form one of the sights of Lahore and are a standing monument of his brilliant success in business activities. He was the right-hand man of

the late Sirdar Dayal Singh Majithia, the leading noble man of his time in the Punjab and is the Chairman of the Board of Trustees of Dayal Singh College. He is also one of the trustees of the Lahore "Tribune." As a Chairman of the Indian National Congress and Industrial Conference Reception Committees, he was one of the most prominent members of the Exhibition Committee. He was also a member of the Punjab Legislative Council. The address of such a distinguished citizen and a practical economist and industrialist necessarily commands attention and deserves close study. At the very outset of his address, he makes two suggestions which call for the consideration of the Conference organisation. The first suggestion that, "the future Exhibitions should be attached directly to the Industrial Conference rather than to the Congress," has a good deal to commend it, as the Industrial Conference, is directly concerned with the Industrial activity in the country and has to keep itself abreast of the latest progress in that line. It will, therefore, be more conducive to convenience and real work, if the Industrial Conference organisation—general and provincial—is invited to cooperate with the exhibition committees.

His second suggestion that "Conferences should be held at Easter rather than Christmas to enable the Public to devote more time and attention to economic subjects, than has been hitherto the case," does not appear capable of general acceptance in view of the enormous distances between the different parts of India and the demands on the time of those who take real interest in both the movements.

Dealing with the formative influence of economics, he quotes Professor Marshall to show that "the two great formative agencies of the world's history have been religion and economics," and that "man's character is moulded by his every day work and by the material resources which he thereby procures, more than by other influen-

ces, excepting those of his religious ideals." Politics is but a passing phase. The readjustment of religious ideals, in India necessitated by the advent of the new era began with the work of Ram Mohan Roy. The economic effects of the new surroundings created by the British Rule are mentioned thus :—

' Here the opinions widely differ. The advocates of the cause of the people strenuously urge and maintain that economically India is declining; while the apologists for the British administration with equal zeal assert that India is enjoying a prosperity which she had never known before. The late lamented Romesh Chander Dutt, the first President of the Industrial Conference, whose recent loss to the country we all deplore, asserted that the Truth may lie midway.

Where actually the Truth lies, it is not easy to say, as the problem is not a simple problem' (p. 7).

All the same there is no question as to the extent to which the new economic forces have disturbed the equilibrated society of India.

' The economic relations of the Government and the people have been placed on a new basis, the economic relations of members of families and village communities have altered; the widow, the orphan, the sick, the aged, the indigent, the Brahman, and the Mullah, have now to shift for themselves; places of education, and worship have to be differently maintained; children have to be afforded more expensive bringing up and education; houses have to be more expensively built and furnished; travelling has to be more luxuriously and largely done; manufactures have to be more expensively and elaborately carried out; marketing of agricultural products has to be differently done, mines have to be differently worked. This argument may be extended *ad infinitum*; whether these changes mean prosperity or adversity, need not be tackled here; but that there is an obvious, patent and profound case, for anxiety no one will question.' (pp. 8 & 9).

To the old recognised factors in the production of wealth, *viz.* land, labour, capital, skill, scientific knowledge, training and "the economic man," Mr. Harkishen Lall, adds a *sympathetic state* as a *sine qua non* for the economic development of a community. Though this is not adequately realised in the west, to whichever country we turn our attention, we find that fully 75 per cent. of the time and attention of the state and its assemblies is devoted to economic matters politics as such and social readjustments

take up only 25 per cent. The international competition is everywhere the concern of the state and there is no other agency equally potent and persistent. Without the *Sympathetic state* neither its internal nor external position is capable of timely readjustment and where timely readjustment has not been made the countries and the peoples have sunk. In the west, the State represents the collected will of the people and is, therefore, the embodiment of patriotism. Mr. Harkishen Lall, therefore, expresses the general wish that "conditions in India would so change that the rulers will carry the collected will of the people with them and thereby secure the co-operation of the growing patriotism in the country."

He rightly points out.—

Patriotism is a force. Its applicability to one's country's religious life may be a sweet dream, when applied to politics it is generally exhausted, when *Magna Chartas* are obtained ; when applied to social readjustments it amounts to applying really to economic readjustment, to economic, as such, it has not been applied in this country to any appreciable extent, but that it is of great potency can be easily established. It should be directed towards Economic problems and without loss of time. * * Patriotism means wholehearted devotion to one's country and its people—Devotion implies sacrifice, which does not mean suicide, or an annihilation ; but the spending of the energies in bettering the condition of the object of devotion. Our energies mean our *time* our *faculties*, our *efforts*, our *money*, and our *influence*. (pp. 10 & 11.)

Referring to the organisation of industries, he touches on the factory and the village cottage systems and shows the scope and possibilities of each, their relative merits and demerits and gives his opinion that both may exist in a country simultaneously and do immense good in their own way ; the village systems being backed up by a system of co-operation. He suggests that the Industrial Conference should classify industries into groups susceptible of the village and the factory systems and otherwise.

In view of the important results which have followed from the application of the principle of co-operation to business finance and to production and distribution of wealth in Europe, he called upon the members of the

Industrial Conference to familiarize the people with the principles and application of co-operation. He justly considers that this may in a measure overcome the difficulties experienced by people in acquiring sufficient capital for their undertakings.

Among questions suggested for consideration by Mr. Harkishen Lall are.

- (1) How to organise capital.
- (2) How to preserve capital, when organised.
- (3) For what objects and under what management should capital be organised.
- (4) If capital be organised as finance, to what extent and under what conditions it should be directed towards the production of wealth.
- (5) Should foreign capital be allowed free scope in State and private undertakings ?
- (6) How could foreign capital be available for private enterprise?

His study of the Franco-British Exhibition of 1908 showed him that climatic conditions or national genius, had very little to do in the preparation of 95 per cent. of the articles manufactured by the advanced countries of the West, and that the best valued articles were those in which land, that is the raw material played lesser part than the labour expended and the capital required for plants was also not prohibitive.

‘These are (he proceeded to point out) conditions favourable to the circumstances of India. But there were certain facts brought home which do not at present exist in India, but which, if effort be directed in that channel, could be easily established. These facts were : knowledge of proportion and designing : power of organisation: and agencies for marketing. The message that the Franco-British Exhibition sent to us amounts to this: Don't lose heart ; look up and adapt yourself to altered conditions. There is nothing that nature has denied us ; and nature has not doomed us to live eternally under the law of diversity (p. 13.)

The Conference has been fortunate in securing distinguished personages for its Presidents and the

Maharaja Sir Rameshwar Singh Bahadur of Durbhanga, elected to preside over the Lahore Conference, possessed in addition to his erudition and business capacities, the special distinction of being one of the leading representatives of the aristocracy of Bengal. The Maharaja Bahadur is well-known for his public spirit and munificence and his name is associated with several beneficent movements and important institutions. The Presidential address of the Maharaja can well maintain its position by the side of the utterances of his predecessors and is interspersed with practical suggestions, deserving of a careful study by all interested in the industrial regeneration of their mother country. The address covers a wide range of topics and takes a practical Survey of the industrial situation of India, with an eloquent appeal for mutual trust and harmonious co-operation on the part of all communities inhabiting this Peninsula.

The Maharaja exhorts his countrymen not to be impatient to "reach a goal without going through the intermediate disciplinary stages" for nation-building to be of a permanent order, is necessarily a very slow evolutionary process. "We must be content," says he, "to do the work that is before us, in our lifetime to carry on the torch in our own day and pass it with undiminished lustre to our successors in the race." He lays special stress also on the fact that nation-building to be of a lasting character requires the co-operation of all the sections of the community and is glad to notice that a feeling of good fellowship is beginning to manifest itself largely between Hindus and Mahomedans. Says he :—

We can be—"distinct as the billows,
yet one as the sea."

'Differences in religions, creeds and rituals there will always be amongst us, but these need not interfere with entire community of feeling and co-operative unity of spirit in promoting the material, social, intellectual, political and moral progress of India. (p. 16)

In his survey of industrial problems, he insists upon the importance of agriculture, as the first and foremost of all Indian industries. In regard to this he remarks :—

‘The soil is not made to yield forth the abundance she is capable of doing, and the consequence is that there are still millions of the inhabitants who do not have enough to eat all the year round, and in years of drought and famine we all know the misery that ensues notwithstanding the splendid efforts of the Government and the land-owners to assuage and stem the tide of starvation and death at such times. Agriculture is receiving the serious attention of our Government. Agricultural Colleges and Government Farms planted here and there have been doing fruitfull work so far as they are able ; but there are not enough of them yet to do more than touch the fringe of the subject. My conviction is that scientific agriculture must begin to be taught and learned at all the primary schools in India, every pupil being practically instructed by means of gardens being attached to each school. I observe that this is also the opinion of Mr. F. Smith, the able Deputy Director of Agriculture in Bengal who has just published a little brochure on the subject, which all interested in the teaching of agriculture should procure and read. It was Jonathan Swift who said “that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.”’ (pp. 16 & 17.)

In support of his contention, he cites the instance of the jute crop which, if scientifically cultivated would yield an additional annual wealth to the two Bengals of at least 24 crores. The Maharaja next touches on “the yet unexploited wealth to be obtained from the sea,” and indicates the vast scope which exists for the expansion of an important industry, which bids fair to be a useful source of food supply to large masses of the population and opens out a new channel of increasing the material prosperity. Adds he :—

‘Fishing brings quite a number of related industries in its train. The manufacture of oil which would find a ready sale ; the curing trade, the making of barrels and packing cases, &c., &c., beside furnishing employment to thousands as merchants and vendors of fish and its products, and ultimately as a Swadeshi industry, the building of steam trawlers with all their equipments, and outfits of tackle and apparatus’ (p. 18)

From fisheries, he passes on to the Textile industries and taking a rapid survey of that industry which has progressed with strides in recent years and calls attention to the great scope for the expansion of the Jute industry which is now entirely in the hands of European firms.

'Would it not now be possible for Swadeshi enterprise to take part in such an industry? I think there is ample room for such. The fibre itself is practically the monopoly of Bengal and good profits are steadily earned by well-managed concerns.' (p. 19)

Coal industry was next dealt with. "Our coal stores under-ground are of a practically inexhaustible nature" and no time should be lost in educating the youths of the country to specialise in the Department in which each is fitted for the exploitation of the mineral wealth of the country, including iron, manganese, mineral oil, etc.

In regard to technical education his views may be thus stated:—

'We have already technical schools and colleges here for the training of young men in a scientific manner for those pursuits where brains and skill are required, but these educational establishments will have to be multiplied manifold if we are to hold our own in the race of industrial competition and I would counsel all parents and guardians who have the means to give the heartiest encouragement in their own spheres of influence, to that technical education, without which their sons will be of little use in taking a grip of the professions and industries by means of which we hope to work out the commercial and industrial salvation of India.'

'Chemists and electrical engineers are wanted in India and these are professions eminently suited for educated young men. The time is at hand when every considerable engineering and textile work will have an expert chemist on their staff, and as for applied Electricity, the vision before us is one of incalculable progress in every sphere of life; in household economy, in municipal life, in inter-communication, in lighting and in motive power. We seem to be as yet on the threshold of our endeavours to harness electricity to the wants of man, and almost every month new discoveries are being made. There is bound to be a wide field in India in the near future for electrical engineers and electrical work of all kinds, and our educational establishments should lay themselves out more and to equip men for coping, with this great enterprise.' (pp. 19 and 20).

The Maharaja next pointed out the importance of utilising the power of wind and water for driving motors, as it is hardly touched in this country, citing the example of the United States of America, where farmers use cheap wind mills of their own construction and these mills do nearly all the farm-work from the pumping of the water to the winnowing of grain.

For small industries, such as the making of delicate and hand-made fabrics, indigenous art-wares in metal, carvings, miniature paintings on ivory, &c., there is a great demand in foreign countries and these industries, therefore, require to be revived on proper basis. Although exhibitions have done a great deal in showing what India can do, much more could be done with the help of the department of Commerce and Industry. The Maharaja suggests that arrangements should be made to have small museums of our artware and other products, attached to the British Consulates in foreign countries with catalogues. This is an excellent suggestion and deserves to be taken up in right earnest as it is sure to give a great impetus to our productions.

'There are a great many goods which we still import that can in due time be made by ourselves. And why should we export such products as cotton seed, when we could export the extracted oil, and enrich the land with the refuse?' (p.22.)

With passing allusion to a federation of sugar growers in India, which was to be shortly instituted, the President proceeded to record his views on the question of the standardization of weights and measures, a subject which was noticed also by His Honor Sir Louis Dane. The Maharaja suggests :—

'It might serve a good purpose if this Conference were to appoint a small select committee to consider the whole question of standardisation and to report at the meeting of the Conference next year what in their opinion ought to be the best means of gaining the end in view. At present it seems to be almost as difficult to get a people to change their weights and measures into a Universal Standard as it would be to get them to change their language.' (p. 23).

The Maharaja has great faith in the Swadeshi as freed from the somewhat bitter accretions which have of late clung to it. "It simply means our wholehearted purpose of doing all we can to foster and develop by all the means in our power the resources of our country." Says the Maharaja :—

'We have the brains, the capital, and the enterprise required for going along on safe lines. And we have the growing national spirit which will produce brotherly, helpful and sympathetic co-operation amongst all classes of the community. For without these things we labour in vain.' (p. 24).

He concluded the address with a brilliant peroration, which ought to be deeply pondered over and acted upon by men of all communities in India, as it is full of extremely sound and sagacious advice. We quote a couple of passages from it :

'Ladies and Gentlemen, India is peopled with many races and communities. Their religious and ethnological characteristics, their traditions and commercial pre-disposition and their adherence to rooted convictions need not cause any anxiety to the advocate of industrial enterprise in our country. Commercial and industrial co-operation is not inconsistent with the preservation of the religious persuasions existing amongst us. The keynote of success in trade and industry is the adjustment of commercial relations of all classes without regard to religion or race. A united effort to secure the greatest possible material prosperity in the land is honourable labour for the Mahomedan and the Hindu alike and for the official and non-official equally'. (p. 26).

'The vision of United India will ever remain an abstraction if the two greatest communities in the land did not step up to a common platform of cordial co-operation and close comradeship. As an agency of unification territorial patriotism is great and potent. Light this sacred fire in every Indian heart without consideration of race and creed; and where more fitting to burn the incense of a nation's devotion than the sphere of commerce and industry. We want India to be a country of happy homes and of a loyal and contented people.' (p. 26).

After the presidential address, came a thoughtful and kindly speech from His Honor Sir Louis Dane, delivered with the grace and felicity so well-known. As His Honor had only a few days previously expressed his views on Indian Industrial problems, when opening the Lahore Exhibition (*Vide* appendix I to this Report) he contented

himself in his short yet instructive speech at the Conference, with pointing out the possibilities of industrial development in the Punjab, Kashmere and the adjacent provinces.

'I have already ventured to say that in the Punjab with its enormous areas that have recently been brought under cultivation and with its comparatively scanty population as compared with other Provinces in India, there is already a field awaiting development of the greatest possible potentialities. We produce already an enormous surplus of raw agricultural products, but those agricultural products unfortunately leave the country and it is my earnest desire and I hope it is the desire of all of you that we should do something to enable us to work up those agricultural products in the country itself and so enrich all classes of the community. (*Cheers*).' (p. 28).

His Honor next dealt with the question of the standardization of weights and measures to which he attaches great importance and emphasised the suggestion of the Maharaja of Darbhanga "to appoint a committee to further consider this subject and bring it prominently to the notice of the public." The remarks of Sir Louis on this subject can hardly be improved upon and we make no apology for reproducing them for the benefit of our readers :—

'The Maharaja Bahadur has referred to the question of the standardization of weights and measures. You all know, gentlemen, that this is one of the most important problems which lies before the commercial development of this country. But perhaps some of you may have forgotten, as you are not as old as myself, that the Government of India had already taken steps in this direction and a good many years ago passed an Act for the regularisation of weights and measures. It so happens that a *seer* is almost exactly the same weight as the French *Kilogramme*, that is, thousand grams, which is the basis of the system of weights that prevails over most of the civilised countries of the world, and the Act exists upon the statute book of the Government of India which has to make a *seer* the same as a *Kilogramme* with the view of introducing that system of weights.' (pp. 28 & 29).

'The Government of India have recognised the extreme desirability of making our *seer* equal to a *Kilogramme* with a view to adopt that standard of weights.' (p. 29)

His Honor then discussed the relative advantages of Village systems and the extension of the Factory system. "The Punjab," said His Honor, "is very proud of its

village communities, which still exist in a stronger form in the province than anywhere else in the country and anything that would strengthen that system would meet with the approval and support of Government."

The usual presentation of the annual report of the conference was the next business. In the unavoidable absence of the General Secretary owing to unexpected difficulties, this duty was performed by Mr. C. Y. Chintamani, who moved the adoption of the report in a neat speech.

The number of papers laid on the table was this year larger than in any of the preceding years, covering a wide range of very important themes, among the contributors being many experts and officials holding high and responsible posts under Government.

Without being open to the charge of making invivable distinctions, the place of honor may appropriately be given to the paper on "combination" contributed by Mr. Frederick Noel Paton the Director-General of Commercial Intelligence Department. As a distinguished representative of Government with wide and varied experience and commanding special facilities for the study of Industrial problems of India, he has pointed out the importance of combination as the basis of industrial activity. Citing the Joint Stock Company as the most familiar form of "combination" he proceeds to observe that "many Indian projects and enterprises miscarry through neglect to provide sufficiently for this principle of reciprocal limitation or through consciousness on the part of persons disposed to participate, that they do not know how to secure effective observance of it. In his opinion, various other forms of combination different from the mere Joint Stock Company, suitable to the requirements of each industry are essential for ultimate success. To quote Mr. Noel Paton—

' A simple example is that of combination among exporters of Indian yarns, designed to secure and maintain a larger and more constant

control of a particular foreign market. We have seen more than once Indian spinners individually make good a position in a foreign market, build up a connection and establish a reputation in the bazaars for their tickets of *chaps*. Again and again we have seen them abandon the market so far conquered and turn their attention exclusively to an opening that had, through temporary causes, arisen in an entirely opposite direction. The new opening may prove to be as shortlived as the first; and before long we see all the shippers of twist hastening back to the market they had forsaken and beginning afresh the task of building up a trade. Some of these fickle spinners are surprised to find, on their return, that their tickets have already been forgotten or have been displaced by the tickets and products of competitors from other countries, who have marked and reckoned on the volatile methods of Hindustan. Others accept as inevitable the law that no shipper or manufacturer can escape the evil consequences of playing fast and loose with a market.' (pp. 35 & 36.)

The author exhorts the Indian Spinners and other traders to combine not only in the marketing of a finished product but also in "the conduct of manufactures and in the procuring and producing of raw materials." "The man," he exclaims, "who can bring about a combination of this kind will have done a great deal more for India than by appearing on a hundred platforms and reading a hundred dull papers," after duly taking into consideration the factor of supervision and control.

The specific suggestions of Mr. Noel Paton may be summarized in his own words as given below :—

SPINNING INDUSTRIES.

'In the meantime I may briefly indicate the method adopted by our competitors. It is that a group of spinners and shippers who are in a position to turn out a uniform range of yarns combine. They adopt one set of tickets and syndicate their interests in these tickets in such proportions as they think fit. For instance there may be two spinners each holding a quarter share in the syndicate and two other spinners holding shares respectively of one-fifth and of three-tenths. The syndicate may agree from time to time what quantity of yarn is to be shipped to a given market; and each of the three participants is under an obligation to contribute his quota at the price agreed upon.' (p. 38.)

COTTON SEED INDUSTRY

'In this country cotton-seed oil will find its best market in the form of what are called edibles—ghi substitutes and oils for cooking and here

here the characteristic Indian scruples about fatty matter of unknown origin protect us from foreign competition without raising any awkward tariff question. But, in the first place, the stearines that constitute the butterlike extract form only a small percentage of the oil from which they are obtained. In the second place, the processes of refining demand expert management and a relatively costly plant. It follows from the first premise that a very large volume of crude oil must be treated to obtain such a quantity of butter substitute as could furnish the basis of a considerable trade. If the establishment that conducts the refining processes is also to crush the seed and make the crude oil, then vast quantities of seed must be brought to it. It will first have to pay inward freight on that seed and will thereafter probably have to pay outward freight on the cake. The cake represents the bulk of the material and would have to be re-distributed to centres where there existed a demand for fodder and manure. A third form of waste would attend this procedure inasmuch as it would afford no employment for the motive power now latent in those ginnery engines which stand unused during a large part of the year. All these difficulties are overcome if the crushing is done at the ginneries and if only the crude oil is sent to the refinery the cake remaining in those places where the crops are to be manured and where large numbers of cattle are maintained both for cultivation and for transport.' (pp. 40 & 41)

The author next proceeds to consider and diagnose the causes of the rapid decadence of sugar Industry in India. His suggestions on the methods of reviving this important national industry being eminently sound and practical, will amply repay a careful perusal:—

'For myself I am convinced that the principal reason lies in India's characteristic disregard of theory—her failure to ascertain and define the principles by which competing countries regulate their action, and to recognise in clear terms the overwhelming contrast that exists between the conditions that have been laboriously brought about in those countries and the conditions which India herself allows to survive year after year in blindness to the lessons plainly set before her.' (p. 46).

• • • • Centralization has been and is increasingly the keynote of all successful enterprise in the modern cane sugar industry, and that centralization in this connection has a somewhat special meaning. It means not only the replacing of numerous small appliances by relatively few establishments of sufficient size to insure economical working and to support the cost of expert supervision, It means still more; the concentration of the cane fields in the immediate vicinity of the factory. • • • • • The sucrose in cane that has been cut undergoes rapid chemical change; and unless the cane is taken to the mills in a short time a large part of the potential sugar is lost. When I say a large

part I mean so large a part as to prevent from the very beginning any hope of profit on a truly competitive-basis,' (pp. 46 & 47)

The author urges on the adoption of the principles of combination with regard to other industries as well.

In every country the present tendency is decidedly towards factories on a large scale and if "India" says he, "is to take a hand in the game she must conform to the rules."

In conclusion Mr. Noel Paton suggests that the details of the organisation, proper to each separate industry should be worked out as distinct problems and considered link by link and that the meetings of the Industrial Conferences would be more fruitful, if one or two specific subjects were prescribed for each year and arrangements made for a symposium of opinions from all the several provinces of India.

Two papers bearing on the possibility of development of "Fisheries" have been contributed by two Government Officials of that Department. Sir Frederick Nicholson, K. C. I. E., Honorary Director, Government Fisheries, Madras, writes on the "Marine Fisheries of the Madras Presidency" and Mr. S. N. Das, Assistant to the Commissioner of Fisheries, Bengal, on "the Bengal Fisheries."

Sir F. Nicholson, indicates in a convincing manner the vast potentialities of the Fishing trade along an extensive coast line of some 1700 miles, in the Madras Presidency. After describing the primitive condition of that industry, the catamaran boats, fishing within an area of 5 or 6 miles up to 6 to 8 fathoms in depth, with comparatively miserable nets, with curing methods as defective and crude as the fishing apparatus, he passes on to describe the modern ideas and necessities with regard to that trade.

In the first place, public hygiene demands in the interest of the individual and the community that the food supply must be of the best and safest quality to satisfy the most fastidious taste and sufficiently plentiful to meet

the ever-growing demands of an increasing population. Fish is also very valuable as a field manure, large quantities of fish which are at present, allowed to rot along coast lines can be very well utilized as fertilisers of the soil. To improve the existing industry with its concomitant bye-industries in a way to enrich and wholesomely, feed the greatest possible number of people and add the harvest of the sea to the harvest of the soil, is the goal of experimental stations started by the Madras Government. The following reforms are being tried at these stations :—

(1) The introduction of live cars and live chests or pens, so that fish can be brought alive to the shore and kept in good condition till required.

(2) Fish not kept alive must be cleaned and washed at sea and properly stored.

(3) Fish intended for food, should be so treated subsequently that its freshness may be preserved for a longer time than usual.

(4) Fish must be taken at once to the curing yards where cleanliness must be an absolute rule.

(5) Rapidity of operation is in many cases necessary, so that fish brought in the early morning may be salted, dried and smoked by the evening.

(6) Pickled fish is under trial and plant has been obtained for carrying on experiments in canning.

Another method of increasing food supply by pisciculture, can be tried only in the inland (fresh) waters with the exception of the culture of the shell fish *e. g.*, oyster, and mussels.

In conclusion the author points out :—

“ Be it remembered that if we take the present annual catches in this (Madras) Presidency roughly at 150,000 tons of edible fish, this is but one-seventh of the British catches for a similar population ; that the addition of only 100,000 tons would mean additional edible rations of something like 180 million pounds, or nearly 4·5 lb. per head for every man, woman, and child in the Presidency, an appreciable addition to the food of the meat-eating population, while there would also be 20,000 tons of offal, etc. for conversion into manure ; the whole

of this mass of food and fertiliser would be pure gain to the country and especially to the working classes, while various by-industries which there has been no space to discuss, would accompany the development; such industries are those which relate to boat building, machinery, the pressing and refining of edible vegetable oils, the production of vinegar, pottery, refrigeration, co-opering, pearl button making, tin plate working, etc., to say nothing of increased traffic and business dealings.' (pp. 76 & 77.)

Paper of Mr. S. N. Das deserves to be read along with that of Sir F. Nicholson. Mr. Das divides the work undertaken by the Fishery Inquiry Office into 3 main heads in the order of their importance so far as Bengal is concerned *viz* :—

(1) Freshwater Fisheries, (2) Estuarine Fisheries, (3) Deep Sea fisheries. Mr. Das appears to possess expert knowledge of the subject he deals with and the information he has collected will be found very useful. He gives the different varieties of fish, which reside in fresh water and suggests methods for remedying the defective supply by re-excavation of the old tanks and in other ways and recommends the starting of carpiculture stations for the artificial propagation of the fish with the co-operation of Government.

He recommends the cultivation of the *Haplochilus* who have a peculiar and natural propensity for eating up the larvæ of the malaria-producing mosquito.

Estuarine Fisheries—The yield of the vast tracts of the Sunderbans is proverbial. The European nets being designed for English waters, country nets are found on practical tests, to be better suited to the Sunderban fisheries. Motor boats fitted with refrigerators might, however, be employed with advantage for working more distant tracts and localities of fish. A company may be floated to work the fisheries on these lines, which are sure to be successful. The experiments conducted by Government in the Bay of Bengal go to prove that there are extensive fishing possibilities in the Bay and that with the aid of improved appliances fish can be

brought to the market, in quite fresh condition, the coarse or inferior fish being converted into manure.

We now come to the excellent and inspiring paper of Dr. T. H. D. LaTouche of the Geological Survey of India on "Mining in India, past and future." The paper is replete with sound and practical suggestions, which fully deserve to be carried out and is couched in the most sympathetic language, which clearly reveals the author's genuine desire to see the revival in India of this important national industry. Dr. LaTouche takes a brief historical review of the past mining activity in the country and proves that "in all parts of India, wherever useful and valuable ores occur, traces of former activity both in extracting ores from the rocks and in smelting and fashioning the metals derived from them, are to be met with." To show how widespread were the mining operations in ancient times, he mentions a few specific instances :—

(1) The existence of old workings in the auriferous tracts for extracting gold in Dharwar District, the Hatti mines in H. H. the Nizam's dominions and in Chota Nagpur. In many of these places even the vaguest traditions of the ancient workings have died out.

(2) In copper belt of Singbhum for a distance of at least 80 miles.

(3) Copper, silver and lead mines of, Kumaon and Kulu.

(4) Traces of old workings in Kashmir, Rajputana, etc.

(5) Iron smelting in the Central Provinces and the washing of gold dust from the river Alluvium.

"It is hardly possible," says the writer, "to travel through any of the hilly tracts of the country without coming across traces of this former activity." Adds he:—

'Of metallurgical processes also, although of as rude a type as their methods of extracting and treating the ores, the ancients were by no means without knowledge. The most conspicuous instance of such knowledge is perhaps the manufacture of the famous *wootz* or steel of

Southern India. For centuries this material was in demand over the whole of the civilised world, and as Mr. Ball remarks in his *Manual of the Economic Geology of India* (p. 340), "The famous Damascus blades had long attained a reputation for flexibility, strength and beauty before it was known that the material from which they were made was produced in an obscure Indian village, and that traders from Persia found that it paid them to travel to this place, which was difficult of access, in order to obtain the raw material."....."There are reasons for believing that *wootz* was exported to the west in very early times—possibly 2,000 years ago". Not only was steel thus produced in Southern India for many ages, but Sir Thomas Holland has shown (*Records, G. S. I., Vol. XXV, p. 147*) that two distinct processes of manufacture had been devised by the natives, both of them afterwards imitated and improved upon by steel makers in Europe. One of these was the carburisation of wrought iron in crucibles, a principle not applied in England till the year 1800, when it led to the great development of steel-making for the manufacture of the celebrated Sheffield cutlery; but the other is almost more interesting, for in the Salem District Sir Thomas Holland found steel being made by the *decarburisation* of cast iron, thus anticipating by ages the latest developments of steel-making processes, the Bessemer and open-hearth methods.' (p. 79)

As another instance of the anticipation of modern methods, the author cites the manufacture of iron in the Khasi Hills of Assam, where the ore occurs in the form of almost microscopic particles disseminated through a granite from which it is separated by crude process of Hydraulic mining. His encomiums of the modes of the native miners may be given in his own words:—

'In the west it is only within recent years that means have been devised for obtaining such fine particles of ore, which is of great purity and therefore of high value, from this class of rocks. Yet here we have the Khasis, an aboriginal tribe, using a practical method of extracting such ore for ages, and turning out a product of such excellent quality that at one time it was proposed to start smelting works on a large scale in that country.' (p. 80)

In the opinion of the author, the decline of the native mining and metallurgical industry is due to the overwhelming competition imported metals from Europe and America where "a single blast furnace will turn out hundreds of tons of iron while the native furnace is only producing a few sheers." The difficulty of supply of charcoal has seriously hampered the smelting by native

methods. The extinction of the smelting industry is largely due also to the apathy and greed of the well-to-do classes.

His exhortations to Indians to revive this industry, and to realise the dignity of manual labour are very stirring and his trenchant attacks on the general lethargy ought to arouse our countrymen to a sense of their duty and to shake off the torpor of ages :—

‘ No one will deny that India has produced in the past, and is still able to produce, men whose intellects are as acute as any that are to be found in the western world.’

‘ Yet it is almost inconceivable that, among so many generations of workers, one man here and there did not arise with glimmering idea of improvement, which, if fostered, might have led to great results. (p. 81.)

* * * *

‘ Are you content merely to receive such a share of the profits as is derived from investments in mining and manufacturing concerns, a poor way of making money at best, looking on while your country is being depleted of the raw material with which Nature has so bountifully supplied you, and compelled to pay highly for the metals which might be very largely extracted from your own mines, and for the articles manufactured from them?’ (p. 82.)

* * * *

‘Is it now too late for a revival of the native industry to be effected? Such a revival would entail an entire reversal of the aspect with which manual labour, except to a small extent agricultural labour, is regarded by the educated classes, the aristocracy of this country. And yet it is not impossible that such a revolution in ideas, a much more worthy object, though even more difficult of attainment, than a political revolution, might be brought about.’ (p. 83.)

The author then proceeds to narrate an interesting account of a visit that he once paid to one of the ship-building magnates in the North of Ireland. While he was admiring the evidences of great wealth and culture around him, the door of the room opened and “ what I can describe” says he, “as a grimy apparition appeared— a figure blackened with oil and coal dust, bearing every mark of strenuous labor, this if you please, was the son of the house, employed not in spending his father’s

wealth or in superintending his workmen, but as one of the meanest of them, learning by the sweat of his brow to file a piece of brass to a true surface."

Are Indian youths prepared for such strenuous work, to forget the behests of false fashion or racial pride? Unless they realise the dignity of manual work, there is not the remotest chance of industrial regeneration for centuries to come.

With this paper may be read with interest, the contribution of Mr. Thakursingh on "The mining and mineral problems." Mr. Thakursingh gives some instructive statistics in connection with mining leases to show that the mining industry of India is almost entirely in the hands of foreign capitalists, "which from an Indian point of view may be regarded as a national calamity." There is a wrong impression in the minds of the people of India that mining operations involve a serious responsibility and that there is no use in sending students to foreign countries to learn mining and allied subjects unless there are mines owned by our capitalists and managed by our own Directors. The revival of this industry cannot be effected without complete mutual trust and combination. The author expresses a hope that European firms also will join hands with Indian Syndicates and suggests the establishment of two mining schools one for coal and the other for metal mining.

We next come to a set of papers contributed by Superintendents or Principals of three Art Schools. These papers may aptly be grouped together for the sake of convenience. "Teaching in Indian Art Schools" is the theme of the paper of Mr. W.S. Hadaway, the Superintendent of the School of Arts, Madras. Mr. Hadaway describes by way of comparison the methods followed in other countries for teaching arts. The *first* is a painting school, where painting, drawing and occasionally model-

ling are taught with a view to produce picture painters or sculptors. The *second* is the arts and crafts school for teaching every variety of artistic work, e.g. wood carving, ornamental metal work, embroidery, enamelling etc., lastly the evening schools for preparing students in arts and crafts, drawing and painting. In the first school, the student has to learn everything by his own observation and comparison of his work with that of other students more or less advanced. Mr. Hadaway pointedly draws the attention to the fact that teaching in art (by showing the faults in the work of a student with instructions to avoid them in future) as is to be seen in Indian art schools is practically unknown in England and hence a student there has to depend on his own perseverance and has to struggle hard for success.

The author is in favor of schools run on the workshop model, where students work under a practical workman and continually see before them a skilled artist executing some fine design.

Sardar Bahadur Ramsing, Principal, Mayo Art School writes a short paper on "Wood carving in the Punjab". He traces the vicissitudes through which the art of wood carving has passed and shows how it was influenced by Persian and other non-Hindu styles. Wood carving appears to have been practised in India from immemorial ages, one evidence of which is that in Hindu houses entrance doors, have always been prepared with great care and labour and at a great cost of time and energy. In some cases workmen used to be set to make them nearly two years before the building itself commenced. Before the time of Akbar, the style practised was distinctly Hindu. In the reign of Akbar, the Akbari style, being a mixture of the Hindu and Persian Styles came into vogue in the Punjab. The author then points out how wood carving gradually came to be neglected, its revival in the Punjab being largely due to the establishment of

the Mayo School of Arts, Lahore. This art school has turned out trained artisans and has improved the general tone of their work.

The third paper in this group has been contributed by Mr. Percy Brown, Principal, Government School of Arts, Calcutta. Mr. P. Brown is apprehensive that the present general desire for extreme commercialism may lead to the extinction of a very valuable trait as regards the well-established artistic instincts in almost every Indian community. To check this decay should be the aim of every Indian,

The Principal next attempts to correct the modern impression that "Bengal is not a particularly artistic portion for the country." In support of this view he cites the instance of the splendid ruins of Patna, the ancient Pataliputra, Dacca, Budh Gaya, Puri and other places, to show that Bengal was not behind other provinces in this matter.

Turning to the industrial arts, the Principal allots the first place to the Muslins of Dacca which are still coveted by customers from the East and West. He calls special attention to the Orissa Art Union of Cuttack started on sound commercial basis.

We now pass on to Mr. J. E. O'Connor's paper on "Industrial Development of India." In the order of importance, he assigns the first place to agriculture, as 'more than two-thirds of the Indian population are dependent upon land.' This industry in the opinion of the writer is largely handicapped. Mr. O'Connor knows well the subject he deals with and without attempting to improve upon his remarks for fear of marring their effect, we make no apology in quoting them for the enlightenment of our readers :—

'It is more to the purpose to consider whether our system of land taxation is capable of justification when judged by the principles of Western Economics, and when this comparison is made there is no doubt about the answer. It may be that we are not taking more from the cultivator

by way of taxation than 25, or 20, 10 per cent., where former rulers took 50 per cent., but it seems to me that even the figure of 10 per cent. would be regarded as excessive and restrictive if it were applied to the customs duties or the income tax, and it is certainly excessive when applied to the land. I have raised this point before, and was met in the *Pioneer* by the jeer that if the Government demand on the land were reduced, the money left to the cultivator would be wasted on wedding feasts. The jeer reminded me of the barbarous justification of the imposition of excessive rents by the Irish landlords : "the best manure for the farm is to salt the land with a high rent." The journal which pronounced its brawling judgment on my proposition frequently fills its columns with dissertations on the indebtedness of the cultivator and on the existence of vast buried hoards all over India. Now, if the cultivator spends his money on marriage, festivities and would so spend more if he had it to spend, and if he is so hopelessly indebted as is stated, where do all these vast hoards come from? I have no doubt myself that the hoards are mythical and that in the main the population dependent on the land lives from hand to mouth and has no money to hoard. The relevancy of this matter to discussions on the industrial development of India lies in this consideration ; with two-thirds of the whole population living in such a condition where are you to find an adequate market and an expanding demand for manufactures which will accompany industrial development ? (pp. 95 & 96).

Until the condition of the agricultural population (he urges) is materially improved, industrial development in India must be necessarily slow, insecure and discouraging. For the purpose of reducing land taxation, land should be subjected to the same rate of taxation as any other commodity. Knowledge of intensive culture should be given to the farmers and scientific principles of different processes explained to them, and Agricultural Banks started to meet the deficiency of capital.

With regard to manufacturing industries, Mr. O'Connor sounds a note of warning that industries conducted on a small scale and by hand power are of little use to-day and it is not desirable to encourage their multiplication, as they cannot stand competition with factory-made goods.

After paying a high compliment to the enlightened communities of Bombay—Hindu, Parsee, Mahomedan—who have set a splendid example to the rest of India in regard to the industrial acumen and enterprise, he dilates

to some extent on the need of Technical education, not only to the artisan classes but to the younger members of families of good social status who should learn the best methods of running a large factory. Says he :—

‘ Technical Schools and Colleges are wanted, and as usual the tendency is to look to the state to supply them. Let me recommend however, that the community should found them and should be content with grants-in-aid from the State. The late Mr. Tata of Bombay gave a noble example of how such things should be done, and I wish that there were even ten other men like him, patriotic, independent, far-seeing, and splendidly public-spirited, ready to do something like what he did.’ (p. 100)

In the opinion of this writer there is a wide field in India for the following industries:—

(1) Extension of cotton manufacture, there being room in India for ten times the number of mills now existing.

(2) Tools and apparatus.

(3) Ploughshares, hoes and kurpi.

(4) Metal utensils.

(5) Leather articles required by the mass of the people.

(6) Earthenware.

(7) Sugar.

The next paper in this group is contributed by Dr. Alfred Hay, D. Sc. M. I. E., Professor of Electrical Technology, at the Indian Institute of Science, Bangalore, on “Industrial development and electric power transmission.” Dr. Hay begins his paper with an allusion to the present intense intellectual activity as displayed in the study of nature and application of Science to minister to the happiness and comfort of the well-to-do classes, if not of the whole human race. “The standard of life,” says he “is immensely higher than it was a few centuries ago.” The science of Electricity has played a very important part in bringing about the present gigantic development of industries and commerce.

In his opinion, the following causes have contributed a great deal to the achievements of modern industry :—

- (a) Introduction of automatic tools and machinery.
- (b) Perfection of methods of measurement and consequent precision of machine tool work and manufacture of interchangeable parts.
- (c) Discovery of new and valuable industrial products.
- (d) Inventions of new processes and methods.
- (e) Development of cheap power generation and distribution.

The author proceeds to show the importance of electricity as the only cheap agent for power transmission destined to play an important part in the future industrial expansion. He bases his conclusions on the following premises which may be given in his own words :—

'All sources of energy may be divided into two great classes : (1) those which represent accumulations of energy gradually formed under the action of the Sun's light and heat in the course of countless ages and which, when once exhausted, cannot be replaced. To this class belong the important fuels represented by the different varieties of coal, peat, mineral oils and natural gas; (2) those which are being replenished by the Sun's action as fast as they are utilised. To the second class belong water-falls, tides, winds, and the various forms of fuel derived from growing vegetation. The distinction between these two classes is a vital one. For so long as we depend on the first class—which is very largely the case at the present time—We are exhausting supplies of energy which are sooner or later bound to come to an end. We are depleting the world of its reserves of energy and depriving future generations of all the advantages connected with the possession of such reserve stores ; while in drawing our power supply from any source belonging to the second class, we have the comforting assurance that we are not playing the part of spendthrifts, but are merely utilising energy at a rate not in excess of that at which Nature is able to supply us with it.' (pp. 111 & 112)

Apart from this, there are some aspects of electric power which undoubtedly establish its superiority over steam. Dr. Hay observes :—

'No one who has experienced the depressing effect of a manufacturing town of the old type—with its countless chimneys belching forth smoke and poisoning the atmosphere for miles around, rendering everything grimy and suggestive of poverty, squalor and misery,—can

fail to feel a deep sympathy for the workers who are doomed to pass their entire lives in such dismal and uncongenial surroundings. If with this we compare the cleanliness, comfort, and cheerful aspect of a manufacturing centre which is supplied with electric power, the contrast will point its own moral.' (p. 116).

With Dr. Hay's paper may be read "A few words about electrical development" by Mr. Shiv Narayan, in which he points out that the Punjab or the Land of the five Rivers is eminently fitted for hydro-electrical development. He advises his countrymen to follow the example of the United States and utilize the waterfalls for driving electric motors, which can be applied to innumerable uses.

We now come to Mr. Tellery's paper on the "Problem of indigenous workmen and indigenous art." Mr. Tellery has been taking an active interest in the work of the Industrial Conference, and has the following important suggestions to make :—

'We should establish the Indian industrial development society with head-quarters either in *Bombay* or *Calcutta* and branches in every province with sub-agencies in every city. The Head office should be in a position to provide every kind of information, the branches might require for the development of indigenous industry and in establishing new industries, the work of the provincial branches should be to be in communication with the people and put before them proposals and some ideas in which way certain industries should be carried out and if developed what machinery and what expenses would be incurred and also what profit could be made out of them. The chief aim must be to form companies and if companies are floated people will take a larger interest in the work than if such concerns are financed by single persons.

The branches and head office should also help the manufacturer to find in market for his goods and also be helpful to him in other ways'.

* * * * *

'As we have not the men to carry out this work with up-to-date machinery and with a profit, we are obliged to import good trained and reliable men, who would train our workmen to perfection in the new arts of the west and so put us on a footing to be able to compete with imported ware. Further, it would be advisable if the society would be the right hand of the Indian Industrial Conference and through whom the Conference would be in a *position* to verify all the information necessary to be put before the General Meeting which requires to be brought before the general public or the Government.' (pp. 301 & 302)

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'An annual report of the working of the Society should also be put before the General Meeting of the Indian Industrial Conference for the information of the public and the members of the Committee.' (p. 302).

That technical, commercial and industrial education has began to attract an increasing share of public attention will be evident from the four papers submitted to the Lahore Conference. The papers deal with the various aspects of the subject and deserve very careful and attentive perusal. In this series, the place of honor may justly be assigned to the paper on "Industrial and Commercial Education as factors in national and international progress" by Rev. T. C. Badley, Manager, Department of Commercial Education, Reid, Christian College, Lucknow. The subject has been very ably handled by Rev. Badley, and his paper deserves to be carefully studied by all, who are interested in the industrial regeneration through the medium of technical education. We are sorry, the limited compass of an introduction precludes the possibility of any attempt to do even a scant justice to its solid contents. Rev. Badley defines commercial and technical education thus :—

'Commercial and Industrial Education, is that technical training, which on the one hand enables a man to comprehend the complex problems presented in the manipulation of the world's commerce and industry and on the other puts him in possession of the specialized training which not only explains the machinery by which it is carried on, but provides him with the skill necessary to alter or improve that machinery.'

'National progress is the measure of that virility in the people and institutions of a country which makes for their increased welfare and enables them to meet their needs. International progress is the measure of a nation's influence in the councils of other nations, which is exercised by virtue of her national resources and strategical power.' (p. 149.)

With these simple yet accurate definitions the author lays stress on the axiom that "no nation can rise higher than the average of its citizens," the worth of each citizen being measured by his ability to add to the state's fund of

knowledge or physical wellbeing. The citizen who does not produce something for the nation is a dead weight that "hinders its progress and drains its vitality." The only way to increase the efficiency of an average citizen is through industrial and commercial education. The author quotes profusely from the admirable essay on "industrial education" by Dr. H. S. Person, Ph. D. wherein the illustrious author gives the result of his study of German educational systems and the secret of her phenomenal success, within a comparatively very short period:—

'Germany is one of the strongest competitors for international trade in the world's markets, surpassing the United States in spite of her incomparable resources, surpassing France, in spite of that country's longer period of development, and having become a source of alarm to Great Britain in spite of the latter's better developed resources and the advantage of two centuries of commercial supremacy. Germany has achieved so much in so brief a time, be it noted, not because of any extraordinary resources, nor merely because of her rapidly increasing population. Meagre, indeed, are her resources as compared with those of the United States. One of the factors of Germany's success is a quality acquired through centuries of intensive labour,—the capacity for taking pains. The second factor that has been at the basis of the development of present industrial Germany is the paternalistic state. The paternalism of the German Empire, applied to the creation of industrial efficiency, has secured wonderful results from the limited resources given by nature to the German people.'

'Students of industry became the advisers of the Government, the scientists in the laboratories of the Universities gave their services to agriculture and manufacturing; geographers and travellers studied with minuteness the physical characteristics of foreign countries; trade schools were established for the development of skilled factory labour, and schools of commerce for the training of salesmen.' (p. 151).

'The same may be said of the Japanese. Their development has been not less remarkable, and it is to be attributed not less to technical education. For some years the Japanese have been sending young men abroad to secure training in the military, naval, and industrial arts. We have just witnessed the remarkable results of such training for war; the results of the similar training for industry are not forced by circumstances into so high a light, but they are not less significant.' (p. 152).

The second paper is on "Scientific and technical education" by Professor, H. N. Allen, College of Science,

Poona. Prof. Allen points out that Lord Macaulay in his famous minute on Education, had distinctly in view technical education also. In the opinion of Prof. Allen—

' Clearly what Lord Macaulay had largely in mind was the introduction of scientific and technical education, to replace the immemorial system in which the ancient scriptures were committed to memory by the pupils, under the guidance of instructors, who often did not themselves understand what they taught. Although the forces of conservatism have been strong, and seem sometimes to have been aided by those who have the perfectly laudable aim of imparting a sound literary education to the thousands of Indian students who desire it, yet progress is at last being made.

Technical instruction, pure and simple, is now being rapidly developed by the efforts of Government, Municipal bodies and private benefactors.' (p. 104).

To avoid the probable danger of the supply of trained men exceeding the demand for their services, the author lays stress on the need of enterprise on the part of capitalists and merchants for starting new shops and factories to provide for these young men. When a youth after leaving school starts work under commercial conditions, he may not at once shine by the side of persons brought up in the hard school of a shop or mill. He should however, not be judged too hastily. Time should be allowed him to become acquainted with the severe conditions of commercial life. The author justly complains that nearly all the students who join the Technical School are from the middle class. Why should not the sons of wealthy merchants train themselves to be "officers in the industrial army?" The son of a manufacturer ought to train himself in mechanical Engineering or industrial chemistry, that his father's business may not crumble to ruin. Each pupil must learn to "form his own deductions from evidence collected by himself or set before him by his teacher," instead of borrowing without question views of others.

Mr. M. B. Sant, Asst. Secretary, Indian Industrial Conference, Amraoti, contributes a very interesting and suggestive paper on "A plea for naval schools and colleges

in India." Mr. M. B. Sant has made therein some very original suggestions and submitted a practical scheme for the revival of mercantile marine and ship-building industry, for the earnest consideration of his countrymen.

After alluding to the present wave of a general industrial awakening and the efforts for the spread of technical education, he brings out prominently the fact that one important branch of Technical Education, *viz.*, the Art and Science of Navigation and Naval Architecture is entirely ignored both by the Government and the people.

Mr. Sant shows that nearly 30 centuries ago India was acquainted with Inland and Ocean Navigation and her mercantile marine carried her commodities even to the most distant parts of the world. In the reign of Chandra Gupta and other ancient kings there were officers corresponding to the modern Port Commissioner, etc. Even coming down to recent times, he has proved that India was not at all backward in the art of ship-building and navigation.

Mr. Sant appeals for the establishment of an Indian mercantile marine for Indian workers. This he contends would make it more possible for Indian manufacturers to place their articles in the markets of their own and other countries, and would also provide a field for the enterprise and skill of a large surplus population. Mr. Sant concludes :—

‘For effecting the revival efficiently and on modern lines of Indian navigation, I would also suggest that Technical Schools and Colleges of navigation be established at the principal ports of India, *viz.*, Karachi, Bombay, Calcutta and Madras, on the lines of the following well-known institutions of England :—

(1) Municipal Science, Art and Technical School, Devon Port (teaches Navigation, Nautical Astronomy, Marine Engineering and Naval Architecture.)

(2) Municipal Technical School for Fishermen, at Hull, England (teaches Seamanship, Fishing and Navigation).

(3) Navigation School, Dundee, Scotland.

(4) School of Engineering and Navigation, London.

(5) The Thames Nautical Training College, London.

For the diffusion of Naval training among khalasis, other sea-faring classes and the general public important works on the theory and practice of navigation, should be translated into the principal vernaculars of India. The existing Translation Societies, like the Deccan Vernacular Society of Poona will confer a great boon on the educated public, if they set aside a certain sum every year, for translations of Technical and Scientific treatises on naval and technical subjects, instead of selecting old classical authors whose works do not possess in the eyes of the present commercial world, any value beyond mere academical interest. Educated men also should undertake the translations of such works, instead of frittering away their energies in writing works of fiction.

I trust, in conclusion, that my attempt will serve to attract the attention of the capitalists and the educated classes of India, to the revival of the mercantile marine and the establishment of Naval Schools and Colleges,—subjects which hitherto remain neglected.' (pp. 236 & 237).

Professor Sohrab R. Davar, F. S. S., the Principal of a College of Commerce in Bombay, is entitled to be heard with respect on "Commercial education and Indian industries." Prof. Davar takes a rapid survey of the growth of commercial education in foreign countries, where its importance was first realised. "Even in England the leading commercial country, it was unknown until a comparatively recent date." The rapid advance of commercial education during recent years is quite commensurate with the important part played by commerce all over the world. The only wonder is why the specialization of this line was not thought of before. The first city to recognise and introduce this education on a practical and scientific basis was Antwerp, where the first Commercial College was established in 1852. This example was soon followed by Brussels, Berlin and other cities. America and Japan soon followed suit. The success of these experiments induced the various Governments to help these colleges and schools by grants and other means. The causes which led to the adoption by England of commercial education are graphically described by Prof. Davar thus:—

'England, which has been enjoying for centuries the unique distinction of being the leading commercial country of the world, and whose children are thus armed with the practical grounding of generations, was

taken by surprise some years ago when the Germans so successfully began to storm the foreign markets that it had hitherto considered as its special preserves. They found themselves driven back inch by inch in the great commercial strife that ensued and at last they thought it time enough to investigate into *pros* and *cons* of this unexplained strength of their rivals. The result was not far to seek, for the great Schools of Commerce in Belgium, France, Germany, Austria and America were famous for the good work they were doing. In France and Germany the diploma granted to the successful candidates in Commercial Examinations reduces the term of compulsory military service, thus placing this diploma on a par with those for Law and Medicine. (p. 221)

Thus when the British nation was brought face to face with this problem, the practical instincts of the race were not slow to feel that in this one particular direction at least, its rivals had succeeded in stealing a march over it. Steps were at once taken to make up for lost time and that great institution, the London Chamber of Commerce appointed a Special Committee for Commercial Education which framed out a model scheme for imparting Commercial Education to England's rising generation.' (pp. 221 & 222)

There has been a lamentable neglect in India of commercial education, and the author expects his countrymen to rise to the occasion and lose no time for starting commercial schools and colleges, if they at all care to avert the ruin of their industries.

Mr. R. S. Troup of Imperial Forest Department, Dehra-Dun, gives in his paper on "Indian woods suitable for match manufacture" very valuable information which ought to be utilised by those actually engaged in or desirous of starting this important industry which holds out an unlimited field.

Mr. Troup shows that past attempts in starting match Factories did not completely succeed owing to wrong choice of sites, lack of expert advice, and ignorance with regard to suitable woods. That there is ample scope for this industry is evident from the fact that the value of matches imported into the country has been increasing by leaps and bounds, the figure having gone up to nearly 74 lacs of Rupees in 1907-08. The following

passages will give some idea of the scope for this enterprise which is generally not recognised :—

'So great, indeed, is the total consumption of matches in India, that it is estimated that if India were to manufacture all the matches she consumes, she would require at the present moment nearly 60 fairly large match factories in addition to those already existing, while within a few years, allowing for the probability of a trans-frontier land trade springing up, she would require at least 70 such factories.

To pursue the question a little further, it is estimated that if India were to manufacture all the matches she now imports, she would require annually for matches, match boxes, and packing cases, some 4 million cubic feet, or 80,000 tons of timber in the round. As most match woods are of the kinds known as "inferior" woods, which are often of little or no value for anything else, the benefit to the State and to the forests, through the cutting out and sale, even at very low rates, of this quantity of inferior timber, would be considerable' (pp. 123 & 124).

Most of the existing match factories are equipped with machinery made by a Berlin firm, the "peeling" process being used for making matches and match box 'Veneers.' Wood is used in green state in round billets usually 1 ft., 8 inches in length and 3½ to 8ft. in girth. The usual outturn of these factories is from 300 to 700 gross of filled boxes per diem. There is room also for the introduction of small portable machines on the Japanese plan, as they can be conveniently carried about from place to place in forest tracts. The Japanese methods deserve more extensive trials in India. Mr. Troup enumerates about 31 different woods with their botanical names, vernacular equivalents and localities of occurrence, being suitable more or less for match manufacture. Water transport is the cheapest method of conveying timber and a site for a match factory should be on or near a Railway Station or a navigable river.

The author brings his excellent paper to a close with the following remarks :—

'If the match industry in India is to reach the importance which it should do, it is necessary that the qualities of matches manufactured should be of a high order; cheapness of production ought not to be a bar, considering the comparatively low rate of labour and the abundance

and cheapness of suitable wood in some of the Provinces. In this connection competition between Indian manufacturers is quite uncalled for at present. Combination is all the more advisable, in that internal competition at present is practically non-existent, whereas foreign competition is one of the most serious menace to an Indian industry which is at present in its infancy but which with proper development has every prospect of becoming a most important one.' (p. 128)

"Some aspects of sugar industry in India" form the subject of the paper written by Mr. A. B. Shakespear of the well-known Sugar manufacturing firm of Messrs. Begg Sutherland & Co., Cawnpore. Mr. Shakespear in his treatment of the subject has displayed a rare insight into the *pros* and *cons* of the question and has placed his expert knowledge at the disposal of the Indian public. His paper is therefore a valuable pronouncement on the sugar industry, which in point of importance stands second only to the cotton industry. His paper touches upon :—

- (1) India's requirements in sugar.
- (2) How they are at present met.
- (3) The refined sugar fallacy.
- (4) Is it possible to replace foreign with the domestic refined sugar ?
- (5) The difficulties agricultural, manufacturing and transport attendant upon the expansion of sugar making in India.
- (6) Protection of this industry during development and establishment of an association of sugar producers.

The author cites figures to show that India consumes annually $4\frac{1}{2}$ million tons of raw and semi-refined sugar of sorts, produced at home and 5 million tons of foreign refined sugar. Glowing pictures sometimes drawn by enthusiasts of the enormous economic gain to be derived, if India could manufacture the whole of her sugar requirements, are more or less chimerical and are not warranted by the experience of those who had to face the practical difficulties in this manufacture. Along

with this paper may be read the portion of Mr. Noel Paton's excellent essay on "combination," where he deals with sugar industry. The conclusions of both the writers are practically the same ; causes of failure in attempts to revive this industry may be summarized thus in the words of the author :—

'Of the causes which at present tend to retard any advance towards more effective methods of cultivation and manufacture, there is the universal condition under which crops are raised in India, *i.e.*, the division of the cultivation into small holdings. With the exception of isolated tracts, the cane crop is raised in widely scattered patches, and this compels the farmer to crush his cane as near the field as possible (pp. 130 & 131). * * * * *

* * * 'The farmer is at present forced to combine with his neighbours and hire a small bullock-power mill, crush the cane, and make it into a saleable product. Here we have the root of the whole trouble. He does not recover nearly all the juice present in the cane, and he dissipates a large quantity of crystallizable sugar in the subsequent manufacturing operations. This is absolute economic waste and the sum total of the losses incurred by these little individual operations goes to make up the enormous bill which India has to pay to foreign countries amounting to nearly 8 crores of rupees' (p. 131)

* * * 'The resources at present available to the cultivator for bringing his cane to the factory are bullock carts, which is a slow and very costly method of transport and would never sustain a factory's requirements. A system of light tramways, following the main roads of the district, and radiating from the factory for distances corresponding to the capacity of the plant, is in my opinion necessary if a modern factory is to be effectively and economically served with cane supplies. As regards the improvement of field yields, the problem is, I think bound up with the intricate questions of irrigation and manure supply. It is beyond question that with sufficient supplies of water and manure, crops of cane can be raised in India which will compete in quantity and quality with those of almost any country in the world but to accomplish this, heavy manuring and abundant artificial water is required, in view of the short growing period which exists under natural conditions. In the matter of irrigation the resources of the cultivator in tracts which are not served by canals are limited by his supply of bullocks, and in short rainfall years even this source of supply fails, and with other crops to be attended to, he cannot economically concentrate all his energies upon his cane fields. I think the question of raising subterranean water for distribution from central points would well repay further investigation.' (pp. 132 & 133).

Professor V. G. Kale, M. A., of the Fergusson College, Poona, deals with "The present economic condition of India" in his excellent and informing paper. Prof. Kale essays to :—(1) take a rapid survey of the general economic situation of the country at the present time, (2) to determine the stage of growth we have reached, and (3) to indicate the directions in which further efforts should be made. The rapid rise of Japan and a close study of the industrial history of England and other countries have engendered in the minds of the people of India, the conviction that salvation of the land lies entirely in the industrial regeneration. "Memories of the past prosperities" says writer, "and despair of the future has combined to nerve men to a resolution to do something to re-occupy the ground which was fast slipping from under their feet." We quote below the concluding remarks of Mr. Kale, which contain the gist of the whole paper :—

'In short, the situation is this. An economic revolution is in progress in the land. The old national industries are dead or dying. New ones have not yet taken their place. The competition around us is keen and killing. We lack enterprise, capital, experience, scientific knowledge and sufficient State protection. Agriculture is in the most backward condition. There is congestion of labour in agriculture, which must be relieved by employment in manufactures. Poverty and ignorance stalk over the land. Conscious of their helplessness, and yet awakened to a sense of their duty, people are doing what they can to relieve the gloom that surrounds them. A ray of hope cheers their way and the Government is showing its interest in their efforts to revive old and start new industries. Most of the credit of the little progress that official reports and statistics show, belongs to European capital and enterprise. Most of what are called flourishing Indian industries with the growth of which India is usually credited, are in European hands, the fruit of their labour. The profits made from them naturally go out of the country and India is none the richer for them. People in India expect their Government to be national and do for them what other States have done and are doing for their own people. New India is Protectionist and wishes Government to adopt the same faith. The complete identification of the rulers and the ruled is the key-note of success. Single-handed, he people can do nothing. Nor have they done, it must be confessed, all that they should have. The little work that has been done only emphasises the vastness and the extreme difficulty of the whole problem. Some efforts are being made both by Government and people; but

infinitely much more remains to be accomplished. The future depends upon how we help ourselves and induce Government to help us. (pp. 177 & 178)

Mr. A. N. Datar, B. A., L. L. B., Director of Commerce and Industry, Baroda State, contributes a very valuable paper on "Industrial development of the Baroda State." It gives a birds-eye-view of the industrial activity of the State, and is an admirable resume of the steps taken year after year by the Government of His Highness the Maharajah Saheb of Baroda, who stands out to-day as the most enlightened and progressive ruler of a prominent Indian State. We regret the limited space at our disposal does not permit us to do full justice to the contents of this paper. We can merely mention some of the important institutions and industrial concerns which are progressing under the patronage and fostering care of His Highness :—

(1) Agriculture being the chief industry of the population deserves primary attention. In 1884 Rao Bahadur Khase Rao Jadhao, who is now the Collector of a District was first sent to England for being trained as a specialist in agriculture. This system of training up specialists in foreign countries has since continued.

(2) To impart practical instructions to the ryot in agricultural matters, demonstration farms and seed depots have been established. Information regarding new manures and other matters is circulated to them. Cultivators are taught improved methods of dealing with insect pests and blights. Dairy industries are spreading, almost every village being now provided with cream separators. The butter industry has become so profitable in certain localities that one village alone annually exports butter worth 2 Lacs of Rupees.

(3) Under the supervision of the late lamented Mr. N. G. Mukerjee a school of Sericulture is established at Vyara for making experiments in rearing eri worms ; it is making a steady progress.

(4) The kalabhuvan is already known far and wide for the excellent work it is doing in connection with technical education. A weaving class was added to this institution in 1897 and a class for watch making in 1902. Facilities are also provided for the training of artisans.

The Bank of Baroda, a few Agricultural Banks, Co-operative Credit Societies, and several other useful institutions are doing excellent work in the Baroda State.

"True patriotism and real swadeshi" is the title of a paper contributed by Mr. John Kenny, Director of Agriculture, Junagad State. We must give Mr. Kenny credit for the refreshing candour with which he has expressed his views on current problems. He is justly indignant at the tall talk in which certain people indulge, without realising the necessity of self-sacrifice. Says he :—

' We hear so much now-a-days of the progress of Japan, forgetful that one little but very important fact is left out of calculation when India is asked to follow in Japan's footsteps. The noble warrior class practically annihilated themselves before an advance was or could be made. Have we any such example in India? When we have, India will soon be a self-governing colony. This is true patriotism— the forgetfulness of one's self for the benefit of one's country.' (p. 196)

Mr. Kenny is very enthusiastic about improvements in Indian agriculture and hold the following views on this subject :—

' The work before the leaders of India lies in the agricultural line if it is to show any lasting success. Thirty years is a very small span in the life of a nation. Yet within that time wonders were wrought in Europe amongst the peasant population. Their priests were their natural leaders and devoted themselves heart and soul to the amelioration of the lot of their poor parishioners. Can we not find people in India to devote their lives to a similar object, men who will endeavour to spread the three R's in every village and add a little more to the knowledge of manures and their value? The sowcar must be replaced by the Village Banks and the Village Bank must be prepared to supply the best and cheapest artificial fertilizers where natural manures are insufficient, as is the case in all parts of India. That the Raiyat will take advantage of cheap money and cheap supplies of manure is amply proved by the "Interim Report of the first crop year 1908-1909 of the Nira Canal Tagai Loans Scheme, Poona District." Money to the extent of Rs. 2,66,500 was advanced on crops at 9 per cent interest and the

recoveries for this first year were Rs. 2,25,689 and Rs. 18,395 as interest. Rs. 2,07,815 were advanced against the crops due between October 1909 and June 1910.' (p. 197)

We now come to the paper of Mr. S. D. Saklatwala, B. A. of the Empress Mills, Nagpur, on "The Textile Industry of India, its present condition and future prospects." Mr. Saklatwala is an authority on the subject he deals with and his views ought to command close attention. The following factors have in the opinion of this writer contributed to direct the attention of the general public to the condition of our industries :—

- (1) Problem of labour.
- (2) Difficulty of dealing with strikes.
- (3) Question of short time working.
- (4) Want of technical education.
- (5) Problem of housing the operatives.
- (6) Home and foreign competition.
- (7) Swadeshi movement.
- (8) Factory commission.

The textile industry has "passed through many changes and though carried on in the past by more or less inefficient labor, under ill-qualified supervisors and in many cases by managers, who were merely content to follow old time methods and presided over by greedy agents, this industry stands to-day on a fairly strong basis:

Lack of joint effort, increase in production just at a time, when the market was in a depressed condition, disregard of the impetus given by the Swadeshi movement to place on the market products hitherto supplied by foreign rivals shortsighted policy of turning out worthless goods to compete with the fine products of Lancashire, slackness in keeping hold of already established foreign markets by supplying goods of uniformly superior quality, want of systematic effort to find out new markets, woeful lack of originality, servile imitation of better class mills,

marking of inferior goods with the number of superior mills, imitation of labels and trademarks of other factories—all these are the drawbacks of the present textile industry of India.

One remedy suggested by the author deserves a very careful consideration at the hands of those who are engaged in this line and are struggling hard for success. "Why can our mills (says he) not specialise, certain mills supplying only certain lines?"

The author deplores the injustice which is being done to this industry by the levy of the iniquitous Excise duty, but welcomes the advent of the new factory bill, which, in his opinion, is bound to prove beneficial eventually, as it will rescue the operative and increase his efficiency.

In concluding his paper, Mr. Saklatwala calls the attention of capitalists to the necessity of improving the quality and quantity of cotton supply and also to the formation of reserve funds for the permanent stability of the industry.

Mr. C. S. Raghunath Rao of the Agricultural College, Pusa, in his paper on "Gardening and box making" puts forth "a plea for nature study and manual training" and his treatment of the subject is deeply interesting.

To a nation desirous of entering upon a career of industrialism after centuries of indolence and indifference for the progress in the country of modern arts and sciences, the sound advice of Mr. Raghunath Rao is quite opportune, as it will lead to the training of the younger generation along more practical lines, instead of their taking to the merely academical courses. The author largely quotes Professor Geddes to show that "any system of education worth the name should have in view the development of all the faculties and such development is best attained by the use of tools and gardening work." Adds he :—

'Does gardening give the rustic child this needed schooling? Yes, and to an extent that books can never dream of doing. The latter can load the memory of the pupils with facts, but they can never train the

powers of observation and give the children an intelligent interest in the every-day facts of rural life. The training which a child receives by gardening leads to an appreciation of the dignity of labour, and of the beauty in nature, and eventually arouses in him a spirit of enquiry which is the foundation of all scientific progress and research. It will thus be seen that the education of the rural child has a large bearing on the progress of agriculture and the prosperity of the country.' (p.201).

' In the first place, the boy who uses tools must necessarily use both his eyes and hands, and the value of this training in later life cannot be lightly estimated. Secondly, the tools employed call into play all the muscles of the body, including those of the leg, trunk and chest. Thirdly the boy enjoys the work —this cannot be said of books, for few boys ever think of taking a book unless compelled to do so, and on this account he is impelled by the interest of the work to develop the powers of thinking. And lastly, the occupation, involving as it does personal effort, develops the boy's will-power. In short, there is no other occupation in which a child can so well and simultaneously develop his physical, mental and moral powers. As regards the other objection that the ideal of the occupation is low, it need scarcely be pointed out that the financial consideration of the work does not at all enter the boy's head.' (p. 201).

What is of the utmost importance is that instruction in rural schools should be so arranged that "*teachers may teach less but learners learn more.*" The advantages of box making or similar pursuits requiring the use of tools may be summed up thus in the words of Dr. Larsson, one of their ablest exponents :—

1. It arouses self-respect and instils respect for all honest labour.
2. It develops self-reliance, concentration and the power to make and execute a plan.
3. It develops habits of order, accuracy and neatness.
4. It develops the æsthetic sense, the power to judge rightly as to beauty of form and proportion.
5. It develops right feeling by stimulating the desire to be useful, and by its appeal to the affection through the cultivation of consideration for others.
6. It strengthens the will by offering such motives as will induce a boy to work hard, and steadily to overcome increasing, but carefully graded, difficulties.' (p. 206).

We now come to Mr. Puran's contribution on "the utilisation of some Indian tanning materials for the manufacture of tannin extracts." Mr. Puran F. C. S. in his capacity as Assistant Imperial Forest Chemist, Debra Dun

possesses special facilities for accurate study and research in the subject he has so ably dealt with. Mr. Puran points out that with the advance of chemical science, the old methods of bark tanning have now been replaced by new processes dependent on the use of tannin extracts. The industry of preparing these extracts is assuming great importance in France, Germany, England, America and other countries. He quotes statistics to prove that the demands for bark and wood for feeding the tannin extract factories is so enormous that serious apprehensions are entertained of the approaching shortage of the raw materials. It would be more economical and paying, if factories for these extracts are established in the heart of the forests of India and other tropical countries. The author then gives a list of forest trees which contain tannin and exhorts his countrymen to start these factories in suitable localities. He has drawn up a complete estimate of the probable amount of capital required for starting a tannin factory.

The paper of the Hon'ble Rao Bahadur G. V. Joshi on "Thoughts on the Calcutta Exhibition of 1906" deserves a very careful perusal and a prominent place owing to the originality of the several important suggestions made therein and its breadth of view.

We give below the summary of his paper in his own words :—

(1) The formation of *Trade Museums* at all the provincial centres and in the Presidency towns, as also *one central museum for all India*.

(2) The publication of descriptive catalogues and hand-books both in English and the principal Vernaculars regarding the more important economic products and manufactures of the country.

(3) The institution of *special inquiries* in the Department of Commerce and Industry at each exhibition with a view to ascertaining the requirements of foreign trade in Indian articles.

(4) Collection of *samples of foreign manufactures* and supplying *information* in relation to them—the methods of manufacture and the machinery employed—to the *native manufacturers*; *one or two industries to be selected for such treatment at each exhibition*—industries for which India possesses special facilities.

Much work has to be done on the same lines in regard to *mining*.

(5. Request to Government this year to place Mr. Hadi and Mr. Dutt on *special duty*, one in connection with sugar-refining and the other in regard to mining who should visit the various Provincial centres with a view to dissemination of a knowledge of the newer methods amongst the people.

As regards art work, organisation of.

(a) *Local Museums and Local Committees.* } at the centres of art manufacture.

(b) *Provincial Museums and Provincial Committees* } with a view to a comprehensive effort.

(c) *Moveable exhibitions*—In foreign countries with a view to promote a wider appreciation of Indian Art work.

(d) The formation of a bureau of Indian Arts under the direction of the ministry of Commerce and Industry to have the care of all this work. (pp. 285 & 286).

A complete description of the industrial activity of Kashmir will be found in the exhaustive "Notes on the arts and industries in Kashmir" drawn up by Mr. A. Mitra, Public Works Minister. Mr. Mitra reviews historically the following industries of the State with valuable suggestions for their revival :—

(a) Shawls.

(b) Embroidery.

(c) Woollen, cotton and textile fabrics.

(d) Carpets.

(e) Paper mache.

(f) Wood work and wood carving.

(g) Metal work.

(h) Stone work and carving.

(i) Sericulture.

The author points out that Kashmir affords very suitable ground for the advance of technical education owing to general dexterity of its inhabitants. There is also ample scope in that state for the introduction of nearly twenty industries which may be taken up in right earnest by the people of Kashmir or outsiders who may find it convenient to settle there.

"Joint Stock Companies and Co-operation in the Punjab" is the title of a very instructive and informing paper

by Mr. W. S. Hamilton, Registrar, Joint Stock Companies, Punjab. In his opinion—

‘ Mistakes have been made and failure has been not uncommon: many Joint-Stock Companies are defunct, others are moribund or racked with disease ; but those which are still alive, must be nursed into greater vigour ; and the multiplication of healthy Joint-Stock Companies is not only beneficent but indeed indispensable. We can bless the movement of co-operation amongst capitalists and recognize it as a mighty industrial power while we do not shut our eyes to the disasters of the past and the blemishes of the present.’ (p. 304)

After defining a Joint Stock company as a combination of small capitalists to form one large capital to be used for specific purposes under the direction of the representatives of the capitalists, the author proceeds to point out the importance of the following factors for the successful working of these concerns :—

(1) Sufficient funds for buildings, machinery, payment of salary and wages, to tide over the initial period unremunerative outlay.

(2) Public confidence, without which there will be no response to the blandishments of the company promoters.

(3) Necessity of corporate along with individual honesty.

(4) Like the captain of a ship or the general of an army, a director of a company must possess “ scientific knowledge, presence of mind, dash, courage, zeal, and the habit of command.”

(5) The promoters or contributors of capital must not usurp to themselves the actual management of the concern.

(6) There should be no hurry to declare a large dividend and to make its early payments.

(7) Shareholders should exercise in full their rights of supervision over the working of the concern.

(8) The correct audit of accounts by officers approved by Government.

Professor Jogindranath Samaddar contributes two valuable papers one containing "Some reflections on co-operative credit" and the other describing the "progress" of that movement." Professor Samaddar proves conclusively with the aid of reliable statistics that since the passing of the Co-operative Credit Societies Act in 1904, the movement is spreading with extraordinary rapidity during the last few years and its beneficent results are becoming perceptible, the money lenders in many districts having reduced the rates of interest. The Urban and Rural Societies and the Agricultural Banks show a distinct advance and the prospects of this movement are on the whole very cheering.

The contribution of Mr. C. S. Raghunath Rao on "Agricultural credit" should be read with the above paper. In any scheme of agricultural reform, says he, "the organisation of capital must perforce take the first place." His treatment of the subject is very able and exhaustive and any attempt at summarising the contents of this paper would mar the effect of the original, which we would strongly recommend for the careful perusal of all interested in the subject.

"Life Insurance in India" is the theme selected by Mr. Narain Das, B. A., C. E. of Amritsar for his extremely wellwritten paper. Insurance is a very old business in Western countries. It commenced first with Marine insurance and then it came to be applied to life and fire. Its modern developments, may be described thus :—

' We can not only insure our ships against the fury of the waves, our houses or property against the risks of fire, or make suitable provision for those dependent upon us after we are called off to other words by a Higher Power that rules our destinies but we can secure compensation in the event of loss of sight or limbs through accidents and, if we are, only up to date in our information as to the various schemes of Insurance in force in the West, we can insure our crops against the devastation of hailstorms, our plate-glass against the carelessness of servants of mischief mongers, our cattle against the ravages of disease our ledgers against bad debts and our business investments against the

risks of possible loss. We can have the fidelity of our clerks and establishment guaranteed and our race horses assured against the infidelity of grooms open to temptation. Add to these, the House Purchase Schemes that have been recently introduced and have become so popular in Europe, and you have, before yourself, the whole Modern Assurance business in a nut shell. You will, thus, see how largely it guards, enriches and improves human life in all its aspects and connections, social, industrial, physical, and even political.' (p. 291.)

The insurance business presents in fact an unlimited field and it behoves our country men to seriously devote their attention to this important branch of national industry. After alluding to the principal insurance companies started recently with Indian capital and working under Indian management, the author proceeds to a detailed consideration of the principles involved in Life Assurance business and points out the items which bring jointly or severally revenue to the coffers of a Life Office which it is needless to recount here.

As a managing proprietor of the boot and shoe factory of Amritsar, Mr. D. N. Rozdon has very practical suggestions to make anent "Tanning and leather manufacture." He speaks from personal knowledge and practical experience of the subject he deals with. After describing the various uses to which leather can be applied, he proceeds to point out the importance of establishing tanneries on modern lines in different parts of India as there is unlimited scope for this industry.

We have now to call attention to an excellent paper or rather a treatise on the "Development of Glass-making" by Mr. Alakh Dhari, Secretary, Upper India Glass Works, Amballa city. Mr. Alakh Dhari is an expert in Glass-making and his genuine interest in the subject may be gauged by the amount of labour that he appears to have bestowed in collecting valuable information and in making many practical suggestions. "According to Pliny and other classical writers of Europe" says the author, "there was a tradition among the ancient that the best glass in the world was manufactured in India." Antiquarian

researches have also disclosed the interesting fact that glass-making was known in Egypt, Phœnicia, Greece and Rome. Through Budhistic and other influences, the art appears to have travelled from India to China and Japan. The glass bangle industry seems to have existed at least for the last three centuries and it is yet lingering on in several places even in spite of fierce foreign competition. The principal old centres of glass-making are Najeebabad, Benares and Nagina in U. P. and some places in Bengal and Punjab, where glass phials and flasks are manufactured.

During the last 25 or 30 years, a new school has come into existence for developing this industry on Western lines. Two factories in Bengal, one at Sodepore and the other at Titagarh had to close their business owing probably to the inexperience of the promoters and other causes. The Rajpur and Ambala factories and several other ventures in this line are being made at present in different parts with varying degrees of success.

The difficulties in glass-making may be enumerated thus:—

‘A serious obstacle in the way of the rapid development of the new school of glass-making is the scarcity, or rather the absence, of a tolerably pure supply of indigenous alkaline base for making glass. If our scientists could succeed in devising some method whereby sodium chloride, which is so abundantly available in India, could be introduced into the glass-pot in its natural (*i. e.*, common salt) form, this great problem would soon be solved. As it is, the volatile character of the chloride at high melting points presents a serious difficulty; for, before the sodaic substance can combine with silicic and other ingredients, a great portion of salt disappears by vaporisation. This difficulty has been overcome in Europe by first depriving sodium or potassium chloride of its volatile character and for this purpose it is converted into a sulphate by the direct action of sulphuric acid. The resultant substance is rendered anhydrous in a reverberatory furnace and then calcined with a mixture of lime and coal forming a black coloured carbonate, which is afterwards lixiviated in a successive number of tanks in order to produce the commercial carbonate of soda. This method of treating salt is known as the famous ‘Le Blanc’ process. Another treatment of salt, which is called the ‘Ammonia-Soda Process’, consists of gaseous Ammonia being passed into a solution of salt

and water and played on by carbon di-oxide until the solution is thoroughly saturated. The acid carbonate of soda, thus formed, is heated and turned into the carbonate of commerce. A number of bye-products are also obtained and as they have considerable commercial value in Europe, the cost of the main product is very much cheapened there.' (pp. 275 and 276.)

The author makes certain valuable suggestions which can only be studied by reference to the original paper. To this group belongs the paper of Mr. Kannayalal, Drawing master, Lahore, on "Pottery, tiles manufacturing, glass-making and enamelling." Mr. Kannayalal shows the importance of these industries and describes the processes employed by Indian artisans, and appeals to his countrymen to emulate the example of an Englishman who, for the sake of learning the secret of manufacturing steel, joined a Japanese factory in the garb of a beggar and enriched himself and his country after mastering the secret.

"Cocoanut oil and coir industry" are dealt with by Mr. R. R. Nabar, B. A. of Bombay in an exhaustive and ably written paper. Facts and figures collected by Mr. Nabar disclose a true business insight and furnish valuable material for those interested in manufacturing various articles as well as the bye-products of the cocoanut, which grows so abundantly in several parts of India, with the aid of modern machinery and appliances. The author estimates the total output of cocoanuts in India at the colossal figure of 360 crores every year. Mr. Nabar demonstrates with the aid of reliable statistics that exports of cocoanut fruit and copra are steadily increasing, while exports of coir have fallen. This shows that Germany, England, France and U.S.A. who are our customers prefer to purchase our raw materials, as they wish to provide employment to their own capital and labour and thereby get a larger return on them." Consequently Indian capital and labour remain unemployed. Oil, cocoabutter, candle, soaps, mattresses, cordages and several other articles and bye products are made from the cocoanut. This fruit can be divided naturally into four distinct parts.

(1) The outer husk out of which bristle or coir is made.

(2) Kernel or copra for oil and butter.

(3) Shell for buttons and other articles.

(4) Water for several bye-products.

The advantages in favour of this industry as well as the practical difficulties in its way are thus described by author:—

SOME ADVANTAGES IN FAVOUR OF THIS INDUSTRY.

(1) The Indian Cocoanut is the best of its kind in the matter of oil and color yielding properties.

(2) The crop is available four times a year at a short interval of three months and so the mills and other works need not be closed like those for expressing cotton seed oil where the crop is only once a year.

(3) The cocoanut crop is more independent of the vagaries of the monsoon than cotton, wheat, &c. Consequently, the prices do not much vary and therefore, will not disturb the continual working of the mill.

(4) The raw material is very cheap in comparison with the price of the very finished articles such as cocoabutter and the manufactured articles of coir.

(5) Labour and fuel are cheap and plentiful.

(6) Cocoanut trees being along the sea-coast, cost of carriage, both for raw and finished articles will be the least.

(7) The amount of capital required for starting a large mill with all the latest appliances for turning out all the abovementioned finished articles will be comparatively small, that is, a few lacs.

(8) The market is certain, both for raw and manufactured articles, both at home and abroad.

CERTAIN DEFECTS WHICH CAN BE REMOVED EASILY.

(1) Introduction of modern machinery on a larger scale and more scientific methods in the place of antiquated and wasteful ones.

(2) Establishment of Techno-Chemical Laboratories like that of Prof. Gajjar in Bombay in connection with the oil and coir mills to find out how bye-products can be made out of waste materials. (pp. 352-353)

“ High prices of food stuffs in India is the subject chosen by Mr. Seedick R. Sayani of Bombay. Mr. Sayani points out that the trade of any country is affected by wages prevailing therein and these chiefly depend on the prices of the necessaries of life and argues the need of this subject being taken up by the Industrial Conference

for the purpose of suggesting some remedies for the prevailing high rates. The price of an article being its value in terms of money, the lowering of the value of money, *i. e.* (Silver) has been one of the principal causes of the phenomenal rise of prices in India.

According to Mr. Sayani prices are affected by the following causes :—

- (a) Foreign competition.
- (b) Growth of population.
- (c) Importation of precious metals, especially silver.
- (d) Opening of the country by railways, telegraphs, etc.
- (e) Building up of real credit.
- (f) Fall in the price of silver compared with that of gold.

Mr. A. P. Ghosh of the Commercial Intelligence Department, writes on "Brinjal cultivation." Mr. Ghosh gives an estimate of the total expenses per bigha and proves that it is a very lucrative industry.

SUMMARY OF PROPOSALS AND SUGGESTIONS

A.—*The work of the Conference*

1. Future Exhibitions should be attached directly to the Industrial Conferences rather than to the Congress. (*Lala Harkishen Lal*, p. 5.)
2. The Conferences should be held at Easter rather than at Christmas to enable people to devote more time and more attention to economic subjects than has been hitherto the case. (*Ibid*, p. 5.)
3. The Industrial Conference would be doing a deal of good, if it directed its energies in classifying industries into groups, susceptible of Village system, Factory system and otherwise. (*Ibid*, pp. 11-12.)
4. The Industrial Conference and its members, should familiarise the people with the principles and application of co-operation. Co-operation may in a measure overcome the difficulties experienced by people in acquiring sufficient capital for their undertakings. (*Ibid*, p. 12.)
5. It might serve a good purpose if this Conference were to appoint a small select committee to consider the whole question of standardisation (of weights and measures) and to report at the meeting of the Conference next year what in their opinion ought to be the best means of gaining the end in view. (*Maharaja Sir Rameshwar Singh Bahadur*, p. 23.)
6. If the result of the deliberations of the Conference is to appoint a committee, as the Maharaja suggests to further consider this subject (Standard weights and measures) and bring it prominently before the public, I am sure that that result will be of the greatest possible benefit. (*His Honor Sir Louis Dane, the Lieut.-Governor of the Punjab*, p. 29.)

7. Capitalists should be furnished with approved forms suitable to any particular industry. (*Mr. F. Noël Paton*, p. 56.)
8. These meetings would be more fruitful if one or two specific subjects were prescribed for each year and arrangements made for a symposium of opinion from all the several provinces of India. The speakers would then come up with their budget of local experience and in many cases we should probably make a definite step towards action or at all events towards the formulation of a principle and a policy and towards the prescription of lines to be followed at the succeeding meeting. (*Ibid*, p. 58.)
9. It behoves those concerned in the many industries of India, and especially the sugar industry, to be prepared for the change (in the trade policy of the empire) should it come about, for on no industry in India would the initiation of a protective tariff have as far-reaching effects. It seems to me of the utmost importance in these circumstances that the industry in this country should take steps to coalesce and frame a definite policy for its guidance. (*Mr. A. B. Shakespear*, p. 133.)
10. This Industrial Conference should do all in its power by practical measures to attract the attention of the people to the true value of Industrial and Commercial Education as vital factors in national and international progress. (*Rev. T. C. Badley*, p. 159.)
11. The Industrial Conference shall get Actuarial Training included in the list of foreign studies worthy of attention at the hands of our rising students. (*Mr. Narain Das*, p. 299.)
12. We should establish the Indian Industrial Development Society with head-quarters either in *Bombay* or *Calcutta* and branches in every province with sub-agencies in every city. The Head Office should

be in a position to provide every kind of information the branches might require for the development of indigenous industry and in establishing new industries, the work of the provincial branches should be to be in communication with the people and put before them proposals and some ideas in which way certain industries should be carried out and if developed what machinery and what expenses would be incurred and also what profit could be made out of them. The chief aim of the branches must be to form companies and if companies are floated, people will take a larger interest in the work than if such concerns are financed by single persons. (*Mr. A. Tellery*, pp. 301-302).

13. The branches and Head office should also help the manufacturer to find a market for his goods and also be helpful to him in other ways. The Society should give all preliminary advice *gratis* but if the person or company is starting work or ordering goods through the society, then in all such work a certain commission should be charged which would pay something towards the expenses. (*Ibid*, p. 302.)
14. The Society should be the right hand of the Indian Industrial Conference and through it the Conference would be in a *position* to verify all the information necessary to be put before the General Meeting which requires to be brought before the general public or the Government. (*Ibid*, p. 302).
15. An annual report of the working of the Society should also be put before the General Meeting of the Indian Industrial Conference for the information of the public and the members of the Committee. (*Ibid*, p. 302).

B.—Investigation

16. It is a problem worth considering whether we should direct our energies towards centralising institutions and work them on Factory system or devote our attention towards what is now termed village industries. (*Lala Harkishen Lal*, p. 11).
17. The first and principal need is an investigation by eminent authorities of the potentialities of sugar production in India on modern methods and this investigation must be conducted under practical working conditions. A mere *ipse dixit* that salvation is to be found in this or that system, is not sufficient to convince capital, much less Government, and we must be able to present to both an undeniable proof that India can supply the consumer with the white sugar internally as cheaply as our competitors over sea. Once establish this fact, and a case is made out for protecting the domestic industry, temporarily at any rate by means of a moderate import duty in order to encourage capital to engage in its development. (*Mr. A. B. Shakespear*, p. 134).
18. In my last year's article I suggested that a committee be appointed in every province to go thoroughly into this industrial question and prepare schemes of work which can be carried out. (*Mr. A. Tellery*, p. 301).

C.—Education

19. Scientific agriculture must begin to be taught and learned at all the primary schools in India, every pupil being practically instructed by means of gardens being attached to each school. (*Maharaja Sir Rameshwar Singh Bahadur*, p. 17).
20. The agricultural education of the people must be put in the foreground of the endeavours of the Government and of all our educational authorities. (*Ibid.*, p. 17).

21. If these undeveloped resources along with the other mineral wealth of the land such as iron, manganese, mineral oil, etc., etc., are to be exploited by the sons of the soil, no time should be lost in encouraging the educated youth of the country to specialise, in the departments for which they are fitted, for their future work. We have already technical schools and colleges but these educational establishments will have to be multiplied manifold ; all parents and guardians who have the means should give the heartiest encouragement in their own spheres of influence, to that technical education, without which their sons will be of little use in taking a grip of the professions and industries by means of which we hope to work out the commercial and industrial salvation of India. (*Ibid*, p. 19).
2. Chemists and Electrical Engineers are wanted in India and these are professions eminently suited for educated young men. The time is at hand when every considerable engineering and textile work will have an expert chemist on their staff, and as for applied Electricity, the vision before us is one of incalculable progress in every sphere of life (*Ibid*, p. 20)
23. For example it would be difficult for a man who had dealt in wheat all his life to be sure that if he erected a flour mill and employed a manager he would be able to check that manager's estimates of cost of production at any given date. My own opinion is that our commercial schools ought to give more attention to these matters than is now bestowed on them. The comparative failure of technical and scientific education is attributable to the fact that students are not taught how to find the costs of the materials and processes involved in their operations. (*Mr. Frederick Noel Paton*, pp. 55-56).

24. The first advance that must be made is to encourage a belief in the dignity of manual labour ; to realise that it is not the dust and sweat of industrial pursuits, (which can be washed off by the application of a little soap and water) that defile a man; but that not all the holy water of Ganges can eradicate the stains too often produced on the mind by the influences to which youths with busy brains but idle hands are subjected. (*Mr. T. H. D. La Touche*, p. 84).
25. The foundation and fostering by Government of Universities and Schools however indispensable they may be, can never by themselves supply the whole of your needs. But you should encourage the smallest spark of inventive and constructive genius that may from time to time discover itself in the younger men of the coming generation, especially in those of the better and well educated classes ; and above all, by using all your influence to discourage the idea that there is anything derogatory to personal dignity in engaging in manual labour. (*Ibid*, p. 84).
26. The cabinet maker or carver should be able to provide his own patterns, just as much as the illuminator who does the actual work himself. The teaching and suggestion of the tool is as important if not more important than the actual use of the tool itself. (*Mr. W. S. Hadaway*, p. 88).
27. The head of the institution (art school) should be not only conversant with many crafts, but a master of one at least and a man of catholic and wide interest and sympathies and fine artistic taste and perception. (*Ibid*, p. 90.)
28. So far as the actual conduct of a School of Art goes, local circumstances will affect the curriculum, the artistic crafts known or practised in or near a parti-

cular place, and other crafts new to the place which may be of benefit to already existing industries should be the first thing to consider. (*Ibid*, p. 91.)

29. If there is any likelihood of picture painters working successfully after their training in school, likely students should be encouraged to study painting and drawing with this object in view—the difficulty in Madras in this respect is to get really good teachers, and poor teaching is almost worse than none. (*Ibid*, p. 91.)
30. Drawing masters, too, for employment in schools of general education should be taught, though, here again the same difficulty as to teaching crops up. (*Ibid*, p. 91.)
31. Furniture making, too, would be greatly improved if the ordinary tradesmen followed the patterns and careful workmanship of the best school work, and the metal-work of the country, so important a craft in almost every part, should look to the schools for improvements in patterns, and in alloys. (*Ibid*, pp. 91-92.)
32. Another mistake is in looking to a School of Art as a place where experiments toward the starting of new industries are desirable. This should be the work of either a separate Government department, or, better still, of enterprising individuals, who might, if successful ultimately benefit by their own Pioneer work. (*Ibid*, p. 92.)
33. Many a good workman would be more efficient with a knowledge of drawing, and for carpenters and metalworkers, a knowledge both of decorative drawing and enough simple geometry for practical use is desirable. (*Ibid*, p. 93.)
34. Ornamental drawing can best be taught to young students by copying and adapting good specimens of old work. (*Ibid*, p. 93.)

35. The well known acanthus leaf ornament of the west is the backbone, the foundation of all ornament and whether it nearly represents actual leafage in nature or not it is still the great essential in designing. Other well known units or designs, the mango, the peepul leaf, the lotus, and the host of grotesque and animal forms commonly found in old work should be thoroughly well taught to the student. (*Ibid*, p. 93.)
36. Improvement may be made by references to nature and by becoming familiar with certain well-defined natural characteristics, such as reasonable anatomical structure and simple and possible growth. Even a grotesque form should look as though it might be possible and joints and legs should not be so far from nature as to be ridiculous. (*Ibid*, p. 93.)
37. It is essential, if drawing and painting by western methods is to be practised, that a knowledge of rendering objects as they appear to the eye be gained. This is a matter of close observation, of teaching the pupil to see accurately, more than anything else. (*Ibid*, p. 94.)
38. It is, on the contrary, essentially necessary that the younger members of families of good social status should learn the best methods of running a large factory and qualify for responsible executive positions in such a factory. (*Mr. J. E. O'Conor*, p. 100.)
39. Technical Schools and Colleges are wanted, and as usual the tendency is to look to the state to supply them. Let me recommend however, that the community should found them and should be content with grants-in-aid from the state. The late Mr. Tata of Bombay gave a noble example of how such things should be done, and I wish that there were even ten other men like him, patriotic,

independent, far-seeing, and splendidly public-spirited, ready to do something like what he did. (*Ibid*, p. 100.)

40. When a youth first leaves school, he should however, not be judged too hastily. Time should be allowed him to become accustomed to the severe conditions of commercial life, when it should be found that, in many cases, his grasp of principles, his avoidance of rule of thumb methods, his cultivated intelligence and even his gentlemanly bearing will make him a much more valuable man to his employers than those who have not had his educational advantages. (*Mr. H. N. Allen*, pp.104-105)
41. Sons of the wealthy manufacturers, should be training themselves to be officers in the industrial army. Wealth is a stewardship, and the accumulation of great fortunes in individual hands can only be excused on the ground of important services rendered to the country by those holding them. (*Ibid*, p. 105.)
42. The sons of a rich man are in duty bound to prepare themselves, by every means in their power, for the future administration of their fathers' wealth; learning how to use it to increase the prosperity and happiness of their fellowmen. (*Ibid*, p. 105.)
43. A man who in the future will draw a large income from agricultural sources should, in general, study agriculture thoroughly and scientifically, and devote his life to the agricultural development, not only of his own estates; but also of the surrounding country. (*Ibid*, p. 105.)
44. The son of a manufacturer should prepare himself for his life's work by a thorough course in Mechanical Engineering or in industrial chemistry, if he cannot find a school or college giving a course in the special line of industry to which he will afterwards have to devote his energies. (*Ibid*, p. 106.)

45. There are few countries in which a general diffusion of the knowledge of the methods of modern science is so greatly needed as it is in India. (*Ibid*, p. 106.)
46. Much further study will be needed before the laws of inheritance of the different human qualities, bodily and mental, are fully worked out but it does not seem an impossible dream, having in view the careful regulation of marriage which already exists in this country, that voluntary associations for the improvement of the race may be formed, the marriages of the members, and of their children, being arranged on scientific principles, so as to perpetuate, and even by careful selection to improve, the best elements in humanity. (*Ibid*, p. 107.)
47. The study of science should begin in the schools. The practice of confining such instruction to the study of a few isolated chapters in a School Reader cannot be regarded as satisfactory. Science badly taught has little value from an educational point of view. Its real value is in the training which it gives in methods of careful observation, experiment and measurement, and in the insight it gives into the manner in which knowledge is to be obtained by means of these methods. (*Mr. H. N. Allen*, p. 107.)
48. Knowledge of truth should be cultivated for its own sake. (*Ibid*, p. 108.)
49. To some extent this is unavoidable ; but one could wish to see the love of learning for its own sake grafted on to the love of learning for the sake of a livelihood. (*Ibid*, p. 108.)
50. The spirit of scientific research, in natural sciences, also in Mathematics, History, Political Economy, Philology, Archæology and Anthropology should be encouraged and developed. (*Ibid*, pp. 108-109.)
51. Experience alone cannot supply this need : the man must come to his profession with a clear-

- cut knowledge of the principles underlying the problems of modern commerce and industry. To reduce this knowledge to a science and to impart it to the young men who are to be the future "Captains of Industry" of a nation is the special province of commercial training. (*Rev. T C. Badley*, p. 157.)
52. Larger numbers of Indian students must receive instruction in mining and metallurgy, licenses and mining leases must be altogether withheld from or more sparingly given to non-Indians, and Indian enterprise and capital ought to be encouraged. (*Prof. V. G. Kale*, pp. 173-174.)
53. The State here must make it its serious business to see that Indian resources are developed in the interests of India and its people. It must give us all the facilities we want; nay much more. It must stimulate interest, spread broad-cast primary, technical and scientific education, send young men in their hundreds and thousands to foreign countries to learn various industries there, help capitalists and enthusiastic men to start new industries and protect them against outside competition. (*Prof. V. G. Kale*, pp. 176-177.)
54. What is most urgently needed is Technical and Industrial Education. (*Mr. A. N. Datar*, p. 178.)
55. Can we not find people in India to devote their lives to a similar object, men who will endeavour to spread the three R's in every village and add a little more to the knowledge of manures and their value? (*Mr. John Kenny*, p. 197.)
56. Any system of education, worth the name, should therefore have in view the development of *all* the faculties. Such development, in the case of children, is best promoted by occupations which involve the use of tools. (*Mr. S. Raghunath Rao*, p. 201.)

57. What is required of the pupils in rural districts is a maximum of out-door work with a minimum of book work. (*Ibid*, p. 204.)
58. (1) That a closer connection should be established between the Educational and Agricultural Departments in the control of rural education,
 (2) that the Director of Agriculture should be a Member of the Text-book Committee appointed to revise the curriculum and text-books of rural schools,
 (3) that the Provincial Directors of Agriculture should submit the revised text-books to the Imperial Department of Agriculture for advice before their final adoption. (*Ibid*, p. 204.)
59. Nature study is thus one of the surest ways of preparing children for engaging successfully in occupations of rural life, and one of the methods by which this object is attained is by means of school gardens. (*Ibid*, p. 205.)
60. With the aid of a few simple tools, and with a trifle expenditure, every boy ought to be able to make some really useful articles of domestic use such as a shelf or book-case. The labour involved in the work is such as to develop all the faculties of the child, and the child who is able to make a neat book-shelf will have learnt, untaught, lessons of personal intelligence, ability and unselfishness. (*Ibid*, p. 205.)
61. The only course laid open to us is to meet the competitors of the West on their own scale, armed with the up-to-date training in industries and commerce and run our enterprises on large lines. Turn out a large army of highly trained commercial and industrial experts of our own. (*Prof. S. R. Davar*, pp. 224-225.)

62. Therefore, another point, which must be looked to, is the imparting of technical education to our youth with a view to fit them to be leaders capable of organizing and guiding our labour. Our youth must be taught to attach the same value to industrial as to literary education. We must not only look to our Educational Department to supply the want ; the combined efforts of our millowners can do much in this direction. In fact, as far as textile industry is concerned every mill can be a training ground for apprentices. (*Mr. S. D. Sakalatawala*, p. 230.)
63. For effecting the revival efficiently and on modern lines, of Indian navigation, I would also suggest that Technical Schools and Colleges of navigation be established at the principal ports of India, *viz.*, Bombay, Karachee, Calcutta and Madras on the lines of the following well-known institutions of England :—
- (1) Municipal Science, Art and Technical School Devon Port, (teaches Navigation, Nautical Astronomy, Marine Engineering and Naval Architecture.)
 - (2) Municipal Technical School for Fishermen, at Hull, England, (teaches Seamanship, Fishing and Navigation.)
 - (3) Navigation School, Dundee, Scotland.
 - (4) School of Engineering and Navigation, London.
 - (5) The Thames Nautical Training College, London.
(*Mr. M. B. Sant*, p. 236.)
64. In order, to derive full advantage from the training received by our youths in foreign countries it is necessary that students should first be admitted in some factory in India for a short course of apprenticeship and be given there a good grounding in the essential elements of this glass industry and

made fully acquainted with the character and properties of raw materials available in the land and the manner of their present treatment in our factories, together with a practical demonstration of the defects of our older systems and the difficulties under which we labour. They will then be in a proper position to follow intelligently the processes of glass-manufacture pursued abroad and be also able to learn how best to adapt foreign methods to the exigencies of our own conditions. (*Mr. Alack Dhari*, p. 271.)

65. We should have well-equipped laboratories, run on commercial lines where everybody can, on payment of a small fee, have specimens of any material analysed and ascertain its industrial uses. We want consulting chemists, whose vocation it is to find out the nature of defects that may exist in any raw material, and give advice about the manners in which they can be remedied. In the development of all pre-eminently chemical industries, like glass-making, the existence of such facilities has great practical value. (*Ibid*, pp. 274-275.)
66. A master foreman would not be in a position to establish new industry. He must have several years' practical training before he is in a position to be in full charge of any work and this is the reason why we must have our several industries established before hand. (*Mr. A. Tellery*, p. 301.)
67. "All our complex forms of industry involve sometimes in the director's engineering or practical genius, a sort of instinct of the market and a life-long familiarity with an involved mass of considerations partly mechanical, partly monetary, partly administrative. The head of a great production is like the captain of a ship or the general of an army. He must have scientific knowledge, technical know-

ledge, practical knowledge, presence of mind, dash, courage, zeal and the habit of command." (*Mr. W. S. Hamilton*, pp. 307-308.)

68. The promoters and contributories of the capital of a company must not seek to usurp to themselves the actual managing of the company. That is the separate function of the Manager or the Managing Agent who should have been trained by long practice in the branch of business concerned. Choose your Manager for his special qualifications and then give him as free a hand as possible. (*Ibid*, p. 308.)
69. To provide the auditors of the future, a special class for accountants, ending in a diploma, should be established in one or more Indian College. (*Ibid*, p. 310.)
70. If there are to be profit producing companies—whether on a great scale or a small one—the young men of India must obtain the necessary technical knowledge. Those who can afford it should go to Europe, and learn all they can of the jealously guarded processes of the great industries in their own strongholds. They will have to labour hard for their knowledge, for trade secrets are not willingly imparted. For those who cannot afford to go to Europe, there are the lower grades of industry to be filled and a training for them whether as factory manager or as engineer or as expert mechanic or expert factory hand of any sort can be obtained in many places in India. It is an era of specialism in every branch and the insatiable demand for specialists of every grade and in every line must be satisfied if the larger industries of India are not to be starved. Without expert assistance capital must remain dormant or will waste itself in financial cobweb weaving. (*Ibid*, pp. 312-313.)

71. It is no use sending Indians to Europe or to America to learn mining if you have no Indian-owned mines in which to employ them, since the European companies will not encourage them. (*Mr. Thakur Singh*, p. 318.)

D.—Capital and Co-operative Credit

72. The establishment of purely Swadeshi Banks under experienced management and possessing ample capital, is going on in all quarters of India, and there is ample room for more of these institutions for helping on the expansion of industrial enterprise. (*Maharaja Bahadur of Darbhanga*, p. 23.)

73. How to organise Capital.

How to preserve Capital when organised.

For what objects, and under what management, should the capital be organised.

If capital be organised as Finance, where, to what extent and under what conditions it should be directed towards production of wealth.

Should the Foreign Capital be allowed free scope in State and private undertakings.

How could foreign Capital be available for private enterprise.

I am indeed sorry that these matters have not been scientifically dealt with so far, and I humbly direct the attention of the many students of Economics, in the country, to place these subjects in their true light before the people. (*Lala Harkishen Lal*, p. 12.)

74. In this connection, I might venture to suggest both to the people and the Government, the desirability of the people of the Province entering the export and import business; adopting its banking system to help in this direction, and providing transport and storing facilities. (*Ibid*, p. 14.)

75. In every country the tendency is towards factories on a larger scale ; and if India is to take a hand in the game at all it will have to conform to the rules. (*Mr. Frederik Noël Paton*, p. 53.)
76. With the concentration of capital must be associated technical skill, and I hope the leaders of the industrial movement will not make the mistake of thinking that the acquisition of technical skill may be limited to the artisan class. (*Mr. J. E. O'Connor*, p. 100.)
77. But if we ourselves borrow foreign capital for the exploitation of our national resources, the burden of the interest charged thereon will be more than counter-balanced by the profits that will find their way into our pockets and the increase of national wealth that will ensue. So long as no Indian capital is coming forth in the desired quantities, we must borrow cheap foreign capital. But the industries thus financed by foreign capital must be entirely in the hands of Indians. The enterprise, and the management must be Indian, all the profits derived therefrom must also be Indian. Let us try by all means to get as much indigenous capital as possible. (*Prof. V. G. Kale*, p. 174.)
78. At present we put all European-managed industries whether coal or gold mines, woollen or jute mills, tea or coffee plantations, in the Swadeshi category, and this is good so far as it goes. But our next step must be to make them genuinely Swadeshi. (*Ibid* p. 174.)
79. The sowcar must be replaced by the Village Bank and the Village Bank must be prepared to supply the best and cheapest artificial fertilizers where natural manures are insufficient, as is the case in all parts of India. (*Mr. John Kenny*, p. 197.)

80. I contend that even at the cost of slower development, European capital should be excluded at least in the native territories as far as Mining industry is concerned. (*Mr. Thakur Singh*, p. 316.)
81. A little mutual help amongst some of our people is all that is needed for the revival of mining industry. (*Ibid*, pp. 318-319.)
82. The prospecting licenses are cheap enough and enormous sums are not required in all cases to keep the mines going, once the mining leases are obtained. In the present state of affairs it is of no use to take an antagonistic attitude towards the European firms in India. What is wanted is to win them over to our side by making use of their capital and business experience. (*Ibid*, p. 319.)

E—Fiscal Policy

83. It behoves those concerned in the many industries of India, and especially the sugar industry, to be prepared for the change should it come about, for on no industry in India would the initiation of a protective tariff have as far-reaching effects. It seems to me of the utmost importance in these circumstances that the industry in this country should take steps to coalesce and frame a definite policy for its guidance. (*Mr. A. B. Shakespear*, p. 133.)

F.—Agriculture

84. For irrigation purposes, these wind-motors, where they could be applied, would be the means of saving to the cultivating classes of an enormous amount of manual labour. The power of the wind and water for driving motors is as yet hardly touched in this country. (*Maharaja Sir Rameshwar Singh Bahadur of Durbhanga*, p. 20.)

85. If agriculture is to be improved, the first measure to be adopted is to lighten the burden of the taxation which it bears. (*Mr. J. E. O'Connor*, p. 95.)
86. The first step to be taken is to reduce the share of taxation which that community pays to the state by treating land like any other form of property subject to the same rate of taxation, no more and no less. (*Ibid*, p. 96)
87. The next thing needed is intensive culture. At present the land produces really less than half what it would be capable of producing if it were better cultivated. (*Ibid*, p. 97.)
88. The capital is non-existent, but part of it would be supplied if the land revenue were reduced and the other and larger part would be supplied if capital could be concentrated in Banks and supplied to the cultivator as is done in agricultural countries in the West, as for instance Ireland, Canada, the United States, at a moderate rate of interest. I commend this point to the gentlemen interested in industrial development. Let them take steps to found a Bank with numerous branches for the special purpose of advances for agricultural improvements. (*Ibid*, p. 97.)
89. What is needed is that the agriculturist should know the scientific reasons on which he unconsciously bases his practice—for his practice is in fact applied science, that he should learn the theory of his trade like the engineer, the builder, the sailor, and every other artisan. (*Ibid*, p. 98.)
90. It is quite certain that no important improvement can be looked for in field yields unless the manure supply can be augmented, and it is for this reason that I attach much importance to the working up of oil seeds in India instead of exporting them to foreign countries. (*Mr. A. B. Shakespear*, p. 133.)

91. In fact, with such potentialities lying before her staple crops, it seems that India could well afford to go almost any length to retain her fertilizers in the country. (*Ibid*, p. 133.)
92. India is essentially an agricultural country. Devote all your energies to its improvement ; develop it to the highest degree attainable. Foreign manufacturing countries will require food, they will want raw materials, and must look up to you for the supply of the same. (*Prof. V. G. Kale*, p. 163).
93. The development of agriculture, is therefore, a very important direction in which we must make serious efforts, if not for the purpose of increased exports of food and raw materials, at least for the sake of meeting the growing demand for the same in the country itself. One of the causes that have been assigned for the high prices of food-grains prevailing at present is that the production of these grains has not been keeping pace with the increasing demand for them. Again, agricultural improvement is essential for the growth of the manufacturing industry. Let us take the sugar industry as an illustration. (*Ibid*, pp. 166-167).
94. Educated people and Jamindars must co-operate with Government in this matter and not leave the poor and ignorant ryot to his own crude efforts. (*Ibid*, p. 167.)
95. The material prosperity of the country must first be aimed at. India is almost entirely an Agricultural country and the foundation for political freedom can be laid deep only if the state of the peasant is improved. (*Mr. John Kenny*, p. 197).
96. The need of India is manure. There is an insufficiency of cattle manure, and artificial fertilizers must be introduced. But this wants money and

money can be placed at the disposal of the Indian peasant only by means of Rural Banks. Will true patriots once wake up to what their country wants of them ? (*Ibid*, p. 199.)

G.—Other Industries.

97. In this connection, I might venture to suggest both to the people and the Government, the desirability of the people of the Province entering the export and import business ; adopting its banking system to help in this direction, and providing transport and storing facilities. (*Lala Harkishen Lal*, p. 14.)
98. The Fisheries of India surely ought to be an industry that ought to receive every encouragement. (*Maharaja Sir Rameshwar Singh Bahadur*, p. 19.)
99. There is still plenty of room for expansion of this jute manufacturing industry for we have still to export one-half of the jute crop as raw material. The forty jute mills on the banks of the Hooghly have all been erected under European supervision and all are managed by European firms. Would it not now be possible for Swadeshi enterprise to take part in such an industry ? I think there is ample room for such. (*Ibid*, p. 19.)
100. Our Coal stores underground are of a practically inexhaustible nature and if these undeveloped resources along with the other mineral wealth of the land such as iron, manganese, mineral oil, etc., etc., are to be exploited by the sons of the soil, no time should be lost in encouraging the educated youth of the country to specialise, in the departments for which they are fitted, for their future work. (*Ibid*, p. 19.)
101. For the beautiful designs of drawn thread work on cotton and linen cloth, the supply is not nearly equal to the demand, and the beauty of these indus-

tries is that they can be made by the people in their own homes. Hitherto no systematic efforts have been made in getting the producers of these articles into touch with foreign customers, who would be only too anxious to purchase them if they were afforded the opportunity. And the same observations apply to the indigenous artwares in metal, the wonderful carvings and the miniature paintings on ivory, which would find a greatly increased sale if they were only brought into contact with the customers. (*Ibid*, p. 21.)

102. There are a great many goods which we still import that can in due time be made by ourselves. And why should we export such products as cotton seed, when we could export the extracted oil, and enrich the land with the refuse? (*Ibid*, p. 22.)
103. I am convinced that at least a portion of this drain on the finances of India might have been saved, if more attention had been given in the past to the encouragement and development of the indigenous arts of mining and metallurgy; for it is quite possible that, with less wasteful methods of smelting and the use of simple machinery, and above all with the assistance of intellects of a higher order than the uneducated classes, whom the industry was left, could be expected to possess, many of the low grade ores of copper and other minerals, which are now found to be worthless for exploitation on western lines, might have continued to be productive if worked by improved native methods (*T. H. D. La Touche*, pp. 82-83.)
104. There are hundreds of petty industries which our village communities may go in for by themselves and by an intelligent system of co-operation, transport all their products to the market, and village industries may be carried on quite effectively in

this province (Punjab). (*His Honor Sir Louis Dane, the Lieut.-Governor of the Punjab*, p. 30.)

105. The reply is that the Indian spinners must imitate their competitors in the far east. They must combine. (*Frederick Noel Paton*, p. 37.)
106. The syndicate (of spinners) may agree from time to time what quantity of yarn is to be shipped to a given market ; and each of the three participants is under an obligation to contribute his quota at the price agreed upon. (*Ibid*, p. 38.)
107. It is easy to see that the comparatively large quantity of yarn marketed in this way under one set of tickets while the market is active, quickly makes the goods familiar to every buyer and user and obtains for them a recognition and popularity much greater than could be secured by the same quantity of yarn under a number of different tickets. It is still more obvious that when the market is in a depressed or neglected state a relatively small quantity of yarn, if it bears a well known mark, is, even when widely distributed, much more effective in keeping its hold on public notice and favour than a larger aggregate quantity when presented under a variety of marks not one of which is universally recognised. (*Ibid*, pp. 38-39.)
108. As one example of combination in the production of a manufactured article, I may instance the cotton seed industry in which, as I know, a good many of you are taking a lively interest. I think it is recognised now that in this country cotton-seed oil will find its best market in the form of what are called edibles—ghi substitutes and oils for cooking. (*Ibid*, p. 40.)
109. If the establishment that conducts the refining processes is also to crush the seed and make the crude oil, then vast quantities of seed must be brought to it.

It will first have to pay inward freight on that seed and will thereafter probably have to pay outward freight on the cake. The cake represents the bulk of the material, and would have to be redistributed to centres where there existed a demand for fodder and manure. A third form of waste would attend this procedure, inasmuch as it would afford no employment for the motive power now latent in those ginneries which stand unused during a large part of the year. All these difficulties are overcome if the crushing is done at the ginneries and if only the crude oil is sent to the refinery, the cake remaining in those places where the crops are to be manured and where large numbers of cattle are maintained both for cultivation and for transport. (*Ibid*, p. 41.)

110. From the facts already stated it follows that the company that proposes to refine and to make butter substitutes must, in the beginning organise combination and co-operation between itself and the ginneries. It is necessary to select, as the site of such a pioneer refinery, as is in question a district or tract that contains a number of ginneries likely to co-operate by installing crushing machinery, working it in the off-season, and marketing their own cake. The next step is to decide on what scale the refinery is at first to operate, and to fix the quantity of crude oil to be treated. The third step is to establish a working arrangement for a series of years with such numbers of the adjoining ginneries as could furnish that quantity of oil without fail. There are certain places in India where it would be convenient to adopt the American practice of pumping the oil through pipes from the crushing mill to the refinery. (*Ibid*, pp. 42.)
111. In any such arrangement it would probably be necessary to lay down the minimum quantity of

crude oil which each crusher was to furnish to the refinery and the maximum quantity which the refinery should be bound to take over from each crusher. The simplest form of combination in such a case as this is that in which the so-called manufacturers agree to put in crushing plant of a certain capacity and further to take up in whole or in part the joint capital for the installation of the refinery. It is however sometimes found more convenient at a later stage that there should be no actual relationship between the manufacturers and the refiners beyond that constituted by the terms on which the crude oil is to be produced and supplied. (*Ibid*, pp. 42-43.)

112. The point to be brought into prominence at the present time is that unless we can develop a certain power of combination amongst ourselves, the establishment of a large cotton seed industry on a basis of most economical working remains in the air. (*Ibid*, p. 43.)
113. It is necessary in the circumstances that capital should be employed upon the manufacture of the article which are used by the people at large, not upon the articles which are used by the few. There is a wide field for the extension of cotton manufacture, to begin with. Then there is the manufacture of the tools and apparatus to which I have already referred. Ploughshares should be made in factories as elsewhere, and could be made more cheaply, and beam of the plough might also be so made. So with the hoe and the kurpi. The metal utensils should be made in large factories, for already the hand-made vessels are being supplemented, and will presently be superseded, by machine-made metal vessels imported from abroad. Take again the leather articles which

are required by the mass of the people. If they could get cheap shoes their use would be greatly extended, widely as they are used at present. Women in particular would soon take to the use of shoes of elegant make though cheap instead of going barefoot or in clumsy slippers as at present. Then again there is room for earthenware factories in which could be made more neatly and cheaply the articles now clumsily finished, though of good design, by the potter. In this country, Doulton's and other companies make their principal profit out of common articles of universal use. There is also an excellent opening for the profitable manufacture of sugar, which is so widely consumed in India. (*Mr. J. E. O'Conor*, pp. 100-101.)

114. The textile industry is making a commendable progress, but we want cotton of a finer quality to be produced in the country and this also points to improvements in agriculture. (*Prof. V. G. Kale*, p. 167.)
115. Our tobacco industry is also handicapped by the poor quality of the stuff we produce. The same remark applies to other agricultural products and industries depending upon agriculture. Here then is a vast field for work. The greater the value, we may coax mother earth into yielding to us, the better will it be for the poor cultivators and the country generally. (*Ibid*, p. 167.)
116. The hand-loom industry has been the national industry of India since ancient times, and no effort should be spared to enable it if possible to complete successfully with the power-loom. (*Mr. A.N. Datar*, p. 192.)
117. We may surely aspire to supply some of our main wants by indigenous manufactures by giving a new lease of life to old industries and starting new ones.

Instead of sending all our raw materials to foreign countries to be manufactured there, and returned to us as finished articles, we may be able to manufacture our own goods and pocket all the profit that goes at present to other people. By manufacturing locally articles for which we enjoy special facilities, and exchanging them for such as we cannot make with advantage, we shall profit ourselves and contribute an economic gain to the world. (*Prof. V. G. Kale*, p. 170.)

118. As regards foreign market, every effort should be made to keep hold of those already established by supplying uniformly (cotton) goods of a superior class, whilst a systematic effort should be made to push goods into new markets, adapting ourselves to their standard. (*Mr. S. D. Sakalatwala*, p. 227.)
119. Instead of frittering away their energies in thrusting worthless imitations on the market, it would be far better for themselves and the industry, if their energy was directed towards the improvement of their own goods which could then stand on their own merits. Why can our mills also not specialize, certain mills supplying certain lines only? Such a policy, as is now followed, may bring profits for a short while to particular concerns, but in the long run is bound to spell ruin for the industry generally. The same may be said of short-reeling in spinning which has already tarnished the good name—if ever there was one—of Ahmedabad yarns. (*Ibid*, pp. 227-228.)
120. Honest Swadeshism has widened the scope of our home industry and our main object must be to create a demand for homemade in place of foreign goods by supplying articles of equal quality at a slightly lower rate. If we are to drive away in a great measure our rivals from the field, the products

of our mills must be of a better texture and finish and greater attention should be given to up-to-date methods of dyeing, bleaching and mercerising. (*Ibid*, pp. 228-229.)

121. Our industry has now grown to such an extent that we cannot employ European experts in sufficient numbers without incurring a pecuniary loss. If we cannot yet dispense with them wholly, let us yet make an effort to supplant the majority of them and keep the money spent on them in the country. Surely we have had enough experience in the line to be able to dispense with a few foreign experts, who in spite of their technical knowledge are ignorant of local conditions. (*Ibid*, p. 230.)
122. Let there be men thoroughly acquainted with the details of the industry and possessing the necessary qualities of organization and there will not be such a complaint of want of enterprise. It must be said that though there is a vast scope for the expansion of our industry as is apparent from our import trade, it would be well to improve and make stable the present concerns, and train workmen whom the limit imposed by the new Bill on working hours will surely attract. (*Ibid*, pp. 230-231.)
123. Finally what is of greater importance still is, those who would be at the helm of the industry as its trusted captains, must be men not only of ability but of honour and integrity, who have in view not merely a certain amount of profit, but the furtherance of the industry, and the improvement of the methods and men employed therein. (*Ibid*, p. 231.)
124. Attention must also be paid to the cultivation of cotton. We are more favourably situated with regard to our raw product than our rivals, but hitherto we have not taken full advantage of our

opportunities. Every attempt must be made to improve the quality and quantity of our raw product. The present situation of the American cotton market ought to urge us on to find means to be independent as regards price of the American market which seems to be guided not on natural principles of demand and supply, but mainly depends on the prevailing speculative elements. Efforts are made by the Agricultural Department but these ought to be adequately backed up by private enterprise supported by the local mills. (*Ibid*, p. 231.)

125. It is absolutely essential for the stability of the industry that substantial reserve funds should be built up. (*Ibid*, p. 231.)
126. Let us then hope, men will not be wanting, who will rise to the occasion and prove themselves equal to the task of remodelling our textile industry on modern lines, and thus assure its future prospects. (*Ibid*, p. 232.)
127. It may not perhaps be possible to raise in India sufficient capital to pioneer new Railway lines for the present; but there is no reason, why there should be no expansion of shipping industry at important ports, like Bombay, Karachi, Calcutta and Madras, on modern lines. (*Mr. M. B. Sant*, p. 235.)
128. There is undoubtedly room for the employment in India of small portable machines for match factories on the Japanese plan, these being carried about from place to place in the vicinity of the forests. Japanese methods have recently been studied by more than one Indian gentleman, but hitherto these methods have not yet been subjected to any extensive trial in India. (*Mr. R. S. Troup*, p. 124.)
129. Match factory sites should usually be on or near a railway, navigable river, or other main line of com-

- munication, and should be situated either near the forest or else on a floating stream, for it should be remembered that water transport is the cheapness of all methods of conveying timber, while for purposes of match manufacture, the wood itself remains fresher and in better condition if kept in water than if kept for any length of time in a dry state. (*Ibid*, p. 127.)
130. If the match industry in India is to reach the importance which it should do, it is necessary that the qualities of matches manufactured should be of a high order ; cheapness of production ought not to be a bar, considering the comparatively low rate of labour and the abundance and cheapness of suitable wood in some of the provinces. In this connection competition between Indian manufacturers is quite uncalled for at present. (*Ibid*, p. 128.)
131. Their most advantageous course of action would be to combine where necessary in obtaining good expert advice and assistance with a view to improving the quality of their matches, for it is only by such means that there can be any fair prospect of overcoming the severe stress of foreign competition. (*Ibid*, p. 182.)
132. If things go on at this rate uncontrolled, it is very likely that sometime there will be a world-wide shortage of tanning materials. Rich as the tropical countries are in their vegetation, it may be expected that much of the demand for tanning extracts will have to be met in future by the establishment of tannin extract factories in the heart of the forests of India and Burma, Strait Settlements, Borneo, Java, etc.—forests that are beyond doubt enormously rich in tanning materials. (*Mr. Puran Singh*, pp. 239-240.)

133. So far as I am aware, practically no advantage of this enlightened policy of the Government has yet been taken by the people and no steps have been taken by the latter to develop this industry, which promises to be one of the most flourishing industries of India. It is high time, therefore, that the Indian capitalist took time by the forelock and seized his opportunities in this direction. (*Ibid*, p. 240.)
134. Simultaneously with the manufacture of katha, the writer is of opinion that a good light-coloured tannin extract can be prepared as a by-product from the wood, but the operations will have to be carried on a much larger scale than is at present done, with up-to-date machinery. Under proper conditions a product almost like Gambier, a tanning material much in demand, can be prepared from this tree. (*Ibid*, p. 244.)
135. The bark of the tree is also capable of yielding a good tannin extract. (*Ibid*, p. 244.)
136. It should be noted here that when this profit is yielded by the treatment of chestnut wood with 7-10% of tannin under European conditions of highly paid labour, there is every reason to believe that a factory working under the cheaper labour conditions of India would yield a still greater margin of profit. (*Ibid*, p. 251.)
137. With a capital expenditure of Rs. 50,000 on the plant, an extract factory can be started which should be able to turn out a minimum of 1 ton of finished extract per day. (*Ibid*, p. 251).
138. But if glass-making industry on modern lines is actually to develop in India on a large scale, the manufacture of sodium carbonate from Indian salt or *reh* should be undertaken at once and considering the predominant part which carbonate of soda plays in many important industries, and the incen-

tive which its local manufacture and consequent cheapening of cost would give to them, our Government or some enterprising Indian prince may well take-up the question of the development of this branch of industry and start on their own account, some soda-making works or subsidise soda-making industry on some substantial basis. (*Mr. Alakh Dhari*, p. 276.)

139. In order to explain the extensive range of its uses I may mention that the carbonate of soda forms an essential constituent in the manufacture of soap and paper, in refining oils, in spinning and weaving of cotton, in tanning and curing of leather and in the process of extracting aluminium from its ore, and in all important and growing industries. It reflects a great reproach on our country's industrial enterprise that such an important industry should be left undeveloped. (*Ibid*, pp. 276-277.)
140. We possess such mighty mountain ranges and such large rivers, that several sites can be found where at least a part of the energy can be well employed. In the case of some rivers, the same stream of water can be made to create energy at two different places. (*Mr. Sheo Narayan*, p. 290.)
141. The other Indian Offices (Life Assurance have managed to copy their figures, almost *mutatis mutandis*, and commenced to issue Policies. This course of conduct is not only unsafe but positively dangerous and it is time our offices took immediate steps to requisition the services of some English or American Actuary, duly qualified in this art, not forgetting in the meantime to induce some of our countrymen to go to these countries and receive their training in this science. (*Mr. Narain Das*, p. 298.)

142. Life assurance is a branch of knowledge to which no attention has, till now, been given either by the Government or such popular institutions as the Society for Promotion of Technical Knowledge among Indian Students. This is more important than Tanning, Glass-making, Dyeing, Textile Mechanical or Electrical Engineering, Sericulture, Agriculture or other industries in so far as no single business has ever wielded so much influence, on the public weal or woe of a nation. (*Ibid*, p. 298.)
143. Only if we work on the right lines we are sure to find in Insurance Business in this country a huge reservoir of power, wealth and influence. (*Ibid*, p. 300.)
144. I consider that the only means of saving the present situation is that we should set to work every square foot of mining ground still available within India. Some of the wealthy native citizens with the aid of the Indian chiefs should for this purpose form themselves into syndicates. (*Mr. Thakur Singh*, p. 318.)
145. We must try to secure what little remains of the Manganese; like coal it has also drifted out of our hands. If we could start prospecting at once, there are still some deposits left in various places, for instance in Dharwar, Belgaum and other places. (*Ibid*, p. 320.)
146. The Iron deposits have not yet been touched to any appreciable extent. The iron ores of India differ from those of Europe and are somewhat refractory to the methods of smelting at present in vogue, which have been devised for ores of a different character. This difficulty can be overcome if some little attention and study is given. (*Ibid*, p. 320.)
147. Concessions from Indian States ought to be secured wherever minerals of good quality are found. (*Ibid*, p. 321.)

H.—Exhibitions.

148. Exhibitions have done much in this country for showing what India can do in the industries to which I have referred; but I would humbly suggest that much more could be done with the help of our Department of Commerce and Industry. If arrangement could be made to have small museums of the products of our industries in art wares, fabrics, etc., attached to the British Consulates in foreign countries, with catalogues and prices, I am sure a great impetus would be given to our indigenous productions, which would greatly stimulate them and enlarge them to the increased wealth of the producers. (*Maharaja Sir Rameshwar Singh Bahadur of Darbhanga*, p. 21).
149. Germany has for sometime past had floating museums of her products, visiting all the likely ports in the world. These ships show off the samples, give the prices and the names of the manufacturers, and book orders. These floating museums have been a great success in increasing the foreign trade of Germany. When Great Britain adopts the same plan, I trust that India will not be unrepresented in the venture. (*Ibid*, p. 22.)
150. *The suggestions respectfully submitted for consideration may be thus summarised :—*
- (1) The formation of *Trade Museums* at all the provincial centres and in the Presidency towns as also *one central museum for all India*.
 - (2) The publication of descriptive catalogues and hand-books both in English and the principal Vernaculars regarding the more important economic products and manufactures of the country.
 - (3) The institution of *special inquiries* in the Department of Commerce and Industry at each exhi-

bition with a view to ascertaining the requirements of foreign trade in Indian articles.

- (4) Collection of *samples of foreign manufactures* and supplying *information* in relation to them—the methods of manufacture and the machinery employed—to the *native manufacturers*; *one or two industries to be selected* for such treatment at each exhibition—industries for which India possesses special facilities.

Much work has to be done on the same lines in regard to *mining*.

- (5) Request to Government this year to place Mr. Hadi and Mr. Dutt on *special duty*, one in connection with sugar refining and the other in regard to mining who should visit the various Provincial centres with a view to dissemination of a knowledge of the newer methods amongst the people.

As regards art work, organisation of—

- (a) *Local Museums and Local Committees* } at the centres of art manufacture.
- (b) *Provincial Museums and Provincial Committees* } with a view to a comprehensive effort.
- (c) *Moveable Exhibitions*—In foreign countries with a view to promote a wider appreciation of Indian Art work.
- (d) The formation of a bureau of Indian Arts under the direction of the ministry of Commerce and Industry to have the care of all this work. (*Honorable Rao Bahadur Ganesh Vyankatesh Joshi*, p. 279.)

I.—Weights and Measures

The evils of having diverse standards throughout the various Provinces and Districts are manifest to

all who buy and sell, and who have ever to translate one standard into its equivalent in another. Perhaps, if I may make such a suggestion, it might serve a good purpose if this Conference were to appoint a small select committee to consider the whole question of standardisation and to report at the meeting of the Conference next year what in their opinion ought to be the best means of gaining the end in view. At present it seems to be almost as difficult to get a people to change their weights and measures into a Universal Standard as it would be to get them to change their language. (*Maharaja Sir Rameshwar Singh Bahadur of Darbhanga*, p. 23.)

The standardisation of weights and measures is one of the most important problems which lies before the commercial development of the country. The Government of India have already taken steps in this direction and a good many years ago passed an Act for the regularization of weights and measures * * * * * If the result of the deliberations of the Conference is to appoint a committee, as the Maharaja suggests to further consider the subject and bring it prominently to the notice of the public, I am sure that that result will be of the greatest benefit. (*His Honor Sir Louis Dane, the Lieut.-Governor of the Punjab*, p. 29.)

J.—Miscellaneous

A united effort to secure the greatest possible material prosperity in the land is honorable labour for the Mahomedan and the Hindu alike and for the official and non-official equally. Commercial and industrial co-operation spreads out its protecting and fostering wing of national prosperity without regard to sectarianism. (*Maharaja Sir Rameshwar Singh Bahadur of Dharbhanga*, p. 26.)

154. The close examination of the articles kept in the Franco-British Exhibition further disclosed the fact that the best valued articles were those in which land, *i.e.*, the raw material, played lesser part than the labour expended ; and capital required for plants was also not prohibitive. These are conditions favourable to the circumstances of India. But there were certain facts brought home which do not at present exist in India, but which, if effort be directed in that channel, could be easily established. These facts were, knowledge of proportion and designing, power of organisation, and agencies for marketing. The message that the Franco-British Exhibition sent to us amounts to this : Don't lose heart ; look up and adapt yourself to altered conditions. There is nothing that nature has denied us ; and nature has not doomed us to live eternally under the law of adversity. (*Lala Harkishen Lal*, p. 13).
155. We produce already an enormous surplus of raw agricultural products, but those agricultural products unfortunately leave the country and it is my earnest desire, and I hope it is the desire of all of you that we should do something to enable us to work up those agricultural products in the country itself and so enrich all classes of the community. (*His Honour Sir Louis Dane, the Lieut.-Governor of the Punjab*, p. 28).
156. It is obvious that to secure a generally good product, the consumer must be educated as well as the producer, and the first step is the production, by various reforms, of a better article which will appeal first to the better class of consumer and will gradually become acceptable and available to others. (*Sir. F. Nicholson*, p. 62).
157. It is our manifest duty under these circumstances to ward off the evil day as long as possible and to

- exercise the utmost economy in the utilisation of the irreplaceable fuels at our disposal. Development in this direction may be said to have proceeded along two main lines: (1) Improvement in the efficiency of the various types of heat engine now in use, and (2) centralization of power generation. Improvements along the first line have been mainly due to a general diffusion among engineers of a knowledge of the science of thermodynamics, while centralization of power generation has been rendered commercially feasible by the development of electrical methods of power transmission and distribution. (*Dr. Alfred Hay*, p. 112.)
158. We are thus led to conclude that in the development of industrial enterprise, which depends on the possibility of a cheap supply of power, electric power transmission is destined to play a very prominent part. (*Ibid*, p. 113.)
159. Alcohol could be most cheaply manufactured from potatoes, and if it is destined to play any large part in the world's future power supply, the cultivation of potatoes is bound to increase to a considerable extent. The corresponding type of power house would contain large alcohol motors driving electric generators, the power being transmitted and distributed electrically. (*Ibid*, pp. 114-115.)
160. Water-power and irrigation schemes will go hand in hand, and cannot fail to re-act most favourably on the agricultural and industrial development of India. (*Ibid*, p. 116.)
161. Any genuine development of the æsthetic must come from the Indian people themselves. This is no doubt true of all healthy national growths, but doubly so with regard to that somewhat transcendental subject—Art. It seems appropriate that this should be borne in mind at a time when

the more materialistic industries are receiving so much earnest and thoughtful attention. (*Mr. Percy Brown*, p. 123.)

162. The general impression that a study of the indigenous industries, old and new, leaves on one's mind is, to put it briefly, that it is an unequal fight in which we are engaged. But fight we must. The cessation of efforts would be suicidal. * * We are slowly but steadily progressing. But we have got to realise what is exactly the situation in which we are placed and what is the nature and extent of the obstacles we have to surmount. An easy-going optimism is not better than a despairing pessimism. The situation must be rightly understood before we essay to face the odds that are against us. And however gloomy the prospect, we must work with a singleness of purpose and a firm faith in our destiny. (*Prof. V. G. Kale*, p. 163.)
163. We may, indeed try, if possible, to avoid the evils that have been disgracing industrialism in the West. But we cannot remain where we were or what we are. We must advance, we must imitate, we must assimilate. (*Ibid*, p. 165.)
164. The spread of primary education, the establishment of co-operative societies and agricultural banks, the diffusion of useful information regarding improved methods among the ignorant peasants, the supply of better manures and more extended irrigation works, are the directions in which effort has to be made. (*Ibid*, p. 167.)
165. India as we all know is pre-eminently an agricultural country. But she cannot afford to be content with being merely agricultural. With cheap labour and the untapped resources of the land she ought to take her proper share in the manufacturing industries of the world. With the reduced productive

power of labour in agriculture and the teeming millions of population at her command she is well fitted to organize and develop industries. (*Mr. A. N. Datar*, p. 178.)

166. For the diffusion of naval training among khalasis, other sea-faring classes and the general public, important works on the theory and practice of navigation, should be translated into the principal Vernaculars of India. (*Mr. M. B. Sant*, p. 236).
167. The existing Translation Societies, like the Deccan Vernacular Society of Poona will confer a great boon on the educated public, if they set aside a certain sum every year, for translations of Technical and Scientific treatises on naval and technical subjects, instead of selecting old classical authors whose works do not possess in the eyes of the present commercial world, any value beyond mere academical interest. (*Ibid*, p. 236).
168. Educated men also should undertake the translations of such works, instead of frittering away their energies in writing works of fiction. (*Ibid*, p. 237).
169. A minor cause of distrust is the exorbitant commission sometimes allowed to brokers or Managing Agents. Commission should be on profits, not on sales or purchases. (*Mr. W. S. Hamilton*, p. 308).
170. The powers of shareholders, if they will only act as a corporate body, are really very extensive. For information they are entitled to inspect the records of the companies prescribed by law and they can see the returns made to the Registrar of Joint Stock-Companies : if one-fifth of them can agree together they can have the affairs of the company examined by a Government Inspector : they can refuse to pass a balance sheet which does not truly represent the financial position of the company : they can refuse to ratify any unsatisfactory contract made by

the promoters of the company with any agents or others and they can set aside any arrangement made by the directors which is not to the company's advantage—whether it be the appointment of Managing Agents or brokers or any other contract—even though the Articles of Association authorize the directors to do all such acts as could be done by the company in general meeting. These powers are very real : let shareholders rouse themselves and use their powers. (*Mr. W. S. Hamilton*, pp. 309-310.)

171. To my mind the reform that is needed beyond all others is that Government should lay down by whom accounts may be audited. (*Ibid*, p. 310).
172. In England balance sheets are audited by Chartered Accountants. Of these—there are not many in India at present, but there are a few and I would suggest that no one but they and one or two qualified Indian Accountants certificated by Government should be permitted to audit accounts. (*Ibid*, p. 310).
173. Again a prospectus—or a return in lieu of a prospectus—should be obligatory, as it is in England. In it a mass of information is given which enables the investor to know a good deal more about his company than is now possible in India. Amongst other things the prospectus must shew the minimum subscription on which the Directors may proceed to allotment. (*Ibid*, p. 310.)
174. Let the Mahajans or the landowners form a society by contributing shares, let them invite the weavers to contribute their small shares, let them buy warping machines, looms and yarn, let them lend them out to the weavers and pay the weavers at fair rates for the cloth produced—with it may be a bonus out of the annual profits—and then let them place the finished goods on the market. (*Ibid*, p. 310.)

175. Could not a Co-operative Society be formed to organize some industry by which these poor women could help themselves? It has been suggested that the knitting of socks and vests and the like is a work they will and can undertake. It is respectable and sufficiently easy. Here then is a chance for capitalists to unite and buy knitting machines, hire them out to the women on the hire purchase system, collect the knitted goods and place them on the market. The society would earn its profits both by the sale of the machines and by the sale of the manufactured goods; and the principle of co-operation and the energy of the workers would be maintained by paying the women a share of the profits as well as wages on the piece system. (*Ibid*, pp. 315-316.)

K.—Sugar Industry

176. But in order that you may perceive the force of the contrast I may promise that centralization has been and is increasingly the keynote of all successful enterprise in the modern cane sugar industry, and that centralization in this connection has a somewhat special meaning. It means not only the replacing of numerous small appliances by relatively few establishments of sufficient size to insure economical working and to support the cost of expert supervision. It means still more the concentration of the cane fields in the immediate vicinity of the factory. (*Mr. F. Noel Paton*, p. 47.)
177. If the Indian sugar industry is to be saved, the measures will have to be drastic and prompt; and an association often accomplishes much more with a steadily growing constituency holding sound and homogeneous views than with a large and dissentient membership incorporating everything that is uninformed and irreconcilable. (*Ibid*, p. 54.)

178. We cannot hope to secure much greater concentration of the crop : to accomplish this contemplates a revolution in the agricultural methods of the people. We must, therefore, deal with the cane crop as at present sown. It is evident that in the first place a factory for the direct production of refined sugar must ensure to the man who grows the crop as good a price as he gets at present from the conversion of his cane into raw sugar. (*Mr. A. B. Shakspear*, pp. 131-132.)
179. There is a tremendous amount of room for improvement even in these individually small operations, and the spread of the co-operative movement in other directions should be taken advantage of to encourage groups of cultivators to adopt appliances and methods of greater efficiency. (*Ibid*, p. 132.)
180. In the more condensed tracts, sufficient supplies can undoubtedly be collected for factories treating 300—350 tons of cane per day, but to render this possible, mechanical transport is, in my opinion, essential, not only to cheapen transport costs but to ensure cane reaching the factory in good condition. The resources at present available to the cultivator for bringing his cane to the factory are bullock carts, which is a slow and very costly method of transport and would never sustain a factory's requirements. A system of light tramways following the main roads of the district, and radiating from the factory for distances corresponding to the capacity of the plant, is in my opinion necessary if a modern factory is to be effectively and economically served with cane supplies. (*Ibid*, p. 132.)
181. Unless we at the same time move forward systematically in the improvement and cheapening of our sugar, we cannot hope to secure a really sound

foundation for the industry in this country. (*Ibid*, p. 134.)

182. But we are told that unless we adopt the central factory system, which has proved such a success in Mauritius and Formosa, our prospects must be anything but cheerful. (*Prof. V. G. Kale*, p. 162.)

L.—*Fisheries*

183. Public hygiene demands for the individual and for the community alike and in the common interests of both, that food should be of the best and safest quality obtainable, and should at least be above the suspicion of favouring, if not begetting, disease; increasing wealth among many sections develops a more fastidious taste in food and a craving for new flavours and foods together with the ability to pay for them; a population rapidly becoming dense demands more food and more nutrient food. (*Sir F. Nicholson*, p. 60.)
184. To sum up; we have in this Madras Presidency an ancient industry employing a large population but primitive in its methods from catch to sale; knowledge and capital, energy and organization, introduced as much as possible by private enterprise, are necessary to improve the old and develop new methods in such wise as to ensure that the present catches shall all be turned into wholesome food; that these catches shall be gradually augmented, as the fisher folk show capacity to deal with them, so as to assist in feeding a growing population; that fish which for any good reason cannot be turned into direct food shall, after the expression of their oil, be turned into high class fertiliser for the benefit of *Indian* soil; that fish waste shall be utilised to the utmost possible extent; and that these developments shall be carried out as far as possible through and for the benefit of the existing fisher folk and

curers, and by means, on the Government side, of a carefully devised general and technical education—and other assistance—in which demonstration through experimental stations, fixed and peripatetic, shall play a chief part. (*Ibid*, p. 76.)

185. The whole of this mass of food and fertiliser would be pure gain to the country and especially to the working classes, while various by industries, which there has been no space to discuss, would accompany the development; such industries are those which relate to boat building, machinery, the pressing and refining of edible vegetable oils, the production of vinegar, pottery, refrigeration, co-opering, pearl button making, tin plate working, etc., to say nothing of increased traffic and business dealings. (*Ibid*, pp. 76-77.)
186. The best thing would be to employ country fishermen to fish those tracts (far off tracts) and bring the fish in motor boats fitted with refrigerators. Moreover these motor boats can take provisions, water and other necessaries to the tracts for the fishermen when going on their outward journey. The number of such carrying boats should be large enough to bring sufficient fish daily for all the chief markets. It has been determined conclusively by experimental fishing in the more distant uninhabitable tracts of Sunderbans and those near the seaface that the fishing possibilities and the yields are more than the demand. Now if a Company be floated to work the fisheries in these tracts on the lines sketched out above, it is bound to be very profitable with good business returns and at the same time the scarcity of the fish will be greatly removed. (*Mr. S. N. Das*, p. 143).
187. It should be remembered as pointed in the case of fresh water fishculture, that when the fish grow in

size, some of them must be removed for the healthy growth of the rest. Then it comes to the thing that also some revenue is derivable from the arrangement for helping the growth of the fish which does not entail any expense at all beyond catching the fish for market. (*Ibid*, p. 144.)

188. I may note that to run a commercial fishing concern in the Bay it is necessary that a fleet of at best 5 trawlers should work together and the catches brought to Calcutta daily on motor boats of small draft fitted with refrigerators from the seaface. (*Ibid*, p. 147.)
189. It would be more profitable in that case to convert these coarse fish into manure. The livers can be submitted to some peculiar operations to extract oil. The sounds can be made into isinglass so it appears essential that a factory should be established to have the by-products of fish in order to make a fishing concern commercially successful. It may also happen that the supply of fish is far greater than the demand. Such being the case, it is also desirable to have a curing yard established along with the trawling business so that instead of selling the fish at a very low prices, it would be more profitable to "save the life" of the surplus fish by salting, smoking, canning, and to keep them for bad season or export them to different places where there is a demand for such fish. (*Ibid*, p. 147.)
190. The offals of the fish, their heads and the fins, &c. which are separated before curing the fish, may be profitably converted into powdered manure. (*Ibid*, p. 147.)

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